Mission Expansion/Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan

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Final Environmental Impact Statement

National Guard Bureau
and
Michigan Department of Military Affairs

June 1994

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To meet the needs of the restructured Army, staff at the Camp Grayling Army National Guard Training Site proposed implementing three Master Plan projects. Included in this proposed action are the construction of two logistic support facilities, and a state-of-the-art armor training facility, the Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R). An Environmental Impact Statement (EIS) was prepared to assess the impacts of these construction projects.

This Final EIS was filed with the Environmental Protection Agency in June 1994. The Record of Decision issued in August 1994 selected to implement all three installation Master Plan projects as proposed.

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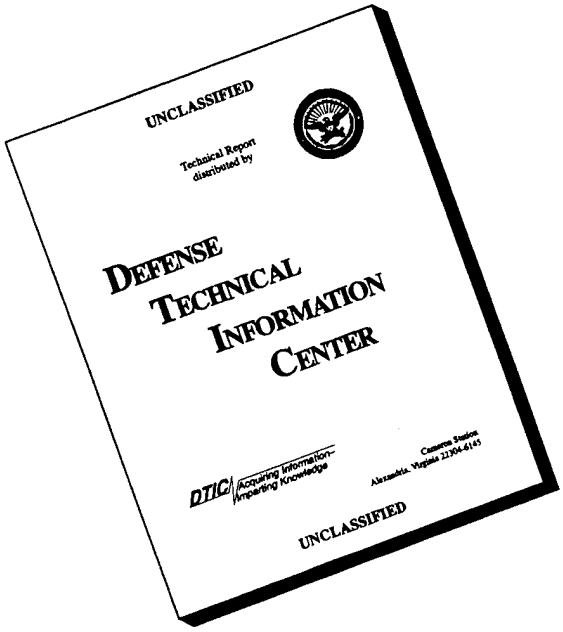

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Mission Expansion/Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan

by
Manroop K. Chawla
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Randolph D. Norris
LTC Tim Everett

In response to everchanging global security requirements, the U.S. National Command Authority is reorganizing its force structure throughout the world. National defense planners are proposing to reduce, over the next several years, the overall military forces of the United States. As the number of Active Component soldiers and airmen decreases, the importance of Reserve Component soldiers and airmen to the overall defense of the nation increases.

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Foreword

This report was prepared for the Michigan National Guard Bureau and the Michigan Department of Military Affairs (DMA) with funding through the Michigan DMA under military interdepartmental purchase requests (MIPRs) 448S2006500274, dated 29 September 1992, and 448S2006594144, dated 24 May 1994, and through the U.S. Army Engineer District, Detroit under MIPRs CENCE-IA-94-013, dated 16 November 1993, and CENCE-IA-94-0036, dated 3 March 1994, "Preparation of Camp Grayling Final Environmental Impact Statement."

The work was performed by the former Environmental Resources (ENR) Team of the Environmental Division (EN), now the Natural Resource Assessment and Management Division (LL-N) of the Land Management Laboratory (CECER-LL), U.S. Army Construction Engineering Research Laboratories (USACERL). The principal investigator was Manroop Chawla (LL-N). Dr. David Tazik is Acting Division Chief, LL-N, and William Goran is Chief, CECER-LL.

LTC David J. Rehbein is Commander and Acting Director, USACERL, and Dr. Michael J. O'Connor is Technical Director.

The authors would like to thank Dr. David Price, team leader of the ENR Team, for his valuable guidance and assistance thoughout the project. The authors also wish to acknowledge the significant contributions made to the Final EIS by Dr. Harold Balbach, Bruce Dickson, Steve Foley, and Patricia Kirby of USACERL; the development of Geographic Information System analyses and figures by Robert Feeney of USACERL and Carla Elenz of the Michigan DMA; and extensive support in reviewing, revising, and supplementing the Final EIS by Greg Huntington, John Hunt, Larry Jacobs, Andrea Sikkenga, and numerous other officers, enlisted personnel, and civilian employees of the Army National Guard Bureau, USACERL, and Camp Grayling. In Chapter 7 of the EIS, the names and contributions of participants in the EIS data collection, research, and writing process are described in greater detail. Without the assistance of these individuals, and others unnamed, successful completion of the project would not have been possible.

Cover Sheet
Final Environmental Impact Statement

Lead Agency: Michigan Department of Military Affairs

Title of Proposed Action: Mission Expansion/Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan

EIS Status: Final Environmental Impact Statement

Affected Jurisdictions: Camp Grayling and Crawford, Otsego, and Kalkaska Counties, Michigan

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Abstract:

In response to everchanging global security requirements, the United States National Command Authority is reorganizing its force structure throughout the world. Currently, National defense planners are planning to reduce, over the next several years, the overall military forces of the United States. As the number of Active Component soldiers and airmen decreases, the importance of Reserve Component soldiers and airmen to the overall defense of the nation increases. This Final Environmental Impact Statement (FEIS) analyzes two construction alternatives and the No Action Alternative. The implementation of any of the alternatives with on-going and proposed mitigation measures, including full implementation of the Integrated Training Area Management (ITAM) program, can be carried out with minimal impact to the environment.

June 1994

Final
Environmental Impact Statement
Mission Expansion/Multiple Construction:
Camp Grayling Army National Guard
Training Site, Michigan

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Lewis D. Walker
Deputy Assistant Secretary of the Army
(Environmental, Safety, and Occupational Health)

June 1994

EXECUTIVE SUMMARY

Proposed Action

The "Action" proposed is the implementation of Camp Grayling, Michigan Installation Master Plan projects. Included in this proposed action are the construction of two logistic support facilities, as well as the construction of a state-of-the art armor training facility, the Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R).

Background and Need for the Action

This Environmental Impact Statement (EIS) examines the environmental impacts of Master Plan construction projects at Camp Grayling, Michigan. Military activities at Camp Grayling are sanctioned by the original Hanson land grant, leases in perpetuity, 20-year leases, and the State Military Board for state-owned lands. This EIS considers three alternatives, examined by the proponent, the Michigan Department of Military Affairs (DMA). The Department of the Army/National Guard Bureau and Michigan Department of Military Affairs will utilize this document in their decisions regarding Camp Grayling. The Department of the Army will utilize this EIS to verify their selected alternative in the Record of Decision (ROD). This decision will support a commitment of manpower and resources for continued operations and training at Camp Grayling.

This EIS has been prepared pursuant to the requirements of PL 91-190, 40 CFR 1500-1508 and Army Regulation 200-2 to examine the environmental impacts of implementing the Installation Master Plan projects at Camp Grayling. The Department's preferred alternative is to implement the current Master plan by constructing support facilities and by building the MPRC-H-R.

This Study was prepared by the U.S. Army Corps of Engineers, Construction Engineering Research Laboratories (USACERL), Environmental Sustainment Laboratory, under the management of U.S. Army Corps of Engineers, Detroit District. The Michigan Department of Military Affairs provided several technical experts to the interdisciplinary team which prepared this EIS.

Draft Camp Grayling Environmental Impact Statement

A Draft Environmental Impact Statement (DEIS) was prepared in 1989 by Eugene A. Hickok and Associates for twenty proposed construction and renovation projects. Of those proposed projects, two support facility proposals and the construction of the MPRC-H-R remain viable and are evaluated in the current document. The rest of the projects have been completed under other environmental documentation or have been canceled or otherwise deleted from the current Installation Master Plan.

Summary of Changes Between the DEIS and FEIS

The DEIS was released to the public for comment in March 1989. The closing date for public comments was July 31, 1989. Input on the DEIS was received from agencies, organizations, and individuals. Several changes were made in the FEIS in response to public input, in the interest of clarity, and to conform to the requirements of Army Regulation 200-2. The more important changes are highlighted below:

The following projects have been completed under separate environmental documentation and are not considered in this EIS: (1) Repair/Replace Wastewater Treatment Facility, (2) South Access Road, Phase II, (3) Civilian and Administrative Vehicle Parking, (4) Reconstruct Roads and Tank Trails.

Several projects are no longer included in the Installation Master Plan and therefore have been dropped from further consideration in this document: (1) Installation Command Headquarters, (2) Installation Maintenance, (3) Rail Sidings, (4) Ammunition Supply Point and Logistical Support Facility Railroad, (5) Parachute Rigging Facility, (6) Troop Command Housing, (7) Assault Landing Strip, (8) Assignment of New Aviation Units, and (9) New Lanes Training.

The following projects are no longer included in the current Installation Master Plan due to funding constraints and are not considered in this FEIS. If these projects are added to the Master Plan later, separate environmental review will be required. These projects are: (1) Grayling Army Airfield Housing, (2) Field Grade BOQ, (3) Battalion Supply Buildings, and (4) Construction projects associated with Cold Weather Training.

In response to the public comments, additional studies and research were performed. The results have been included in the analysis of impacts. Where possible, updated information pertaining to a description of the baseline environment has been incorporated.

The FEIS is a re-structured version of the original DEIS. Re-structuring was done to make the document more understandable, to reflect changes in the alternatives, and to adhere more closely with the EIS format set forth in Army Regulation 200-2.

Table ES-1
Summary of Master Plan Actions

Action	Proposed in DEIS	Considered in DEIS	Cancelled	Completed	Programmed in Master Plan	Analyzed in FEIS
1) Wastewater Treatment Facility	●	●		●		
2) Installation Command Headquarters	●	●	●			
3) Grayling Army Airfield Housing	●	●				
4) MATES Vehicle Storage Buildings	●	●			●	●
5) Field Grade BOQ	●	●				
6) South Access Road, Phase II	●	●		●		
7) Battalion Supply Buildings	●	●				
8) Civilian/Administrative Parking	●	●		●		
9) Installation Maintenance	●	●	●			
10) Rail Siding	●	●	●			
11) ASP/Logistic Support Railroad	●	●	●			
12) Parachute Rigging Facility	●	●	●			
13) Troop Command Housing	●	●	●			
14) Bulk Fuel Dispensing Facility	●	●			●	●
15) Roads and Tank Trails	●	●		●		
16) Multi-Purpose Range Complex	●	●			●	●
17) Assault Landing Strip	●	●	●			
18) Cold Weather Training	●	●				
19) Assignment of New Aviation Units	●	●	●			
20) New Lanes Training	●	●				

Reference: Table 1-1 (Current Status of Originally Proposed Actions [Draft EIS, March 1989])

Description of the Alternatives

The EIS discusses three alternatives for implementing the Master Plan for Camp Grayling.

Alternative 1 - Implement Master Plan Projects as Proposed - the Preferred Alternative

- Construct MATES Vehicle Storage Buildings.
- Construct Bulk Fuel Dispensing Facility.
- Construct a Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R).

Alternative 2 - Implement Master Plan Projects at Different Locations

- Construct MATES Vehicle Storage Buildings at Different Location at Camp Grayling.
- Construct Bulk Fuel Facility at Different Location at Camp Grayling.
- Do Not Construct MPRC at Camp Grayling; Train at MPRC Out-of-State.

Alternative 3 - Do Not Implement Master Plan Projects - No Action

- Do Not Construct MATES Vehicle Storage Buildings.
- Do Not Construct Bulk Fuel Facility.
- Do Not Construct MPRC; Continue to Train at Camp Grayling with current facilities.

During the development of the EIS, a range of alternatives were considered. As the analysis evolved, many alternatives were eliminated from detailed evaluation for mission related, environmental, or economic reasons.

Preferred Alternative

The Michigan Department of Military Affairs has identified a preferred alternative in the Final Environmental Impact Statement in accordance with 40 CFR 1502.14(e) and Army Regulation 200-2. The preferred alternative is Alternative 1 - Implement Master Plan Projects as Proposed, which best meets the present readiness requirements of the approximately 165 units which typically train at Camp Grayling.

Environmental Consequences

The primary environmental impacts of implementing the Installation Master Plan projects at Camp Grayling occur on vegetation and soils. Because of the close relationship between vegetation, soils, and water resources, these primary impacts then may induce secondary impacts on water resources. However, some impacts resulting from implementing proposed Master Plan projects (under Alternative 1) are anticipated to be beneficial. Better protection of water resources should result from construction of the Bulk Fuel Facility (BFF) since this project represents improvements over the existing facility. The proposed BFF will be located farther from surface and groundwaters and will be a safer facility than its predecessor. The MATES vehicle storage building (MVSB) will provide equipment storage on concrete floors, precluding leaks and spills to the environment.

The MPRC-H-R, because of its well-defined lanes of travel, is expected to reduce site-specific impacts to soils and vegetation at the proposed site on the Range 30 complex. The preferred alternative has some potential for short-term disturbance of vegetation and soils. Due to soil disturbance and excavation, all projects have the potential to increase erosion during the construction phase. Vegetation will be disturbed, although quite minimally, as a result of the construction of the MATES vehicle storage buildings, and the bulk fuel facility. No change is expected after construction of these projects is complete. Presently, damaged maneuver training areas are rehabilitated, with the exception of those areas that are continuously disturbed due to a specific type of training, and are not near water resources, or do not have the potential to impact off-post fugitive dust. With the full implementation of the Integrated Training Area Management (ITAM) program (refer to Section 3.5.1), areas needing repair will continue to be rehabilitated within a specified time frame. Camp Grayling and the Army National Guard have implemented the ITAM program, which is believed to be capable of managing predicted effects.

Construction of the MPRC-H-R will involve clearing approximately 25 acres of woods. Wildlife would be displaced by the clearing. Management and protection of threatened and endangered species occurring on Camp Grayling will continue to be coordinated with the U.S. Fish and Wildlife Service and the Michigan Department of Natural Resources (DNR) regardless of which alternative is implemented. No significant impacts to these species are anticipated because mandated management guidelines and habitat protection practices will be followed.

The construction activities would result in minor short term noise impacts related to construction. No new short or long term noise impacts are anticipated following construction. Operation of the MPRC-H-R is expected to, on an average, slightly reduce noise impacts from the level produced by use of the current tank range.

Under any of the three alternatives, employment would remain stable at Camp Grayling. The number of troops using the Post are not expected to change, and staff and expenses related to training and operations and maintenance will remain stable.

The socioeconomic impact of Camp Grayling funds flowing into the communities comprising the economic effects area is significant. The Post's total operating budget for 1993 was $21.7 million, of which $5.5 million is calculated to be directed to the local Crawford, Kalkaska, and Otsego counties area. In the three county area, Camp Grayling generates $19.3 million of the retail, wholesale and service sales; directly supports 443 jobs and indirectly supports 96 jobs; and supplies $11.8 million of personal income.

Conclusions

As the number of soldiers and airmen in Active status decreases, the importance of Reserve component soldiers and airmen to the overall defense of the nation will increase. Increased reliance on the combat readiness of Reserve components is expected to continue. Combat readiness can only be attained with the best training facilities the country can provide. Camp Grayling's unique characteristics of location, size, and natural environment offer the state and nation a premier military training facility whose importance to the National defense posture will only increase.

The implementation of the preferred alternative with on-going and proposed mitigation measures, including full implementation of the Integrated Training Area Management (ITAM) program, can be carried out with minimal impact to the environment.

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Chapter 1
PURPOSE, NEED, and SCOPE

1.1 Purpose of and Need for Action

1.1.1 Purpose

The purpose of this action is to implement Installation Master Plan projects at Camp Grayling, Michigan. This will enable the Michigan Department of Military Affairs (DMA) to assist in sustaining quality military training.

The purpose of this document is to evaluate and analyze the proposed projects to ensure the best alternative action is taken.

Within the next several years, a number of facilities at Camp Grayling will require renovating, replacement, or their operational capabilities improved in accordance with the Installation Master Plan to meet future needs of the military users of Camp Grayling. The final composition of these Master Plan projects awaits detailed environmental evaluation in order to form the basis for the Adjutant General's final determination of future activities.

> *An installation master plan is a representation, in both graphic and narrative form, which depicts an installation as it could exist five years in the future. It is based partly on known data and partly on valid assumptions concerning the future. It is primarily a planning vehicle for state level staffs, but also serves as a basis for National Guard Bureau review for conformance to policy, regulations, etc. Approval of the master plan does not signify approval of any specific project.*
>
> Source: (National Guard Regulation (AR) 415-5, Military Construction Army National Guard (MCARNG) Project Development, 30 November 1990).

The purpose of the Camp Grayling Master Plan is to state the long range mission of the Camp, to establish long range planning goals, and to insure that Federal funds are expended in the most economical manner to obtain the most efficient use of land and facilities. The Camp Grayling Master Plan is available upon request from either the Camp Grayling Environmental Office, or DMA headquarters in Lansing, Michigan.

1.1.2 Missions of Camp Grayling

Camp Grayling is a State owned, State operated installation currently assigned a series of missions:

(1) Provide a major year-round training facility for the National Guard, as well as Active Component and U.S. Army Reserve (USAR) troops.

(2) Provide, operate, maintain, and control facilities and equipment that support the pre-mobilization training of military forces of the United States.

(3) Provide ranges for individual and crew served weapons to include tank main gun, artillery, attack helicopters, and Air Force tactical aircraft (e.g., F16, A10, C130).

(4) Provide non firing tactical maneuver areas for armor, armored cavalry, infantry, mechanized infantry, artillery, engineer, military police, signal, medical, aviation, and other troop units.

(5) Provide specialized training areas for air assault, engineer demolitions, bridging, and military prisoner of war camp operations.

(6) Provide a winter training site for Active and Reserve Component forces with training missions in cold weather operations and winter warfare.

(7) Provide limited operational and ground control services to Army aviation units at the Grayling Army Airfield.

(8) Provide a facility for civil disturbance training for National Guard units with civil disturbance street missions.

(9) Provide site logistical support as required by units conducting training at the facility.

(10) Provide fixed facilities for unit administration and supply, troop housing, dining facilities, and Bachelor Officer Quarters (BOQs).

(11) Provide organizational maintenance support through a Mobilization and Training Equipment Site (MATES) facility.

(12) Maximize the opportunity for all units to achieve their combat readiness requirements and minimize the necessary administrative and logistical requirements to attain training goals.

(13) Be prepared to provide, operate, maintain, and control facilities and equipment that support the Post mobilization training of military forces of the United States during partial or full mobilization.

(14) Provide training support for civil defense and public educational institutions that do not interfere with military training.

1.1.3 Need

In response to everchanging global security requirements, the United States National Command Authority is reorganizing its force structure throughout the world. Currently, National defense planners are proposing to reduce, over the next several years, the overall military forces of the United States. As the number of Active Component soldiers and airmen decreases, the importance of Reserve Component soldiers and airmen to the overall defense of the nation increases.

As a result of the adoption of the "Total Force" National military policy by the United States at the end of the national military draft era in 1973, reliance upon the Reserve Components of the U.S. military establishment has risen dramatically. The recent Gulf War highlighted this reliance as the Michigan National Guard mobilized and deployed 1,500 soldiers and airmen in 13 units worldwide within the time and readiness standards set by the National Command Authority.

Greatly increased reliance on the combat readiness of the Reserve Components is expected to be the norm at the turn of the century. Combat readiness can only be attained with the best training facilities the country can provide.

Camp Grayling is one of those training facilities. Its complex characteristics of location, size, and natural environment offer the state and nation a unique military training facility. The key in continuing to provide this critical training resource to the nation in the future lies in the best possible management of the Camp's resources.

The Federal Government, because of the national importance placed upon the Federal mission assigned Camp Grayling, pays almost all the costs associated with operating and maintaining the Camp.

State and Federal agencies will utilize this EIS in their decisions concerning Camp Grayling, Michigan. The State of Michigan's Department of Military Affairs (DMA) and the National Guard Bureau (NGB), located in the Pentagon, Washington D.C., will utilize this EIS to verify, in the Record of Decision (ROD), selected alternatives and commitment of manpower and resources to support military related activities at Camp Grayling, Michigan.

1.2 Scope and Background of EIS

1.2.1 Scope

This Environmental Impact Statement (EIS) analyzes the effects of implementing current Installation Master Plan projects. This EIS describes the environmental and socioeconomic effects of construction and operations in the Camp Grayling area. The study area is Crawford, Otsego, and Kalkaska counties.

This EIS is being prepared pursuant to the requirements of the National Environmental Policy Act (NEPA) - 42 U.S.C. Sections 4321 et seq., 40 CFR Sections 1500-1508 and AR 200-2.

1.2.2 Background

The Draft EIS (DEIS), issued in March 1989, outlined a number of Master Plan construction, renovation, and training projects that were to be examined for potential environmental impacts. A summary of the current status of each of these projects is shown in Table 1-1.

1.2.3 Public Involvement

Concerns pertaining to implementation of Camp Grayling's Master Plan were identified through the EIS scoping process conducted in accordance with 40 CFR 1500 and Michigan Department of Natural Resources (DNR) Commission policy for preparation and review of EIS documents. On July 29, 1986, a table describing the EIS procedure for the Camp Grayling EIS was submitted to the Michigan Environmental Review Board for comment. It was subsequently approved.

A Notice of Intent (NOI) to prepare this joint State/Federal EIS for Camp Grayling's Master Plan was published in the Federal Register July 22, 1986. State notice was provided in the Michigan Environmental Review Board "Status Report." A preliminary scoping document for the EIS was prepared and notice for the public scoping meeting was announced in the local papers serving Kalkaska, Crawford, and Otsego Counties. Preliminary scoping documents were displayed at the Grayling Public Library, Camp Grayling Commander's office, and mailed to those contacting the DMA.

1.2.4 Scoping Issues Summary

A public scoping meeting was held at Camp Grayling on September 4, 1986. Approximately 20 public and/or agency persons attended. The scoping document was distributed to those attending. The concerns expressed at the public meeting and during the 17-day comment period that followed are summarized below:

- Vibrations at homes in the Guthrie Lakes area from increased artillery fire.

- More military troops and vehicles straying onto private property and roads (along Highway 612 and in the Guthrie Lakes area).
- Increased noise from helicopters (in private lands along Highway 612 and in the Guthrie Lakes area).
- Increased noise or vibrations from night firing at the tank Range 30 complex (along Jones Lake Road north of the tank range and near the junction of the Stephan Bridge Road and North Down River Road).
- Cracks in driveway and basement walls from increased vibrations due to artillery activity on Range 40 (in the Guthrie Lakes area).
- Maintenance problems of snowmobile or all terrain vehicles (ATV) trails within the Camp Grayling lands due to proposed training.
- Potential harm to wildlife from training activities.
- Potential damage to migratory birds from fixed wing activities at the Post.
- Potential spills from storage facilities.
- Sedimentation to area lakes or streams from eroding roads and trails.
- Potential impacts to resources due to firing activities at Range 40.

Several agencies also submitted comments as part of the scoping process in response to previous agency coordination or notices of the scoping process. The U.S. Fish and Wildlife Service (USFWS) referenced technical assistance comments provided in August 1986 regarding general concerns for fish and wildlife and threatened and endangered species. The Michigan Bureau of History indicated that the Officers' Open Mess is listed on the State Register and that further comments would be forthcoming upon availability of the current cultural resource survey.

The Community Assistance Division of the Michigan DNR furnished comments compiled from the Forest Management Division, the Engineering-Water Management Division, Floodplain Control Unit, the Geological Survey Division, the Land Resource Programs Division, the Wildlife Division, and the Air Quality Division.

These comments included concerns about the effects of increased activities on recreational use on surrounding lands, effects on timber production, effects on wildlife habitat, construction in the floodplain of a river or stream, endangered species, unique and sensitive natural areas, archeological and historical sites, dedicated wilderness or natural areas, wetlands, erosion and sedimentation control permits, construction affecting wetlands or lakes, effects on dedicated farmlands or open spaces, hydrocarbon emissions from fuel storage facilities and fugitive dust generated during construction or trail use.

1.2.5 Public Review of Draft EIS

A Draft Environmental Impact Statement (DEIS) was prepared in 1989 by Eugene A. Hickok and Associates for twenty proposed construction and renovation projects. Of those proposed projects, two support facility proposals and the construction of the Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R) remain viable and are evaluated in the current document. The rest of the projects have been completed under other environmental documentation or have been canceled or otherwise deleted from the current Installation Master Plan (see Table 1-1).

Approximately 600 comments, both written and verbal (including comments from the meeting transcripts), were received during the public comment period. The full text of comments received and their responses is presented in Appendix M of this EIS.

No comments were received which specifically identified concerns related to the following actions:

- C7 - South Access Road Phase II
- C8 - Battalion Supply Buildings
- C9 - Civilian and Administrative Vehicle Parking
- C10 - Installation Maintenance
- C13 - Parachute Rig Facility
- C14 - Troop Command Housing

Two comments or less were received regarding the following projects:

- C2 - Installation Command Headquarters
- C6 - Field Grade BOQ
- C11 - Rail Sidings
- T1 - Road and Tank Trails

The DEIS was approved for release in March of 1989. Notice of Availability (NOA) was provided via the April 21, 1989 Federal Register. The DEIS was delivered to the State environmental review staff on April 21, 1989, and the local papers serving Crawford, Kalkaska and Otsego counties received it on May 11, 1989. The public comment period extended from April 21, 1989 through July 31, 1989. Public hearings were held May 17, 1989 at the Grayling High School, June 13, 1989 at the Kalkaska High School and July 22, 1989 at the Grayling High School.

Three actions accounted for approximately 70 percent of the project-specific comments:

- T2 - Multi-Purpose Range Complex-Heavy (MPRC-H)
- T3 - Assault Landing Strip
- Cold Weather Training

Table 1-1
Current Status of Originally Proposed Actions (DEIS, March 1989)

Action	Description/Purpose	Current Status
C1 - Repair/Replace Wastewater Treatment Facility	Construct a new 1.1 MGD spray-type land application wastewater treatment facility with an annual capacity of 75 million gallons; upgrade sanitary sewer system.	Proposed & considered in DEIS; completed in 1991 under a Final Order of Abatement issued by the DNR.
C2 - Installation Command Headquarters	Build a new installation command headquarters to replace Building 110R.	Proposed & considered in DEIS; project canceled & eliminated from Master Plan & FEIS.
C4 - Grayling Army Airfield Housing	Construct barracks facilities at Grayling Army Airfield consisting of five 100-person barracks, two 100-person mess/administration buildings, two 200-person BOQ's, two battalion headquarters, and two support facilities.	Proposed & considered in DEIS; project not programmed due to funding constraints; not considered in this FEIS; if and when programmed will require separate environmental review.
C5 - MATES Vehicle Storage Buildings	Construct two buildings, one 23,000 square feet and one 48,000 square feet, at the new MATES for storage of assigned vehicles.	Proposed & considered in DEIS; considered in this FEIS.
C6 - Field Grade BOQ	Construct one 12,000 sq. ft. BOQ on cantonment area. Note: has been changed to three 4,000 sq. ft. buildings.	Proposed & considered in DEIS; project not programmed due to funding constraints; not considered this FEIS; if and when programmed will require separate environmental review.
C7 - South Access Road, Phase II	Pave the existing dirt south access road.	Proposed & considered in DEIS; completed in 1991 to help correct erosion and fugitive dust control issues. Record of Environmental Consideration filed.
C8 - Battalion Supply Buildings	Construct 15 battalion supply buildings, each approximately 1,200 square feet, around the cantonment area along the main convoy routes.	Proposed & considered in DEIS; project not programmed due to funding constraints; not considered in this FEIS; if and when programmed will require separate environmental review.

Table 1-1
Current Status of Originally Proposed Actions (DEIS, March 1989)

Action	Description/Purpose	Current Status
C9 - Civilian and Administrative Vehicle Parking	Construct several motor parks, 50-100 spaces each, surfaced with aggregate hardstand.	Proposed & considered in DEIS; completed in 1992 to help correct erosion and fugitive dust control issues. Record of Environmental Consideration filed.
C10 - Installation Maintenance	Construct a new vehicle maintenance facility south of the Armory.	Proposed & considered in DEIS; project canceled and eliminated from Master Plan & FEIS.
C11 - Rail Sidings	Construct a rail dock and 400 yards of railroad track laid out in seven parallel railroad spurs on the southwest side of the airfield, adjacent to the main rail line.	Proposed & considered in DEIS; project canceled and eliminated from Master Plan & FEIS.
C12 - Ammunition Supply Point & Logistical Support Facility Railroad	Construct a five-mile rail line from the Detroit Mackinac line west to the cantonment area and the Ammunition Supply Point.	Proposed & considered in DEIS; project canceled and eliminated from Master Plan & FEIS.
C13 - Parachute Rigging Facility	Construct a parachute rigging facility at the Grayling Army Airfield.	Proposed & considered in DEIS; project canceled and eliminated from Master Plan & FEIS.
C14 - Troop Command Housing	Construct troop command housing adjacent to Building 103.	Proposed & considered in DEIS; project canceled and eliminated from Master Plan & FEIS.
C15 - Bulk Fuel Dispensing Facility	Replace existing bulk fuel dispensing/storage facility at the Grayling Army Airfield with new dispensing/storage facility of 100,000-150,000 gallon capacity. New facility planned for southwest corner of cantonment area, adjacent to south access road.	Proposed & considered in DEIS; considered in this FEIS.
T1 - Roads and Tank Trails	Reconstruct certain roads and tank trails throughout the Camp.	Proposed & considered in DEIS; project are maintenance related; completed for erosion control, fugitive dust control, and emergency vehicle access.

Table 1-1
Current Status of Originally Proposed Actions (DEIS, March 1989)

Action	Description/Purpose	Current Status
T2 - Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R)	Construct a three-lane, six trail, Multi-Purpose Range Complex to upgrade and replace existing tank and armored personnel carrier gunnery ranges.	Proposed & considered in DEIS; project has been downsized and renamed Multi-Purpose Range Complex-Heavy-Reduced; Considered in this FEIS.
T3 - Assault Landing Strip	Construct an assault landing strip in the South Post area, nine miles southwest of the cantonment area, to accommodate joint military service training with C-130 aircraft.	Proposed & considered in DEIS; project canceled and eliminated from the Master Plan & FEIS.
Cold Weather Training	Construction/upgrade of the necessary facilities to support cold weather training activities of approximately 4,000 troops simultaneously and the conduct of related training activities.	Proposed & considered in DEIS; training action canceled per updated training philosophy; construction projects not programmed due to funding constraints; not considered in this FEIS; when programmed will require separate environmental review.
Assignment of New Aviation Units	Two helicopter units (then new to the Michigan Army National Guard force structure) would be permanently assigned to the Camp.	Proposed & considered in DEIS; force structure action canceled and eliminated from Master Plan & FEIS.
New Lanes Training	Implementation of a more developed "lanes" application of an existing training practice.	No longer included in the Master Plan as a project; action is a training strategy; is addressed in this document as an on-going (current) training activity.

The most prominent issues identified relative to the MPRC-H were:

- Questions regarding the description of the action
- Concerns regarding the noise effects on wildlife and humans
- Concerns about effects on recreation and tourism
- Questions regarding the potential for increased use of a "state-of-the-art" range

Note: This action has been significantly modified from the DEIS; see current description in Chapter 2.

Issues identified relative to the proposed Assault Landing Strip included:

- Questions regarding the description of the action
- Concerns about wildlife effects
- Water quality effects related primarily to potential spills at the site
- Noise effects upon tourism

Note: This action has been canceled (i.e., it is no longer proposed).

The primary issues identified relative to cold weather/winter training included:

- Noise
- Effects upon natural resources, including vegetation and wildlife
- Effects on recreation and tourism

Note: The expansion of field winter training has been canceled (i.e., it is no longer proposed). Cold weather training at Camp Grayling (principally on weekends, during the months of October to May) continues at the same scale as it has for the past 20 years.

Summary of Changes Between the DEIS and FEIS

The DEIS was released to the public for comment in March 1989. The closing date for public comments was July 31, 1989. Input on the DEIS was received from agencies, organizations, and individuals. Several changes were made in the FEIS in response to public input, to reflect changes in alternatives, in the interest of clarity, and to more closely adhere with the EIS format set forth in Army Regulation 200-2. The following highlights the majority of these changes:

The following projects have been completed under separate environmental documentation and are not considered in this EIS: (1) Repair/Replace Wastewater Treatment Facility, (2) South Access Road, Phase II, (3) Civilian and Administrative Vehicle Parking, (4) Reconstruct Roads and Tank Trails.

The following projects are no longer included in the Installation Master Plan and therefore have been dropped from further consideration in this document: (1) Installation Command Headquarters, (2) Installation Maintenance, (3) Rail Sidings, (4) Ammunition Supply Point and Logistical Support Facility Railroad, (5) Parachute Rigging Facility, (6) Troop Command Housing, (7) Assault Landing Strip, (8) Assignment of New Aviation Units, and (9) New Lanes Training.

The following projects are no longer included in the current Installation Master Plan due to funding constraints and are not considered in this FEIS. If these projects are added to the Master Plan later, separate environmental review will be required. These projects are: (1) Grayling Army Airfield Housing, (2) Field Grade BOQ, (3)

Battalion Supply Buildings, and (4) Construction projects associated with Cold Weather Training.

In response to public comments and concerns, additional studies and research were performed. The results have been included in the analysis of impacts. Where possible, updated information pertaining to a description of the baseline environment has been incorporated.

1.3 Mission Expansion

When this EIS was originally scoped in 1986, the "Cold War" was raging across the globe and the very real possibility of a large scale air/land war was ever present. This threat formed the basis of the original concept behind the 1986 draft Installation Master Plan. Senior military leaders envisioned the need to expand the missions already being conducted at several military installations both here in the United States and abroad.

Today, however, the end of the "Cold War" (at least as we knew it in 1986-89) has caused those same senior military leaders to rethink the need to expand military missions at training sites such as Camp Grayling. Now the planning considerations are turning more and more to consolidation and sustainment of the training base built with the vast amounts of tax dollars during the "Cold War" and not expansion of it. Indeed, it is with this sustainment in mind for Camp Grayling that has led to the changes between the originally conceived EIS and this final version. Currently, renovation and replacement of facilities to support sustained military training requirements is the driving force behind long range military planning.

Although training is not anticipated to increase at this time, additional environmental documentation will be developed if the amount of training (defined as total mandays) over a 2 year training period is anticipated to exceed 10 percent of the average established by Camp Grayling usage in the last 5 training years (1989-1993). Refer to Table 3-4 for the established average.

1.4 Impact Analysis

This EIS identifies, documents, and evaluates the effects of implementing the proposed Master Plan actions upon existing resources at Camp Grayling. Chapter 2 describes the various alternatives being analyzed in the EIS.

Chapter 3, prepared by an interdisciplinary team of planners, engineers, biologists, economists, archeologists and historians, military technicians, and other technical experts, presents the current environmental and socioeconomic setting at Camp Grayling.

Chapter 4 analyzes the alternatives against baseline conditions, identifies the beneficial and adverse impacts of the alternatives, and presents planned mitigation measures.

The Army has standardized the evaluation of socioeconomic effects by using the Economic Information Forecast System (EIFS) model developed by the U.S. Army Construction Engineering Research Laboratories (USACERL). The EIFS model is described in Appendix G.

Chapter 2
ALTERNATIVES CONSIDERED

2.1 Definition of Alternative Action

The National Environmental Policy Act (NEPA) (42 U.S.C. Sections 4321 et seq.) requires all reasonable alternatives be rigorously explored and objectively evaluated. Alternatives that are eliminated from detailed study must be identified along with a brief discussion of the reasons for eliminating them.

2.2 Background/Overview

2.2.1 Background of Alternative Selection

Among the issues raised during the public review of the Draft EIS (March 1989) was the comment that the Department unreasonably limited alternatives to proposed actions. The comments generally stated the Department should consider alternate training locations, other than Camp Grayling or the Grayling area. Those comments have been addressed in this FEIS.

The proposed action involves the Master Plan construction projects required at Camp Grayling to adequately support the training needs of the military forces designated to train there. During development of alternatives for implementing the proposed action, the Department considered various combinations of mission levels and construction projects (see Table 1-1).

As stated above, the alternatives addressed in this FEIS have been modified from the DEIS to address the public's perception of the need for military training activities at Camp Grayling in light of the changing international climate; arms and forces reduction; military budget reductions, and training at other locations.

The Camp Grayling EIS does not attempt to defend National or State security policy, current or future force structure, budget expenditures, or requirements for training.

This EIS makes clear that the proposed alternative responds to a training requirement which will persist undiminished whatever the outcome of current military force structure reviews. This EIS was not intended as the forum for deciding either the future structure of the military forces of the United States or the National and State Command Authorities' budget priorities.

Factors contributing to the elimination of several potential alternatives included the increase in costs to the taxpayers associated with training on other military installations, the importance of combined arms training to the execution of the Airland Battle Doctrine, the importance of maneuver areas in close proximity to the primary users, the unpredictability of even short-term training needs, and the socioeconomic concerns of many citizens of the Grayling area if a reduction in military activities should occur at the Camp.

2.2.2 Overview of Alternatives Considered

The following alternatives are considered in this EIS:

- Alternative 1 - Implement Master Plan Projects as Proposed (Preferred Alternative)
- Alternative 2 - Implement Master Plan Projects at Different Locations
- Alternative 3 - Do Not Implement Master Plan Projects (No Action Alternative)

See Table 2-1 (Alternatives).

2.3 Alternative 1 - Implement Master Plan Projects as Proposed - Preferred Alternative

This is the preferred alternative. Under this alternative, three projects would be implemented to improve operational capabilities to meet the needs of the users of Camp Grayling.

The three projects shown in Table 2-1 are considered essential to maintain the necessary training facilities to meet the Camp's training mission requirements. These projects were included in the DEIS of March 1989. The remainder of the actions proposed in the DEIS have been either completed under separate documentation or dropped from further consideration. Tables 1-1 and 2-1 summarize each projects' draft and current status.

Table 2-1
Alternatives

Alternatives Considered	Master Plan Projects
#1 Implement Master Plan Projects as Proposed - Preferred -	1A - Construct MATES Vehicle Storage Buildings
	1B - Construct Bulk Fuel Facility
	1C - Construct Multi-Purpose Range Complex (MPRC)
#2 Implement Master Plan Projects at Different Locations	2A - Construct MATES Vehicle Storage Buildings at Different Location
	2B - Construct Bulk Fuel Facility at Different Location
	2C - Do Not Construct MPRC at Camp Grayling; Train at MPRC Out-of-State
#3 Do Not Implement Master Plan Projects - No Action -	3A - Do Not Construct MATES Vehicle Storage Buildings
	3B - Do Not Construct Bulk Fuel Facility
	3C - Do Not Construct MPRC; Continue to Train at Camp Grayling

Reference Table ES-1 (Summary of Master Plan Actions) and Table 1-1 (Current Status of Originally Proposed Actions [Draft EIS, March 1989])

2.3.1 Project 1A - Construct MATES Vehicle Storage Buildings

This project is an improvement to the Camp's current capability to store properly and maintain the heavy military equipment provided to the National Guard of Michigan, Indiana, and Ohio by the Federal Government.

When the Mobilization and Training Equipment Site (MATES) was completed in 1986, it had been built, due to funding constraints at the time, without two major vehicle storage buildings (one 23,000 square feet and one 48,000 square feet). The need for these storage buildings, however, was real in 1986, and it remains very real today. The concept behind storing expensive, complex mechanical equipment (e.g., M-1 tanks, self-propelled howitzers) out of the elements is well known to business people, especially farmers, in northern Michigan; leaving it exposed to the elements will greatly shorten its life and add dramatically to its upkeep costs.

These storage buildings (totaling 71,000 square feet) will be constructed using standard, commercial building practices at the current MATES facility (see Figure 2-1) for an estimated cost of one and a half million dollars.

The Department has tried hard in the past several years, primarily because of environmental concerns, to ensure all equipment in long-term storage is parked on some kind of "hardstand." In keeping with the design of the current storage facilities at the MATES, the two additional storage buildings will have concrete floors to prevent any accidental leakage from entering the soil.

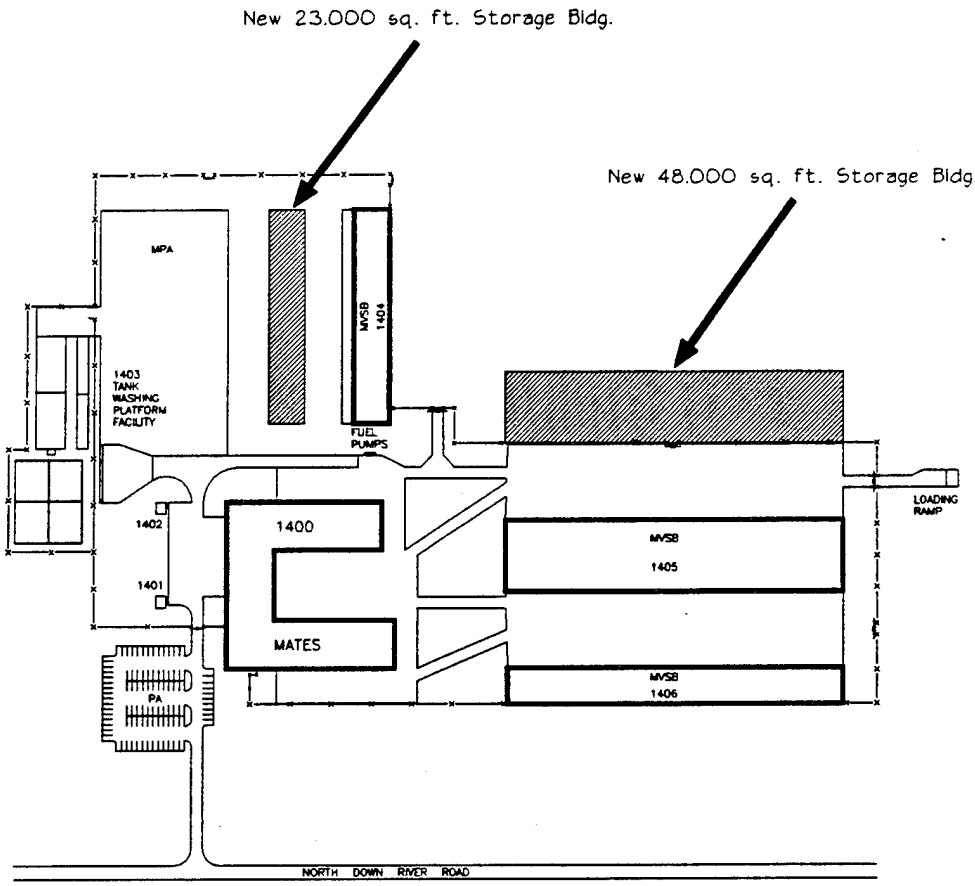
2.3.2 Project 1B - Construct Bulk Fuel Facility (BFF)

This replacement project is an improvement to the Camp's overall operational capability.

The proposed replacement of the bulk fuel dispensing/storage facility, currently located near the Grayling Army Airfield, will provide, in the cantonment area, a safer, more secure and convenient facility. The new bulk storage facility will have a capacity between 100,000 and 150,000 gallons. All tanks will be aboveground.

Under this alternative, the construction is planned for the southwest portion of the cantonment area south of the Logistical Support Facility and northwest of the Ammunition Supply Point along the South Access Road (see Figure 2-2).

This facility will be constructed using current, standard, commercial building practices and state-of-the-art secondary containment and environmental protection features for an estimated cost of approximately one million dollars.



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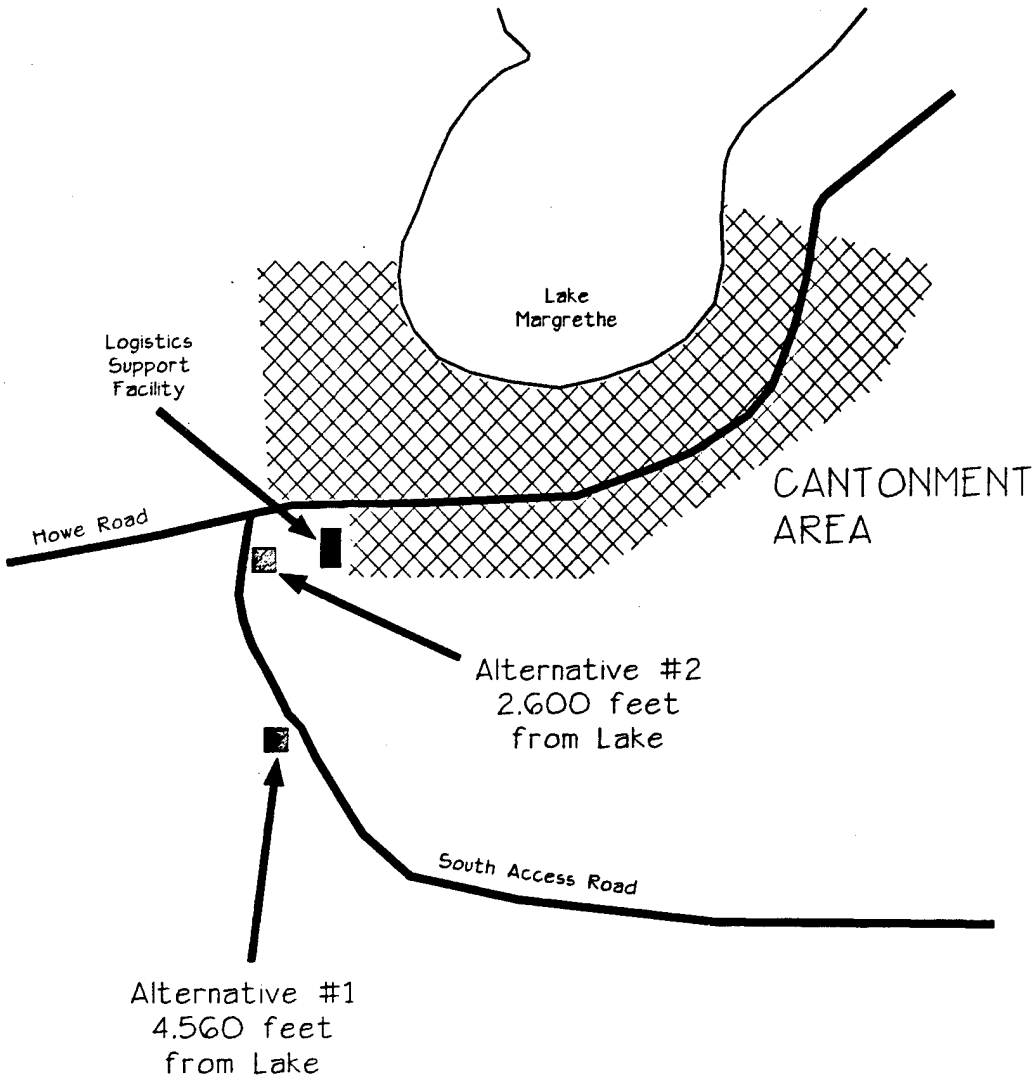
Camp Grayling FEIS	Figure 2-1
New Vehicle Storage Buildings (MATES)	



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Camp Grayling FEIS	Figure 2-2
New Bulk Fuel Facility	

2.3.3 Project 1C - Construct Multi-Purpose Range Complex (MPRC)

This project is a replacement of the following facilities:

- Range 35 (.50 Caliber & Tank Table V)
- Range 36 (Tank Table VI)
- Range 37 (Tank Tables VII & VIII)
- Range 43 (Infantry Platoon Battle Course)

2.3.3.1 Background of the Multi-Purpose Range Complex

In the late 1970s, the U.S. Army designed a new standard tank, mechanized infantry, and helicopter gunnery range complex to replace its World War II era, large caliber, direct fire ranges worldwide. Instead of building, or attempting to upgrade, three to five separate ranges with large surface safety fans to satisfy the training requirements of each type of weapon involved, a single Multi-Purpose Range Complex was developed.

In the early 1980s, the National Guard Bureau, in Washington D.C., proposed to build two such complexes; one at Gowen Field, Idaho and one at Camp Grayling, Michigan. Design work was started on the Camp Grayling MPRC in early 1984.

The MPRC was originally proposed and described in the DEIS (March 1989) as the Multi-Purpose Range Complex-Heavy (MPRC-H). The current proposal (which the Department has named a Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R)) is a down-sized MPRC-H; this was accomplished by eliminating Lane B (the center lane) from the design. This action resulted in a downsizing of the complex by approximately one-third. The primary issues identified in the DEIS public comments relative to this action included:

- Questions regarding the description of the action
- Concerns regarding the noise effects on wildlife and humans
- Concerns about effects on recreation and tourism
- Questions regarding the potential for increased use of a "state of the art" range

Much of the public comment has been focused on the perception that the MPRC constituted an expansion of the firing activities at the Camp. The Department has maintained from the beginning of the EIS process that the MPRC is a replacement of an outdated facility. Refer to Section 1.3 for discussion of mission expansion.

2.3.3.2 Purpose of the Multi-Purpose Range Complex

The purpose of the MPRC-H-R is two-fold. First, it is designed to replace a WWII era armor training range which is currently inadequate to allow training to U.S. Army standards. Second, it is designed to simulate a battlefield; its construction will allow more effective combat training of its users than will the current facilities.

The MPRC will be used by the military units traditionally training at the Camp. These units consist of one armor battalion (with 58 tank crews) and two infantry battalions (with 27 infantry squads each or 54 total) from Michigan; two armor battalions (with 58 tank crews each or 116 total) and two infantry battalions (with 27 infantry squads each or 54 total) from Ohio; one cavalry squadron (with 18 tank crews) and three infantry battalions (with 27 infantry squads each or 71 total) from Indiana. In addition, several aviation units from all three states will conduct some gunnery exercises on the MPRC; currently, they use Range 40.

The MPRC is multi-purpose in three ways: multiple weapons can be used, multiple levels of training (individual, crew, and collective) can be conducted, and multiple training scenarios can be programmed. This new type of facility has several advantages: it permits consolidated, specialized, individual training on one range; maximizes land use; reduces and consolidates construction costs; and reduces hardware and maintenance costs. Its potential disadvantage is that the more intensive land use associated with MPRC training activities can be expected to have severe impacts on land and natural resources if not carefully designed, constructed, and managed.

2.3.3.3 Placement and Design of the Multi-Purpose Range Complex

Placement Considerations

The proposed MPRC-H-R has been designed and will be constructed in accordance with the U.S. Army Corps of Engineers Design Manuals (HNDM11110-1-6 [Multi-Purpose Range Complex], 1988 and HNDM1110-1-22 [Infantry Platoon Battle Course], 1993). It will be equipped with an electronically scored target system that permits multi-training scenarios that are realistic and vital to the training and combat readiness of the armor, mechanized infantry, and attack helicopter units that train at Camp Grayling.

Although the design concept is standardized for Army-wide use, it has been site-adapted to fit Camp Grayling terrain features (i.e., targets are placed where they can be seen from firing points without requiring removal of a hill or ridge). The overall design concept of the Department has reduced, to the very minimum possible, any disturbance of either the firing locations or the target emplacements. In order to fully utilize the remote targets to be installed on this range, 12 additional targets have been added to Lane C to accommodate an Infantry Platoon Battle Course. This concept reduces land commitments for range use; since the MPRC-H-R at Camp Grayling overlies the existing Range 30 complex, no additional land (other than a slightly increased safety fan area) is involved.

The placement of the MPRC was the subject of several public comments to the DEIS. Several people advocated it be moved to somewhere else on the Camp, somewhere else in Michigan, or even moved out-of-state. The cost of moving troops away from Camp Grayling for this priority training was determined to be too expensive an alternative for the DEIS; assuming it was possible to either build a range elsewhere or use a range already built (the closest is at Fort Knox, Kentucky). The FEIS, however, has included

an alternative (Alternative 2C) which assesses the impacts to Camp Grayling of moving MPRC training activities to an out-of-state location.

The Department evaluated seven different locations on Camp Grayling before determining that the historical placement of tank maingun firing on the current Range 30 complex was (and continues to be) the only possible site. This historical and current determination was and is driven by the combination of the long gun-to-target sight lines required and the 10,000 meter-plus safety danger zone forward of each firing location.

While safety was the primary factor in determining the final placement of the range, noise was a primary factor in all potential mitigation involving the search for the final placement. The final siting of the range maximizes the Department's efforts to provide the most relief possible to residents and users of the area. Currently, the majority of tank gunnery noise is directed east into a small valley approximately 2 kilometers north of North Down River Road. Under the preferred alternative, the majority of the tank gunnery noise source is moved approximately 2 kilometers further north, 2 kilometers further east, and behind a very large hill mass. This places a large sound buffer between the majority of the residents of the area and the gunnery activity on the range which cannot be accomplished using the current range complex.

Additionally, the MPRC will be fully electronic and computerized. The Army is constantly developing gunnery training devices for all weapons systems which utilize either eye-safe lasers or sub-caliber (small explosive devices rather than full size) devices. The electronic, computerized targets on the MPRC will allow for much quieter gunnery exercises in the future as the cost of ammunition goes up and budgets for full caliber munitions remain stable or even decrease.

Design Considerations

The MPRC-H-R is designed not only to provide gunnery training for individuals and crews, but also to provide combined arms training of different types of small combat units. It also provides the capability for small dismounted (foot soldiers) infantry units (platoons and companies) to use the MPRC-H-R in a live fire exercise.

The MPRC-H-R, which encompasses 4,500 by 1,000 meters, consists of a block of land of approximately 900 acres with two nonlinear lanes that enter the complex on one end and extend roughly two-thirds of the total length of the range to turnaround locations. Tanks and other armored vehicles will exit the range at the same place they enter. More than one lane will be used concurrently, and day and night training activities will receive nearly equal priority, within the overall training day restrictions practiced at the Post (see Section 3.4.2.3.3, Noise Abatement Procedures).

The MPRC-H-R provides multiple targets, both stationary and moving, in an environment designed to simulate the battlefield. This type training under live fire conditions provides the realism necessary to improve the ability of individuals to accomplish their missions and survive during combat. Firing lanes will be guided by billboard sized panels that

direct gunners to aim within the margins of the safety fan. The firing lanes and perhaps some critical roadways will be illuminated for night maneuvers. The size of the range safety fan will change with the type of weapons being used. Because of the longer axis of the new range and the additional margin of safety needed for the many new target emplacements, the fan will be larger, by 12.5 percent (approximately 13,250 acres current and approximately 15,175 acres on MPRC), than it has been in the recent past. Although training, public access, and land management of much of the fan will be possible when coordinated with activities on the range, the off-limits area in the new fan will be larger than for the ranges the MPRC is replacing (see Figure 2-3).

The MPRC-H-R will be located entirely within the existing Range 30 complex north of North Down River Road and east of Jones Lake Road (see Figures 3-8 and 2-3). It will consolidate tank ranges 35, 36 and 37, and infantry range 43, and will contain two firing lanes and associated stationary and moving targets for small arms, armored vehicles, and helicopters. The proposed MPRC-H-R will include support facilities as well as the firing range. Support facilities include: instructional building, ammunition dock, mess shelter, two latrines, control tower, administration/storage building, and covered bleachers (see Figure 2-4).

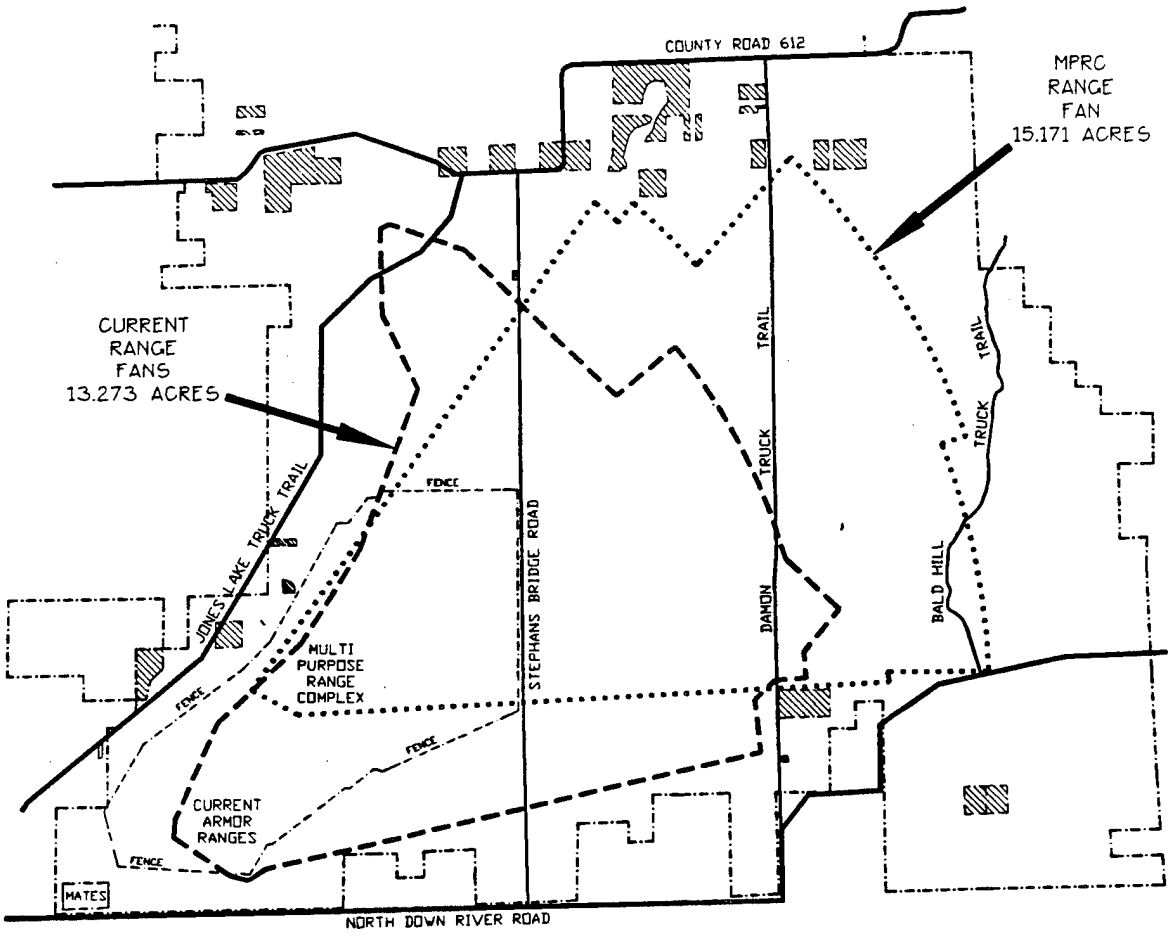
2.3.3.4 Construction of the Multi-Purpose Range Complex

The range complex will be constructed by a commercial contractor utilizing current, standard, commercial building practices, to include substantial erosion control measures, at a cost of approximately eight million dollars.

Construction of ranges in the past has often resulted in severe impacts to the environment they are placed upon. This has been due to the construction practice of cutting down all the trees, leveling the ground flat with earth moving equipment, and then building berms and structures on the bare ground.

The Department will not tolerate this practice at Camp Grayling for the construction of this range. To repeat from the design description: although the design concept is standardized for Army-wide use, it has been site-adapted to fit Camp Grayling terrain features (i.e., targets are placed where they can be seen from firing points without requiring removal of a hill or ridge). The overall design concept of the Department has reduced to the very minimum possible any disturbance of either the firing locations or the target emplacements. For example, of the 900 acres the new range will encompass, approximately 25 acres will be cleared for roads and approximately 350 acres will be disturbed, with some selective tree cutting for construction of target mechanisms.

The Department is determined to preserve the maximum number of trees currently on the site. This is being undertaken for both training realism and environmental impact reasons. The construction contractor will be penalized for exceeding the strict construction limits imposed by the designer. After the range is completed, the Department will spend considerable effort to ensure only those trees which actually



Scale: 1" = 50.000

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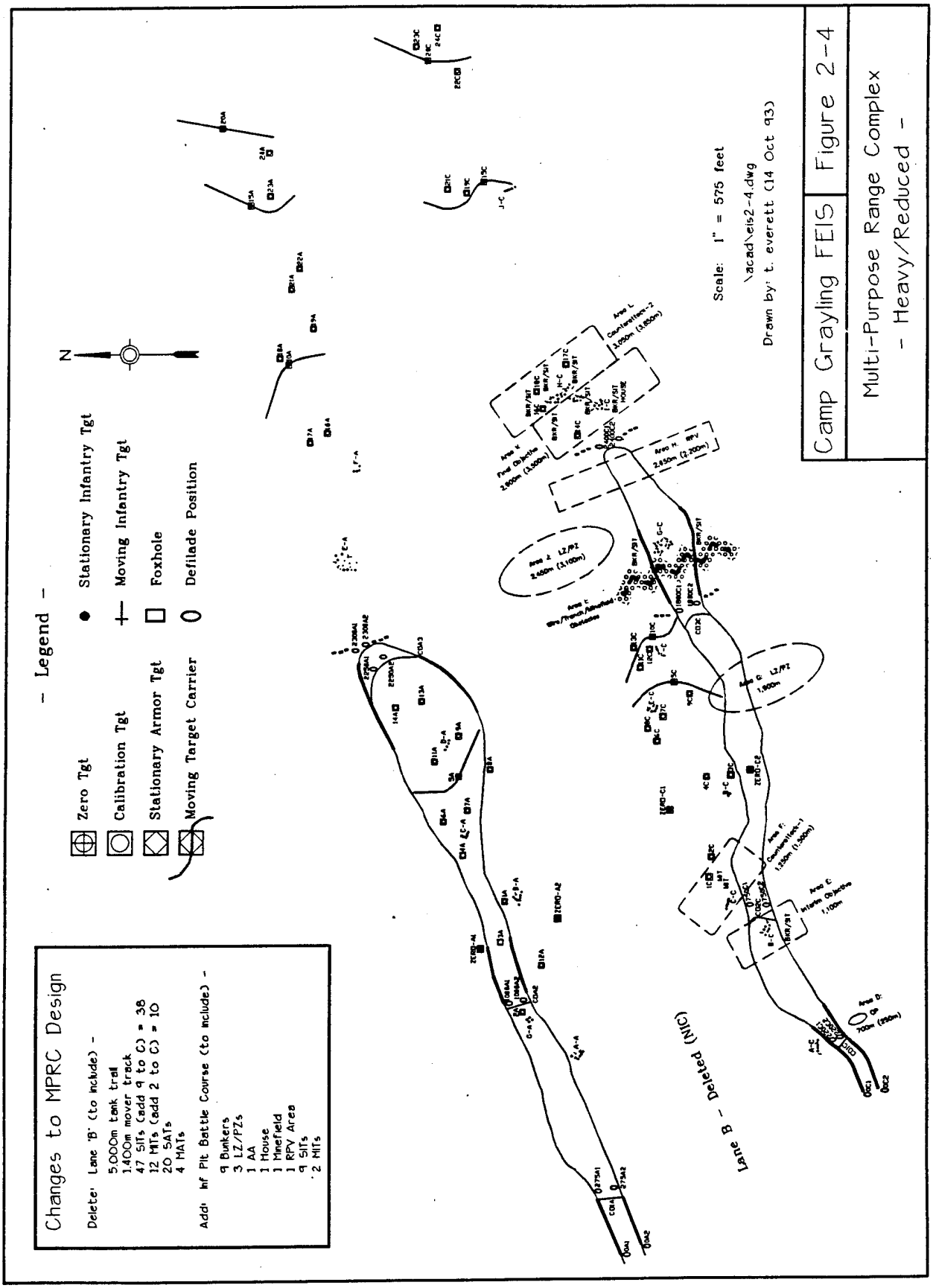
Camp Grayling FEIS	Figure 2-3
Multi-Purpose Range Complex - Heavy - Reduced Overview Map	


Camp Grayling FEIS | Figure 2-4
Multi-Purpose Range Complex
- Heavy/Reduced -
Scale: 1" = 575 feet
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Drawn by: t. everett (14 Oct 93)
- Legend -
Zero Tgt
Calibration Tgt
Stationary Armor Tgt
Moving Target Carrier
Stationary Infantry Tgt
Moving Infantry Tgt
Foxhole
Defilade Position
N
Changes to MPRC Design
Delete: Lane 'B' (to include) -
5,000m tank trail
1,400m mover track
47 SITs (add 9 to C) = 38
12 MTs (add 2 to C) = 10
20 SATs
4 MATs
Add: Inf Plt Battle Course (to include) -
9 Bunkers
3 LZ/PZs
1 AA
1 House
1 Minefield
1 RPV Area
9 SITs
2 MTs
Lane B - Deleted (NIC)

impede the user's ability to train effectively on the range are removed (and then only to the height necessary).

2.3.3.5 Managing, Monitoring, and Maintaining the Multi-Purpose Range Complex

The Department is fully committed to reduce the effects of training activities from the new MPRC. As a basis for developing a land management/maintenance plan for Camp Grayling, it has used the results of a demonstration test conducted by the U.S. Army Construction Engineer Research Laboratory at Fort Riley, Kansas (Development of Environmental Guidelines for Multipurpose Range Complexes, Volumes I and II, USACERL Technical Report N-87/02, January 1987).

Environmental Management

Since training realism and the long-term usefulness of the range are very important, management of the following environmental concerns (as discussed under ITAM) will be addressed by the Camp Grayling environmental staff and made compatible with the Department's training mission:

- Erosion control
- Maintenance or enhancement of plant cover, using native species compositions when possible
- Control or elimination of undesirable plants
- Management for wildlife benefits
- Maintaining water quality and integrity of aquatic and wetland ecosystems
- Protection of threatened and endangered (T&E) plant and/or animal species

Environmental Monitoring

Environmental monitoring will be addressed at three levels: periodic, annual, and management effectiveness.

- Periodic: Every one or two months, the facility will be surveyed visually with special emphasis on potential problem areas such as berms, culverts, drainage features, and T&E species. The objective will be to identify problems before substantial land damage occurs. This type of monitoring will be used to detect a need for maintenance in critical problem areas and would best be done by specially trained Camp Grayling personnel.

- Annual: The facility will be monitored annually to establish its overall condition. Detailed ground investigation will be done to determine the extent of any damage in areas showing changes to include T&E species. This annual monitoring will be performed prior to any scheduled maintenance so that any new requirements can be included. Monitoring will be done in-house.

- Management Effectiveness: This monitoring will validate the effectiveness of the environmental management plan. Camp Grayling will adopt a strong environmental monitoring program that provides detailed data on the environmental conditions of the range and on the effects of training activities. It will also evaluate the effectiveness of management and maintenance strategies. This program will also allow range managers to diagnose problems relating to toxicology, pathology, and mortality of plants and representative wildlife species early.

Maintenance

Maintenance is the continuous process of upkeep required to guarantee conformance of range conditions with original management planning. Particular attention will be given nonvegetated areas including continuously disturbed areas such as immediate target locations and berms, off-road vehicle turning points, and roads and associated shoulders. Attention given to vegetated areas will include replanting if necessary due to vehicle traffic, die-back of vegetation from excessive or severe burning, fuels, lubricants, or damage by animals. Lastly, fires will be allowed to burn only in the early spring (March-May). Fires will be suppressed during all other seasons, since reduction of vegetative cover could lead to unnecessary erosion. Maintenance crews will selectively trim, mow, or drag any vegetation that obscures targets, blocks vision, or causes safety hazards (e.g., at road intersections). Trees and shrubs will be replanted to maintain both the natural terrain and wildlife habitat in and adjacent to the range.

2.4 Alternative 2 - Implement Master Plan Projects at Different Locations

Alternatives were added to the FEIS to address several concerns expressed by the public during both the scoping process and the DEIS process. The major difference between this alternative and Alternative 1 is the MPRC would not be built at Camp Grayling; instead, the crews and units requiring higher level training would move to an out-of-state training site for that training.

2.4.1 Project 2A - Construct MATES Vehicle Storage Buildings at Different Location

This project is an improvement to the Camp's current capability to properly store and maintain the heavy military equipment provided the National Guard of Michigan, Indiana, and Ohio by the Federal Government.

This alternative has been included to address any possibility these two storage buildings (totaling 71,000 sq. ft.) could be constructed at any location other than that shown at Alternative 1 on the north side of the current MATES facility (see Figure 2-1).

While it is possible that these buildings could be built in a slightly different location at the MATES (approximately 30 acre complex), it is not possible to build them anywhere else on the Camp and still have them accomplish the mission for which they are being constructed. This is due to the fact that the equipment being stored must be located immediately adjacent to the maintenance facility. Proposing to construct these buildings at several possible locations at the MATES represent "micro" adjustments to the basic proposal; impacts to the environment remain the same under all variations practical.

Therefore, the Department will evaluate only Alternative 1 (construct the buildings as proposed) and Alternative 3 (do not construct the buildings) for this project.

2.4.2 Project 2B - Construct Bulk Fuel Facility at Different Location

This replacement project is an improvement to the Camp's overall operational capability.

The proposed replacement of the bulk fuel dispensing/storage facility, currently located near the Grayling Army Airfield will provide, in the cantonment area, a safer, more secure and convenient facility. The new bulk storage facility will have a capacity between 100,000 and 150,000 gallons. All tanks will be aboveground.

Under this alternative, the construction is planned for the southwest portion of the cantonment area southwest of the Logistical Support Facility (see Figure 2-2). The major difference between this alternative and Alternative 1 is that the facility would be built within sight of the Logistical Support Facility for operational efficiency and additional security but closer to Lake Margrethe. This facility will be constructed using current, standard, commercial building practices for an estimated cost of approximately one million dollars.

2.4.3 Project 2C - Do Not Construct MPRC at Camp Grayling; Train at MPRC Out-of-State

The MPRC would not be built at Camp Grayling. Tank gunnery activities would be limited to machine gun gunnery practice levels (Tank Tables I-V) on the current tank ranges (Ranges 35, 36, and 37). Maingun tank gunnery activities at crew practice and record levels (Tank Tables VI, VII, and VIII and above) would be moved to an out-of-state location which has an MPRC. Either the National Guard Bureau or First U.S. Army would determine which out-of-state training site would be utilized. However, Gowen Field, Idaho has the only existing National Guard MPRC to date.

The following considerations have been made for this alternative.

(1) The National Guard armor training complex at Gowen Field, Idaho will be made available by the National Guard Bureau for this alternative's out-of-state gunnery. Active Army MPRC sites will be unavailable due to intensive use by active Army units.

(2) The three and one half battalion sized armor units currently using Camp Grayling tank gunnery ranges (approximately 192 tank crews of 4 men each; 768 men) will not train at Camp Grayling during the Annual Training period they would normally conduct record tank gunnery (every 2nd year).

(3) The 192 tank crews addressed above will continue maneuver training at Camp Grayling during both Inactive Duty Training (weekend) and Annual Training (2-weeks) periods.

(4) Gowen Field will be able to fit the battalions into its training schedule.

(5) Sufficient tanks will be available at Gowen Field to meet the increased training load.

(6) Gowen Field's environment will not be significantly impacted by the increased training load.

(7) The Federal Government will fund the relocation to Gowen Field of the approximately 1,000 soldiers involved (approximately 768 armor soldiers and 232 command and control and maintenance soldiers). This is estimated to be $740,000.00 for each deployment, based upon one third of the soldiers flying (via commercial air carrier) from Grand Rapids, Michigan; Indianapolis, Indiana; and Columbus, Ohio.

(8) The extra training time required to travel to and return from Gowen Field (1-2 days each way) will be made available.

(9) The scout and mortar crews (approximately 50 vehicle crews total) of the affected battalions will continue to train at Camp Grayling for all training periods, due primarily to the cost of moving them to an out-of-state location, when it is not critical for these crews to train on an MPRC.

This alternative represents an approximate two-third reduction in total tank gunnery activity at Camp Grayling. This alternative would cause a 100% reduction of tank maingun noise at Camp Grayling.

2.5 Alternative 3 - Do Not Implement Master Plan Projects - No Action

The No Action Alternative is the continuation of the existing conditions at Camp Grayling without constructing any of the three proposed Master Plan projects.

2.5.1 Project 3A - Do Not Construct MATES Vehicle Storage Buildings

The No Action Alternative would result in the continuation of storing heavy equipment outdoors and on gravel parking areas.

2.5.2 Project 3B - Do Not Construct Bulk Fuel Facility

The proposed replacement of the bulk fuel dispensing/storage facility, currently located near the Grayling Army Airfield would not take place.

The Department would continue to use the old facility as long as it could be safely maintained. If the facility fails to meet safety and/or environmental standards, its use would be discontinued and either commercial storage facilities sought in the area or the use of tanker trailers more thoroughly explored as an interim, emergency measure. All tanks used would be aboveground.

2.5.3 Project 3C - Do Not Construct MPRC; Continue to Train at Camp Grayling

The MPRC would not be built at Camp Grayling. All tank gunnery activities would continue in the same manner as has been the practice of the past 30 years on the current tank ranges (Ranges 35, 36, and 37).

An assumption is made that the U.S. Army would continue to certify as meeting the Army standard for record tank gunnery purposes, the training of the three and one-half battalions of armor troops who currently use Camp Grayling.

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Chapter 3
AFFECTED ENVIRONMENT

3.1 Introduction

The actions analyzed in this Final Environmental Impact Statement (FEIS) have the potential to impact the physical, biological, social, and economic environment of both the Camp Grayling Training Site and off-post lands. In order to assess the impacts of the proposed actions and understand potential effects of the alternatives under consideration, it is necessary to describe the existing conditions, the installation, and its environs.

3.2 History and Setting of Camp Grayling

The area occupied by Camp Grayling was ceded to the United States by the Ottawa Indians under the Treaty of Washington in 1836. After the Civil War, the lumber industry entered the territory to exploit the white pine and hardwoods found in the area. After the forest was logged off, farming was attempted; however, the growing season was too short and the soil unsuitable for agriculture.

3.2.1 Land Acquisition and Land Use History

Camp Grayling was established in 1913 (Public Act 172) when Mr. Rasmus Hanson, a Grayling lumberman, donated 13,754 acres of land at the south end of Portage Lake (now Lake Margrethe) to the State of Michigan for training of the State Militia, game preservation, and forest reserve. Hunting was prohibited on these original grant lands.

The boundaries of the Camp have undergone numerous changes over the past 80 years, as it has grown from that original gift of 13,000 plus acres to the more than 147,000 acres it now comprises (see Figures 3-1 through 3-4).

Minor changes to the original intended use of the lands have also been introduced over the decades. A brief overview of this growth and change, with the appropriate historical document referenced for further study, follows.

Act 287 of the Public Acts (PA) of 1919 authorized recreational uses of the lands by state institutions and county and local governments, provided that such uses did not interfere with the military uses of the lands and that people with certain diseases were not permitted on the lands.

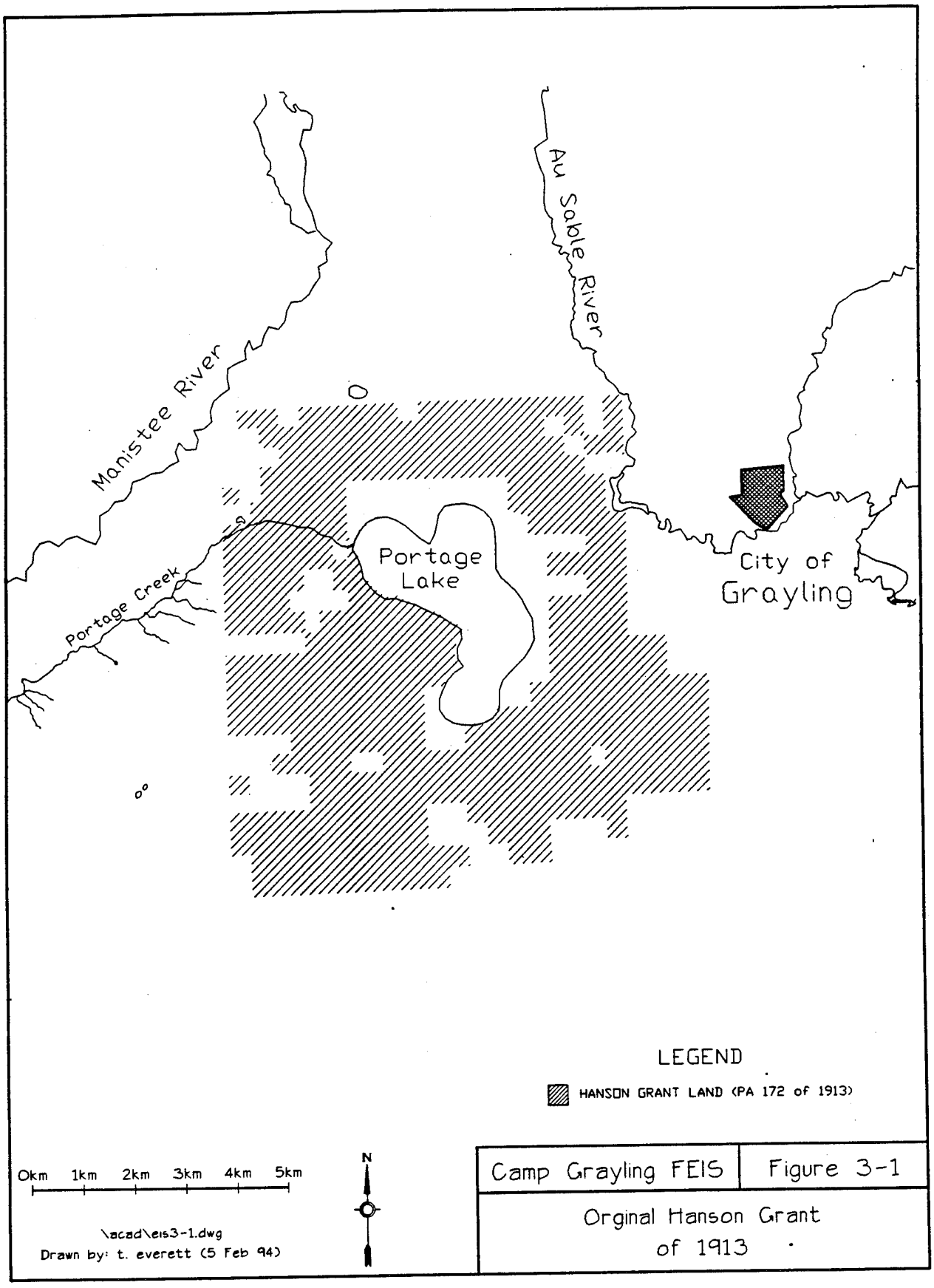
Act 28 of the Public Acts of 1934 further amended the original act by allowing the transfer of DNR lands to the Hanson military reservation and the exchange of lands. It was stipulated that hunting shall not be prohibited on any transferred lands.

Finally, Act 192 of the Public Acts of 1976 permitted the Military Board to take over highway improvements and maintenance from local governments (with the approval of those governments) for those highways within the Post boundaries. Act 192 further provided that the Military Board would make annual payments in lieu of taxes to those local units of government in whose jurisdiction the Post lands lie.

Approximately 57,000 acres of land were leased in perpetuity from the Department of Conservation (now the Department of Natural Resources (DNR)) by the Military Board under authority of Act 154, PA of 1941 and executed on May 3, 1948. The "in perpetuity" lease allows the land to be used for military purposes by the Military Board, but the DNR retains control for hunting, fishing, timber, and mineral extraction purposes. The DNR must first obtain the permission of the Military Board before developing any conservation, recreational, or other project in order to assure that there will be no interference with military activities.

On October 11, 1984, the Department of Military Affairs (DMA) and the DNR agreed to a 20-year lease covering over 42,000 acres of land in Crawford and Kalkaska counties. The lease is not similar to the "in perpetuity" lease since it has a cancellation clause, and DNR does not have to have the permission of the DMA to manage or sell the leased lands' natural resources. In addition, the lease provides for an unlimited number of optional 10-year extensions if agreed upon by the DNR and the DMA. Tanks and other tactical tracked vehicles are expressly prohibited from these lands.

Furthermore, the 1984 lease agreement requires the DMA to erect signs and/or fencing to limit or prohibit access to certain sensitive areas by DMA personnel or to prohibit access by the public into troop maneuver areas during periods of actual DMA use. The DMA must limit the use of off-road vehicles and it cannot allow the construction of roads on these lands by DMA personnel, although the DMA is responsible for the maintenance and/or repair of all existing roads. Stream and woodland crossings are also limited, as is the use of designated deer ranges from December 1 to April 1. Kirtland's Warbler habitat areas cannot be used from May 1 to August 15. Finally, oil and gas lease areas containing facilities for this purpose will be protected from damage by the DMA.


Manistee River
Au Sable River
Portage Creek
Portage Lake
City of Grayling
LEGEND
HANSON GRANT LAND (PA 172 of 1913)
Okm 1km 2km 3km 4km 5km
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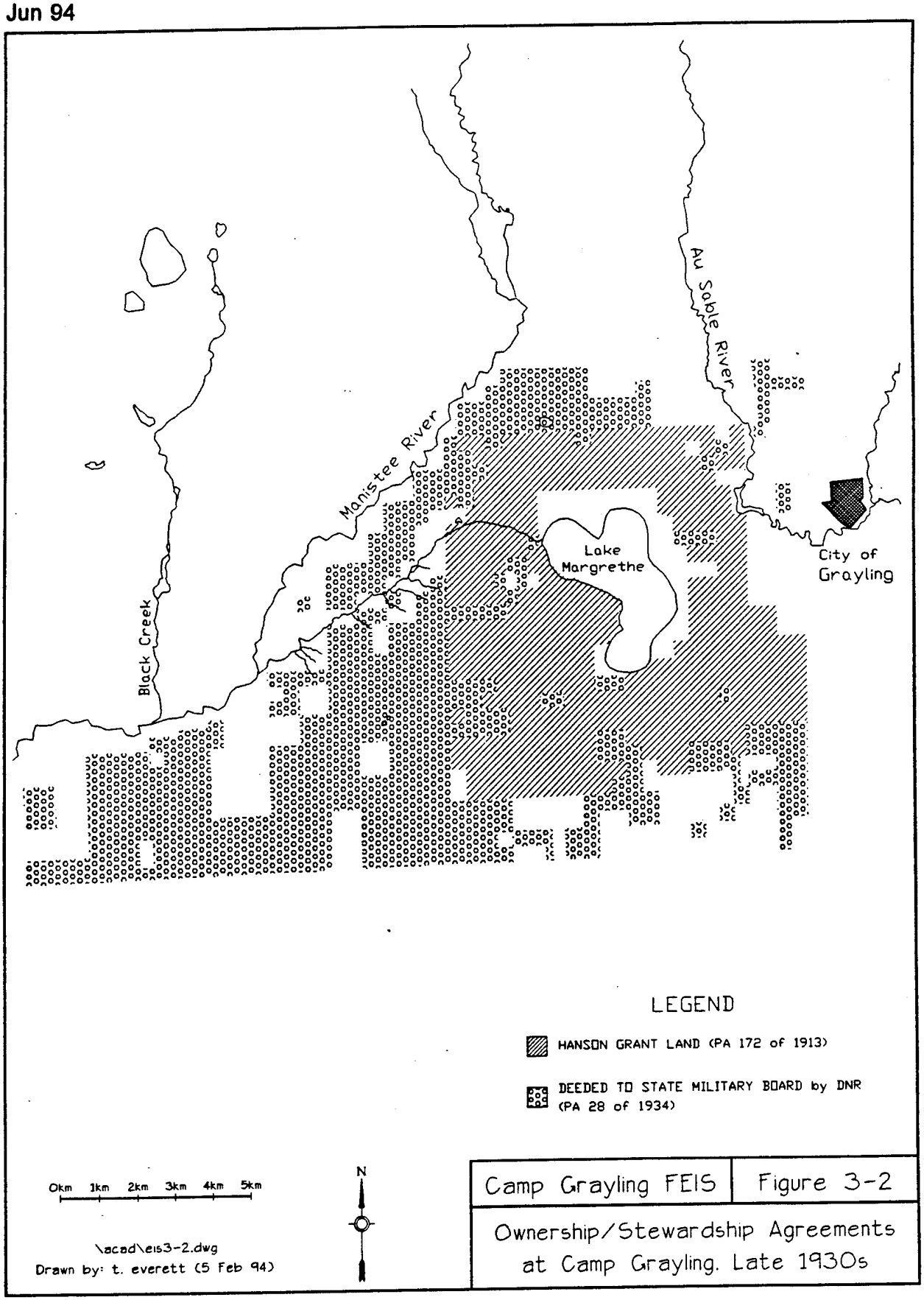
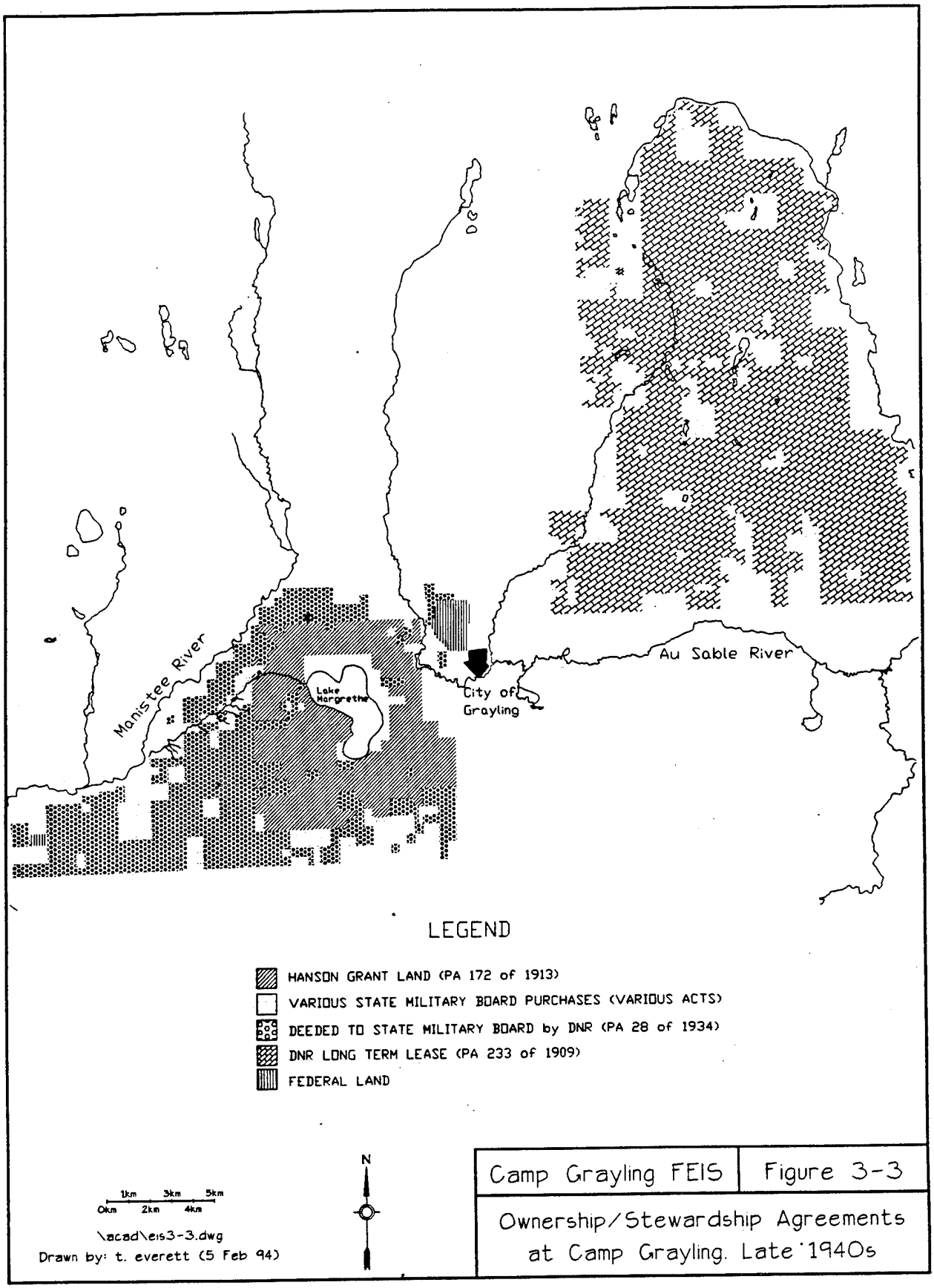
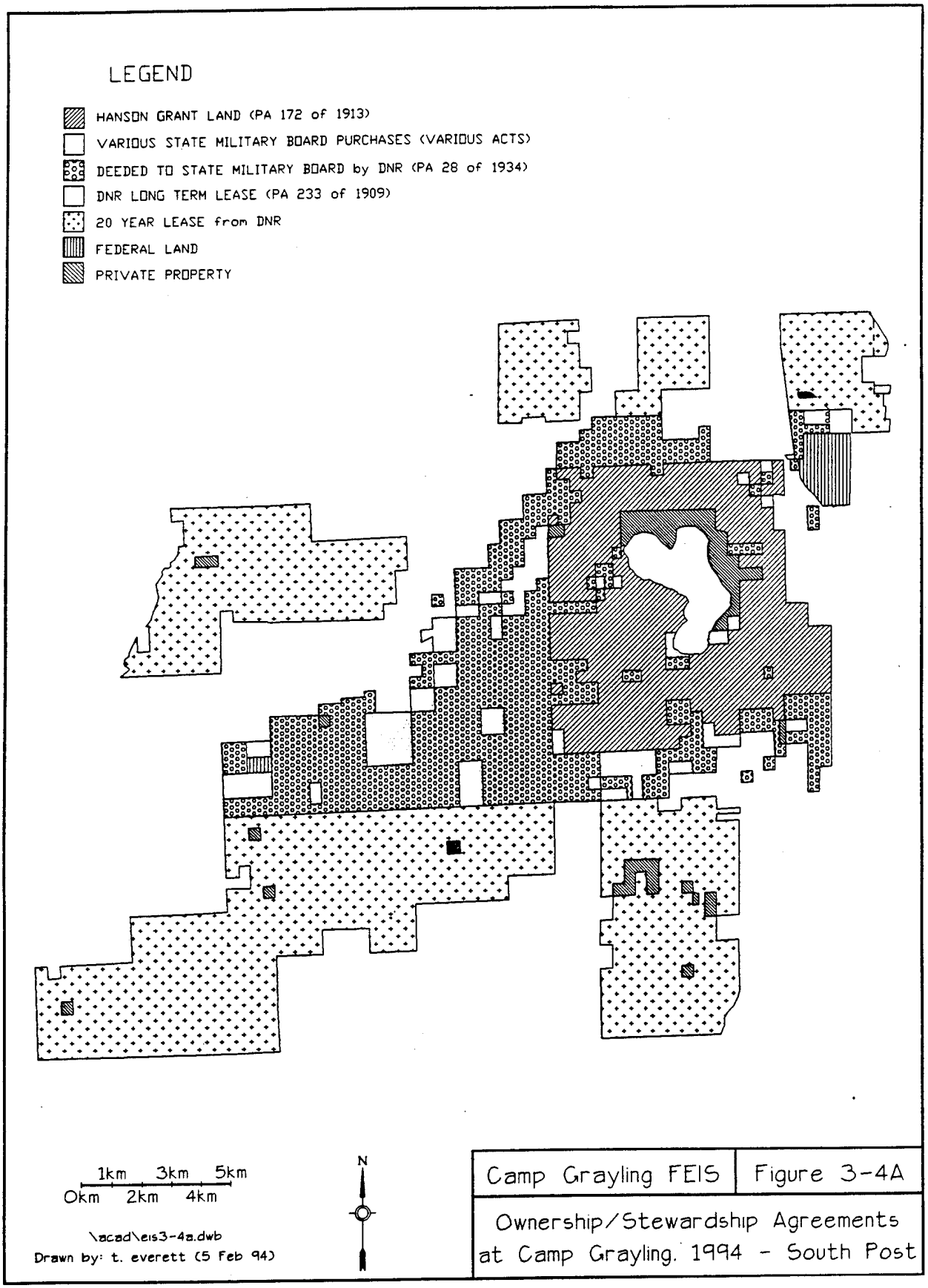
Camp Grayling FEIS
Figure 3-1
Orginal Hanson Grant of 1913



Camp Grayling FEIS	Figure 3-2
Ownership/Stewardship Agreements at Camp Grayling. Late 1930s	



Camp Grayling FEIS	Figure 3-3
Ownership/Stewardship Agreements at Camp Grayling. Late '1940s	


LEGEND
HANSON GRANT LAND (PA 172 of 1913)
VARIOUS STATE MILITARY BOARD PURCHASES (VARIOUS ACTS)
DEEDED TO STATE MILITARY BOARD by DNR (PA 28 of 1934)
DNR LONG TERM LEASE (PA 233 of 1909)
20 YEAR LEASE from DNR
FEDERAL LAND
PRIVATE PROPERTY
1km 3km 5km
0km 2km 4km
N
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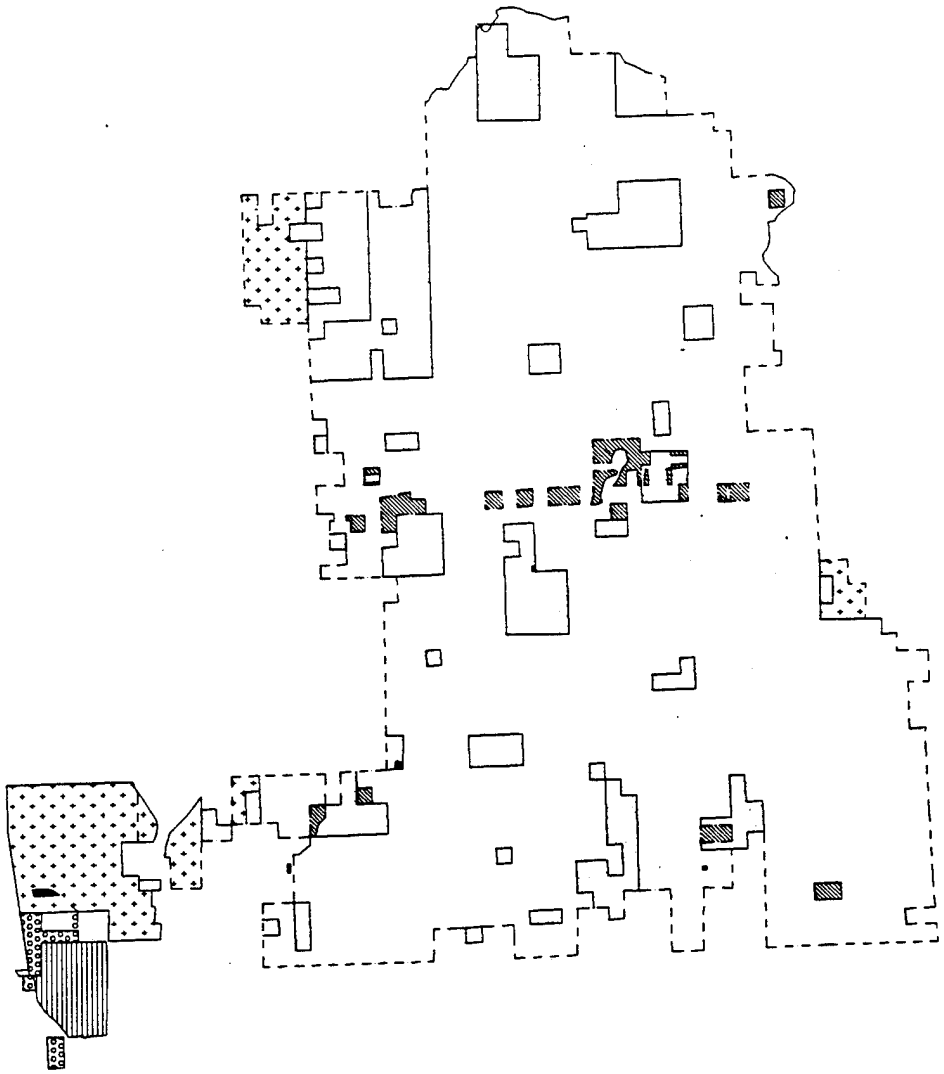
Camp Grayling FEIS
Figure 3-4A
Ownership/Stewardship Agreements at Camp Grayling. 1994 - South Post



LEGEND

- HANSON GRANT LAND (PA 172 of 1913)
- VARIOUS STATE MILITARY BOARD PURCHASES (VARIOUS ACTS)
- DEEDED TO STATE MILITARY BOARD by DNR (PA 28 of 1934)
- DNR LONG TERM LEASE (PA 233 of 1909)
- 20 YEAR LEASE from DNR
- FEDERAL LAND
- PRIVATE PROPERTY

1km 3km 5km
0km 2km 4km

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Camp Grayling FEIS	Figure 3-4B
Ownership/Stewardship Agreements at Camp Grayling. 1994 - North Post	

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3.2.2 History of Military Activities

National Guard troops first trained at Camp Grayling in 1914, with the quartering of one regiment of 1,000 men. In June 1916, the Michigan National Guard was called into Federal service at Camp Grayling, underwent a short period of post mobilization training, and then was sent to Texas for patrol duty along the Mexican border.

In 1917, the first major building effort took place with the construction of a hospital, warehouse, power plant, water reservoir, administration building, and several mess halls. The Officer's Club, now a state historic place, was also constructed that year by Mr. Hanson and donated to the officers of the Michigan National Guard.

Land for the first artillery range was obtained between 1918 and 1921, bringing the Post's total acreage to approximately 48,000 acres. Also during this period, the first water and sewer lines were constructed. A pumping station with two wells was in use, along with a reservoir.

The New York Central built a railroad spur in the 1920s into Camp Grayling for National Guard use; it was removed in the late 1950s. The station was named after Rasmus Hanson. Although most equipment and supplies arrived by railroad at that time, it did not always return that way. When field training ended in 1933, the 119th Field Artillery marched, with horse-drawn prime movers, from Grayling to Lansing, a 16-day march. It was the last year that horses were used at Camp Grayling.

During 1927-1929, the Grayling airport was constructed for use by the National Guard Air Squadron of Detroit. Although the first runways were short and made of sand, they were enlarged and blacktopped in 1936. During 1942, a PX (Post Exchange), control tower, fire department, and barracks were constructed. The National Guard has maintained the airfield except during World War II when the Federal government assumed responsibility.

In 1948, over 53,000 acres of land were acquired for the Michigan National Guard from the DNR on a long-term lease and tanks were first brought to Camp Grayling. Tracked vehicles now make up a large portion of the vehicles used for training at the Post.

A complete facility modernization program commenced at the Camp in the early 1960s. Before the program was completed in the early 1980s, a majority of the structures on the Camp, particularly in the cantonment area south of Lake Margrethe (renamed from Portage Lake in honor of Rasmus Hanson's wife), had been replaced.

The Enlisted Men's Club was completed in 1967 and named for MG C.J. Kennedy, a former commander of the Michigan Army National Guard's 46th Infantry Division. The main exchange was completed in 1974, as was the new chapel. The chapel, constructed of field stone and cedar shakes from the upper peninsula, was funded entirely by voluntary contributions. During the same time period, many two-story and one-story barracks, mess halls, and supply-administration buildings were completed.

The Non-Commissioned Officers Club, overlooking Lake Margrethe, was completed in 1977 near the main exchange. The first armory at the Camp was constructed in 1981-1982.

Since 1982, the maturing of the Department of the Army's Total Force policy has seen several major facilities added to the Camp. In the cantonment area, a 110,000 sq. ft. logistical support facility, a vehicle wash facility, and seven motor pools were added. Dining halls and latrines in the 600 area were upgraded, as was the ammunition supply point. One of the last major facilities to be completed in the South Camp was the construction of the wastewater treatment facility in 1991.

Finally, a new 57,000 sq. ft. Mobilization and Annual Training Equipment Site (MATES) facility was added in 1986 to the North Post.

Training facilities have undergone a similar history at the Camp. Since the horses left in 1936, tanks, armored personnel carriers, helicopters, and high performance jet aircraft have moved in. Tanks came in 1948 and began firing on the range complex northeast of Grayling that same year. Honest John rockets joined them in the early 1960s.

Range upgrades have been performed in the past 10 years to provide a variety of automated record fire and field fire ranges. The tank range was last improved in 1971-72 and its target area was fenced (as was the impact areas of Ranges 13 and 40) in the mid-1980s.

Equipment used at the Camp has always represented a cross-section of what was then in the inventory of every military service in the country. As the military services modernized, equipment was normally rotated through the National Guard before being consigned to either Foreign Military Sales or the scrap heap.

The recent history of tanks at the Camp serves to illustrate this point. M48A5 tanks arrived at MATES in 1976 to replace the 24-year old M48A1s. In the ensuing 17 years, the M48A5s gave way to the M-60, which gave way to the M60A1, then to the M60A3 (still around), and finally, to the newest member of the armor family at Camp Grayling, the M-1 Abrams.

3.2.3 Setting

3.2.3.1 Location

Camp Grayling is located in the northcentral portion of the lower peninsula of Michigan, just below the 45 degree parallel (see Figure 3-5). The major portion of the Post is within Crawford County. Smaller acreages lie within southern Otsego and eastern Kalkaska Counties. These counties provide the majority of services to Post personnel and have been delineated as the area of influence in past socioeconomic studies.

Grayling, Michigan (population 1,792), 4 miles to the northeast of the South Post, is the nearest urban center (see Figure 3-6). The town is located along a nationally known trout stream, the Au Sable River, and is located 4 miles south of Hartwick Pines State Park and within the Au Sable State Forest (see Figures 3-7 and 3-8).

Camp Grayling is located on the state's major north-south interstate highway network. The Post straddles Interstate Highway 75 approximately 200 miles northwest of Detroit and 80 miles south of Michigan's upper peninsula. Interstate Highway 75 (connecting to the Detroit area) and U.S. Highway 27 (connecting to south central Michigan) join south of Grayling and continue north as I-75, terminating in the upper peninsula at Sault Ste. Marie. State Trunk Highway M-72 provides regional east-west access.

Saginaw Tri City Airport, 100 miles southeast of Grayling, is the nearest civilian international airport; a regional airport served by national carriers is located in Traverse City, 52 miles to the west of Grayling. Military air transport is available at the Grayling Army Airfield. Rail access is provided via the Detroit Mackinac Railway running between Detroit and Gaylord.

3.2.3.2 Population

The full-time resident population of Camp Grayling (1993) is two; only the Camp Commander and his wife reside on the Camp.

The population of the three-county area (Crawford, Kalkaska and Otsego counties) increased from 35,413 in 1980 to 43,714 in 1990, and is expected to continue to increase until at least the year 2000.

The three-county area comprises 4,300 square kilometers (1,638 square miles), approximately 3 percent of the total state area. Population density of the study area equaled about 24 people per square mile. This is considerably lower than the state average of 159 people per square mile and the state average excluding the Detroit metropolitan area of approximately 84 people per square mile (U.S. Department of Commerce, 1980).

3.3 Description of the Installation

Camp Grayling is comparable to other large military installations in the United States in terms of activities conducted on the Post. The only real differences are the full-time work force does not live on the Post and the training activities conducted are compressed into either weekends or the months of June, July, and August.

3.3.1 Major Military Activity Areas of the Camp

Military activities at Camp Grayling occur in either the three main support bases or the

training/firing/maneuver areas. Occasionally, lands adjacent to the Camp are utilized by military units for bivouacs and vehicle parking. Those few occasions are controlled through the normal special land use permit process of the DNR.

The three main support bases are the (1) cantonment area, 800 acres, Figure 3-9, (2) Grayling Army Airfield, 962 acres, Figure 3-10, and (3) MATES, 25 acres, Figure 3-11.

The training/firing/maneuver areas are almost equally distributed southwest (80,112 acres west of I-75) and northeast (67,528 acres east of I-75) of the City of Grayling.

At the cantonment area, Camp Grayling can house approximately 1,400 soldiers in heated barracks, approximately 5,400 soldiers in unheated barracks, and can provide tentage to another approximately 5,600 soldiers. There is no permanent housing at the Grayling Army Airfield; however, there are tent pads and bath houses for approximately 2,760 soldiers and mess halls for 800 soldiers.

Military units using Camp Grayling prepare food in any of the 70 mess halls on the cantonment area or the airfield or by utilizing mobile kitchens in the training areas.

3.3.2 Camp Support Activities

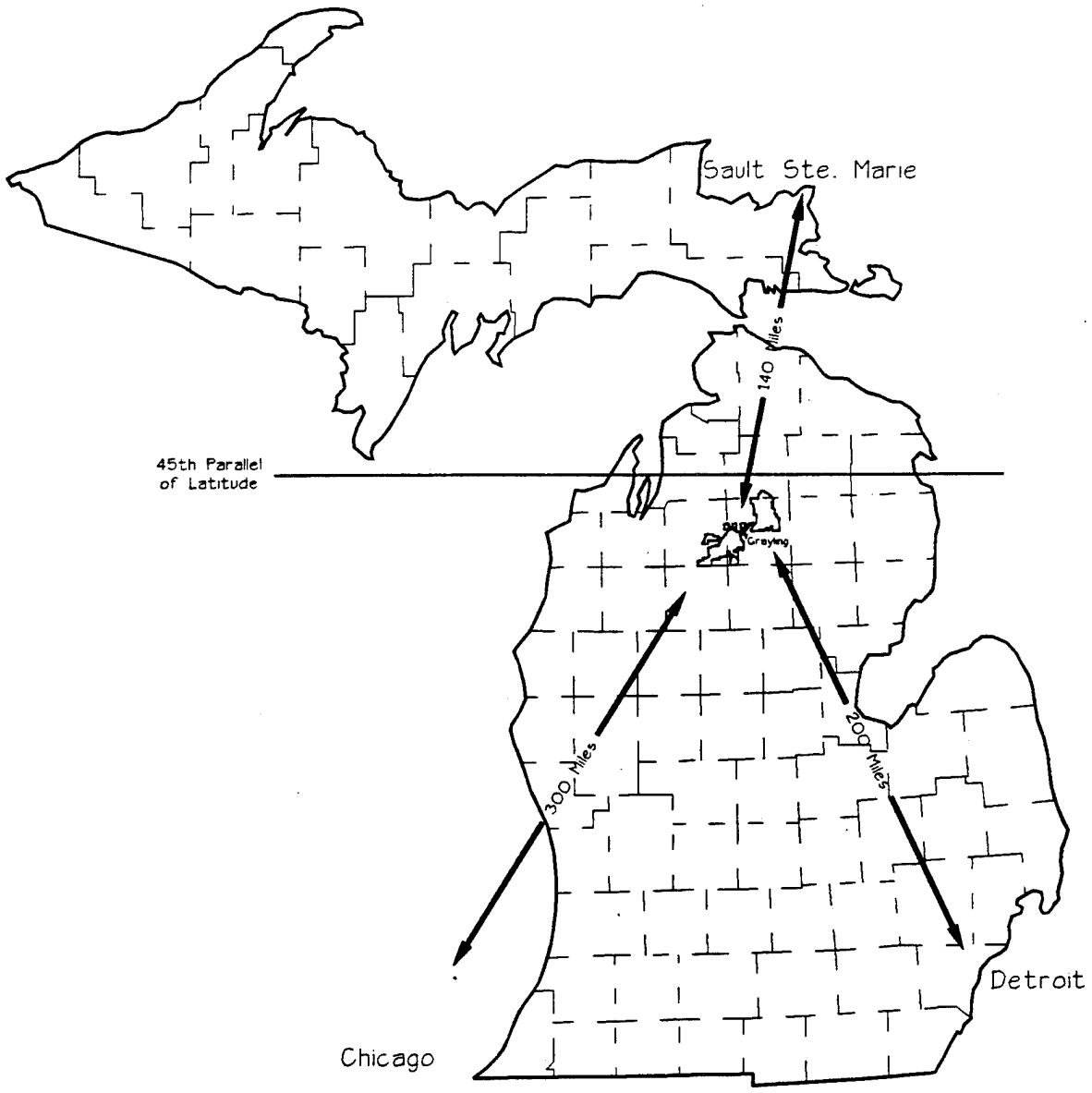
Camp Grayling is staffed by approximately 230 federally reimbursed state and federal employees on a permanent basis. This staff is supplemented in the high training seasons (normally summer) by approximately 20-30 soldiers and civilian technicians.

The Army and Air Force Exchange Service (AAFES) staffs several retail and military clothing sales stores throughout the year; on a full-time basis in the summer and a partial schedule during the remainder of the year.

3.3.2.1 Camp Command and Control

Camp Grayling is typically commanded by either an Active Guard/Reserve (AGR) Colonel (0-6) or a senior Federal Technician (GS-13) of the Michigan Army National Guard. This officer reports to the Assistant Adjutant General for Army in the Department of Military Affairs at Lansing. The Camp Commander is responsible for the activities undertaken at Camp Grayling by both the resident work force of approximately 230 people and the approximately 40-50,000 military personnel who visit annually.

The Camp Commander does not have direct command authority over military units visiting Camp Grayling. However, through the authority of the Adjutant General of Michigan and a Special Use Agreement consummated with users, this officer does have the authority to stop any activity ongoing at the Camp and, if necessary, order the offending individual or unit to leave. The Adjutant General of Michigan can institute Report of Survey proceedings against any military person accused of negligence in his or her duty which causes damage to or loss of any piece of military equipment or resource, to include the environment.



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Camp Grayling FEIS	Figure 3-5
Camp Grayling Regional Setting	

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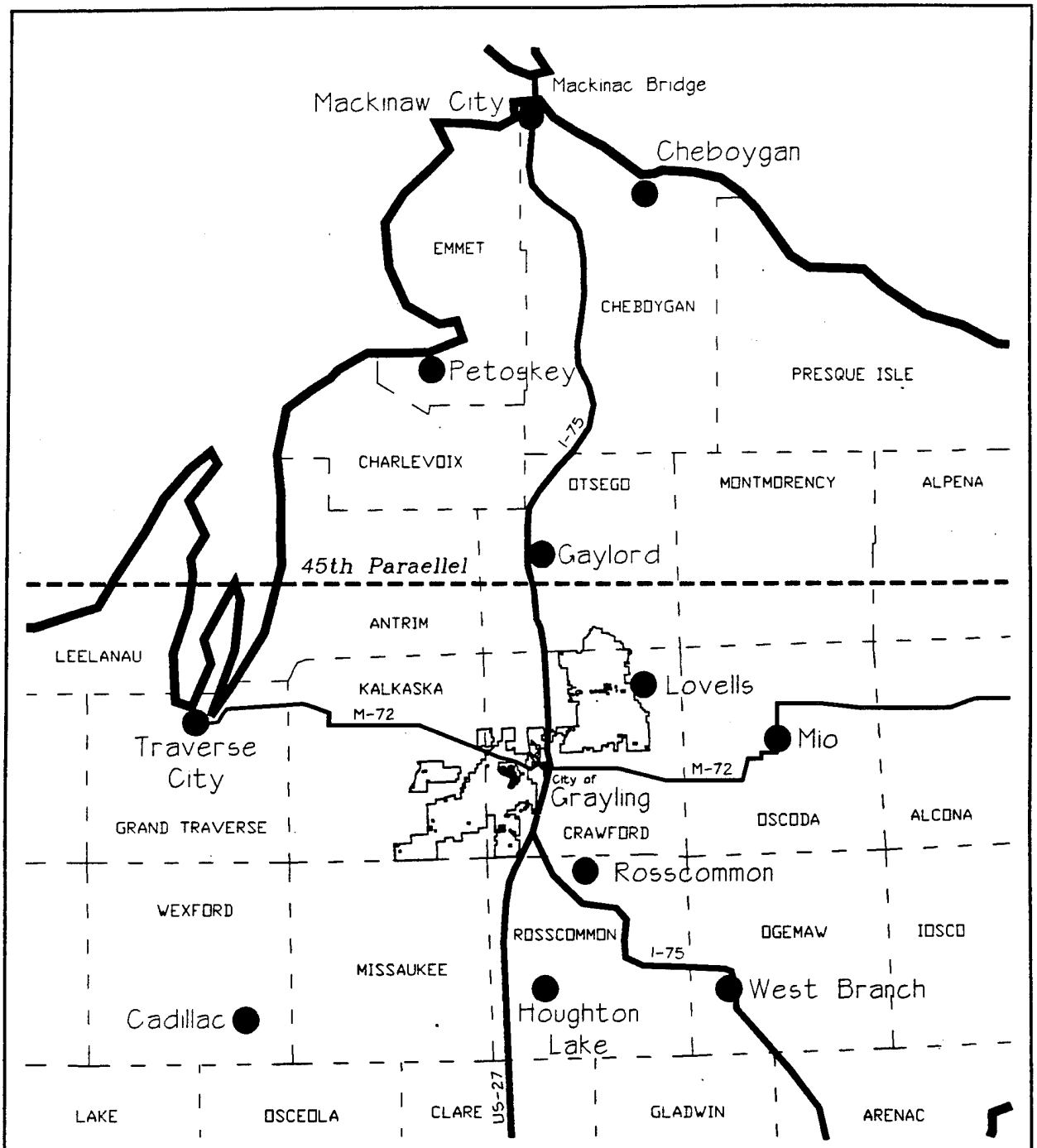
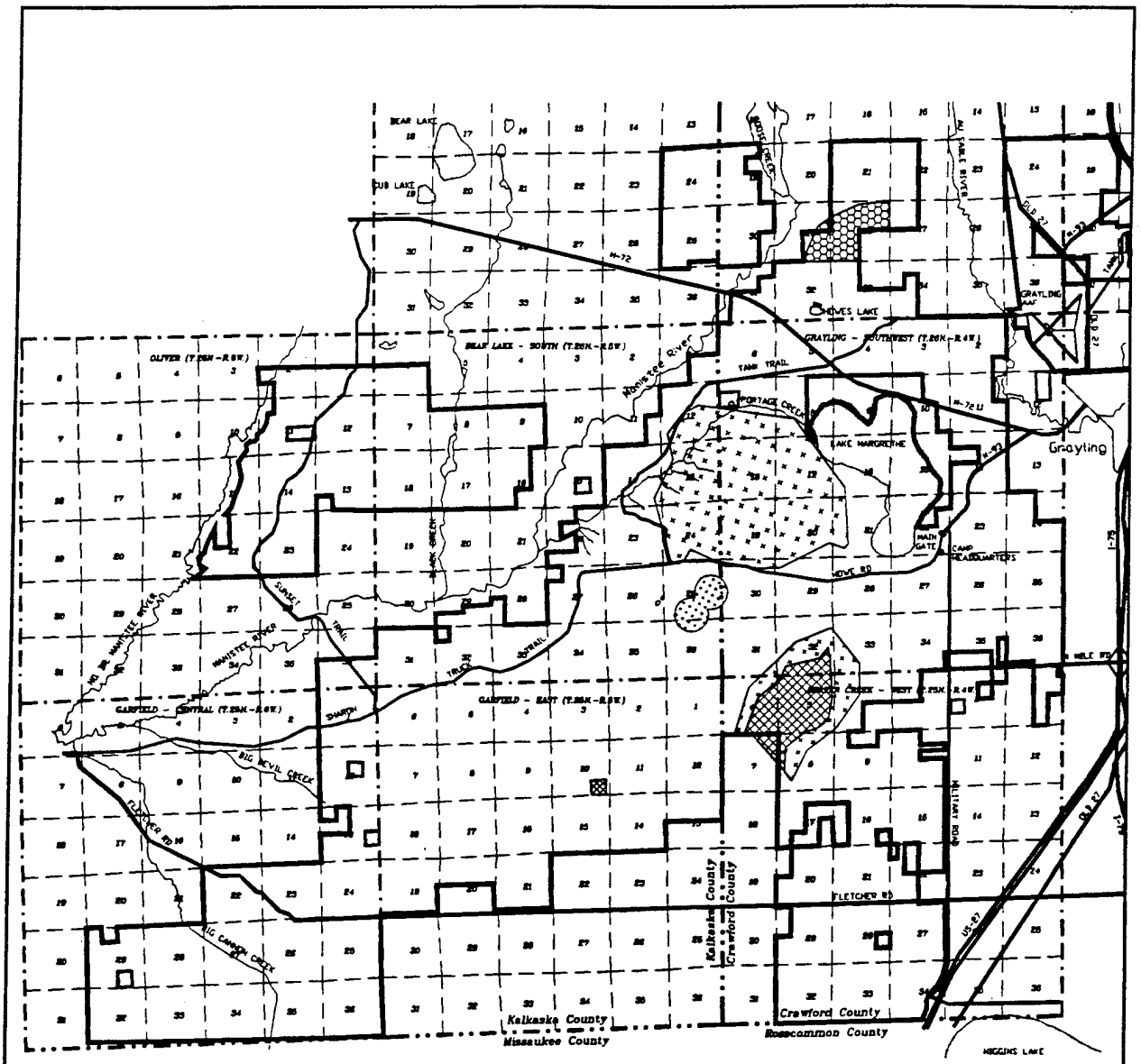


Camp Grayling FEIS	Figure 3-6
Camp Grayling + Local Vicinity	



- Legend -

- Areas closed to public traffic at all times under closure orders published by the Department of Natural Resources.
- Kirtland's Warbler nesting areas closed to all off-road traffic from 1 May until 10 September each year.
- Weapons Ranges - Extreme caution must be used when moving in or through these areas.
- Areas of private property contained within the traditional training boundary of the Camp.

Scale: 1" = 3 miles

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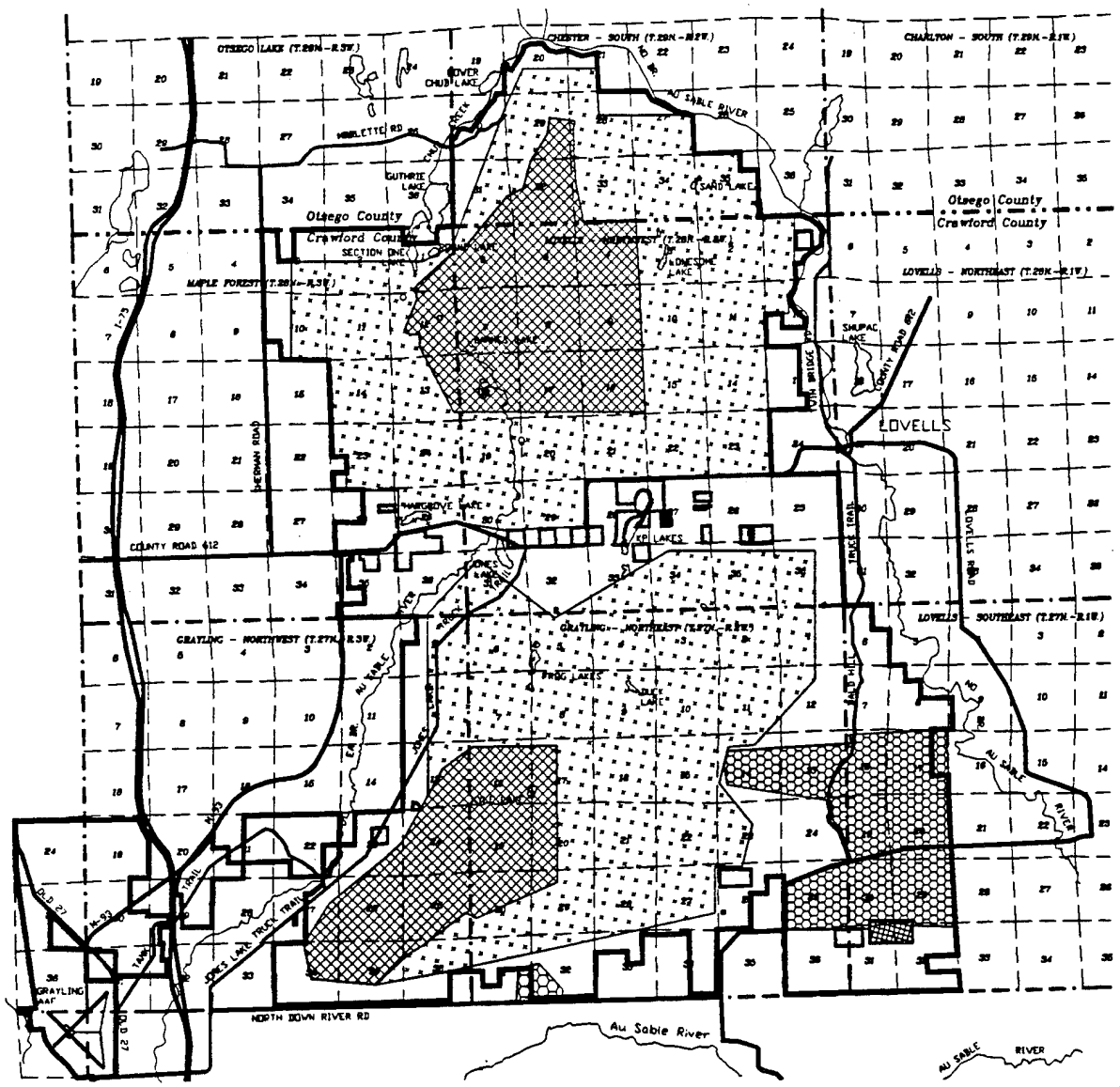
Camp Grayling FEIS	Figure 3-7
South Post. Camp Grayling, Michigan	



- Legend -

Areas closed to public traffic at all times under closure orders published by the Department of Natural Resources.

Kirtland's Warbler nesting areas closed to all off-road traffic from 1 May until 10 September each year.

Weapons Ranges - Extreme caution must be used when moving in or through these areas.

Areas of private property contained within the traditional training boundary of the Camp.

Scale: 1" = 3 miles

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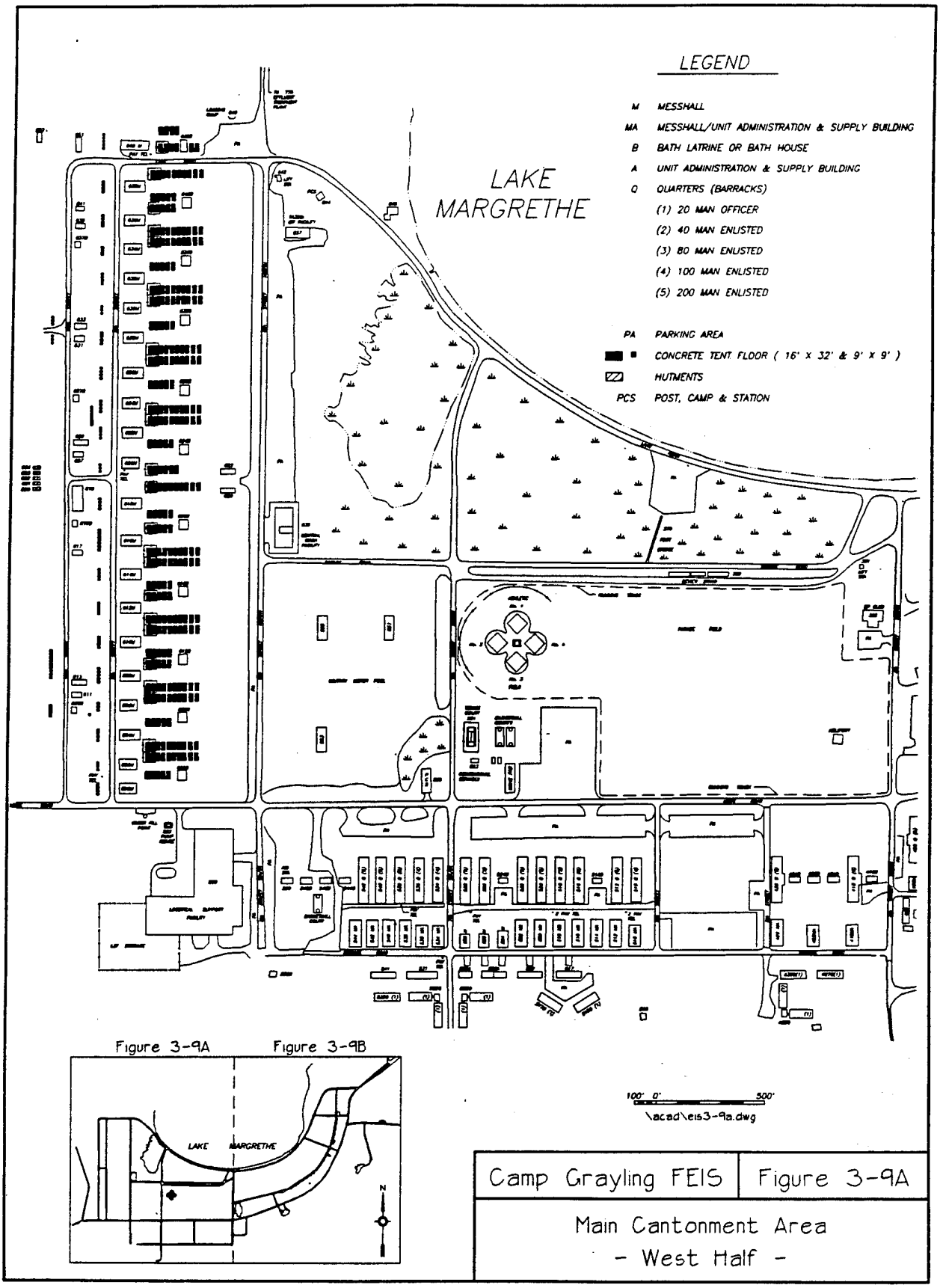
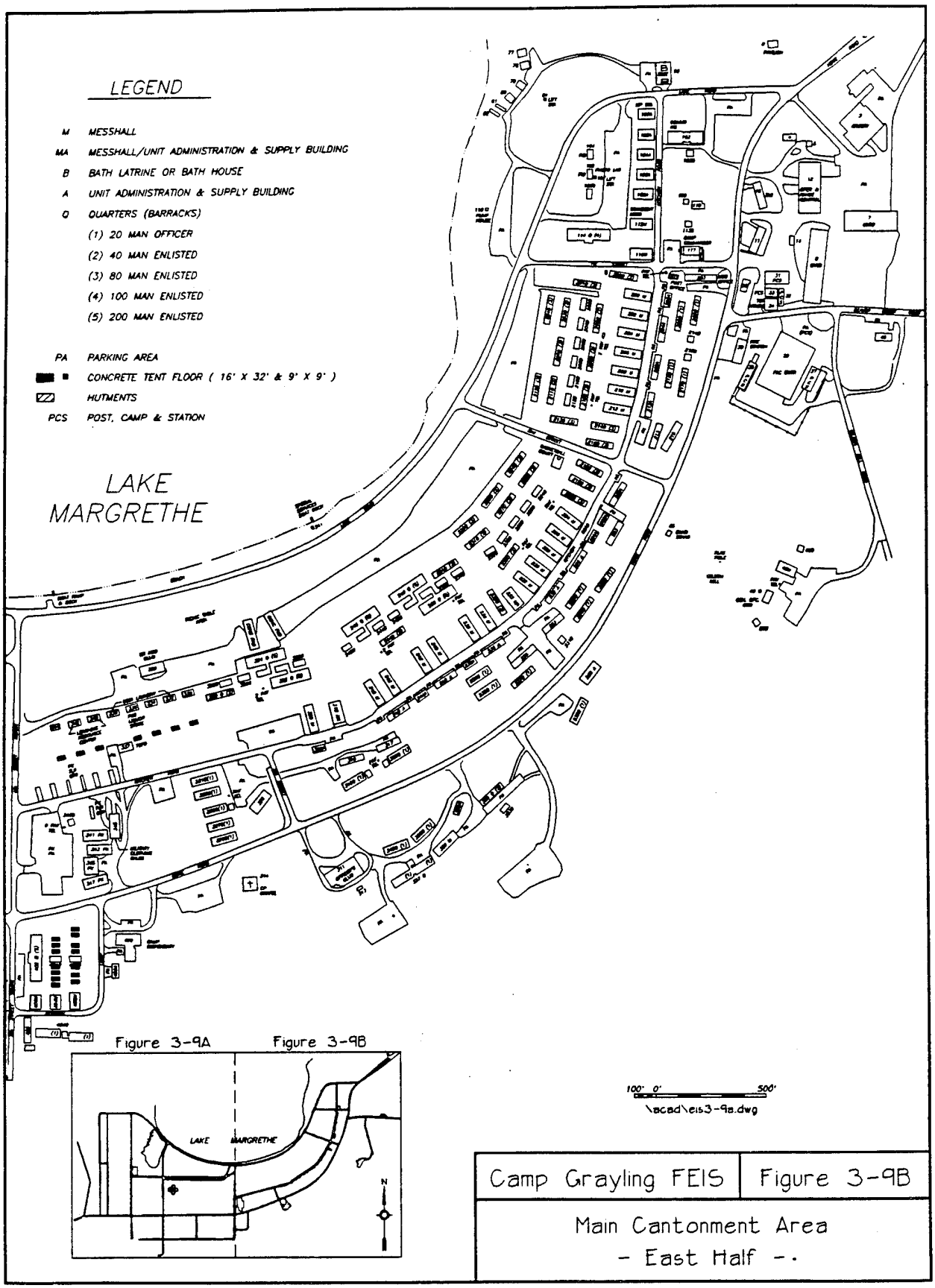
Camp Grayling FEIS	Figure 3-8
North Post. Camp Grayling, Michigan	



Camp Grayling FEIS	Figure 3-9A
Main Cantonment Area - West Half -	



Camp Grayling FEIS	Figure 3-9B
Main Cantonment Area - East Half -.	

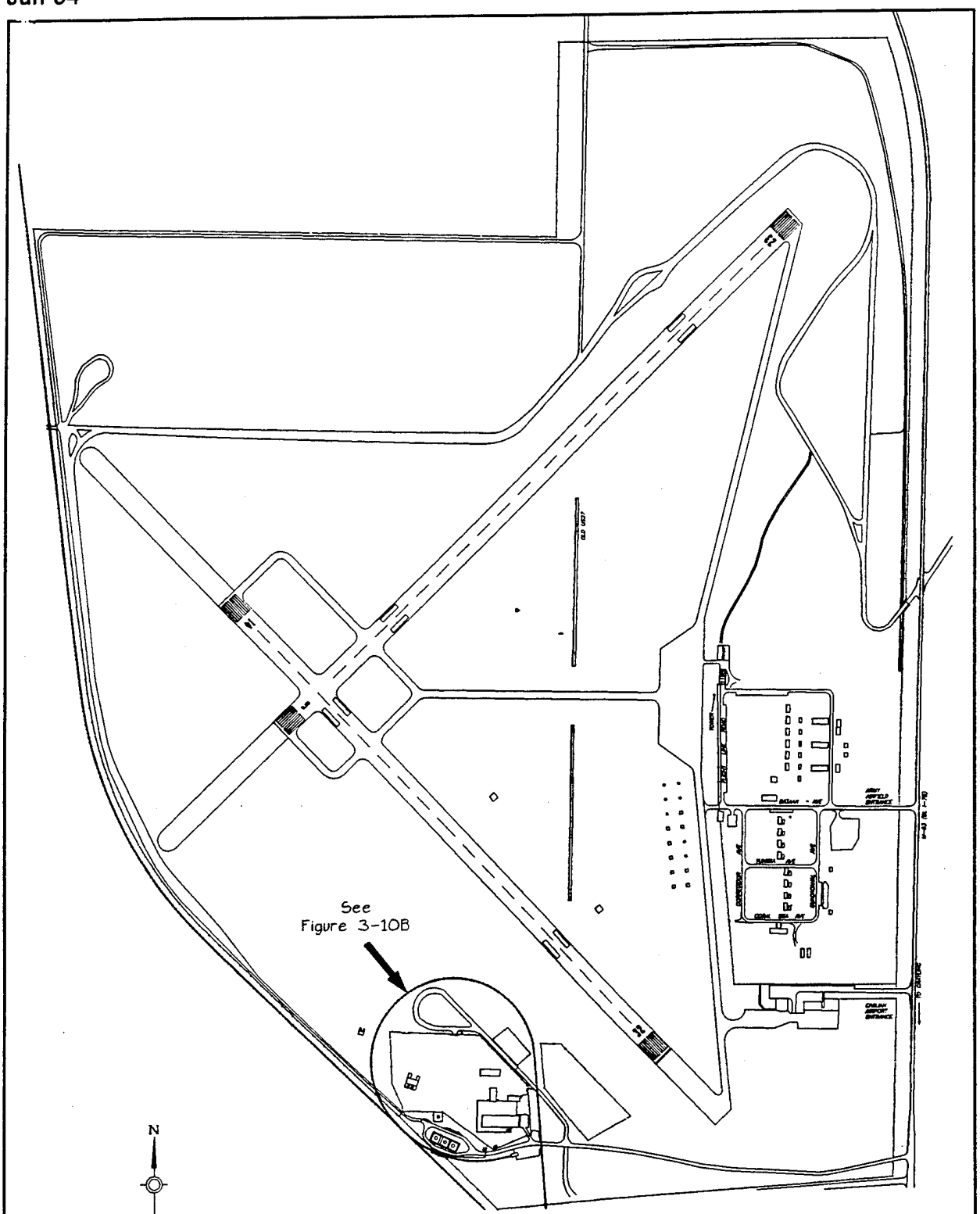

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Figure 3-10B
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Scale: 1" = 1,040'
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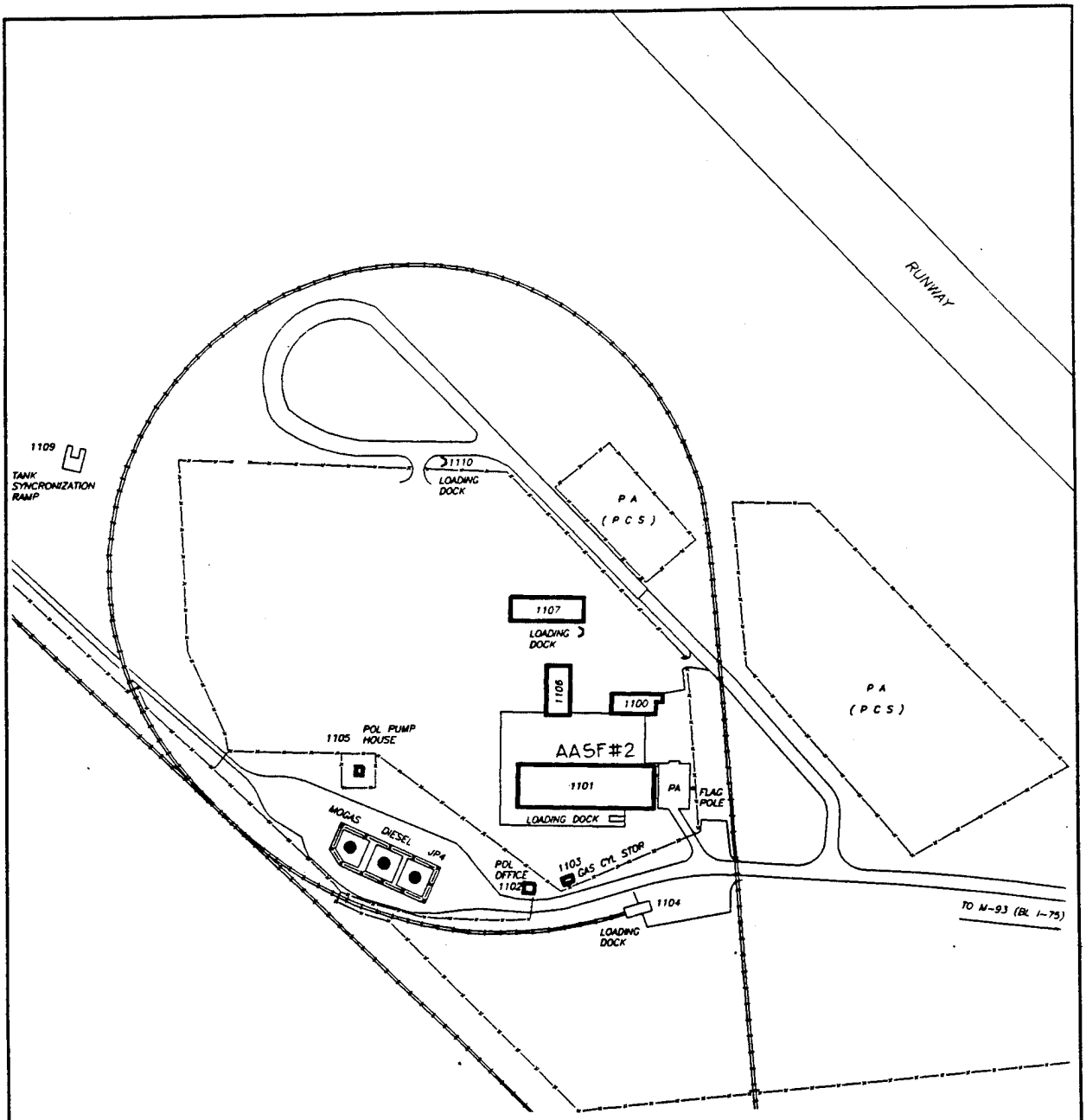
Drawn by: t. everett (5 Feb 94)
Camp Grayling FEIS
Figure 3-10A
Grayling
Army Airfield


RUNWAY
1109
TANK SYNCRONIZATION RAMP
1110
LOADING DOCK
PA (PCS)
1107
LOADING DOCK
1106
1100
AASF#2
1101
PA
FLAG POLE
LOADING DOCK
PA (PCS)
1105 POL PUMP HOUSE
MOGAS
DIESEL
JP4
POL OFFICE 1102
1103 GAS CYL STOR
1104
LOADING DOCK
TO M-93 (EX I-75)
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Scale: 1" = 170'
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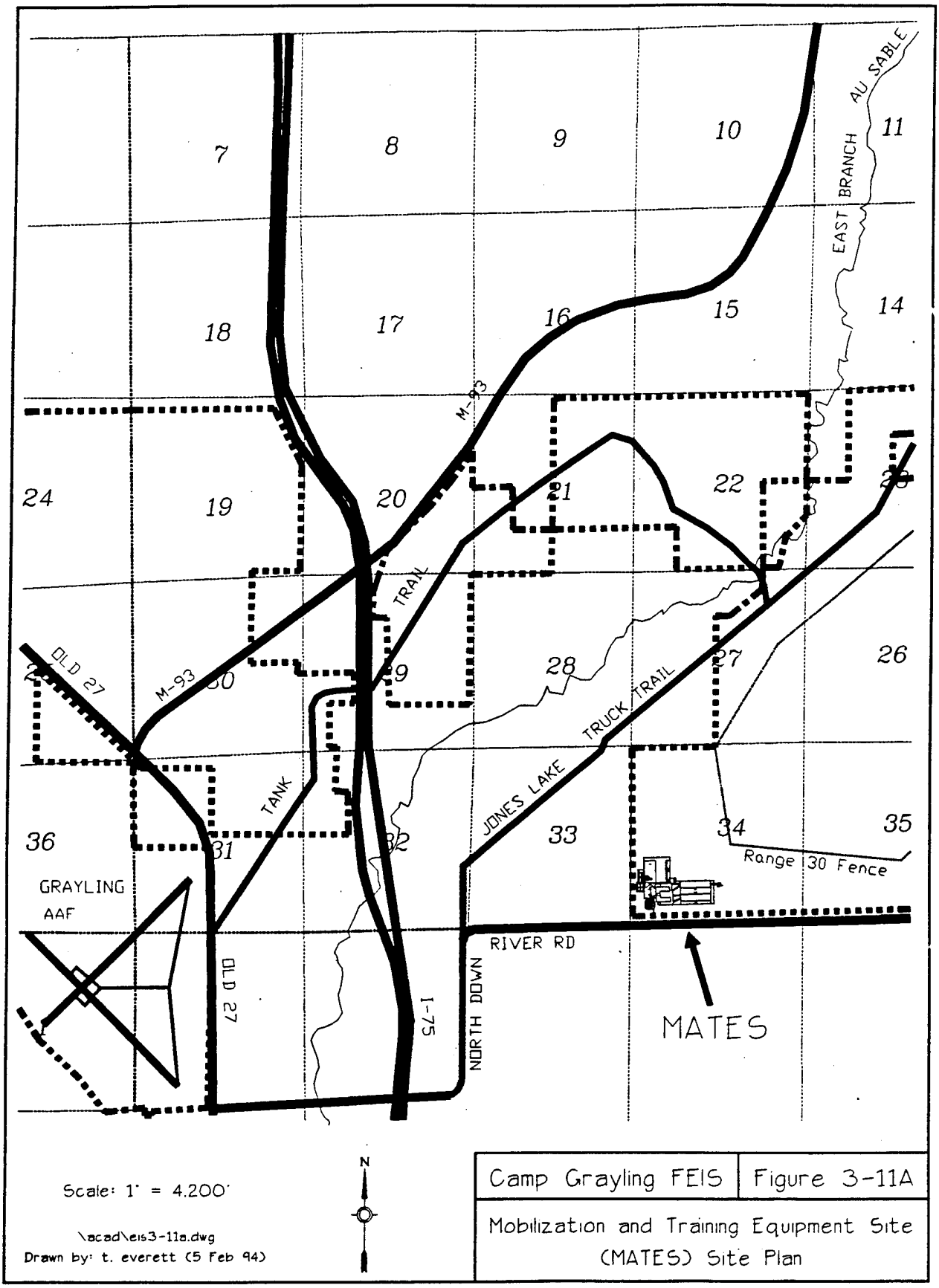
Drawn by: t. everett (5 Feb 94)
Camp Grayling FEIS
Figure 3-10B
Army Aviation Support Facility #2.
Railhead. + POL Storage Area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AU SABLE
EAST BRANCH
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M-93
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TRAIL
OLD 27
M-93
30
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28
27
26
TRUCK TRAIL
TANK
JONES LAKE
36
31
32
33
34
35
Range 30 Fence
GRAYLING
AAF
RIVER RD
OLD 27
I-75
NORTH DOWN
MATES
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Scale: 1" = 4,200'
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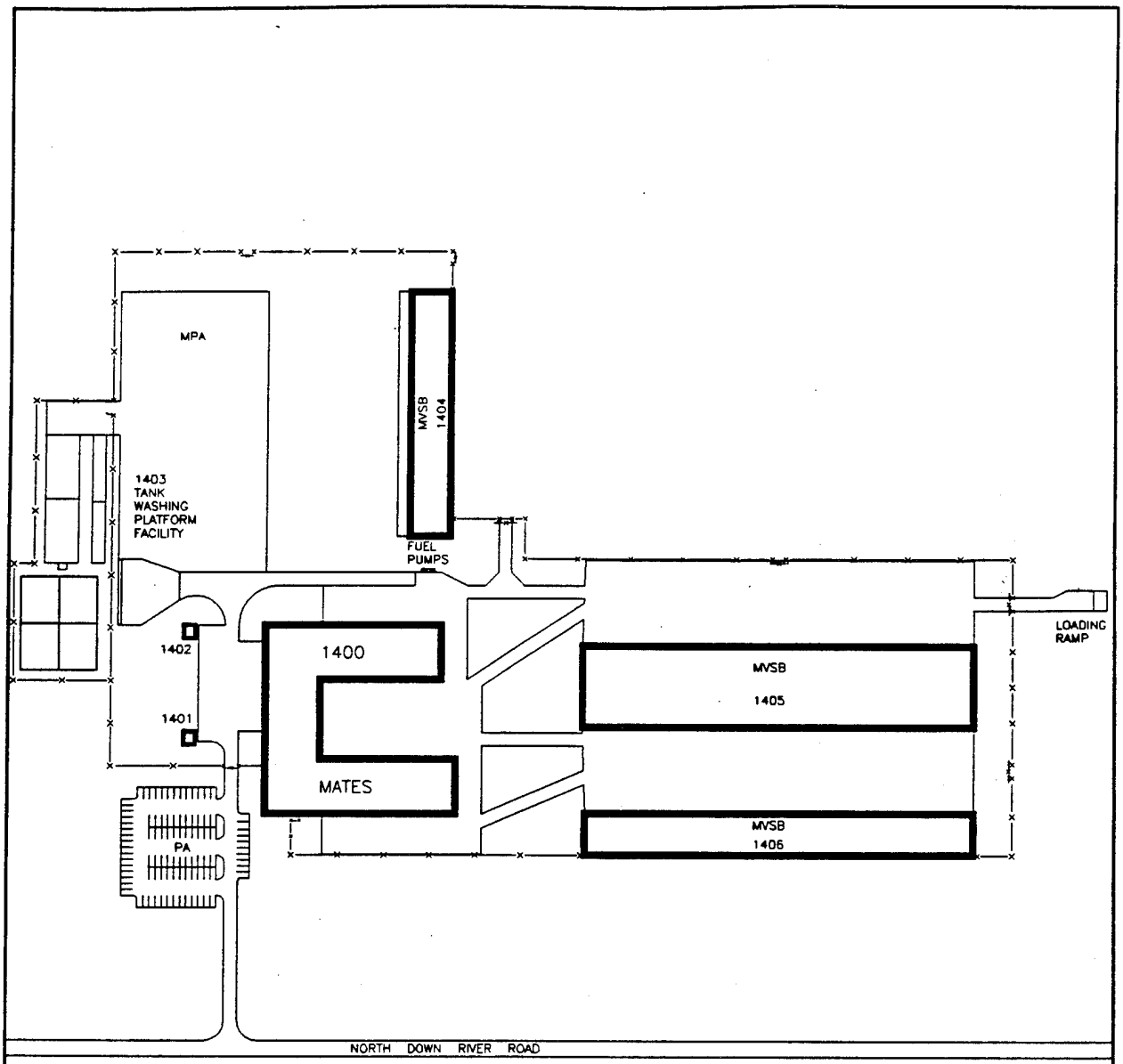
Drawn by: t. everett (5 Feb 94)
Camp Grayling FEIS
Figure 3-11A
Mobilization and Training Equipment Site (MATES) Site Plan



Scale: 1" = 88'

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Camp Grayling FEIS	Figure 3-11B
Mobilization and Training Equipment Site (MATES)	

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3.3.2.2 Directorate of Plans, Training, and Mobilization

The Directorate of Plans, Training, and Mobilization (DPTM) is responsible for coordinating and supervising operations and planning, training, mobilization and deployment, audiovisual, aviation, environmental, and security functions for Camp Grayling.

To accomplish this mission, the Directorate is divided into six separate Branch/Divisions. The Operations Branch, Range Division, Environmental Branch, Training Support Division, and the Security Division are located in Building 12; the Aviation Division is located at the Grayling Army Airfield. The Directorate is authorized 15 military and 26 civilian personnel; it currently operates with a full-time workforce of 6 military and 17 civilian personnel.

3.3.2.2.1 Operations Branch

The primary function of the Operations Branch is to plan, organize, staff, direct, and control the overall activities of the Directorate. The Branch manages the Camp Grayling Facilities Request System; coordinating all on-post and off-post training and logistical support requirements for all organizations (military or civilian) utilizing Camp Grayling.

Camp facilities are primarily scheduled at two annual scheduling conferences. Annual Training (AT) (two weeks) scheduling is conducted at the 1st U.S. Army Site Scheduling Conference, normally held during the winter months for the following training year (i.e., conference held in February 1994 is for training year 1995). Inactive Duty Training (IDT) periods (weekends) are scheduled during a conference normally held in the spring of the year, again for the following training year. Any additions or deletions to these schedules are handled directly with the Post Operations Officer.

Upon arrival at Camp Grayling, all units/organizations are required to complete in/out processing procedures. During in-processing, unit representatives are required to schedule an environmental protection in-brief, a range safety briefing (if applicable), and an aviation safety briefing (if applicable). The "Training Site Agreement" between the Camp Commander and the visiting Commander of Troops is also signed during this in-processing procedure.

Upon completion of training activities, unit/organization representatives are required to out-process. This consists of clearing each Camp Grayling Directorate and ensuring any Post, Camp, and station property borrowed has been returned.

An "Affidavit of Training Area Environmental Compliance" (signed by unit commanders) and an After Action Report must be submitted to the Operations Branch prior to any unit's departure.

The Operations Branch is the controlling agency for Camp Grayling's restricted airspaces. Direct coordination between this office and the Federal Aviation Administration is conducted for activation of either of these airspaces.

3.3.2.2.2 Range Division

This Division is responsible for range firing activities and Range Control Operations to ensure all weapons firing is conducted according to applicable safety procedures. Considerable additional detail of this Division's duties are contained in Section 3.4.2.3 (Live Firing Activities).

Communications between Range Control and the firing ranges are primarily FM radio, with telephone service located on a small number of ranges. If, for any reason, communications between Range Control and the firing range is lost, the Range Officer-in-Charge has been instructed to immediately cease fire until it has been re-established.

Range Control is responsible for the emergency evacuation of military personnel who are injured on a range, training facility, or in a training area. When Medical Aerial Evacuation (MEDEVAC), the preferred transportation method, is not available, military or civilian ground ambulance is utilized. Serious injuries are normally directed to Grayling's Mercy Hospital.

3.3.2.2.3 Range Control

Training activities involving live ammunition are closely monitored to ensure the highest possible level of safety for the surrounding public as well as the troops conducting the training.

Camp Grayling range regulations (CG Reg. 385-1) state the proper precautionary measures which must be carried out for proper safety standards to be met. Those regulations further state the ranges and the type of ammunition to be used on those ranges to execute several different types of firing missions utilizing one or more of the several training methods described briefly below.

Firing activities at Camp Grayling are under the direct charge of the Range Control Officer, located in Building 12 on the cantonment area. This Officer is responsible for scheduling all ranges, ensuring only authorized training is conducted and authorized ammunition is used, and ensuring proper clean-up after the completion of training.

3.3.2.2.4 Environmental Branch

The primary function of the Environmental Branch is to provide instruction and guidance to all organizations (military and civilian) utilizing any Camp facilities. This Branch also monitors and inspects all issued facilities to ensure compliance of all environmental rules and regulations, and coordinates natural resource management and environmental protection programs with the Camp Grayling Environmental Office.

This Branch also manages the Installation Compatible Use Zone (ICUZ) program. This includes collecting actual noise event data, analyzing it for accuracy, and developing noise contours based upon actual training events.

All soldiers are required to report (and take prompt corrective action on) any spills (of any kind) to Range Control. These spills are investigated, monitored, and corrected under the supervision of this Branch.

Unit bivouac sites are constantly inspected to ensure proper facilities and locations are established for disposal of human waste; any other waste disposal is not permitted in any training area. These inspections ensure avoidance of contamination and/or pollution of local waterways, wetlands, and other sensitive areas of the training areas.

Upon completion of training activities, the Environmental Branch inspects training areas to ensure they are clean and corrective action has been taken for any environmental deficiencies.

3.3.2.2.5 Training Support Division

The Training Support Division plans, directs, and coordinates the procurement or fabrication, repair, storage, issue, and use of training devices.

The greatest enhancement to training realism available in this Division is the Multiple Integrated Laser Engagement System (MILES). The MILES system consists of nine different weapon fire simulator systems, employs eye-safe lasers and microelectronics to realistically simulate the firing capabilities of rifles, machineguns, and other direct fire weapons. This system, which is employed across the entire U.S. Army Total Force, offers a tremendous cost savings and safety advantage over live weapons firing in many instances. It also has the potential to lessen the environmental impacts of weapons and maneuver training.

3.3.2.2.6 Security Division

The Security Division is tasked with providing physical security for the Camp Grayling cantonment area, Army Aviation Support Facility, MATES, Grayling Army Airfield, and the Ammunition Supply Point.

All weapons and ammunition located at Camp Grayling are stored in facilities conforming to Army standards.

A combination of Joint-Service Intrusion Detection Devices, Intrusion Detection Systems, and roving patrols are utilized to provide security of Camp facilities. Additionally, coordination is on-going with the Michigan State Police and local law enforcement agencies.

3.3.2.2.7 Aviation Division

The Aviation Division manages and directs the operations of the Grayling Army Airfield. The airfield is operated on a seasonal basis, utilizing National Guardsmen and Active component personnel on short tours of duty to staff the facility.

During prime Annual Training periods (June - August), the airfield staff provides air traffic control, flight service planning, flight following, weather services, crash rescue support, and refueling operations.

3.3.2.3 Engineer Services

The Directorate of Engineering performs the functions associated with operating, maintaining, repairing, and constructing real property facilities at the Camp. This includes utilities and facilities operation, maintenance, repair and construction, engineering design and services, contract supervision, inspection and administration, master planning, energy management for fixed facilities, fire protection and prevention, facilities engineering supply, forestry, environmental restoration, pest control, custodial, refuse services, facilities engineering, equipment maintenance, and real property control.

While the Directorate is authorized approximately 130 civilian and 4 military personnel to accomplish the work listed above, funding limitations have historically limited the civilian workforce to approximately 30-35 personnel.

3.3.2.3.1 Pest Control

This program consists mainly of mosquito, black fly, spider, and rodent control and is contracted to a qualified and licensed applicator. The contractor applies appropriate materials as needed to the 70 mess facilities on the installation prior to their use and responds to other problems as they occur.

3.3.2.3.2 Buildings and Utilities

The Buildings and Utilities division has all the trades personnel assigned to the Camp for the repair and maintenance of 450 buildings. These buildings contain in excess of 1.6 million square feet of floor space.

Electrical service is extended to 402 buildings using over 28 miles of high voltage transmission lines. The lines are overhead in the cantonment area and underground at the airfield. Primary electrical service is provided to the cantonment area by Consumers Power Company. This primary service, a 14,400 volt delta system, is transmitted to the Camp's two sub-stations; each has a 1,500 kilovolt amperes (kVA) capacity.

Michigan Power Company supplies the electrical power to the MATES and other facilities in the North Post, while Consumers Power supplies the Grayling Army Airfield.

Water service is extended to 299 buildings. The Camp's two pumping wells produce all of the water used in the cantonment area. Grayling Army Airfield is serviced by the City of Grayling's water system. The Camp's water system uses over 30 miles of main water lines and has a combined capability of 2,160,000 gallons per day. While chlorine treatment of the water is available, it is only used when needed.

Water service to MATES, ranges, and remote facilities is provided by individual wells licensed and tested by the Michigan Department of Public Health.

3.3.2.3.3 Wastewater Treatment Facility

The DEIS included an assessment of the proposed wastewater treatment facility. The treatment plant in use at the time, which had been in use since 1949, was not performing effectively and was no longer in compliance with National Pollution Discharge Elimination System (NPDES) permit standards for discharges to the waters of the State.

As part of an initial assessment of the new facility, an environmental checklist was completed in 1987. The determination was made that additional assessment of the potential environmental impacts was required and would be accomplished in the upcoming EIS. In the meantime, an interim waste stabilization lagoon was constructed and put into operation in June, 1988.

The proposed wastewater treatment facility was included in the DEIS issued in March, 1989. However, on January 9, 1989, prior to issuance of the DEIS, a Final Order of Abatement was issued by the Michigan Water Resources Commission which required the DMA to "abate the existing illegal discharges to the waters of the State."

The DMA was required to discharge wastewater to the interim waste stabilization lagoon until construction of the new wastewater treatment facility was completed. The Water Resources Commission further ordered that the new treatment facility be in operation and in compliance with permit requirements by May 1, 1991. As a result of this Order of Abatement, construction of the treatment facility was authorized prior to completion of the EIS.

The new facility was put into operation during the summer of 1991 and consists of a land application wastewater treatment system capable of handling a total annual wastewater flow of 75 million gallons. The system contains three lagoons of 2.33 acres each, along with the necessary piping and spray equipment for land application. The first and second lagoons are aerated while the third lagoon is facultative. All lagoons are lined.

A spray irrigation system sized for 0.42 million gallons per day (MGD), applies effluent over an area of approximately 40 acres. The system includes all necessary pumps, piping and sprinklers. Additionally, adequate power has been supplied to the site and the site access road (approximately 1 mile) has been upgraded.

The spray irrigation component of the land treatment system was sized for 0.42 MGD because all of the wastewater generated during the year is applied to the land during the summer 6-month application period. During periods in which the wastewater flow exceeds 0.42 MGD, the storage component equalizes the flow to the spray irrigation component. The storage component of the land treatment system is sized to hold 6 months of wastewater during the winter non-application period.

Camp Grayling employs one full-time, certified, wastewater treatment plant operator to operate the facility based upon guidelines and parameters developed and permitted by the DNR.

3.3.2.3.4 Natural Gas

Natural gas is supplied to the main cantonment area and the MATES by Michigan Consolidated Gas Company. Natural gas is used as the primary fuel for heating, hot water, and cooking. Of the 232 buildings with gas service, 117 are heated. The main gas line comes into the cantonment area at a metering device near the main gate. The Camp owns the system beyond that point; line maintenance is performed by Michigan Consolidated.

3.3.2.3.5 Roads and Grounds

The Roads and Grounds Division of the Directorate of Engineering is staffed by equipment operators and laborers. They maintain, including grading, shaping, dust control, and snow removal, approximately 84 miles of improved roads and 160 miles of unimproved roads.

Grounds maintenance consists of grass mowing and the addition of fertilizers and lime where needed. Fertilizer and lime treatments are confined to the cantonment area, approximately 800 acres on the south end of Lake Margrethe.

3.3.2.4 Logistics Services

The Camp Grayling Logistics Directorate is located at the Logistics Support Center (Building 560) and the Ammunition Supply Point (ASP). The Logistics Support Center is a 110,000 sq. ft. warehouse located at the intersection of Howe Road and 8th Street. The ASP is located on the south access road, approximately three-quarters of a mile southeast of Building 560. The ASP consists of a 1,681 sq. ft. office building (Building 950), a 4,000 sq. ft. inert devices storage building, 10 ammunition igloos (each 2,080 square feet), and 2 ammunition igloos of 1,040 square feet each.

The Directorate also operates a bulk fuel facility, located adjacent to Army Aviation Facility #2, at the airfield.

The Logistics Officer, Supply Accounting Branch, Supply Division, Troop Issue Subsistence Activity Division, and Housing Division are located in Building 560. The

Ammunition Division is located at the ASP. The Directorate is authorized 31 military and 4 civilian personnel; it currently operates with 10 military and 13 civilian personnel.

All divisions and branches of the Directorate are actively involved in five basic operations: receiving, storing, accounting, issuing, and inventory. These five operations are routinely performed year-round in the normal course of logistics operations with only the types of commodities handled by each division or branch being different.

3.3.2.4.1 Property Accounting

The Property Book Officer (PBO) is responsible for accounting for all federal property received at Camp Grayling.

The PBO stores most property in the main warehouse on pallets, bins, and shelves. Some of the more pilferable items are kept in wire mesh cages under lock and key control. Stock is rotated in use following normal supply procedures of first in, first out.

All weapons stored at the Camp are locked in vaults constructed specifically for this purpose.

3.3.2.4.2 Housing

The Housing Manager receives requests for facilities from units desiring training at Camp Grayling. The Housing Branch stores over 18,000 sheets, 13,000 pillow cases, and 14,000 mattress covers for use by transient troops. This linen is sent to a commercial laundry after each use.

3.3.2.4.3 Ammunition

Military Supply Class V (Ammunition) items are received from U.S. Army Depots through the U.S. Army Armament Munitions and Chemical Command and are delivered to the Ammunition Supply Point (ASP) by commercial motor carriers.

Because of the sensitive nature of ammunition items, dual driver protection service is utilized. Trailer loads of ammunition are sealed at the point of shipment and the seal is not broken until the shipment is unloaded at the ASP. In an average year, more than 1.5 million pounds of ammunition items (with a value in excess of $5 million) are received.

All ammunition items are stored in the 12 igloos at the ASP. Ammunition is segregated according to compatibility guidelines and inhabited building distance factors. Unloading and moving ammunition requires the use of materials handling equipment, including electric and clean-burning diesel forklifts, electric pallet lifts, and two and four-wheeled manually powered carts. Ammunition is stored on wooden pallets and in its original packing material.

The life cycle of ammunition at Camp Grayling is carefully controlled and all ammunition items are 100 percent accounted for at all times. The requirement for ammunition items is forecasted by a unit for a particular training event and is requisitioned from a depot by the ASP based on that forecast. Basic stockage of ammunition items is not kept at the ASP; all ammunition is there to be used in an upcoming training event.

Ammunition is issued to the user on Department of the Army (DA) Form 581 (Request for Issue and Turn-in of Ammunition). The issued ammunition is inventoried jointly by the user and the ASP and loaded onto vehicles belonging to the training unit. Ammunition loads are stabilized with blocking, bracing, and tie-down materials before leaving the ASP. All vehicles transporting ammunition are required to undergo a rigorous maintenance inspection and display the appropriate placard ("Explosive") required by the United States Departments of Defense and Transportation.

3.3.2.4.4 Troop Issue Subsistence Activity (TISA)

The TISA receives foodstuffs from Army Depots, commercial contractors, and local vendors. All shipments arrive via commercial motor carrier; some shipments of perishables require refrigerated trailers.

In a typical year, the TISA receives more than 2 1/2 million pounds of food, with a value exceeding 1 1/2 million dollars.

Rations are stored in the TISA warehouse, a 47,000 sq. ft. facility located in Building 560. Included in the TISA warehouse is a 9,600 sq. ft. refrigerator and a 4,000 sq. ft. freezer. Rations (subsistence) are not stored long term, rather, because of the perishability, foodstuffs are ordered to arrive just in time to support a training unit and often go from receipt to unit issue in a very short time.

3.3.2.4.5 Petroleum Supply, Medical Supply, Warehousing

The Supply Division of the Directorate of Logistics is staffed with 3 military and 7 civilian personnel.

The Petroleum Branch receives bulk unleaded gasoline, diesel fuel, and JP-4 jet aviation fuel from commercial contractors and government owned petroleum terminals. The fuel is transported by commercial motor carriers to the bulk fuel site at the airfield.

Bulk fuel is stored in above ground storage tanks; a 57,000 gallon gasoline tank, a 47,000 gallon diesel tank, and a 50,000 gallon JP-4 tank.

The Petroleum Branch also operates a small retail issue site at the cantonment area. This site consists of a 6,000 gallon underground gasoline tank and a 6,000 gallon underground diesel tank. These tanks were installed in 1992 and meet all federal and state requirements for underground storage tanks.

The Medical Supply Branch receives medical supplies from Army Depots and commercial contract vendors. Medical supplies are issued directly to the Troop Medical Clinic only. The Camp does not issue medical supplies to units in training.

The Warehouse Branch receives all classes of supply, not only for the installation, but also for Camp Grayling's eight units and the Post Exchange. The majority of these shipments are received from commercial motor carriers and the trailers are unloaded at the Troop Issue Warehouse dock utilizing electric fork lifts and pallet lifts and clean-burning diesel forklifts.

3.3.2.4.6 Regulated Waste Handling

Building 560 serves as the central collection point for all regulated waste generated by units in training at Camp Grayling. The Mobilization and Training Equipment Site (MATES) and the Army Aviation Support Facility #2 (AASF #2) are the collection points for any regulated wastes generated by these facility operations.

This waste includes used oil, used antifreeze, used transmission fluid, used solvents, waste JP-4 fuel, battery acid, waste gasoline, and waste diesel fuel. The Warehouse Branch also receives barrels of fuel soaked soil (or spill residue) from the cleanup of small fuel spills, which average 5 to 6 gallons.

These wastes are stored in regulated waste storage areas until picked up and disposed of by a commercial contractor. All Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) manifests, labels, and records are maintained by the Warehouse Branch. This activity is overseen by the State Environmental Protection Officer at State Headquarters in Lansing and is regularly inspected by the DNR.

3.3.2.5 Mobilization Services

The Mobilization Planning Division at Camp Grayling is the installation's proponent for planning and execution of the possible mobilization of over 26,000 military personnel at the Camp. Mobilizations can encompass a small number of soldiers to several large organizations with thousands of soldiers and massive amounts of equipment, depending upon the State or National emergency which sends them to Camp Grayling for last-minute training.

3.3.2.6 Environmental Services

The Camp Grayling Environmental Office assists the Camp Commander in providing the most prudent stewardship of the Camp's natural resources practicable. It does this by managing a variety of programs, inventories, studies, regulations, contracts, and projects designed to maintain and ensure installation compliance with all federal, state, local, Department of Army (DA), DOD, DMA, and Camp Grayling rules, laws, and regulations.

Four full-time DMA State Civil Service employees are stationed at Camp Grayling's Building 30, under the direction and oversight of the DMA State Environmental Manager in Lansing.

3.3.3 Major Tenant Operating Activities

Three tenant organizations employ approximately 40 percent (88 of 220) of the Camp's overall full-time work force. The MATES is under the supervision of the Michigan Army National Guard's State Maintenance Officer in Lansing. The Army Aviation Support Facility #2 (AASF #2) is under the supervision of the Michigan Army National Guard's State Aviation Officer at Grand Ledge. The Air-to-Ground Range Operations Facility is under the supervision of the Michigan Air National Guard's Combat Readiness Training Center Commander at Alpena.

3.3.3.1 Mobilization and Training Equipment Site (MATES)

Units which historically train at Camp Grayling have pooled their heavy equipment at the MATES, located on North Down River Road just east of I-75 (see Figure 3-11).

MATES employs 79 full-time (out of an authorization for 149 employees), and up to 10 temporary maintenance personnel throughout the year. Maintenance is performed on over five battalions worth of tracked and wheeled equipment, or approximately 400 combat vehicles (tanks, howitzers, personnel carriers, missile launch vehicles, heavy engineer equipment, etc.) and 879 wheeled vehicles and support equipment stored at the site (see Table 3-1).

Maintenance tasks include automotive repairs, hydraulic/pneumatic repair, engine/transmission/transfer rebuild, optical/laser/instrument repair, small arms repair (0.50 caliber and below), and painting, welding, and machine shop operations.

Equipment inspections (for both issue to using units and receipt from using units) and any subsequent maintenance activities are performed on concrete surfaces around the MATES complex. Approximately one half of the vehicles are stored in concrete block storage buildings with metal roofs. All combat vehicles stored at the MATES (both inside and outside) are parked on concrete surfaces. Wheeled and engineer vehicles stored at the MATES or vehicles awaiting service and/or repair are parked on unimproved areas or gravel parking areas within the compound.

Repairing, servicing, and maintaining this equipment requires the annual approximate usage of the following products:

5,300 gallons of gasoline	20,000 gallons of diesel fuel
605 gallons of paint	150 gallons of thinner
1,600 gallons of antifreeze	360 gallons of hydraulic oil
4,000 gallons of oil	1,200 pounds of grease

Table 3-1
Mobilization & Training Equipment Site (MATES) Vehicle Inventory
5 January 1994

LIN	ACCT #	NOMENCLATURE	TOTAL
		OHIO NATIONAL GUARD CONTRIBUTIONS:	
C12155	211-41	Carrier Personnel F/T (FISTV): M981	6
D10741	211-28	Carrier Mortar S/P 107mm: M106A2	6
D11049	211-13	Carrier Cargo F/T 6T: M548A1	5
D11538	211-12	Carrier Command Post L/T: M577A2	11
D12087	211-11	Carrier Personnel F/T Ar: M113A2	61
E56896	211-38	Combat Vehicle ITV: M901A1	9
K57667	211-23	Howitzer Med S/P 155mm: M109A3, M109A4	6
R50681	211-51	Recovery Vehicle F/T Med: M88A1	13
T13374	211-37	Tank Combat F/T 105mm: M-1	70
			187
		INDIANA NATIONAL GUARD CONTRIBUTIONS:	
C12155	211-41	Carrier Personnel F/T (FISTV): M981	3
C20414	251-03	Bridge AVLB	2
D10741	211-28	Carrier Mortar S/P 107mm: M106A2	6
D11049	211-13	Carrier Cargo F/T 6T: M548A1	2
D11538	211-12	Carrier Command Post L/T: M577A2	7
D12087	211-11	Carrier Personnel F/T AR: M113A2	46
E56578	211-33	Combat Engr Veh F/T: M728	1
E56896	211-38	Combat Vehicle ITV: M901A1	11
K56981	211-24	Howitzer Hvy S/P 8 in: M110A2	2
L43390	211-35	Launcher AVLB: M48A2	1
L43664	211-35	Launcher AVLB: M-60	1
R50544	211-52	Recovery Vehicle F/T Lt Ar: M578	2
R50681	211-51	Recovery Vehicle F/T Med: M88A1	1
T13169	211-36	Tank Combat F/T 105mm TTS: M60A3TTS	9
			94
		MICHIGAN NATIONAL GUARD CONTRIBUTIONS:	
D10741	211-28	Carrier Mortar S/P 107mm: M106A2	3
D11049	211-13	Carrier Cargo F/T 6T: M548A1	9
D11538	211-12	Carrier Command Post L/T: M577A2	15
D12087	211-11	Carrier Personnel F/T Ar: M113A2	10
E56896	211-38	Combat Vehicle ITV: M901A1	1
L44894	408-05	Multiple Launch Rocket Sys: M270	24
R50544	211-52	Recovery Vehicle F/T Lt Ar: M578	2
R50681	211-51	Recovery Vehicle F/T Med: M88A1	8
* K57667	211-23	Howitzer Med S/P 155mm: M109A3, M109A4	(18)
T13169	211-36	Tank Combat F/T 105mm TTS: M60A3TTS	46
			118
		Total of all contributions:	399

*Not included in current totals. Howitzers due to arrive June 94 to support proposed reorganization of 1st Battalion, 119th Field Artillery from 105mm, Towed to 155mm, S/P.

When time and staffing allow, all combat vehicles used for training are pressure washed at the site's outside wash rack. Approximately 300 vehicles per year are cycled through this facility. In addition, all combat vehicles serviced in the shop area have various compartments washed. Annually, these activities generate approximately 97,000 gallons of wash water which is collected via floor drains to a 20,000 gallon underground storage tank. This wash water is disposed of, under DNR permit, through the wastewater treatment facility on South Post.

In 1992, the site generated 1,403 gallons of Resource Conservation and Recovery Act (RCRA) waste. The site's proactive waste stream minimization program now includes both an antifreeze recycler and a diesel fuel recycler. Over 1,500 gallons of antifreeze and over 3,000 gallons of diesel fuel were recycled in 1993 which resulted in only 160 gallons of antifreeze and 925 gallons of diesel fuel waste. Additionally, due to conversion to sealed type batteries, the site is almost completely out of the battery charging business. Most of its supplies come from commercial vendors. Currently, only one or two batteries are serviced by MATES personnel each week; this represents a dramatic reduction from the old annual average of 400 batteries serviced.

As a general rule, all materials used or replaced during maintenance or administrative activities are subject to some type of recycling process. This includes scrap metal bins, cardboard containers, and contracted vendors for used liquids, such as antifreeze, waste oil, and parts washer solvent.

All solid wastes are disposed of in the nearest licensed landfill, City Environmental Services of Waters, Inc., a privately operated landfill on Sherman Road in Maple Forest Township, Crawford County. This landfill is located approximately 2 miles west of Range 40.

3.3.3.2 Army Aviation Support Facility 2 (AASF#2)

3.3.3.2.1 Location/Mission

The Army Aviation Support Facility (AASF) #2 at Grayling Army Airfield is an extension of the Michigan Army National Guard's AASF at Grand Ledge (see Figure 3-10). Its mission is to supplement services provided by the AASF, Grand Ledge, for rotary wing units and individual aircrews training at or transiting Camp Grayling.

AASF #2 is operated with Federal funds and is staffed by two logistics branch employees of the MI AASF on extended temporary duty at Camp Grayling. Two to four helicopters are normally "forward staged" at AASF #2; no aviation unit is permanently stationed there.

3.3.3.2.2 Major Activities

MIARNG aircrews may perform Additional Flight Training Periods (AFTPs) from the AASF #2 with prior coordination with and approval of the operations officer, AASF, Grand

Ledge. An AFTP consists of a minimum of 4 hours duty and 1 1/2 hours of flight time. AFTPs do not equal flying hours as aircrews consist of two to four members, each potentially performing an AFTP. Approximately 678 AFTP workdays were performed at AASF #2 during FY93.

The AASF #2 is ideally suited to provide Inactive Duty Training (IDT) forward basing support to an attack helicopter company or platoon sized element of the Assault Helicopter Battalion. These units typically consist of 40 or fewer personnel and normally operate six to eight helicopters. Units of this size operated from the AASF #2 for 30 IDT weekends in FY93.

During annual training (AT) periods, the maintenance companies of each of the aviation battalions and the Aviation Intermediate Maintenance Detachment (Detachment 2, Company E, 106 Aviation), (AVIM), use the facilities at AASF #2 to conduct aircraft maintenance which is too sophisticated to be completed in the battalion's tactical forward assembly area. Each battalion puts between one and three helicopters through a complete Aviation Phased Maintenance Inspection during any one annual training period.

The State Area Command (STARC) aviation section also operates from this facility during annual training. This section provides VIP helicopter support for the period and coordinates all AT aviation activities with its 15 soldier staff.

3.3.3.2.3 Services

The AASF #2 staff provides full-time aviation support at the Grayling Army Airfield to include fueling of aircraft, flight operations support, and limited aircraft maintenance. The staff also provides primary airfield operational maintenance support by maintaining airfield lighting, navigational aids, and providing Notice to Airmen (NOTAM) service to the Federal Aviation Administration (FAA).

3.3.3.2.4 Facilities

AASF #2 consists of the former MATES facility (Building 1101), a helicopter parking area with six concrete helicopter parking pads, and a paved ramp area between the main facility and the Quonset buildings to the north. Building 1101 contains four large maintenance bays, each of which can accommodate up to two helicopters. Two helicopters can be parked on the paved ramp outside Building 1101, plus six more on the concrete parking pads.

3.3.3.2.5 Traffic Pattern

Takeoff and landing operations are conducted along runway 14/32. Takeoffs by military aircraft directly over the area to the south of AASF #2 are not permitted by the Camp Commander, due to the large population concentration in that direction.

3.3.3.3 Air-to-Ground Range Operations Facility

This facility is one of two (MATES being the other) of the major year-round operating tenants of the Camp. It is operated by a range control cell from the Michigan Air National Guard's Combat Readiness Training Center at Alpena. The range shares ground, air space, and range fans with Army National Guard artillery/mortar and helicopter crews.

3.3.3.3.1 Location

The Grayling Air Gunnery Range (also known as the Air-to-Ground Range) occupies approximately 1,800 acres of the northern portion of Range 40 (see Figure 3-12). It is located in Chester township, Otsego county.

3.3.3.3.2 History

The range has been in existence since 1967. The current range complex (tower and maintenance building) was completed in 1970. There is no landing facility at this range.

3.3.3.3.3 Mission/Activities

The mission of the range is to provide a training environment for:

- U. S. Air Force fighter and attack aircraft to practice bombing and strafing.
- Cargo aircraft to deploy simulated cargo (sandbags).
- Forward Air Controller (FAC) training (normally by OA-10 aircraft firing 2.75-inch rockets) to mark targets for other armed aircraft. Fighter aircraft may orbit off the range waiting for the FAC to mark the target and clear the strike (fighter) aircraft to the target site.
- U.S. Army ground laser teams to work with armed aircraft.
- Helicopters (HH-3, UH-1, AH-1, OH-58, CH-47, UH-60, AH-64) to practice rocket, cannon, and machinegun firing. These helicopters are normally controlled by an Army officer from the aviation unit using the Range 40 helicopter gunnery range; this officer is located with the Air National Guard Range Control Officer in the top of the control tower.
- Evaluation of flying proficiency by Air Force higher headquarters during Operational Readiness Inspections. These missions are characterized by a higher sortie to pass ratio than normally occurs.
- Aircrews to practice tactics and planning by conducting air exercises within the restricted military airspace (R4201A) around the range.

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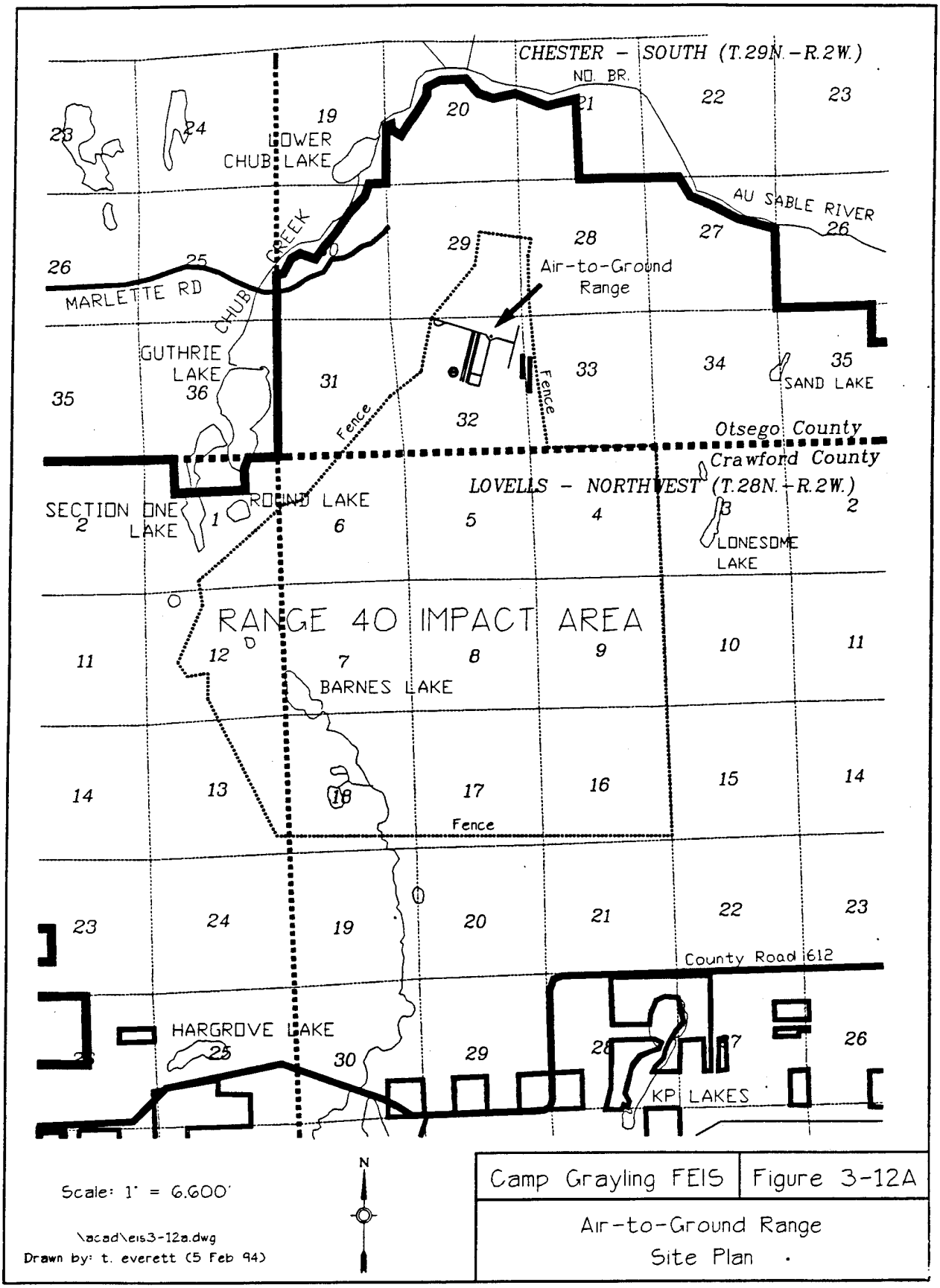
CHESTER - SOUTH (T.29N.-R.2W.)
NO. BR.
LOWER CHUB LAKE
AU SABLE RIVER
CHUB CREEK
MARLETTE RD
Air-to-Ground Range
GUTHRIE LAKE
SAND LAKE
Fence
Otsego County
Crawford County
LOVELLS - NORTHWEST (T.28N.-R.2W.)
SECTION ONE LAKE
ROUND LAKE
LONESOME LAKE
RANGE 40 IMPACT AREA
BARNES LAKE
County Road 612
HARGROVE LAKE
KP LAKES
Scale: 1" = 6,600'
N
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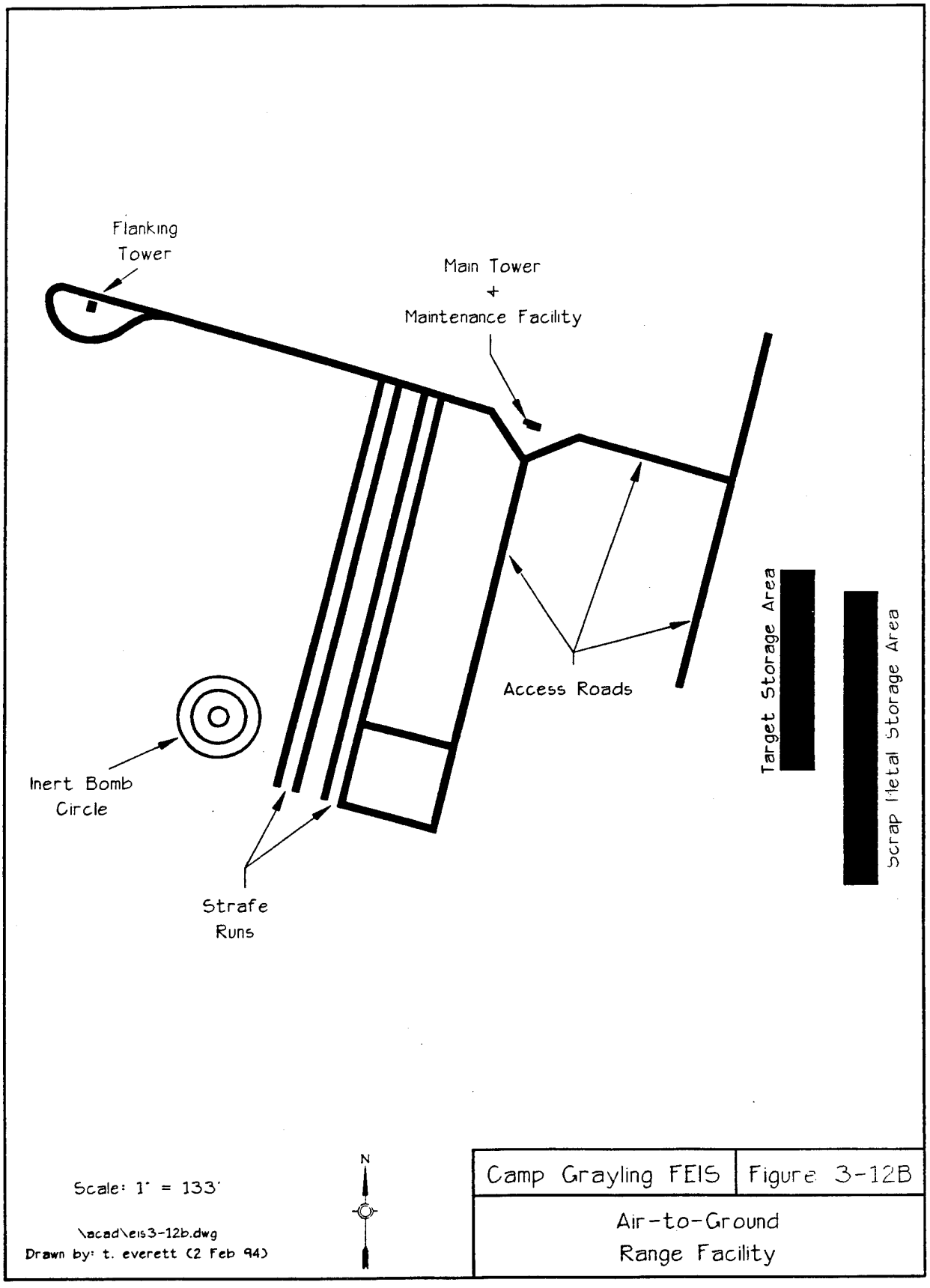
Drawn by: t. everett (5 Feb 94)
Camp Grayling FEIS
Figure 3-12A
Air-to-Ground Range
Site Plan


Flanking
Tower
Main Tower
+
Maintenance Facility
Access Roads
Target Storage Area
Scrap Metal Storage Area
Inert Bomb
Circle
Strafe
Runs
N
Scale: 1" = 133'
\acad\eis3-12b.dwg
Drawn by: t. everett (2 Feb 94)
Camp Grayling FEIS
Figure 3-12B
Air-to-Ground
Range Facility

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- The range hosts Army, Marine, and Air Force units for various types of ground training and range support activities each year. Range personnel also host approximately 3,000 visitors annually.

- The range has also hosted aircraft of several allied nations including Canadian Forces F-18s, Tornados from Great Britain, and Mirages of the Italian Air Force.

3.3.3.3.4 Personnel

Seven Michigan Air National Guard personnel are permanently assigned full-time to the range. Two additional personnel are authorized, but not funded. These positions are expected to be filled by 1997.

3.3.3.3.5 Facilities

The air-to-ground impact area is fenced on three sides and shares a boundary with the artillery impact area on the fourth (south) side. The main tower is electrically heated and cooled, and has a septic tank and approximately 22 feet deep water well. The well's water is checked quarterly for contaminants; none have ever been found.

The site contains a 1,000 gallon underground diesel fuel tank for refueling the four wheeled and four tracked vehicles assigned to the range. This underground storage tank (UST) is a regulated UST and is registered with the State of Michigan. This tank is checked annually for leakage by a civilian contractor and is scheduled to be converted to above ground storage about 1995. Normal solid waste is taken to Alpena Combat Readiness Training Center (CRTC) in plastic bags for disposal. Batteries, oil, brake fluid, transmission fluid, and anti-freeze from automotive targets and small amounts of contaminated earth and rags from target and normal vehicle maintenance is collected at the range. This hazardous waste is handled by contractors hired by Alpena CRTC.

3.3.3.3.6 Activity Level

The normal sortie (a take off and a landing equals one sortie) rate is 3,800 - 4,800 annually, with an average of 4,500 per year. In FY93 there were 4,687 sorties. Assuming 8 flight passes per sortie (6 bomb and 2 strafe) (LTC McKenna, Personal Communication, 1994), an average of approximately 36,000 flight passes per year could be expected.

Approximately 51 percent of the aircraft are F-16s, 20 percent A-10s, 20 percent rotary wing, and 9 percent others (mainly C-130's).

Users are identified as "daily units" or "deployed units." Daily units normally utilize Camp Grayling's air-to-ground range without deploying or stopping at Phelps/Collins Combat Readiness Training Center. These units are normally from Michigan, Indiana, and Ohio.

Deployed units deploy from home station to Phelps/Collins as a unit and then operate from that facility.

With the exception of most Army helicopters and several C-130s, none of the aircraft using the range land at Grayling Army Airfield.

3.3.3.3.7 Ordnance

The vast majority of ordnance used on the range is practice, not high explosive. Because the angle at which the ordnance is delivered from the aircraft firing/dropping it to the ground is quite shallow, spent munitions are generally found close to the surface rather than deeply buried. Approximately 10 percent of the bombs dropped on the range are 500 lb bombs which can penetrate the soil to an estimated depth of six feet. Cannon rounds used on the strafing passes, however, are generally found on or close to the surface.

The most commonly used ordnance on the range are 20mm and 30mm Target Practice (TP) rounds. Approximately 300,000 of these aluminum tipped steel rounds are fired annually from gatling guns of various aircraft. These rounds are picked up regularly by a mechanical clearing device and sold as scrap or contracted removal.

A second type of cannon round used is the High Explosive Incendiary (HEI) 20mm and/or 30mm round. Fewer than 5,000 of these rounds are expended annually. The shell casings of all cannon rounds are retained in the aircraft and returned to its servicing airfield.

Currently, three types of bombs are regularly dropped by various aircraft utilizing the range. Approximately 20,000 of the most common, a 25 lb inert (does not explode) practice bomb (the BDU-33), are dropped annually. This bomb has a spotting charge that weighs approximately four ounces, including casing, firing pin and a small amount of red phosphorus. Approximately 95 percent of these spotting charges detonate upon impact.

A second type of bomb infrequently expended, in the artillery impact area, is the Mk-82. This is a 500 lb bomb containing 192 pounds of tritonal. Generally, tritonal consists of 80 percent trinitrotoluene (TNT) and 20 percent aluminum. Approximately 100 to 200 of these bombs are dropped annually. Each aircraft using these bombs is restricted to carrying not more than two and may only drop one per flight pass.

A third type consists of a family of full scale iron bombs filled with concrete. Approximately 300 of this family, varying in size from the 500 lb BDU-50 to the 2,000 lb Mk-84 are dropped annually.

Air-to-ground rockets used on the range are of two types; white phosphorus and inert. They are fired by Forward Air Control (FAC) aircraft to designate ground targets. As fewer FAC units have been retained in the force structure over the past several years,

the use of rockets has declined from an average of approximately 2,000 in FY91 to approximately 400 rockets in FY93.

Approximately 400 counter-offensive flares (ALE-40) are expended in a typical training pattern. These flares are dropped above 1,000 feet above ground level (AGL). They have a burn time of 3-5 seconds, leave no solid residue, and are burned out in the air with no ground impact.

C-130 cargo aircraft drop parachute retarded sandbags; these are retrieved by range personnel after each flight.

Annually, approximately 100 specially constructed simulated Surface-to-Air Missiles (SAMS) are fired at the range. They are constructed of cardboard and styrofoam. They resemble a fireworks rocket and are fired to simulate ground-to-air threats against training aircraft. These SAMs are primarily used to familiarize aircrews with the smoke signature of SAMs.

3.3.3.3.8 Explosive Ordnance Demolition

Because they are, for the most part, inert, the bombs used on the range are retrieved from the main target area. The most common bomb, the BDU-33, is picked up once or twice each year. They must be checked to confirm the spotting charge has detonated. Those which can't be confirmed as detonated by normal impact are declared "duds" and detonated with C-4 explosive until the spotting charge can be declared detonated.

The larger inert steel bombs are picked up on a regular basis and stored until they can be sold by the Defense Reutilization and Marketing Office (DRMO) as scrap metal.

3.3.3.3.9 Target Preparation and Disposal

Targets used on the range normally consist of old military vehicles. Prior to being placed at strategic points on the range, they are drained of oil, anti-freeze, fuel, and brake fluid and the battery is removed.

When the target vehicle has been battered to the point of being unusable, it is removed from the range and stored in the storage area until it can be sold by contract by the Defense Reutilization and Marketing Office (DRMO) to a scrap dealer.

3.4 Description of Training Activities

The current training level of approximately 20,500 soldiers, organized in approximately 115 units, for 14-day annual training periods and approximately 26,000 soldiers, organized in approximately 219 units and groups for 2-day weekend training periods annually, would continue - subject to the unknowns referenced throughout this document.

Military training activities at Camp Grayling generally mirror those taking place at any large military base around the Continental United States.

As a general statement of the current training activity at the Camp, military training is conducted by soldiers gathered in groups from 2 to 20,000, organized in many different types of units from section/team to division level, conducting training operations to prepare to execute the entire spectrum of missions required for success on any modern battlefield, operating many different types of equipment, at many different times of the day and night, and at many different times of the year.

All United States military training is governed, to the maximum extent practicable, by the time-tested maxim contained in one of the Army's keystone training documents (FM 25-101, Battle Focused Training, September 1990), "train as you fight."

Many types of military units require large land/air areas for firing and maneuver exercises. Concurrent training by several different units of several different disciplines of military service is normal. Camp Grayling has sufficient land area to contain most of the firing and maneuver requirements of most units of U.S. military forces training to win any engagement with any enemy.

Camp Grayling is utilized as a training facility for many different types of Reserve Component and Active Component training requirements. Primarily, the Camp hosts many different annual training (AT - two-week) periods (see Table 3-2); inactive duty training (IDT - weekend) periods (see Table 3-3); weapons firing/qualification (both AT and IDT), command post non-maneuver exercises (both AT and IDT), field training maneuver exercises (both AT and IDT), and other miscellaneous training activities throughout the training year (1 October - 30 September).

See Tables 3-2 through 3-5 for typical AT, IDT, and cold weather troops usage. See Appendix A for comprehensive lists of typical military units using Camp Grayling.

Training activities for Army units (both Active and Reserve) are goal oriented and are based upon hundreds (and even thousands) of tasks, conditions, and standards outlined in various Army Training and Evaluation Programs (ARTEPs). Generally, an Army unit (at whatever level) must perform any ARTEP task to the required standard before proceeding to the next higher (or more difficult) level. A certain number of ARTEP tasks must be completed to standard before a unit is considered "combat ready" by the National Command Authority of the United States.

Mission tasks (i.e., training activities) for any particular unit vary according to its type and required readiness condition. All units strive for the highest level of combat readiness - Readiness Condition 1 (REDCON 1). Readiness Conditions 2 & 3 (REDCON 2 & 3) indicate a unit which is somewhat short of full readiness and REDCON 4 indicates a unit not capable of deploying for war. A final condition, REDCON 5, indicates a unit which is constrained by higher headquarters, and not necessarily by training deficiencies, from attaining a higher REDCON.

Table 3-2
Typical Annual Training Troop Usage by Military Service
For Any Fiscal/Training Year; 1 October - 30 September

Military Service	Average # of Units	Average # of Soldiers	% of Total
Army National Guard	95	17,341	70.7
United States Army Reserve	20	1,991	8.1
Air National Guard/Air Force Reserve		4,012	16.4
Active Army		865	3.5
Other Forces (e.g. canadians)		268	1.1
Visitors		48	0.2
Totals	115	24,525	100

Source: Camp Grayling Files; data is derived from planned and actual troop strength for Fiscal Years 1989 through 1993.

Annual Training (AT) for any unit normally consists of 1-2 days travel to a training site and 13-14 days training at the site.

Table 3-3
Typical Inactive Duty Training Troop Usage by Military Service
For Any Fiscal/Training Year; 1 October - 30 September

Military Service	Average # of Units	Average # of Soldiers	% of Total
Army National Guard	154	20,816	75.8
United States Army Reserve	18	2,708	9.8
Air National Guard/Air Force Reserve		675	2.5
Other Forces	24	1,545	5.6
Civilians	23	1,741	6.3
Totals	219	27,485	100

Source: Camp Grayling Files; data is derived from planned and actual troop strength for Fiscal Years 1992 and 1993.

Inactive Duty Training (IDT) for any unit (assuming it is leaving its home station for training) normally consists of several hours of travel time to and from a training site and 1-1.5 days of training at the site.

Table 3-4
Annual Training & Inactive Duty Training Troop Usage
Typical For Any Fiscal/Training Year; 1 October - 30 September

Type of Training Activity	Avg # of Soldiers	Avg # of Mandays	% of All Mandays
Annual Training (AT) Usage	24,033	284,306	85.6
Inactive Duty Training (IDT) Usage	24,325	47,975	14.4
Totals	48,358	332,281	100

Source: Camp Grayling Files; AT data is derived from planned and actual troop strength for Fiscal Years 1989 through 1993. IDT data is derived from planned and actual troop strength for Fiscal Years 1992 and 1993.

Individual manday figures are multiplied by 14 to produce AT mandays and 2 to produce IDT mandays, except Fixed Wing which are not multiplied - they are one to one.

Table 3-5
Typical Cold Weather Training Troop Usage For Any
Fiscal/Training Year; 1 September - 1 June

Type of Training	Total Average # of Soldiers	Cold Weather Attendance	% of Total Training
Annual Training (AT)	16,299	2,680	16.4
Inactive Duty Training (IDT)	27,252	23,609	86.6

Source: Camp Grayling Files; AT/IDT data derived from planned and actual troop strength for Fiscal Years 1992 and 1993.

Mission (ARTEP) tasks may be performed on various time cycles; these may be dependent on the unit's REDCON. Some tasks may be trained/performed on an annual or biannual basis, while others may be performed monthly or even every 3, 4, or 5 years. All other military forces training at the Camp are guided by similar training/operations plans and programs. The following sections contain more detail on the major types of military training activities conducted at the Camp. For clarity, the activities have been divided into ground-based activities and air-based activities.

Many of the explanations of the various training missions, while appearing detailed, barely "scratch the surface" of the complexities of military operations on either the training or actual battlefield. A balance has been sought between the detail necessary to evaluate the significance of the impact of these activities on the environment and the clarity sought for the purpose this document is intended. Each activity is briefly described; substantial additional technical detail is available from many sources for those users of this document who require it.

3.4.1 Warm Weather, Cold Weather, and Winter (Snow Training) Activities

All United States military forces, as a general rule, need to be able to conduct military operations worldwide. This includes the vast myriad of terrain, climatic, and social conditions found around the globe. While the military services have organized and assigned specific missions to certain units which make them more suitable for employment in certain parts of the world, this does not negate the basic requirement for worldwide deployment under wartime conditions.

Large areas of Camp Grayling are currently used for training in all the climatic conditions found in the northern and southern latitudes (i.e., all four seasons). The typical seasonal training calendar for the Camp is divided into two major categories; Warm/Cold and Winter.

For the purposes of this activity description and to allow an in-depth environmental analysis, the training season has been divided into two major activities. These activities are; (1) those training activities which are time-resource driven (i.e., many training requirements versus limited training facilities), and (2) those training activities which require extreme cold weather and/or snow cover (i.e., winter) to accomplish.

The vast majority of soldiers and airmen training at the Camp during cold weather are there simply due to the nature and annual scheduling of IDT training activities. These training activities are characterized by a concentration on range firing, maneuver, and cantonment area lodging versus bivouacking.

Some units and individuals, however, come to the Camp during cold weather to conduct either AT or IDT training in the snow. Typically, approximately 5-8 percent of both AT and IDT at the Camp is conducted in the snow.

Snow, particularly deep snow (over 12 inches deep, approximately), severely limits military operations. World history, of course, has recorded the abilities and/or inabilities of armies across the ages to operate in the snow. Winter training activities at Camp Grayling are designed to provide limited snow training for soldiers.

Military training activities in the winter can be generally grouped into the same three categories as "no-snow" training of firing, bivouacking, and tactical maneuvers. While the soldiers are generally required to conduct the same training tasks in the snow as they would during warm weather, it takes significantly longer to perform the same activities

under the more adverse conditions found in the deep winter at Camp Grayling. Besides the personal safety issues which drive the necessity to train individual soldiers for winter deployments to hostile regions, it is this longer mission accomplishment factor which drives both unit and individual training during the deepest winter possible.

The primary winter/snow training activity conducted at the Camp is the Cold Weather Operations School, held in late January and/or early February each year. This school, conducted by staff from the Michigan Military Academy from Fort Custer, Michigan, consist of training 200-300 individuals from the Reserve Components of Michigan, Ohio, and Indiana in the various leadership skills necessary to lead soldiers in extreme cold weather operations worldwide.

Typically, the schedule for this two-week school finds the students spending the first several days in the cantonment area (in heated quarters and classrooms) learning basic survival and snow movement techniques. The next 4-6 days are spent bivouacking in the field, in tents, learning more actual survival techniques. The students get to the bivouac site (and back to the cantonment area when the field period is completed) by either skiing or snowshoeing the 3-6 kilometers to the site.

At some point in the class, the students will spend a day at the small arms ranges where they will typically fire 50-100 rounds from an M-16 rifle.

3.4.2 Ground Training Activities

Ground-based training activities conducted at Camp Grayling fall into two broad classifications; live fire exercises and field exercises. Live fire exercises involve the use of live ammunition or ordnance. Because of safety concerns (to the public as well as the soldiers), live fire exercises are highly structured, occur only at specific locations, and are tightly controlled. Field exercises can involve a wide variety of activities, such as vehicle maneuvers and convoys, foot maneuvers, bivouacking, construction of fortifications, weapons emplacements, and obstacles, and aircraft operations (the latter are described in more detail in Section 3.4.3). Field exercises can take place throughout the Post, including the existing live fire ranges with the exception of the impact areas. With proper coordination, both live fire exercises and field exercises can take place at the same time.

3.4.2.1 Field Exercises

The ability to function effectively under field conditions is crucial to the success of military operations. Field exercises are used to train soldiers to perform field tasks as efficiently and as safely as possible. Field exercises can encompass a wide variety of activities. Individual exercises can involve anywhere from just a few troops to several thousand troops at one time. The following activities are integral aspects of all field exercises. These activities should not be considered mutually exclusive. Field exercises will usually involve several of the described activities.

Activities described here are generally conducted by all units training at Camp Grayling, regardless of size, type, or composition. Further, the activities described here generally pertain to units training in the "field," away from the three main support bases (cantonment area, airfield, and MATES).

3.4.2.1.1 Vehicle Movements

Vehicle movements at Camp Grayling are of four main types. First, units convoy from their home stations in groups of 2 to 25 (or more) vehicles; these convoys arrive at the Camp (and sometimes the maneuver/firing/training areas) on the main improved road network supporting it. Second, vehicles move in tactical convoys within the Camp's boundaries, and where necessary, outside its boundaries on the way to training areas. Third, trucks of all kind move across the entire breadth of the Camp and its outskirts as single and small groups of administrative and logistical vehicles.

The fourth kind of vehicle movement at Camp Grayling, and the one with the most potential to impact the environment, is off-road tactical maneuver. The majority of vehicles involved in this activity are tracked, however, wheeled vehicles can be included in several combat scenarios.

3.4.2.1.2 Bivouacking

During field exercises (and as an integral part of the exercise), troops will bivouac in the field (training areas). Bivouacking involves the establishment of temporary encampments which may be used for a single night or may be used for up to several weeks. Bivouacs vary in complexity, depending on the type of exercise being conducted. Encampments often involve the use of tents which range in size from one person "pup" tents to tents the size of small buildings.

Bivouac sites are normally wooded, dry, and accessible to roads. They rarely have water, electricity, or enclosed latrines. Bivouacking activities usually involve the digging of latrines with hand shovels. Larger bivouac sites may require the digging of small sumps for wash water associated with kitchen and laundry facilities. Bivouac sites are generally characterized by different types and sizes of tentage, some brush clearing, imported water, generators to provide any electricity needed, exported solid waste, and pit latrines.

3.4.2.1.3 Refueling

Refueling activities cover everything from filling 5,000-gallon trailers at the airfield, to refueling vehicles from different size fuel haulers at either fixed or temporary refueling points, to using a 5-gallon can.

3.4.2.1.4 Fortifications, Emplacements, and Obstacles

Combat engineer units at Camp Grayling will often conduct field activities involving the construction of various features designed to protect troops on the battlefield. Such features will often be constructed by engineer units and then used by infantry or other units in a training exercise.

(1) Fortifications: Types of fortifications that can be constructed include bunkers, protection berms, and defilades (fighting positions for armored vehicles). Construction of bunkers involves the digging of a hole, lining the hole with wooden planks, and covering the top with planks and earth. Protection berms function to protect vehicles and aircraft parked next to them from observation, flying shrapnel, and other debris. Berms are constructed by bulldozing earth into a berm of appropriate size for the vehicles or aircraft to be protected. Defilades are wide trenches with sloping ends in which a vehicle can be parked so its top is close to ground level. Defilades can also be covered with tenting and used as a protective shelter for troops.

(2) Emplacements: Emplacements (fighting positions) are intended to provide protection to troops during battle. Emplacements can vary in size from single person "foxholes" to positions large enough to accommodate a crew served weapon, such as a machinegun. Construction of emplacements consists of digging a hole or trench of appropriate size and, in some cases, further fortifying the hole with sandbags or wooden planks.

(3) Obstacles: Obstacles are constructed in the path of advancing enemy forces and are intended to impede their progress. Obstacles are also used to protect encampments, such as logistical base camps. Obstacles most often constructed are vehicle exclusion ditch and berm combinations and barriers of concertina "barbed" wire. Concertina wire is often used to further strengthen anti-vehicle ditches/berms.

Obstacles are normally removed after the training exercise they were constructed for is completed. A special effort is made to remove all concertina wire because of the safety hazards presented by this material.

3.4.2.2 Command, Control, and Staff Training Activities

The activities described here generally involve various size groups of leaders in a static environment.

3.4.2.2.1 Map Exercises (MAPEX)

Map exercises are low-cost, low-overhead training exercises that portray military situations on maps and overlays that may be supplemented with, or replaced by, terrain models, sand tables, and/or computers. MAPEXs allow commanders at all levels to train their staffs to perform essential integrating and control functions to support mission decision making under simulated wartime conditions. MAPEXs may be employed by commanders to train their staffs at any echelon:

- to function as effective teams
- to exchange information
- to prepare estimates
- to give appraisals
- to make recommendations and decisions
- to prepare plans
- to issue orders
- to be proficient in the integration of all branch elements of the team

3.4.2.2.2 Tactical Exercises Without Troops (TEWT)

Tactical exercises without troops are low-cost, low-overhead exercises conducted in the field on actual terrain suitable for training units for specific missions. Using few support troops, TEWTs are used by commanders to train subordinate leaders and battle staffs at any echelon:

- to analyze terrain
- to employ units according to terrain analysis
- to emplace weapon systems to best support the unit's mission
- to plan conduct of the unit mission
- to coach subordinates on the best use of terrain and proper employment of all combat and supporting assets

3.4.2.2.3 Command Post Exercises (CPX)

Command post exercises are conducted at either garrison locations or in the field. Conducted under simulated battlefield conditions, the CPX is used to train subordinate leaders and staffs to function as effective teams in command and control functions. Specific areas of CPX training are designed to improve exchange of information, prepare estimates, appraisals, and plans, issue orders, reconnoiter, select and occupy positions, establish and employ communications, and displace headquarters and command posts.

3.4.2.3 Live Firing Activities

The military lands within the Camp Grayling Military Reservation boundary occupy approximately 148,000 acres. There are approximately 33,000 acres of private, local government, State, or Federal land inholdings throughout the Camp.

The Camp can be considered as four geographical areas: the Cantonment Area, the Grayling Army Airfield, South Camp (training areas west of I-75), and North Camp (training areas east of I-75). This discussion focuses on the North and South Camp weapons ranges. Military range activities are generally located as depicted in Figures 3-13 and 3-14.

The North and South Camp areas include firing ranges and approximately 90,000 acres of non-fire maneuvering area. The North Camp area primarily contains an air-to-ground

range and ranges for artillery, tanks, and larger crew-served weapons. The South Camp mainly contains ranges for small arms and an approximately 1,000 acre mortar range. All ranges are available for year-round use. Refer to Tables 3-6 and 3-7 for descriptions of all ranges.

Camp Grayling hosts various firing activities, ranging from individual civilians hunting on the Post, to battalions firing 155mm artillery cannons.

The activities described above are considered characteristic of military training at Camp Grayling and are proposed to continue at approximately the same level as present.

3.4.2.3.1 Range Control

Training activities involving live ammunition are closely monitored to insure the highest possible level of safety for the surrounding public as well as the troops conducting the training.

Camp Grayling range regulations (CG Reg. 385-1) state the proper precautionary measures which must be carried out for proper safety standards to be met. Those regulations further state the ranges and the type of ammunition to be used on those ranges to execute several different types of firing missions utilizing one or more of the several training methods described briefly below.

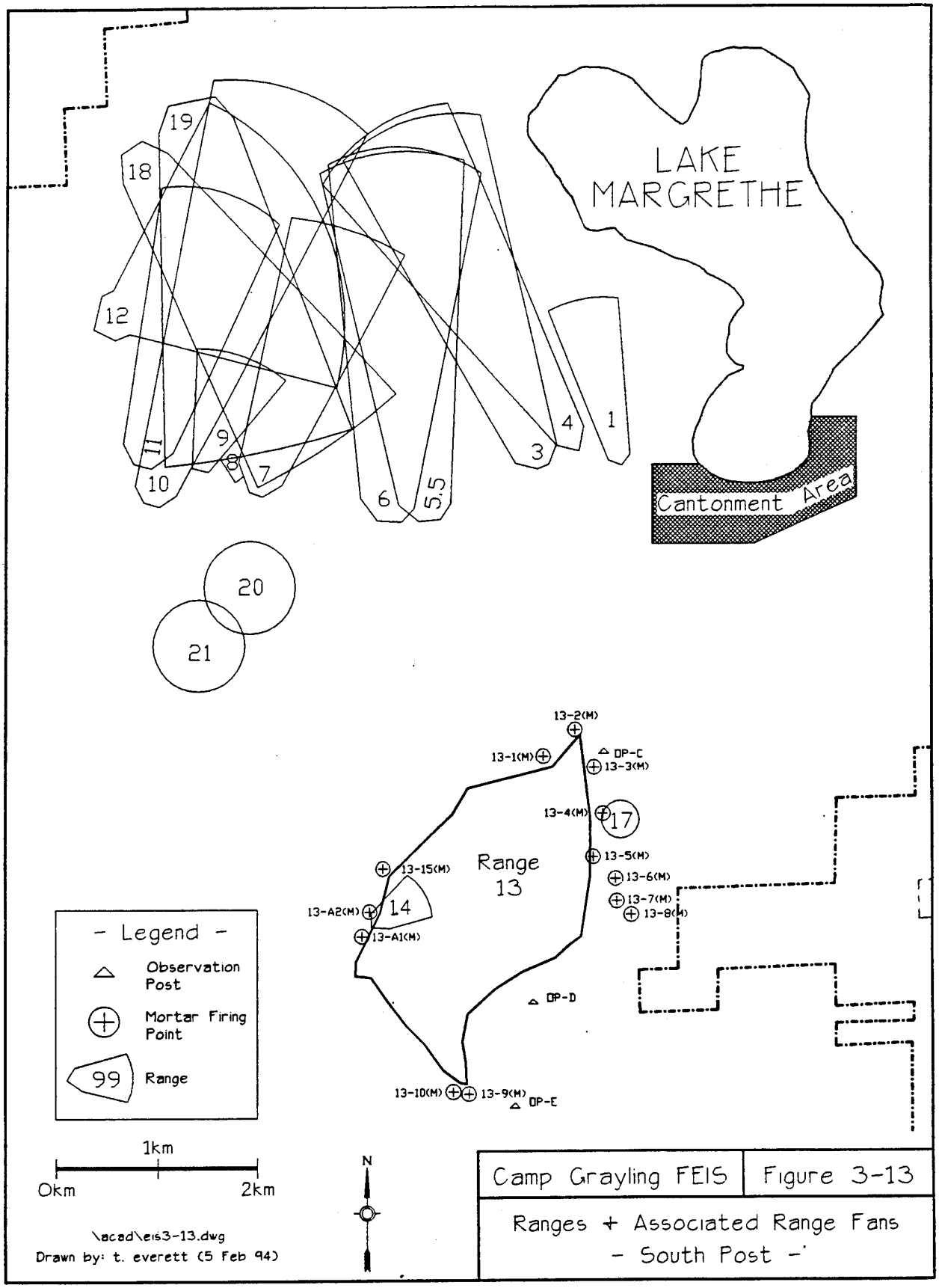
Firing activities at Camp Grayling are under the direct charge of the Range Control Officer, located in Building 12 on the cantonment area. This Officer is responsible for scheduling all ranges, ensuring only authorized training is conducted and authorized ammunition is used, and ensuring proper clean-up after the completion of training.

3.4.2.3.2 Range Scheduling

Scheduling of ranges for Inactive Duty Training periods (weekends) is accomplished at an annual scheduling conference; normally conducted in the spring of the year for the following training year beginning 1 October. Any additions or deletions to the schedule are coordinated directly with the Range Control Officer on a first come, first served basis.

Scheduling of ranges for Annual Training (two weeks) is accomplished by procedures outlined by both the visiting troop command headquarters for the respective annual training period and the Range Control Officer.

Over the past 3 years, the use of firing ranges at Camp Grayling averaged 282 out of 334 possible days (certain holidays and sporting seasons subtract from 365 days). Weekends were utilized for firing an average of 41 out of the 44 typically available (see Table 3-8).


LAKE MARGRETHE
Cantonment Area
19
18
12
11
10
9
8
7
6
5.5
4
3
1
20
21
13-2(M)
13-1(M)
OP-C
13-3(M)
13-4(M)
17
13-5(M)
13-6(M)
13-7(M)
13-8(M)
Range 13
13-15(M)
13-A2(M)
14
13-A1(M)
OP-D
13-10(M)
13-9(M)
OP-E
- Legend -
Observation Post
Mortar Firing Point
99
Range
1km
0km
2km
N
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Drawn by: t. everett (5 Feb 94)
Camp Grayling FEIS
Figure 3-13
Ranges + Associated Range Fans
- South Post -

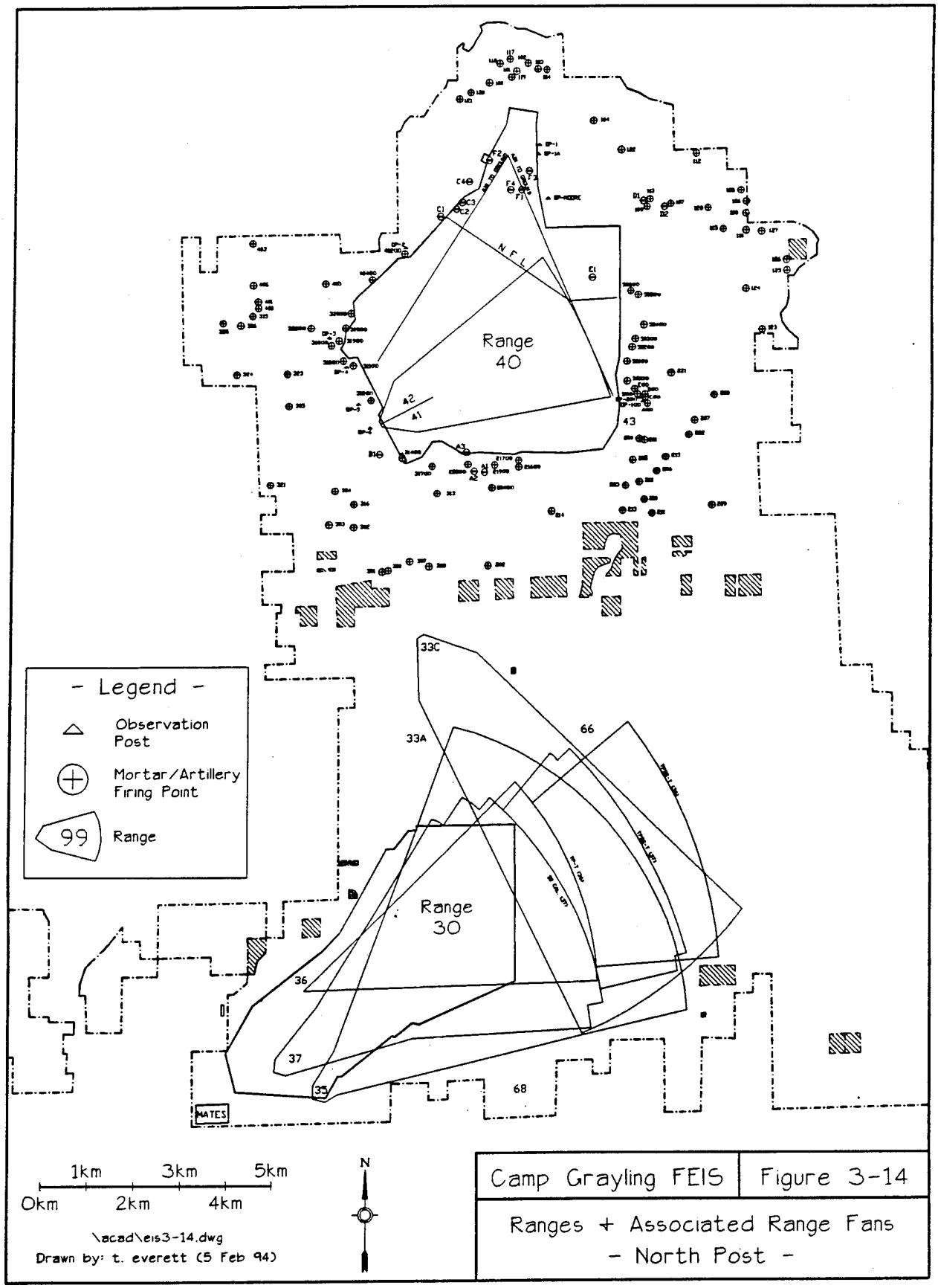
Range 40
Range 30
N F L
A1
A2
A3
43
33C
33A
66
36
37
35
68
MATES
- Legend -
Observation Post
Mortar/Artillery Firing Point
99
Range
1km
3km
5km
0km
2km
4km
N
\acad\eis3-14.dwg
Drawn by: t. everett (5 Feb 94)
Camp Grayling FEIS
Figure 3-14
Ranges + Associated Range Fans
- North Post -

Table 3-6
Camp Grayling Firing Range Descriptions
(South Post)

1	Combat Pistol. Used for firing the .38 cal. revolver and the .45 cal. and 9mm pistols. Consists of four lanes, each with several pop-up silhouette targets.
2	25 Meter Rifle. Used for firing the M-16 5.56mm rifle; has 25 firing points with known distance targets.
3-ABC	10 Meter Machinegun and Meter Rifle. Used for firing both the M-60 7.62mm machinegun and the M-16 5.56mm rifle. Each sub-range has 30 firing points with known distance targets.
5	25 Meter Rifle. Used for firing the M-16 5.56 rifle; has 30 firing points with known distance targets.
6-ABC	25 Meter Rifle/Shotgun. Used for firing the M-16 5.56mm rifle and various calibers of shotguns. Ranges 6-A and B have 20 firing points each, Range 6-C has five firing points; each range has known distance targets.
7-A	Standard Automatic Rifle Transition. Used for automatic weapons firing of the M-16 5.56mm rifle; has six firing points with pop-up silhouette targets.
7-B	Standard Record Rifle, Day/Night. Used for firing the M-16 5.56mm rifle in both day and night training scenarios; has 50 firing points and night firing aids.
7-C	10 Meter Machinegun. Used for firing the M-60 7.62mm machinegun; has 10 firing points with known distance targets.
8	Machinegun Transition. Used for firing the M-60 7.62mm machinegun; has six firing points with pop-up silhouette targets.
9-A	Grenade Launcher. Used for firing the M-16 mounted M-203 40mm grenade launcher; has two firing points.
9-B	Light Anti-tank Weapon. Used for firing either the 66mm LAW or its 35mm sub-caliber device; has five firing points with both stationary and moving targets.
10	1,000 Yard Known Distance Rifle. Used for firing the 5.56mm, 7.62mm and .30 caliber rifles and the M-60 7.62mm machineguns; has 50 firing points at six different ranges and known distance targets at the target "pit" area.
11	Standard Record Rifle. Used for qualification firing of the M-16 5.56mm rifle; has 10 firing points and automatic pop-up targets.
12	Squad Battle Course. Used by riflemen (up to an infantry squad of 11 men) firing the M-16 5.56mm rifle. The range encompasses approximately 35 acres.
13	Mortars. Used by mortar crews to fire both the 60mm and 81mm mortars normally found in infantry units. The range has nine firing points and three observation points surrounding a fenced impact area of approximately 1,300 acres.
14	Mortar/Artillery Sub-caliber. Used to fire various mortar and field artillery sub-caliber devices from 60mm and 81mm mortars and 105mm towed artillery tubes. The range has scaled targets, buildings, roads, and mortar emplacements.
17	Hand Grenade. Used for fragmentation hand grenades; has three throwing bays.

Table 3-6 Camp Grayling Firing Range Descriptions (South Post)	
18	Automated Field Fire. Used for firing the M-16 5.56mm rifle; has 16 firing points, each with three automated pop-up silhouette targets.
19	Automated Record Fire. Used for firing the M-16 5.56mm rifle; has 16 firing points, each with seven automated pop-up silhouette targets and hostile fire simulators.
20	Demolition. Used to fire block, plastic, cord, or shaped explosives up to 42 pounds.
21	Demolition. Used for engineer unit ARTEP training. Used to fire C4 and TNT explosives up to 42 pounds.

Table 3-7 Camp Grayling Firing Range Descriptions (North Post)	
33-A	Infantry Squad & Platoon Battle Course. Use by up to a platoon of mounted/dismounted infantry firing M-16 5.56mm rifles and M-60 7.62 machineguns. Various training pyrotechnics may be used.
33-C	Tank Main Gun. Used for firing the main gun (normally 105mm) of either an M-60 or M-1 series tank.
35	.50 Caliber & Tank Table V. Used for firing the .50 caliber heavy barrel machinegun from either a ground mount, a truck-mounted ring mount, or a M-60 or M-1 series tank. Also used for firing 7.62mm machineguns (normally from either an M-60 or M-1 series tank).
36	Tank Table VI. Used to fire the 105mm main gun and 7.62mm machineguns of up to one tank platoon (currently, four tanks). Range included two moving targets and several stationary armor targets at ranges of from 600 to 1,800 meters.
37	Tank Table VII (practice) and VIII (record). Used to fire the 105mm main gun and 7.62mm machinegun of one tank undergoing either practice or record crew qualification. Also used to fire 81mm and 4.2 inch mortars in illumination support of the armor unit using the range. Also used for firing the .50 caliber heavy barrel machinegun. Range consists of a one-half mile course road with 15 firing points, three full-scale moving targets, and several automated pop-up targets at ranges of 200 to 1,800 meters. Used to fire free rockets with range fans which exceed capacity of Range 40. Shares a fenced target area of approximately 6,950 acres with Ranges 35 & 36.
40	Artillery/Helicopter/Air-to-Ground. Used to fire tube artillery (up to 8 inch), both towed and self-propelled. Used to fire tethered (TOW), and guided (DRAGON) rockets from artillery, helicopters, and hand-held mounts. Used to fire 7.62mm mini-guns and 40mm high explosive grenades from helicopters. Used to fire mortars to 4.2 inch, from both ground and tracked mounts. Used to fire machineguns and cannons (up to 30mm) from jet aircraft. Used to drop training and live ordnance (up to 500 pounds) from jet aircraft. Range consists of 75 surveyed firing points, six observation points, and one air-to-ground control tower surrounding a fenced impact area of approximately 8,000 acres.

Table 3-7 Camp Grayling Firing Range Descriptions (North Post)	
41	106mm Recoilless Rifle/DRAGON. Used to fire both the 106mm recoilless rifle and the DRAGON missile from four firing points at several "hard" targets at ranges from 500 to 800 meters. Utilizes the Range 40 impact area.
42	90mm Recoilless Rifle/DRAGON. Used to fire both the 90mm recoilless rifle and the DRAGON missile from six firing points at several "hard" targets at ranges of 200 to 400 meters. Utilizes the Range 40 impact area.
44	Artillery & Mortar Trainer. Used to fire the 14.5mm artillery trainer and the 81mm mortar SABOT from four firing points at various sub-scale hard targets in the Range 40 impact area.
66	Infantry Squad & Platoon Battle Course. Used by up to a platoon of mounted/dismounted infantry firing M-16 5.56mm rifles and M-60 7.62mm machineguns. Various training pyrotechnics may be used.
68	Infantry Squad & Platoon Battle Course. Used by up to a platoon of mounted/dismounted infantry firing M-16 5.56mm rifles and M-60 7.62 machineguns. Various training pyrotechnics may be used.

3.4.2.3.3 Noise Abatement Procedures

In consideration of local residents and recreational users of the Grayling area, the following noise abatement procedures have been established for use on the Range 30 and 40 complexes:

- Tank maingun and artillery firing, 4.2-inch mortars (High Explosive & White Phosphorus), aircraft bombing and demolitions in excess of 2 pounds will begin no earlier than sunrise and cease no later that three (3) hours after sunset. Only the Commander, Camp Grayling has the authority to grant extensions; this is only done in the most unusual circumstances (CG Reg. 385-1, Chapter 2, para. 2-17).

- To ensure compliance with the above procedures, Range Control publishes official sunrise/sunset data monthly and distributes it to all current and future range users.

- Tank maingun and artillery firing, 4.2-inch mortars (High Explosive & White Phosphorus), aircraft bombing and demolitions in excess of 2 pounds are not allowed during the period from 1600 hours on Friday until sunrise on the following Tuesday for the following holiday periods:

  - Memorial Day Weekend
  - Fourth of July Weekend
  - Labor Day Weekend
  - Trout Season Opener (last weekend in April; from sunset on Friday until sunrise the following Monday)

Table 3-8
Typical Possible Available Training Time

Week of	Annual Training	Inactive Duty Training	Sports/Holiday Event	AT	IDT
Jan 1	Christmas/New Years Holiday Season - No actual training would probably take place			-	-
Jan 8				1	1
Jan 15				2	2
Jan 22				3	3
Jan 29				4	4
Feb 5				5	5
Feb 12				6	6
Feb 19				7	7
Feb 26				8	8
Mar 5				9	9
Mar 12				10	10
Mar 19				11	11
Mar 26				12	12
Apr 2				13	13
Apr 9		No Training/Easter Sunday		14	-
Apr 16				15	14
Apr 23				16	15
Apr 30	Noise Abatement Range Firing Restriction		Trout Season Opener	17	16
May 7				18	17
May 14				19	18
May 21				20	19
May 28	Noise Abatement Range Firing Restriction		Memorial Day Weekend	21	-
Jun 4				22	20
Jun 11				23	21
Jun 18				24	22
Jun 25				25	23
Jul 2	Noise Abatement Range Firing Restriction		4th of July Weekend	26	-
Jul 9				27	24
Jul 16				28	25
Jul 23				29	26
Jul 30				30	27
Aug 6				31	28
Aug 13				32	29
Aug 20				33	30
Aug 27				34	31
Sep 3	Noise Abatement Range Firing Restriction		Labor Day Weekend	35	-
Sep 10				36	32
Sep 17				37	33
Sep 24				38	34
Oct 1				39	35
Oct 8				40	36
Oct 15				41	37
Oct 22				42	38
Oct 29				43	39
Nov 5				44	40
Nov 12	Camp Closed to all Training Activities		Gun Deer Hunting Season	-	41
Nov 19	Camp Closed to all Training Activities		Gun Deer Hunting Season	-	-
Nov 26	Camp Closed to all Training Activities		Gun Deer Hunting Season	-	-
Dec 3				45	42
Dec 10				46	43
Dec 17				47	44
Dec 24	Christmas/New Years Holiday Season - No actual training would probably take place			-	-
Dec 31	Christmas/New Years Holiday Season - No actual training would probably take place			-	-

Note: This calendar is conceptual; it does not represent any actual year - dates are based on 1994.

Note: AT data for FY89-93 and IDT data for FY92-93 show 51 percent (24 of 47) of possible AT weeks with training activities and 98% (43 of 44) of possible IDT weekends with training activities.

- All ranges are closed to all training during the firearm deer hunting season of 15-30 November each year.

3.4.2.3.4 Weather Hazards/Restrictions

Weather conditions do not normally inhibit firing activities. Excessive moisture from rain or snow may affect weapon system electronics or shell fuses. Whenever severe weather conditions (e.g., lightning storms) reach a point where they pose a safety hazard to troops, firing activity is halted until favorable conditions return.

Dry weather conditions cause a higher fire potential. Illumination and tracer rounds from all types of weapon systems and most burning training pyrotechnics are restricted from use, under certain conditions, by the Range Control Officer.

A controlled burning program is periodically used to reduce the amount of standing dead litter that might contribute to the spread of range fires accidently started by training activities. Records of total area burned are maintained. Approximately 5,750 acres of the impact areas and the tank range are burned annually.

3.4.2.3.5 Areas Closed for Firing Activities

Four areas of the Post are closed at all times to the public and to most troops training at the Camp (see Figure 3-15). The artillery range (Range 40) impact area consists of 7,000 acres of fenced land on the extreme northern edge of the Camp. The tank range firing/target area consists of 3,000 acres of fenced land just north of North Down River Road. The mortar range (Range 13) impact area consists of 1,110 acres of fenced land on the southeastern corner of the Camp. These areas are closed to the public under closure orders issued by the Director of the DNR.

Range 9B has been utilized for the firing of 66mm Light Anti-Tank Weapons (LAWs) high explosive (HE) rounds for many years. The surface danger zone for this weapons system is restricted (fenced), but is not closed under a DNR Closure Order. Camp personnel are currently in the process of moving the firing of LAWs from Range 9B to the Range 13 complex impact area. Once all requirements for this move are completed (to include a checklist and REC), a ground clearance of the Range 9B surface danger zone will be completed and the movement restriction lifted.

High Explosive (HE) munitions impact areas provide a place on the ground for artillery shells and air-delivered bombs to land and detonate. While the impact areas are closed for the obvious danger from firing activities, they remain closed at all times because of the potential hazard to people from various types of ordnance which did not explode (i.e., did not function properly). These items of unexploded ordnance, commonly called "duds," are subject to explode at any time, particularly if disturbed by untrained personnel. In addition to being closed to ground traffic, air space over these areas are restricted per an agreement with the Federal Aviation Administration.

Large portions of the Camp are also subject to temporary closure to the public and troops in training. Approximately 27,000 acres are within the range fans of the many ranges across the entire breadth of the Camp (see Figure 3-15).

Safety fans for each type of weapon fired on any range are designed by the Department of the Army. They are not physical; they are lines drawn on a map and known on the ground. They are designed to protect personnel from any round or ricochet from escaping the boundaries of the range. It is the requirement to meet a very high probability of containment which drives the very large land areas required of most range safety fans.

A good example of the range fan principle is the tank range safety fan at Camp Grayling (see Figure 3-15). This area (approximately 13,200 acres) is the largest land area normally closed at any one time at the Camp. This area is closed during firing to all personnel for safety reasons. The extremely high muzzle velocity of the rounds fired by the tanks and other vehicles using the range and the wide target array used for various gunnery programs require an extensive range safety fan whenever the range is in use.

During range fan closure, public recreational activities (and military training activities not related to the range use) are not allowed within the safety fan. Forest management activities also are not conducted during this time frame.

Typically, during weekend tank gunnery, the tank fan is closed from late Friday afternoon until approximately noon on Sunday. The tank range fan is normally closed for 3-10 days at a time during annual training periods, because of the higher level of training being conducted on the range. The rest of the time, most of this range area is open for normal recreational use, including hunting, in season. During the past 3 years, the tank range safety fan has been closed to the public for anywhere from 21 days in 1993 to an estimated 75 days in 1994.

National Guard and other Reserve Forces do not train throughout the year, unlike their Active Duty counterparts. National Guard and Reserve units typically train only on weekends and during the two week annual training period, which normally occurs in the summer months. Because of the large safety fan required when the tank ranges are operational, tank gunnery at Camp Grayling prevents training by any other unit in several prime training areas. For this reason, tank units are either scheduled to fire during a separate annual training period or on weekends throughout the spring, summer, and fall.

The National Guard proposes to continue to use safety fan closure on approximately 15 weekends beyond annual training periods to conduct tank and other combat vehicle gunnery requirements.

3.4.2.3.6 Restricted Airspace

Camp Grayling currently controls three separate restricted airspaces (see Figure 3-16). These airspaces are an invisible boundary overlying the Range 13, 30, and 40

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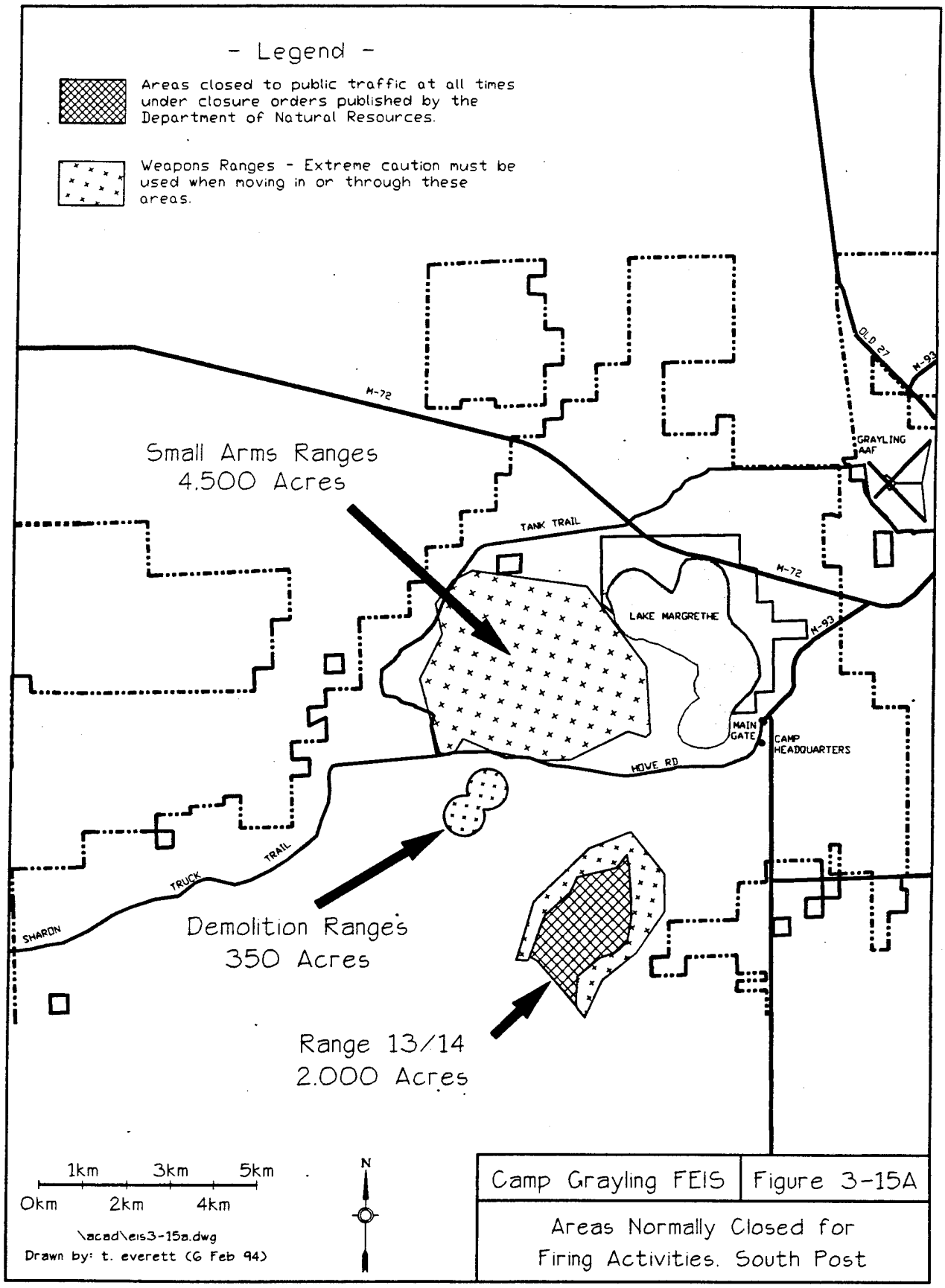
- Legend -
Areas closed to public traffic at all times under closure orders published by the Department of Natural Resources.
Weapons Ranges - Extreme caution must be used when moving in or through these areas.
Small Arms Ranges
4,500 Acres
Demolition Ranges
350 Acres
Range 13/14
2,000 Acres
M-72
OLD 27
M-93
GRAYLING AAF
TANK TRAIL
LAKE MARGRETHE
MAIN GATE
CAMP HEADQUARTERS
HOVE RD
TRUCK TRAIL
SHARON
1km 3km 5km
0km 2km 4km
N
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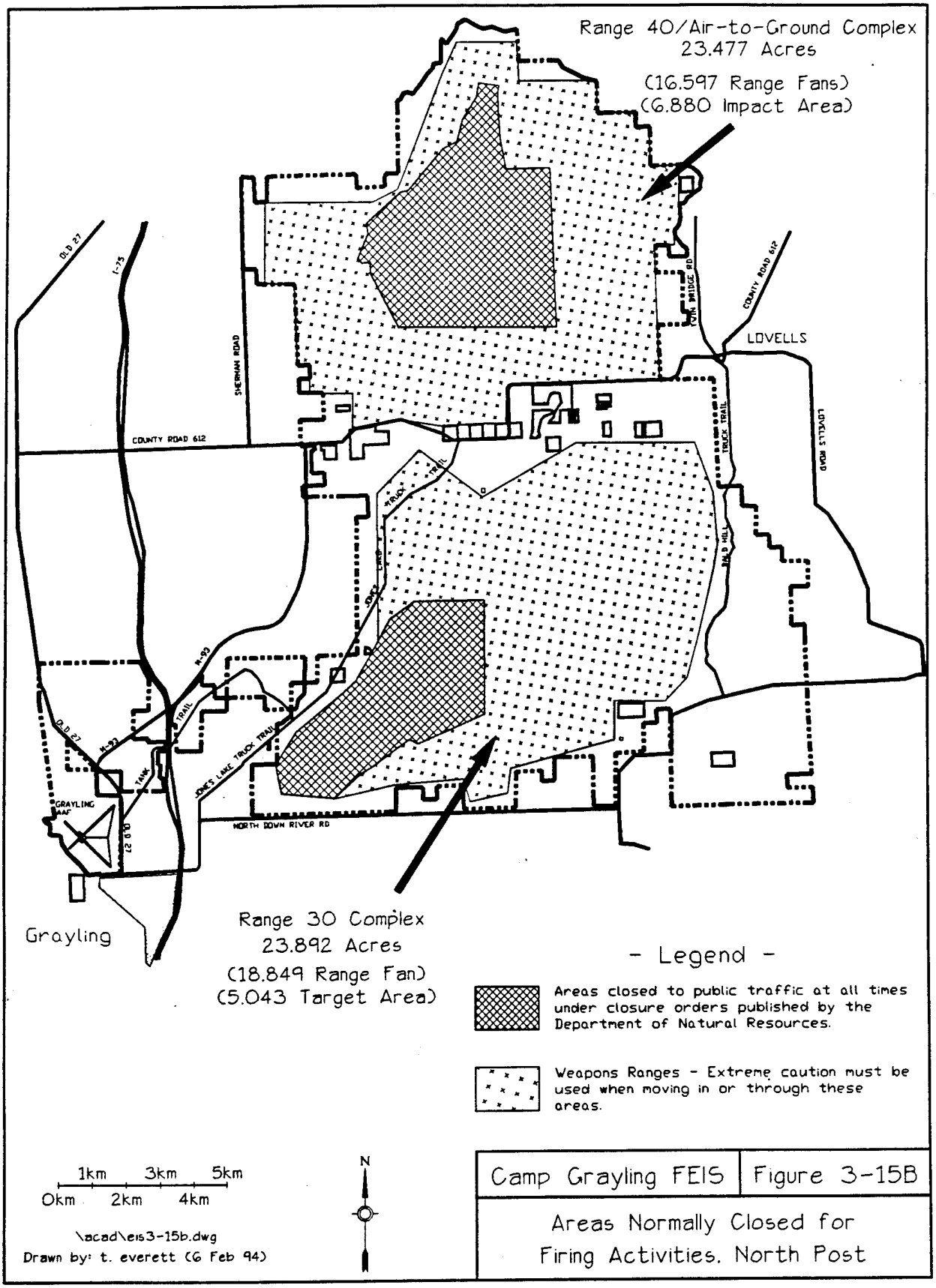
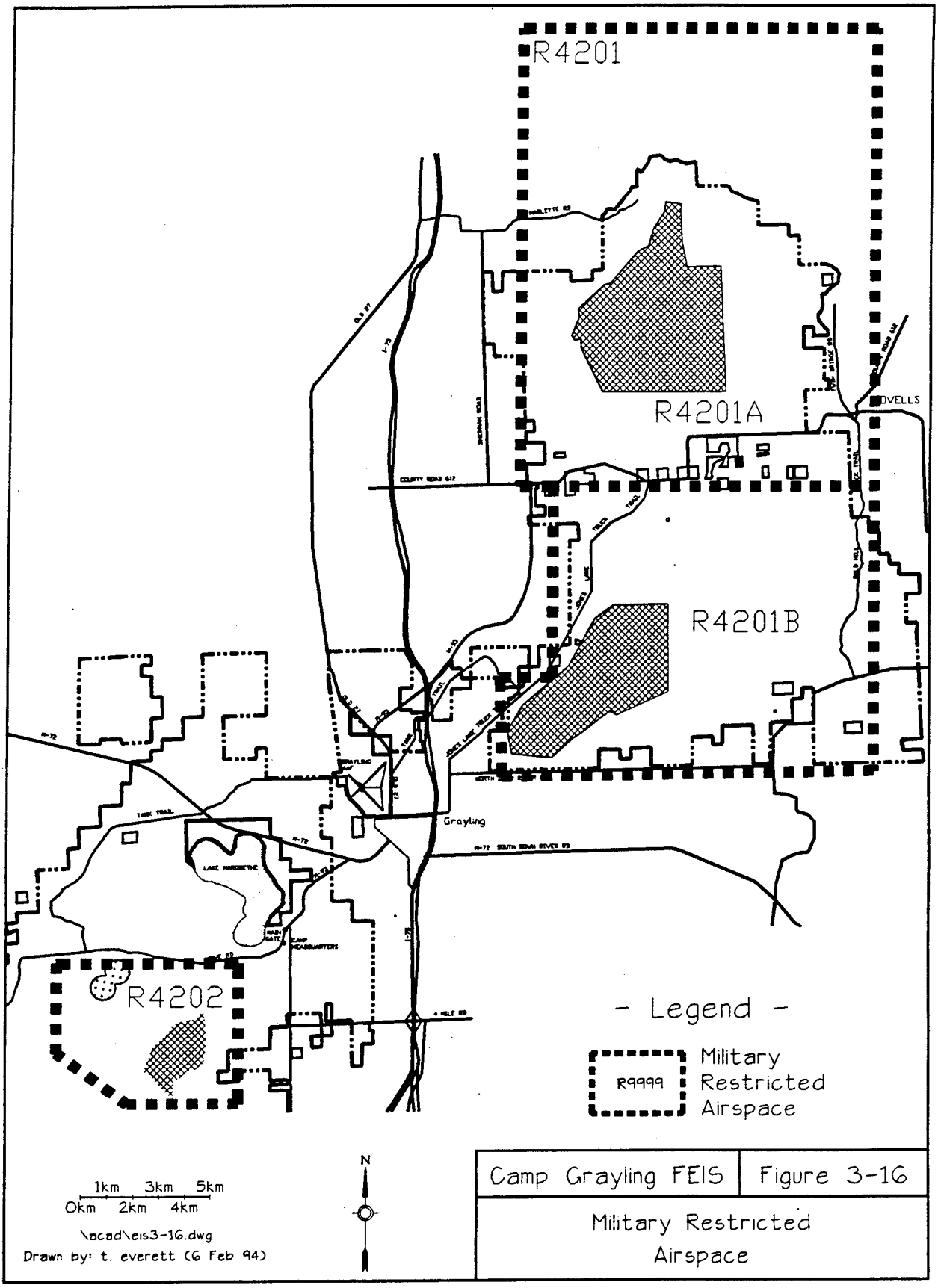
Drawn by: t. everett (6 Feb 94)
Camp Grayling FEIS
Figure 3-15A
Areas Normally Closed for Firing Activities. South Post


Range 40/Air-to-Ground Complex
23.477 Acres
(16.597 Range Fans)
(6.880 Impact Area)
LOVELLS
COUNTY ROAD 612
SHERMAN ROAD
FOX BRIDGE RD
LOVELLS ROAD
TRUCK TRAIL
JONES LAKE TRUCK TRAIL
M-93
TANK TRAIL
GRAYLING AAF
NORTH DOWN RIVER RD
Grayling
Range 30 Complex
23.892 Acres
(18.849 Range Fan)
(5.043 Target Area)
- Legend -
Areas closed to public traffic at all times under closure orders published by the Department of Natural Resources.
Weapons Ranges - Extreme caution must be used when moving in or through these areas.
1km 3km 5km
0km 2km 4km
N
\acad\eis3-15b.dwg
Drawn by: t. everett (6 Feb 94)
Camp Grayling FEIS
Figure 3-15B
Areas Normally Closed for Firing Activities. North Post


R4201
R4201A
R4201B
R4202
Grayling
- Legend -
R9999
Military
Restricted
Airspace
1km 3km 5km
0km 2km 4km
\acad\eis3-16.dwg
Drawn by: t. everett (6 Feb 94)
N
Camp Grayling FEIS
Figure 3-16
Military Restricted
Airspace

complexes. They are designed to protect both civilian and military aircraft from the hazards associated with the firing of various live munitions.

A restricted airspace is an area, designated by the Federal Aviation Administration (FAA), within which a hazard to aircraft in flight exists. Aircraft not participating in the activity for which the restriction has been granted may not enter the area at any time it is being used for the purpose the restriction has been granted.

All hazardous activities must be within the area established. Special precautions are taken to insure the safety of aircraft operating in the airspace near the planned trajectory of all munitions fired in the restricted airspace.

3.4.2.3.7 Training Activities Requiring Weapons Firing

3.4.2.3.7.1 Fire Coordination Exercise (FCX)

Fire coordination exercises are medium-cost, reduced-scale exercises that can be conducted at platoon, company/team and battalion/task force levels. The purpose of FCXs is to exercise the command and control skills of the leadership of the unit through the integration of all organic weapon systems, as well as indirect and support fires.

Sub-caliber devices are substituted for service ammunition to permit fire planning and simulated employment of all weapon systems available to support the commander in the execution of his assigned mission. FCXs stress target acquisition and present target arrays and target information to player units, emplacing commanders, and leaders in realistic battlefield situations. Targets controlled mechanically and electronically appear at the appropriate times and places according to the training scenario.

Commanders employ FCXs to train subordinate leaders to integrate and distribute direct and indirect fire systems out to their optimum ranges. FCXs are fast moving, with several weapons systems engaging multiple targets simultaneously as targets enter optimum engagement ranges. FCXs challenge the skills of commanders, subordinate leaders, crews of direct fire weapons, fire direction center personnel, and forward observers.

FCXs facilitate training in the effective use of organic weapon systems, employment of supporting weapon systems, and target acquisition systems. FCXs require players to react to fluid battlefield situations by promptly applying supporting and organic fires against changing target arrays.

3.4.2.3.7.2 Live Fire Exercise (LFX)

Live fire exercises are high-cost, resource intensive exercises in which participating units move and/or maneuver and employ organic and supporting weapon systems using practice ammunition with integration of all combined arms, combat support, and combat

service support elements available. LFXs can provide maximum training benefits through multiple iterations (i.e., more than one time through).

These iterations, each including an after action review, normally occur in the following sequence:

- a dry run conducted to review the unit standing operating procedure (SOP)/battle drills
- a second run with a reduced amount of ammunition to show the complexities of fire and maneuver coordination
- a third run with full ammunition to reinforce previous training and build confidence
- a fourth iteration, preferably with ammunition, conducted at night or during limited visibility
- other iterations using ammunition saved by crews/units to sustain and attain proficiency for new or unqualified crews/units

3.4.2.3.7.3 Combined Arms Live Fire Exercise (CALFEX)

The combined arms live fire exercise is the CAPSTONE exercise in the training hierarchy - tying together the requirements and the resources of the close-combat leader. This exercise is conducted after leaders and units have previously demonstrated the ability to execute the command field exercise, field training exercise, fire coordination exercise and the live fire exercise. A combined arms live fire exercise (CALFEX) trains units to perform primary combat missions in a realistic, live-fire environment. Supplementary missions and a wide range of supporting tasks can be integrated into the exercise (and normally are, given the cost of running a CALFEX).

3.4.2.3.8 Individual Weapons Firing/Training/Qualification

Individual weapons are commonly called "small arms." This group of weapons consists of pistols and rifles carried and operated by individuals. The M-16 (5.56mm) Rifle and the 9mm Pistol are examples fired at Camp Grayling. These weapons are primarily fired at the small arms range complex located just west of Lake Margrethe. These ranges are characterized by their "rippling" fire, low noise, short sight range, and small range safety fans.

Camp Grayling has 11 small arms ranges. These ranges were used by an average of 40,000 individuals per year during the past 3 years. Individuals also fire these weapons in conjunction with small unit combined training operations on the tank and artillery ranges at the Camp.

3.4.2.3.9 Crew-Served Weapons Firing/Training/Qualification

Crew-served weapons cover a very large range of weapons systems. These include machineguns of various calibers, tank main guns, anti-tank weapons, helicopters, artillery, cavalry/scout vehicles, and various types of infantry personnel carriers. These

weapons systems are fired by everyone from cooks to helicopter pilots on appropriate ranges across the breadth of the Camp.

Camp Grayling has 22 crew-served weapons ranges. These ranges are characterized by their "rippling" and sustained fire, noise, medium to long sight range, and large range safety fans.

Most details of these activities will be addressed in the branch specific training description paragraphs to follow.

3.4.2.3.10 Unit Weapons Firing/Training/Qualification

Combat operations, and the training programs preparing soldiers for those operations, require the grouping together of various weapons and weapon systems into units or combined arms teams. This "standard" of military operations (i.e., grouped units or combined arms teams) is found at Camp Grayling as part of normal operations, particularly on the tank and artillery range complexes. The Combined Arms Live Fire Exercise discussed above is a prime example.

These range complexes are characterized by their sustained fire, noise, short to long sight ranges, and very large range safety fans. In this type of training, fire and maneuver are almost inseparable. Camp Grayling has 2 unit/combined arms weapons ranges, Range 30 and 40 complexes.

Additional details of these activities will be addressed in the branch specific maneuver training description sections to follow.

3.4.2.3.11 Weapons Firing Involving Laser Range Finders and Laser Target Designators

Lasers are used at Camp Grayling for range determination and target designation. Additionally, the Multiple Integrated Laser Engagement System (MILES) is a weapons system which allows training to be conducted using eye safe laser beams instead of firing conventional ordnance. Intrabeam viewing of certain military lazing devices used at the Camp can result in eye injuries to unwarned, unprotected personnel. Camp Grayling range regulations and practice require every precaution to be taken to prevent this intrabeam viewing by any personnel training at or visiting the Camp. Typically, wildlife temporarily leave an area in which training is being conducted.

Lasers are used virtually every time a howitzer unit live fires at the Range 40 complex and when tanks live fire on the Range 30 complex. Unfiltered (non eye-safe) lasers are treated like any other direct fire weapon for safety purposes.

Lasers are used on the Range 40/Air-to-Ground complex for target designation and range determination and on the Range 30 complex for range determination for tank gunnery. MILES lasers are used in virtually all training areas of the Camp. The M-70 series

training set for TOW missile training is restricted to training areas allowing a minimum of 1,500 meters line of sight between the launcher and the target board. The M-70 series training set uses a low frequency infrared beam that is eye-safe beyond 65 meters from the source.

Lasers used on Range 40, with their nominal ocular hazard distances (NOHDs), are as follows:

DEVICE	NOHD
- AN/GVS-5, Range Finder	2,700 meters
- AN/PAQ-1, Target Designator	7,000 meters
- AN/TVQ-2, Target Designator	25,000 meters
- AN/VVG-2, Range Finder	8,000 meters
- AN/VVG-3, Range Finder	5,000 meters

Lasers used on the Range 40 complex are initiated from high ground on the west side of the range down into the impact area. The target box is above the specular hazard caused by the lakes and streams in the area and below the ridgeline on the east side of the impact area. The left and right limits are such that the beam is contained well within the impact area. Intrabeam viewing by unprotected personnel can only occur if someone were to walk into the immediate front of the source on the high ground or stand in the impact area in front of the target being lazed.

The impact area is fenced and always observed for personnel who may have cut the fence and walked or drove into the impact area illegally. The laser source site is supervised by safety personnel whose job it is to keep all personnel clear of the front of the laser.

Lasers used on the Range 30 complex are as follows:

DEVICE	NOHD
- AN/VVG-2, Range Finder	8,000 meters
- AN/VVG-3, Range Finder	7,000 meters

Lasers used on the Range 30 complex are filtered, except when they are being used in live fire exercises. In the filtered (eye-safe) mode, these lasers are used in "force on force" training exercises against unprotected personnel. In the case of live fire exercises, the target area is void of personnel to keep them out of harm's way for not only the laser beam, but also for the live rounds being fired on the range. In all cases of live fire, the laser beam, if it should miss the target being lazed, is absorbed by either the ground or the tree covered ridge downrange that serves as a range backstop.

MILES lasers, however, are used extensively in "force on force" training exercises. Safety precautions are taken to ensure soldiers are not shot by a MILES device with the 7 meter nominal ocular hazard distance for the MILES devices being used at Camp

Grayling. MILES lasers are initiated by firing a blank round in the rifle or machinegun it is attached to.

3.4.2.4 Maneuver Activities

Maneuver is defined as the planned and controlled tactical movement of troops, vehicles, and aircraft on Camp Grayling. These activities are normally, but not always, performed "off-road." It is further defined to include small to large scale practice movements and exercises of troops, vehicles, and aircraft under simulated combat conditions.

As mentioned above, fire and maneuver are closely interwoven in many tactical training exercises, however, it is possible to train on one and not the other.

The maneuver descriptions which follow are assuming a lower level of training than "full-up" combined arms exercises (i.e., combined live fire exercises). In those instances where firing activities would normally be expected of the overall operation, an explanation /description will be provided.

3.4.2.4.1 Situational Training Exercise (STX)

Situational Training Exercises (STXs) concentrate on the basics of maneuver training. They are generally conducted at small unit levels and teach the "best" or "school solution" way to accomplish a task. They teach the standard, or doctrinally sound, way a task should be executed. STXs can facilitate training through the application of standardized tactical formations and their employment under various conditions encountered on the battlefield.

STXs are normally conducted as stepping stones to larger, more complex field training exercises. Trained to standard, they can and should be as realistic to the soldier performing them as practicable, given the logistical and terrain resources available. An infantry platoon conducting a raid or a maintenance section replacing an engine in a vehicle under combat conditions are both examples of an STX leading to a higher level training exercise.

3.4.2.4.2 Field Training Exercise (FTX)

Many of the units using Camp Grayling for either weekend or annual training will train under simulated combat conditions. How these combat conditions are portrayed and how they affect the soldiers, airmen, and units on the ground at the Camp are governed by a Field Training Exercise (FTX). An FTX is merely a plan with a scenario arranged to present the battlefield to the units training under the plan in the most realistic manner commensurate with the training levels of the training units.

While an FTX does not normally involve live fire (because of the complexities of bringing fire and maneuver together in the confines of the training areas available), it can. Its primary use is to move and maneuver units realistically, employ organic weapons

systems effectively (non-firing, normally), build teamwork and cohesion, and plan and coordinate all supporting fires and logistical activities.

Any type of unit at any level of organization and training can conduct an FTX. In fact, it is probably the most common type of training exercise referred to at Camp Grayling; mainly because it is normally a "blanket" type of exercise. For example, a Military Police brigade may conduct an FTX of its subordinate units. While operating under the general scenario of the FTX, those subordinate units may be conducting live fire training, or situational training exercises (STXs), or even individual training on some tasks.

Much of the field bivouacking accomplished by units at Camp Grayling is normally driven by the instructions in a higher headquarters FTX directive (see Section 3.4.2.1.2 (Bivouacs), above).

FTXs are intended to permit commanders to exercise command and control of all echelons of command in battle functions against an actual or simulated opposing force. Tactical situations involving one or more units moving or operating over an extended period of time and over considerable distances are employed. For example, most of the large scale road movement of troops and vehicles at Camp Grayling are in response to an FTX directive of some senior level of command.

3.4.2.4.3 Command Field Exercise (CFX)

The Command Field Exercise (CFX) is an FTX with reduced combat unit and vehicle density, but with full command and control functions intact, and substantial combat support and combat service support elements. The CFX allows the "full-up" employment of certain assets which are difficult to train realistically without the complexity and distance of large units arrayed on the battlefield, such as the signal battalion, the military intelligence battalion, and the target acquisition battery.

CFXs are not simply scaled-down FTXs. They are, in fact, excellent vehicles for training commanders and staffs to perform with certain "full-up" systems to gather information, provide communications links, and develop intelligence, while their units go on about other training activities such as an STX. CFXs provide real-time operations over actual distances with appropriate logistical support. They are driven by schedules of events or by controlled opposing forces operating under the CFX director's control.

CFXs are less expensive than FTXs, yet, they can provide equal training value for training the staff. They may be the single best way to train inter-systems linkages for "full-up" integration of all brigade and above assets. Units and staffs utilizing training lands under special permit around Camp Grayling are normally training in the CFX mode.

3.4.2.5 Individual Training Activities

Military training activities can range from only a single soldier training on a simple task to thousands training on complex tasks. Successful military training does start with the

individual soldier, but at the level of training conducted at Camp Grayling, does not lend itself to detailed analysis for the purpose of this EIS. Most purely individual tasks are taught the soldier during his/her initial basic and advanced individual training conducted at the U.S. military's Active Component schools such as Fort Knox, Kentucky and Lackland Air Force Base, Texas.

For the purpose of this EIS, individual training tasks will be analyzed as part of unit training activities, unless they obviously impact to the extent they must be addressed as a unique occurrence. Currently, none have been identified as needing specific analysis.

3.4.2.6 Generic (non-branch specific) Group/Unit Training Activities

Most activities in this area were covered in Section 3.4.2.1 (Non-firing Activities) above. Unit physical fitness tests, religious services, ceremonies, and unit morale activities are all examples appropriate here.

3.4.2.6.1 Nuclear Biological Chemical (NBC) Confidence Test

One unique training event addressed here is the Nuclear/Biological/Chemical (NBC) mask confidence test, conducted southwest of the cantonment area in building 1010. While this event concerns an individual, it is always conducted in a group setting. This training event consists of the individual soldier donning his/her NBC protective mask and entering a closed area in which CS (O-Chlorobenzalmalononitrile) crystals have been lit.

The purpose of the test is two fold (AR 385-63, Chapter 17, paragraph 17-3). First, the soldier is supposed to have assembled and maintained his/her protective mask in a professional manner (i.e., it is supposed to function as designed). If it is not maintained properly, the confidence test will expose that. If it is maintained properly, the soldier will experience no discomfort.

Emissions from this activity are minor and do not extend beyond the immediate vicinity of Building 1010; under no circumstances do they drift off-post.

3.4.2.6.2 Tactical Smoke Operations

The Army employs smoke/obscurants principally to obscure or screen the movement of troops and vehicles. The ideal smoke screen will hug the ground and remain low to conceal the location and movement of troops. Smokes have critical importance in neutralizing enemy sensors and hiding friendly forces and material. Smoke screens can also be used offensively for immobilizing enemy troops by obscuring their vision.

Current smoke generators use petroleum distillates. Until future prototype generators which can use other smoke/obscurants in addition to oil are fielded, the use of petroleum distillates will be required for troop training. It is imperative that these distillates are maintained because current infrared (IR) smokes are much less effective in the visible region of the electromagnetic spectrum. This means they are more effective in blocking

human vision. Oil smokes can be generated easily from existing munitions and generators, effectively creating a white smoke that screens and obscures the visible spectrum to the maximum.

For these reasons, the Army must be prepared to employ smoke and to fight effectively in a smoke environment against an enemy who is trained and equipped for the same operations. Since the establishment of smoke generating units within the Active and Reserve Components of the Army, troops must be trained to use smoke generating equipment in realistic scenarios. Such training is essential to effect smoke employment concepts and countermeasure readiness.

There are various modes of disseminating an oil smoke/obscurant. The primary technique used for dispensing an oil smoke is by mechanical generator systems, which vaporizes the petroleum distillate and disseminates it by means of a fuel driven engine. Other techniques are the Vehicle Engine Exhaust Smoke System (VEESS) and smoke pots/grenades. The VEESS is mounted on M60A1/3, M-1 Tanks, and the M88A1 Recovery Vehicle. The VEESS uses the diesel fuel of the vehicle it is mounted on, emits particles between 0.5 and 1.0 microns in size, and vaporizes its fuel between 0.4 gal/minute to 1.0 gal/minute (depending upon the vehicle it is mounted on).

The VEESS diverts diesel fuel from its fuel tank and disseminates a vaporized smoke cloud with its exhaust. Smoke pots/grenades, however, vaporize their fog oil payload by superheating the fog oil to the vaporization point and allowing it to escape through an open valve. All three methods of dissemination are used at Camp Grayling. Fog oil dissemination has averaged approximately 350 gallons for the past four years.

Range Control closely monitors all smoke activities at the Camp. Smoke activities are normally contained within the Camp's borders; they are usually ceased immediately upon drifting off-post or across unbarricaded major roads/trails crossing the training areas.

3.4.2.7 Combat Service Support Unit Type Activities

While they are absolutely vital to any success on the battlefield, combat service support units have the least amount of involvement with actual combat situations. Missions of these units include logistical supply, administrative services, and maintenance of all kinds.

Within this category are the units providing support of all kinds, materials of all kinds, and many different types of services such as laundry, bath, clothing repair, personnel administration, and graves registration.

These units generally contain semi-trailers, cargo trailers, tractor trucks, fuel trucks/trailers, generators, forklifts, cranes, and several types of light trucks. Mission tasks, equipment density, and personnel skills are widespread and relate directly to the type of service support provided by the unit. Characteristics of this type unit include

extended bivouac in any location, mission support activities from that bivouac location, and heavy vehicle traffic into and out of that bivouac location.

3.4.2.7.1 Quartermaster Units

These units are responsible for transportation of bulk fuel and the preparation and operation of fuel supply points for receipt and issue of fuel. The unit is responsible for the installation of berms and liners around fuel storage facilities to contain fuel spills, should one occur.

Camp Grayling procedures normally prohibit Quartermaster units from utilizing actual petroleum products in bladder storage for training purposes. This is due to the extensive potential impact from a fuel spill. Camp Grayling has constructed a small (three bladder capacity) bulk fuel dispensing/storage facility training site in the vicinity of FE 690434 (in the South Post). An 8-inch water well is located in the area in order for the unit training at the site to be able to simulate petroleum products with water.

Training activities include the receipt and issue of fuel supplies, night operations, NBC defense operations, convoy operations, and preparation of berm sites.

3.4.2.7.2 Supply and Service Units

The mission of a supply and service unit is to provide the means and location for troops and units to requisition, receive, store, and issue supplies. Services are also provided in the form of laundries, baths, mess, utilities, and ammunition storage operations.

3.4.2.7.3 Maintenance Units

The mission of a maintenance unit is to provide support maintenance and repair parts for mechanical, armament systems, communications, and construction equipment to different units on and around the battlefield. Maintenance is performed on tracked and wheeled vehicles, engineer equipment, and other related military equipment.

3.4.2.7.4 Signal Units

The mission of a signal unit is to plan, provide, and maintain communication systems between command posts and units and to provide non-tactical photographic services. Equipment is primarily light to medium size trucks and trailers.

3.4.2.7.5 Headquarters Units

All military units above section/squad level have a headquarters element. Normally, a headquarters above company level will have a headquarters company-sized unit to provide command, tactical, administration, training, and technical supervision of assigned or attached elements.

Mission requirements normally dictate where on the training or actual battlefield these units will place themselves. For purposes of training at Camp Grayling, units of this type can be found across the breadth of the Camp. In a field environment, headquarters units are concerned with security, therefore, perimeter defense is established through the construction of individual and crew-served weapons fighting positions.

3.4.2.7.6 Explosive Ordnance Demolition (EOD) Units

Explosive Ordnance Demolition units operate at Camp Grayling. The Camp has a resident unit, the 745th EOD Detachment, and is augmented periodically by EOD teams of other states' National Guard and other military services.

Weapons training, involving weapons ranging from small arms to large artillery, is a major component of Camp Grayling's activities. In the course of this weapons training, Camp Grayling's visiting units generate ammunition and ordnance, which by virtue of physical damage, age, or other circumstances is unserviceable (e.g., unserviceable ammunition and unexploded ordnance). Units training at the Camp also generate excess artillery propellants. By virtue of firing range size and weapon characteristics, all pre-packaged propellent cannot be used with every round, thereby generating excess propellant.

EOD units are trained in the safe handling and processing of this "unserviceable ammunition, excess propellant, and unexploded ordnance." Military regulations and procedure provide for and require EOD personnel to train in the methods of safely handling and disposing of explosive devices and materials. Certain unserviceable ammunition and unexploded ordnance which cannot be safely transported must be blown in the field at the point of generation by experienced EOD personnel. Other items, however, are returned to the Camp Grayling Ammunition Supply Point and then assigned to EOD units for use in training of personnel or for return to an Army Ammunition Depot for reissue and/or reuse.

The open burning of excess propellent for training or disposal purposes is not allowed at this time at Camp Grayling. However, pending approval and construction of the proposed EOD Training Area, small quantities of excess propellant may be burned for emergency purposes, only in a specifically designed and constructed burn pan.

The mission of the EOD unit at Camp Grayling is to provide routine and emergency EOD support to Camp Grayling and its exercises and operations.

3.4.2.8 Combat Support Unit Type Activities

Combat support units are indirectly involved with actual combat situations. These units provide direct support to combat arms units, sometimes directly on the battlefield and sometimes off to the side or rear of the immediate conflict area.

Missions of combat support units include, but are not limited to, providing combat medical facilities, military police services, communications systems, transportation systems, and engineer assets.

3.4.2.8.1 Military Police Units

The mission of most military police (MP) units on the modern battlefield is to provide military police services to a combat unit of any size, although normally MP units are not assigned below brigade level. Activities characteristic of MP units of all sizes are internal staff functions, conducting tactical movements, the planning and supervising of security operations, and directing vehicular movements across the entire breadth of the battlefield.

MP units train to take a decisive part in the active defense of the rear area of the battlefield, while accomplishing other assigned missions at the same time. In order to accomplish this dual mission, MP units are normally equipped with a high density of wheeled vehicles (mostly High Mobility Multipurpose Wheeled Vehicles or HMMWVs). MP units must be capable of holding, processing, and transporting prisoners of war (POWs) and defending against attacks by the enemy in rear areas.

3.4.2.8.2 Hospital Units

Combat Support Hospitals provide hospitalization of all classes of patients within a geographical area. Specific functions of these units include patient treatment, surgery, laundry, medical supply, and patient/unit administration.

Training activities include the establishment of a field hospital, complete with a laundry and shower facility. These laundry and shower facilities can produce up to approximately 3,000 gallons of waste water per day, the actual amount is dependent on the level of activity and the size of the hospital.

3.4.2.8.3 Engineer Units

The U.S. military utilizes several different types of engineer units across any area of conflict. Some build, some tear down, some build vertically, some horizontally, some bridge water, some raft over water, others fight fires, and still others perform maintenance work on structures. One thing they all have in common is their very large potential impact on the environment through normal engineer activities.

3.4.2.8.3.1 Combat Engineers

Missions of combat engineer units include, during defensive operations, emplacing obstacles and fortifying various defensive positions across the battlefield and, during offensive operations, breaching and clearing obstacles. A combat engineer unit's operations are very terrain-oriented and enhances effectiveness of any military operation it undertakes.

The whole purpose of its activities is to enhance the capabilities of the friendly forces and decrease the effectiveness of enemy forces. Mission objectives are to increase the mobility of friendly forces, impede the mobility of enemy forces, provide protective shelters of many types, and, when necessary, fight as infantry soldiers. Units are responsible for supporting combat units through the planning, design, and construction of water crossing sites, fortifications, obstacles, bunkers, and various utilities.

Vehicles used by combat engineer units range from the tracked Combat Engineer Vehicle (a modified M-60 tank with a 165mm cannon) to road graders, bulldozers, cranes, front end loaders, backhoes, and HMMWVs.

3.4.2.8.3.2 Construction Engineers

These units share most of the characteristics of combat engineers. However, from an environmental impact viewpoint, there is one key difference. Combat engineer activities can be characterized by "emergency" (i.e. digging tank traps, building fortifications) kinds of activities. Construction engineers, on the other hand, normally enjoy more time to plan construction projects utilizing more environmentally safe methods of operation. Training methods of construction units at Camp Grayling ensure compliance with construction practices of the civilian community.

3.4.2.8.3.3 Bridge Engineers

These units are of two major types. One type builds bridges of various composition and load carrying capacity over water, wetlands, or "dry gaps." The second type operates rafts and boats to carry personnel and equipment over water. Both types of engineer units train at Camp Grayling over water (see Figure 3-17).

Bridge training is not conducted on running water at Camp Grayling. Extreme care is taken when training on still water (lakes/ponds) to both safeguard it and to ensure strict compliance with all rules and regulations concerning possible accidental petroleum oil lubricants (POL) discharges into water or surrounding terrain.

3.4.2.8.3.4 Utility Engineers

Utility engineers are responsible for providing construction, utilities, and electrical power specialist teams to support various fixed facilities, such as base camps and cantonment areas. Training activities include unit movements, security operations, and horizontal and vertical construction operations.

Training methods of utility engineer units at Camp Grayling utilize "state-of-the-art" construction practices of the civilian community.

3.4.2.8.3.5 Firefighters

While firefighter units at Camp Grayling are on call to assist the civilian communities around the Camp in accordance with established agreements, their main objective is to prevent the spread of grass/forest fires caused by military activities at the Camp.

Firefighter units at Camp Grayling utilize rough-terrain fire trucks with a limited water carrying capacity to fight any fire encountered. Coordination with other engineer units with bulldozers and graders and aviation units with water buckets, along with the Michigan Department of Natural Resources and other civilian agencies, is normal in the course of these units' operations. These units also take maximum advantage of the many "dry" water hydrants installed around the Camp's training areas (see Section 4.2.2).

3.4.2.8.4 Nuclear, Biological, and Chemical (NBC) Defense Units

Nuclear, Biological, and Chemical (NBC) Defense units train at the Camp. Primarily, these units are decontamination units. Their activities are centered around instructing soldiers from all kinds of units on the correct procedures of decontaminating people, supplies, and equipment from the effects of nuclear, biological, and chemical munitions. No "wartime" decontaminates are used at the Camp; only water is used for training purposes.

3.4.2.9 Combat Arms Unit Type Activities

3.4.2.9.1 Infantry Units

Infantry are of four basic types: (1) dismounted/light infantry, (2) mechanized infantry, (3) airborne infantry, and (4) air assault infantry. All four types train at Camp Grayling. The basic mission of all types of infantry units does not change, only the mode of transportation to the area where the mission is to be performed changes. All infantry units close on enemy positions by means of fire and maneuver to destroy, capture, or repel enemy forces. Principle foot and tracked maneuver areas are shown in Figure 3-18.

3.4.2.9.1.1 Dismounted or Light Infantry

Dismounted or light infantry forces walk on the training land or the battlefield. Lacking any appreciable number of vehicles, this type of infantry force is capable of maneuvering over all types of terrain and under any climatic conditions. Dismounted or light infantry is also capable of participating in motorized, air assault, or amphibious operations.

Dismounted or light infantry forces offer the least potential for impacts on the resource base. The training does not require a large number of vehicles, tracked or otherwise. Defensive locations and bivouac sites may have potential for fuel spills and ditching; both sites are generally not limited to specific locations.

3.4.2.9.1.2 Mechanized Infantry

Mechanized (track mounted) infantry forces ride to and on training land or the battlefield. Because of the many similarities between mechanized infantry and armored forces, their activity descriptions have been combined in this document, refer to description of Armor Units, below.

3.4.2.9.1.3 Airborne Infantry

Airborne infantry forces travel to their areas of operation via fixed or rotary wing aircraft and parachute. Once on the ground, they display all the characteristics of dismounted or light infantry. The overall difference in this type infantry's potential impact on the resource base is in the flight characteristics of the aircraft providing transportation to the drop zone (DZ) area.

These characteristics include the aircraft lining up on a known point on the ground and steady, level flight through the point where the last parachutist has left the aircraft. Additionally, safety requirements of the DZ dictate a clear area on the ground. The size of the clear area required is dictated by the number of parachutists to be accommodated during any one flight over the DZ.

3.4.2.9.1.4 Air Assault Infantry

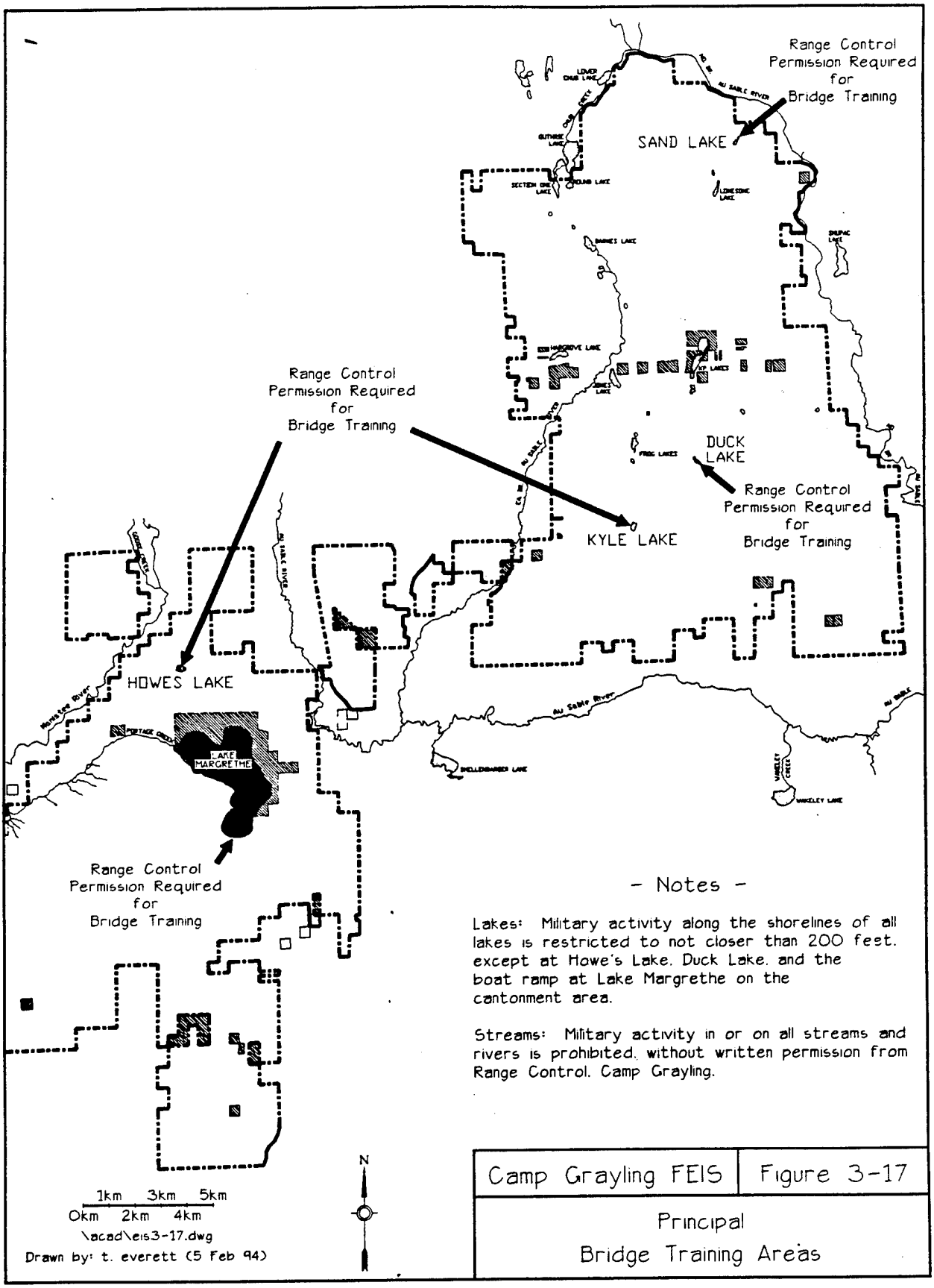
Air assault infantry forces travel to their areas of operation via rotary wing aircraft (helicopter), usually either UH-1s or UH-60s. Once on the ground, they display all the characteristics of dismounted or light infantry. The overall difference in this type infantry's potential impact on the resource base is in the flight characteristics of the aircraft providing transportation to the landing zone (LZ) area. Typically, these aircraft fly "nap-of-the-earth" at tree-top (or just above) level. Additionally, safety requirements of the landing zone dictate a clear area on the ground. The size of the clear area required is dictated by the number of aircraft to be accommodated during any one flight into the LZ.

3.4.2.9.2 Armor Units

This description includes mechanized infantry forces, as noted above, and ground cavalry units.

The missions of armor/mechanized/cavalry units include alerting personnel, loading all assigned equipment and personnel, and deploying by air, sea, and land anywhere in the world to conduct mobile, combined arms offensive and defensive operations.

Armor and mechanized units are characterized by two activities which can potentially have a significant impact on the environment and which make them stand out for constant scrutiny by all concerned. These two characteristics are violently executed tracked vehicle movement and sustained small to large caliber weapons firing.


Range Control
Permission Required
for
Bridge Training
SAND LAKE
Range Control
Permission Required
for
Bridge Training
DUCK
LAKE
Range Control
Permission Required
for
Bridge Training
KYLE LAKE
HOWES LAKE
LAKE
MARGRETHE
Range Control
Permission Required
for
Bridge Training
- Notes -
Lakes: Military activity along the shorelines of all lakes is restricted to not closer than 200 feet. except at Howe's Lake. Duck Lake. and the boat ramp at Lake Margrethe on the cantonment area.
Streams: Military activity in or on all streams and rivers is prohibited. without written permission from Range Control. Camp Grayling.
1km 3km 5km
Okm 2km 4km
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Drawn by: t. everett (5 Feb 94)
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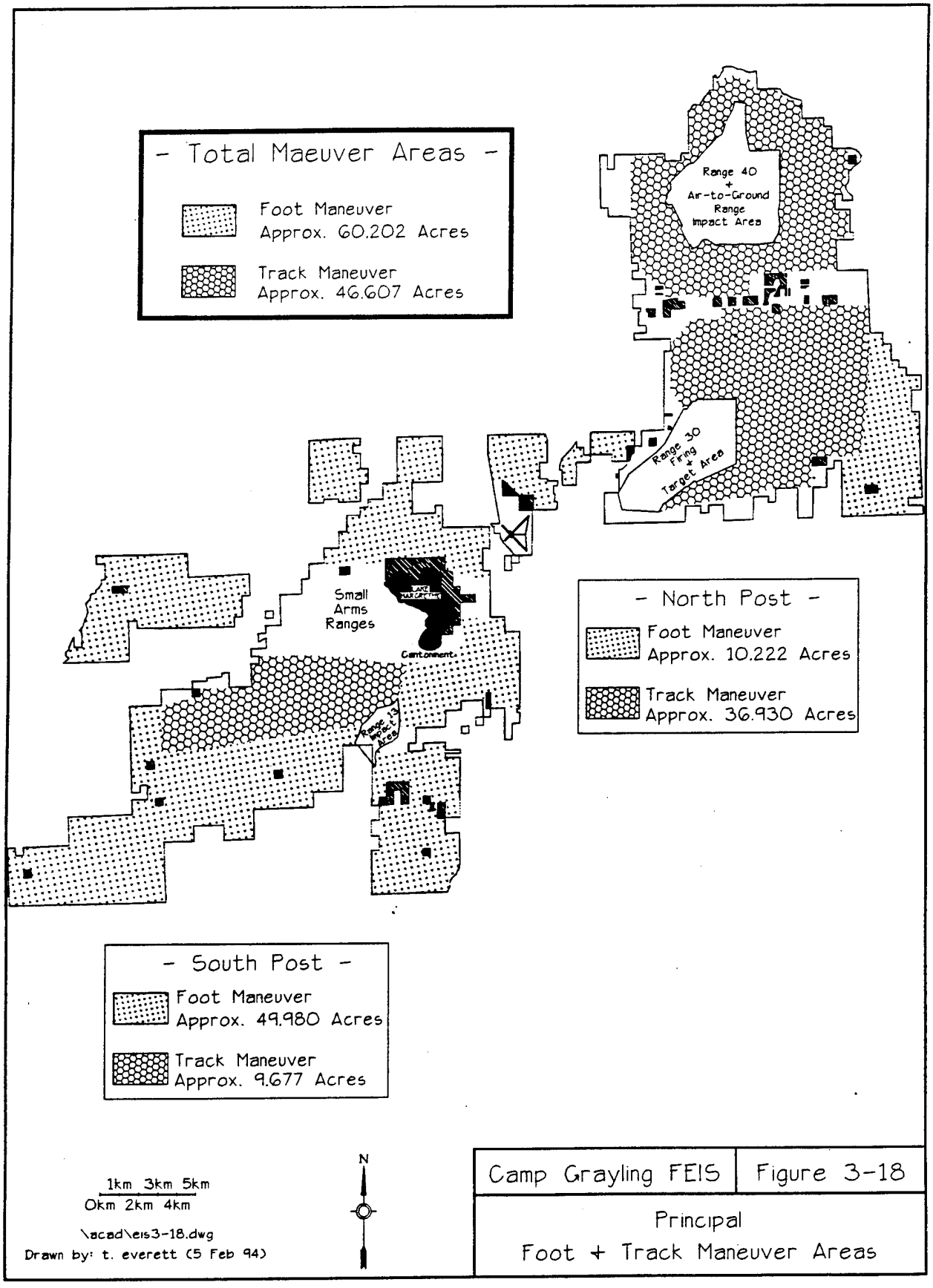
Camp Grayling FEIS
Figure 3-17
Principal
Bridge Training Areas


- Total Maeuver Areas -
Foot Maneuver
Approx. 60.202 Acres
Track Maneuver
Approx. 46.607 Acres
Range 40
+
Air-to-Ground
Range
Impact Area
Range 30
Firing
+
Target Area
Small
Arms
Ranges
Cantonment
- North Post -
Foot Maneuver
Approx. 10.222 Acres
Track Maneuver
Approx. 36.930 Acres
- South Post -
Foot Maneuver
Approx. 49.980 Acres
Track Maneuver
Approx. 9.677 Acres
1km 3km 5km
Okm 2km 4km
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Drawn by: t. everett (5 Feb 94)
N
Camp Grayling FEIS
Figure 3-18
Principal
Foot + Track Maneuver Areas

A pure maneuver battalion is equipped with one major type of equipment. For example, an armor battalion is equipped with one type of main battle tank, normally either an M-1 (and its variants) or an M-60 series tank. A mechanized infantry battalion is equipped with either the M-113 series of armored personnel carrier or the M-2 Bradley series. A ground cavalry unit is also equipped with either the M-113 series of tracked vehicles or the M-3 Bradley series. It is becoming quite rare, however, for a combat unit to operate "pure" on any modern battlefield. Normally, the combat battalions of a division or brigade will be cross-organized into combined arms teams of armor and mechanized platoons and/or companies.

Areas designated at Camp Grayling as tracked maneuver areas support company teams through brigade task force level training. Training areas surrounding the designated tracked maneuver areas are to be utilized by support elements without tracked vehicles.

3.4.2.9.3 Artillery Unit Activities

Camp Grayling has 67 field artillery and 41 mortar firing points (see Figures 3-13 and 3-14). These firing points are designed to fire any tube artillery weapon currently in the Army's inventory.

3.4.2.9.3.1 Towed Artillery

Currently, two different types of towed artillery units utilize Camp Grayling. The type present in the Michigan Army National Guard force structure is the M-102, 105mm Towed Howitzer, which is pulled behind a 2 1/2-ton truck. The second type is the M-198, 155mm Towed Howitzer, which is pulled behind a 5-ton truck.

3.4.2.9.3.2 Self-Propelled Artillery

Currently, two different types of self-propelled (tracked) artillery units utilize Camp Grayling. One is the M-109, 155mm Self-propelled Howitzer and the second is the M-110, 8-inch Self-propelled Howitzer.

3.4.2.9.3.3 Missile Artillery

The Michigan Army National Guard is currently fielding one battalion, 27 launchers, of the Army's standard missile artillery vehicle, the Multiple Launched Rocket System (MLRS). A detailed description of this vehicle and its expected impact on Camp Grayling can be found in a separate Environmental Assessment (MLRS EA, January 1994).

3.4.2.9.3.4 Mortars

Combat units, such as armor and infantry, have mortars assigned to battalions and companies which allow those units to provide their own indirect fire support in the accomplishment of a mission. All mortars currently in the Army's inventory can be fired,

both day and night (subject to the Camp's general noise abatement procedures), from the Camp's 41 mortar points.

3.4.2.10 Combined Arms Training Example

One of the many and varied combat operation scenarios combined arms teams perform on both the training and actual battlefield may well include the missions: (1) Attack and (2) Defend. These two very broad missions are broadly described here as typical of the complex array of events that may occur at Camp Grayling during the execution of combined arms training.

The following example is provided in an attempt to acquaint all readers with the complexities of modern warfare and the challenges facing those responsible for both training our military forces for any modern battlefield and providing good stewardship of the lands utilized for that training.

This example provides a typical task organization and maneuver scenario for the mission essential tasks "Attack" or more specifically "Deliberate Daylight Attack" and "Defend" or more specifically "Defend in Sector" which may be conducted during either Inactive Duty Training (IDT/weekends) and/or Annual Training (AT/summer training).

This exercise could entail use of any size force, but for the purpose of this example, a battalion sized task force is used. An armor battalion task force could consist of 44 M-1 main battle tanks, 13 Bradley fighting vehicles, and associated support equipment. A mechanized infantry battalion task force could consist of 55 M-2 Bradley infantry fighting vehicles, 12 M-3 Bradley cavalry fighting vehicles, 14 M-1 main battle tanks, and associated equipment. Actually, the variations are almost limitless and depend on the mission, the commander's concept of how to execute the mission, and the resources available.

Units currently utilizing Camp Grayling can be expected to conduct individual battalion level exercises once per year in an AT status. These exercises may be conducted in combinations of platoon, company, or battalion levels during AT. Typically, these training exercises are conducted around the clock (24 hrs) and in all weather conditions.

3.4.2.10.1 Battalion Level Exercise

A battalion level exercise theoretically requires the use of a land area approximately 5 miles by 20 miles. One battalion may conduct training in this area at any given time against a simulated enemy force or two battalions may operate against each other (force on force) simultaneously. The following types and quantities of equipment and personnel are typical in an armor and/or mechanized infantry battalion:

- 579 personnel
- 96 armored vehicles, including 58 M-1 tanks and 25 Armored Personnel Carriers
- 120 wheeled vehicles, including 50 2 1/2-ton trucks and 27 HMMWV utility vehicles

3.4.2.10.2 Company Level Exercise

A company level exercise theoretically requires the use of a land area approximately 1.5 miles by 4 miles. Eight companies may be involved in separate training problems at any one time. The following types and quantities of equipment and personnel are typical of any one armor and/or mechanized infantry company, but do not exactly represent any one unit:

- 140 personnel
- 24 armored vehicles, including 13 M-1 tanks
- 30 wheeled vehicles

3.4.2.10.3 Platoon Level Exercise

A platoon level exercise theoretically requires the use of a land area approximately 0.4 miles by 2 miles. Twenty-four platoons may be involved in separate training problems at any one time. The following types and quantities of equipment and personnel are typical in an armor and/or mechanized infantry platoon, but do not exactly represent any one unit.

- 25 personnel
- 4 armored vehicles, including 3 M-1 tanks
- 5 wheeled vehicles

3.4.2.10.4 Conduct of Typical Annual Training Exercises

Mission essential collective tasks are collective training sub-elements of missions at platoon, company, and battalion level. The following is an example of collective sub-elements of the missions: (1) Conduct Deliberate Attack, and (2) Conduct Defense in Sector.

Both operations are normally conducted at Camp Grayling as non-firing combined arms exercises (i.e., field artillery provides fire support, air defense provides counter air support, combat service support units provide logistical support, tactical air and army aviation provide air support, combat engineers provide mobility, counter mobility and survivability, NBC units provide nuclear, biological and chemical defense, and military intelligence units provide electronic warfare support).

A representative example of mission essential collective tasks (listed in chronological order) which support both missions, are defined below. These tasks are not all inclusive, nor is the description definitive, but all are typical examples.

3.4.2.10.4.1 Conduct Deliberate Attack

Collective tasks typically include those described below. Overall duration of this type exercise is approximately 48 hours. Again, this is a conceptual example only.

- Initial Tactical Road March: A tactical road march involves movement of all assigned vehicles from the cantonment area to a bivouac site. The initial tactical road march may occur during day or night, depending on mission requirements, and would be conducted on all major road networks leading to and from the maneuver training areas. For a full battalion, it might require up to 2 hours or more of movement time.

- Occupy an Assembly Area: Occupying an assembly area involves the battalion entering a coil formation, with a 360 degree perimeter, in an area approximately three miles square. Standard occupation time is 45 minutes. Duration of time spent in the assembly area will normally not exceed 24 hours. During this time, units conduct command and control tasks, resupply fuel and ammunition, perform maintenance, feed the troops, and rest. Feeding troops involves establishing a mobile field kitchen and feeding operation. Field sanitation (latrines) would be dug by the using unit.

- Second Tactical Road March: This tactical road march involves movement of all assigned vehicles from the bivouac site to the line of departure. This road march may be conducted along multiple routes. The length and duration of the march and consequent noise generation will be dependent on each specific operations order and the number of routes designated. A typical section or serial of a tactical road march would consist of a company size unit minus some of its organic logistical vehicles. Logistical support is typically centralized in one or two areas under the control of the parent battalion task force. The following organization and type/quantities of equipment typifies a maneuver unit serial in this type tactical road march.

  The road march could be conducted on the existing road network leading to and from the maneuver training areas. All vehicles are typically dispersed 50 to 100 yards apart, depending upon the dust conditions created by the road march.

  The lead platoon could consist of four tracked combat vehicles in a column or staggered column and would extend a distance of approximately 300 to 500 yards. The second element, the unit command section, would follow at approximately 50 to 100 yard intervals and could consist of at least one tracked combat vehicle and a tracked fire support vehicle from the supporting field artillery unit. Total distance covered by this element would be approximately 100 to 200 yards.

  The third element would follow the command section at approximately 50 to 100 yard intervals and could consist of a platoon size element consisting of four tracked combat vehicles in a column or staggered column spread out over 300 to 500 yards. The fourth section, the unit's logistical support, would follow at approximately 50 to 100 yard intervals and would likely consist of several tracked combat and maintenance vehicles and a medical section in several tracked ambulances. Again, this element would be spread over approximately 300 to 500

yards of road. The fifth and final element would consist of the rear security element. This could be a platoon size element of four tracked combat vehicles spread out over approximately 300 to 500 yards.

Total length of this serial would be approximately 1,500 to 2,400 yards, depending on number of vehicles assigned and expected enemy action. Total number of vehicles in this serial would be approximately 18-20. Total number of serials in any battalion task force would be approximately 5 to 7.

- Conduct a Passage of Lines: In most cases, a battalion will conduct a passage of lines through a stationary defending friendly force in order to deploy into a combat formation to continue the attack. This passage of lines may be conducted either day or night and will probably be conducted on multiple routes to speed the passage.

- Move Tactically: A battalion will transition from a tactical road march into a battle formation within the attack zone and upon completion of any passage of lines. The attack zone for a battalion is typically 2 to 4 miles in width. Length of the attack zone and the type battle formation used is dependent upon the factors of the mission, enemy, time, terrain, and the troops available.

  Typically, a battalion battle formation will have a frontage coverage of from 2 to 4 miles. Typically, the depth of the formation is approximately 2 miles, but may vary considerably depending upon the logistical and support trail elements.

  The time required to complete this mission varies widely and will be highly dependent upon the situation faced, however, in a training environment a 3 to 6 hour operation is fairly typical.

- Breach Defended Obstacles: Breaching an enemy prepared obstacle involves the battalion establishing company size sub-element responsibilities to conduct the breach, provide security for the breach element, and designating the sub-element responsible for conducting the assault on the enemy once the obstacle has been breached. Obstacles include, but are not limited to, simulated minefields, wire entanglements (either real or simulated), and tank ditches (either real or simulated). These obstacles are normally overwatched by a typically smaller enemy (i.e., the defense force whose mission is described in the following section) who utilize the obstacle as a delaying factor to enable them to defeat the larger attacking force. Duration of this event is 45 minutes to 1 hour.

- Assault: Tank and personnel carrier units, in concert with the battalion's operations plan, attempt to take the designated objective by destroying the enemy's ability to maintain an effective defense. In training exercises, this will be conducted using Multiple Integrated Laser Engagement (MILES) devices and pyrotechnic simulators to add realism to the training being conducted. This phase of the training scenario is typified by off-road, across country maneuver. A

company size combat formation typically consists of 14 to 18 tracked combat vehicles arrayed in rough line formation from 50 to 100 yards apart across the terrain. Normally, no wheeled vehicles would be part of this formation. Training evaluators would be located in the vicinity to determine the unit's proficiency level in the tasks being conducted, to keep the exercise safe, and to keep environmental damage to a minimum.

- Consolidation and Reorganization: Upon completion of the assault (hopefully gaining the objective and defeating the enemy in the process), the battalion would consolidate and reorganize on the objective by positioning combat vehicles in defensive positions, preparing for future combat operations, eliminating all remaining enemy resistance in the area, evacuating casualties, processing enemy prisoners of war (EPWs), cross leveling supplies, filling vacant leadership positions, and reporting all requirements for additional logistical support. Typical duration of this event is 1 hour.

3.4.2.10.4.2 Conduct Defense in Sector

While a training unit is undertaking the task described above (attack), another unit of the same division, brigade, or battalion could be opposing it by defending the same piece of ground being attacked; this is known as "force on force" training and is typically used when a formal Opposing Force (OPFOR) unit is not available. Overall duration of this exercise is approximately 36 to 48 hours, however, the amount of "digging in" authorized the unit greatly influences the amount of time spent executing this mission. The collective tasks for this mission may include, but are not limited to, the following:

- Initial Road March: This tactical road march involves movement of all assigned vehicles from the cantonment area to a bivouac site. A battalion level road march will be approximately 13 miles in length and consist of approximately 191 assorted vehicles. At 20 miles per hour, it requires at least 98 minutes for all parts of the convoy to pass a given point. This road march may be conducted along multiple routes. The length and duration of the march and consequent noise generation will be dependent on each specific operations order and the number of routes designated. A typical section or serial of a tactical road march would consist of a company size unit minus some of its organic (assigned) logistical vehicles.

  The movement is conducted in sections or serials, with 10-minute intervals between serials, to allow other traffic to pass on the same route. This road march is very similar to that described for the attack, above.

- Occupy an Assembly Area: Occupying an assembly area involves the battalion entering a coil formation, with a 360 degree perimeter, in an area approximately three miles square. Standard occupation time is 45 minutes. Armored vehicles will be started at intermittent intervals with primary traffic consisting of wheeled support vehicles. Duration of time spent in the assembly area will normally not

exceed 24 hours. During this time, units conduct command and control tasks, resupply fuel and ammunition, perform maintenance, feed the troops, and rest. Feeding troops involves establishing a mobile field kitchen and feeding operation. Field sanitation (latrines) would be dug by the using unit.

- Second Tactical Road March: This tactical road march involves movement of all organic vehicles from the bivouac site to the line of departure. This road march may be conducted along multiple routes. The length and duration of the march and consequent noise generation will be dependent on each specific operations order and the number of routes designated.

- Defend: The battalion occupies defensive positions and prepares alternate defensive positions and subsequent defensive positions to form a defense in depth. Typical defensive sectors are 3 to 4 miles in width and 4 to 5 miles in depth, but will vary considerably depending upon mission requirements.

  Obstacles are either constructed or simulated and will include minefields (50 to 200 feet wide), wire entanglements (50 to 200 feet wide), and tank ditches (30 feet wide and various lengths). Fighting positions for both individuals and crew served weapons are dug into the ground. Tank fighting positions are dug into the ground so only the turrets are exposed to enemy fire. Fighting positions for combat vehicles are typically from 25 feet wide, 30 to 40 feet long, and vary in depth from 4 to 8 feet, depending upon the terrain and the vehicle to use the position. A total of 58 to 67 fighting positions are required. Specific time required for this event is dependent upon the unit commander, the mission, and the enemy, but will not normally exceed 48 hours.

- Cover a Passage of Lines: In most cases, a battalion will cover a passage of lines by withdrawing a friendly force through the defensive positions the battalion has built. At this time, the defending unit takes charge of the area of operations and conducts its defensive mission. The withdrawal of the passing force will normally be conducted on multiple routes.

- Withdraw Under Enemy Pressure, Delay, Counter Attack: The battalion utilizes the withdrawal, delay, or counter attack to achieve any objectives it was given in its orders. Withdrawal or delay involves the battalion or sub-elements falling back to subsequent positions under enemy contact to prolong the fight and deplete the enemies' capability to continue the attack. The counter attack involves the battalion or sub-elements intermittently conducting an offensive type operation to achieve local success. This mission is typically conducted over the same area specified for the defense. Duration of this event is dependent upon the overall mission and time afforded the commander, but is typically one to several hours long.

- Consolidation and Reorganization: Upon completion of the defense (hopefully keeping in position and defeating the enemy in the process), the battalion would

consolidate and reorganize on the battle position by re-positioning combat vehicles in defensive positions, preparing for future combat operations, eliminating all remaining enemy resistance in the area, evacuating casualties, processing EPWs, cross leveling supplies, filling vacant leadership positions, and reporting all requirements for additional logistical support. Typical duration of this event is one hour.

3.4.2.10.5 Armor/Mech Infantry/Cavalry Exercises During Inactive Duty Training (IDT)

Collective training events at Camp Grayling consist of basically the same types of training events conducted during annual training. The two sets of activities differ mainly in the manner in which they are executed, the emphasis on particular skills, and the level of training (i.e., the size of the unit participating). Whereas annual training is conducted as a continuous operation for 3 to 9 days long, IDT events are conducted over a period of several hours, typically no more than 24 to 36 hours of elapsed time.

3.4.2.10.6 Summary

Training for modern combat must replicate, as closely as practicable in a peacetime environment, those conditions that may actually be encountered on a battlefield. The foundation and key principal in the Army's training doctrine states:

> *Units must train in peacetime as they will fight during war. Peacetime training must replicate battlefield conditions. All training is based upon this principle. (FM 25-101, Battle Focused Training, September 1990)*

The U.S. Army emphasizes mobility as a major tenet in the Airland Battle Doctrine. Mobility requires the maneuver space necessary to accomplish this tenet. The Reserve Forces of the United States, the National Guard and the U.S. Army Reserve are expected to achieve the same training standards as the active component.

The Department's primary goals of training soldiers to survive and win on any future battlefield and providing sound environmental stewardship of public lands under its supervision require it to carefully consider all impacts of each of these activities on the other.

3.4.3 Air Training Activities

3.4.3.1 General Flying Activities

Flying activities at Camp Grayling can be divided into two main groups, civilian and military. The civilian activities are mainly concentrated at Grayling Army Airfield (see Figure 3-10), are governed by rules and regulations of the Federal Aviation Administration, and are not within the scope of this EIS. The military activities range over

the entire Camp and beyond, are of both fixed and rotary wing varieties, and will be addressed in some detail.

3.4.3.1.1 Fixed Wing Activities

The following types of fixed wing military aircraft utilize Camp Grayling airspace and facilities.

- C-12 and C-26 twin engine non-tactical airplanes ferrying passengers utilize the Grayling Army Airfield facilities.
- C-130 four engine tactical airplanes ferrying passengers and cargo and dropping troops and supplies by parachute utilize both the drop zones of the Camp and the Grayling Army Airfield facilities.
- F-16, A-10, and (occasionally) other jet combat aircraft use the Camp's airspace and the air-to-ground range facilities. These aircraft do not land at the Grayling Army Airfield.

3.4.3.1.2 Rotary Wing Activities

The following types of rotary wing military aircraft utilize Camp Grayling airspace and facilities.

- OH-58 Observation Helicopters used for general observation of military activities utilize the airspace, landing zones, and aviation support facilities of the Camp.
- UH-1, UH-60, and CH-47 Utility/Cargo Helicopters ferry passengers and cargo throughout the Camp and utilize its airspace, landing zones, and aviation support facilities.
- AH-1 and AH-64 Attack Helicopters utilize the Camp's airspace, landing zones, aviation support facilities, and the air-to-ground facilities.

3.4.3.1.3 Air-to-Ground Range Activities

For normal operating activities of the Air-to-Ground Range Operations facility, refer to Section 3.3.3.3. For the purposes of this mission description, only Air National Guard and U.S. Air Force range activities will be described here; Army aviation air-to-ground activities are described below.

The air-to-ground range, located at the north end of Range 40 (see Figure 3-12), is considered vital to the mission of the Air National Guard's Combat Readiness Training Center, Phelps/Collins at Alpena, 80 miles to the northeast (see Figure 3-19). Units from several states conduct annual training (AT) at the Alpena facility and conduct range firing on Camp Grayling's air-to-ground range. This range firing is considered critical to the

combat readiness training of these deployed units. Range firing activities cover weapons systems from the 20mm Gatling Gun to dropping live 500 lb bombs from various jet aircraft.

Units may be identified as "daily units" or "deployed units." Daily units normally utilize Camp Grayling's air-to-ground range without deploying or stopping at Phelps/Collins Combat Readiness Training Center. These units are normally from Michigan, Indiana, and Ohio. Deployed units deploy from home station to Phelps/Collins as a unit and then operate from that facility.

In FY92, 4,523 sorties (flights) were made by Air Guard and Air Force aircraft which used the air-to-ground range; in FY93, 4,687 sorties were conducted. Approximately 20,000 practice bombs were dropped and 300,000 rounds of aircraft cannon ammunition were expended each year during normal training operations. Range usage is expected to continue at approximately this level in the future.

3.4.3.1.4 Airborne and Air Cargo Drop Zones

One fixed wing airborne and air cargo drop zone is located on Camp Grayling on the eastern edge of the tank range safety fan. It is utilized for both parachute jumps by airborne soldiers and by transport aircraft to practice parachute drops of cargo. These flights utilize multi-engine transport aircraft and are relatively infrequent as compared to bombing and gunnery missions; typically no more than 25 flights per year use the drop zones.

Rotary wing airborne drops do not generally require the large cleared land areas and fixed, low-level flight corridors required of fixed wing drop zones. Based upon a number of environmental (mainly tree clearing), operational, and safety factors, Camp Grayling has several areas across the breadth of the Camp for rotary wing airborne drops.

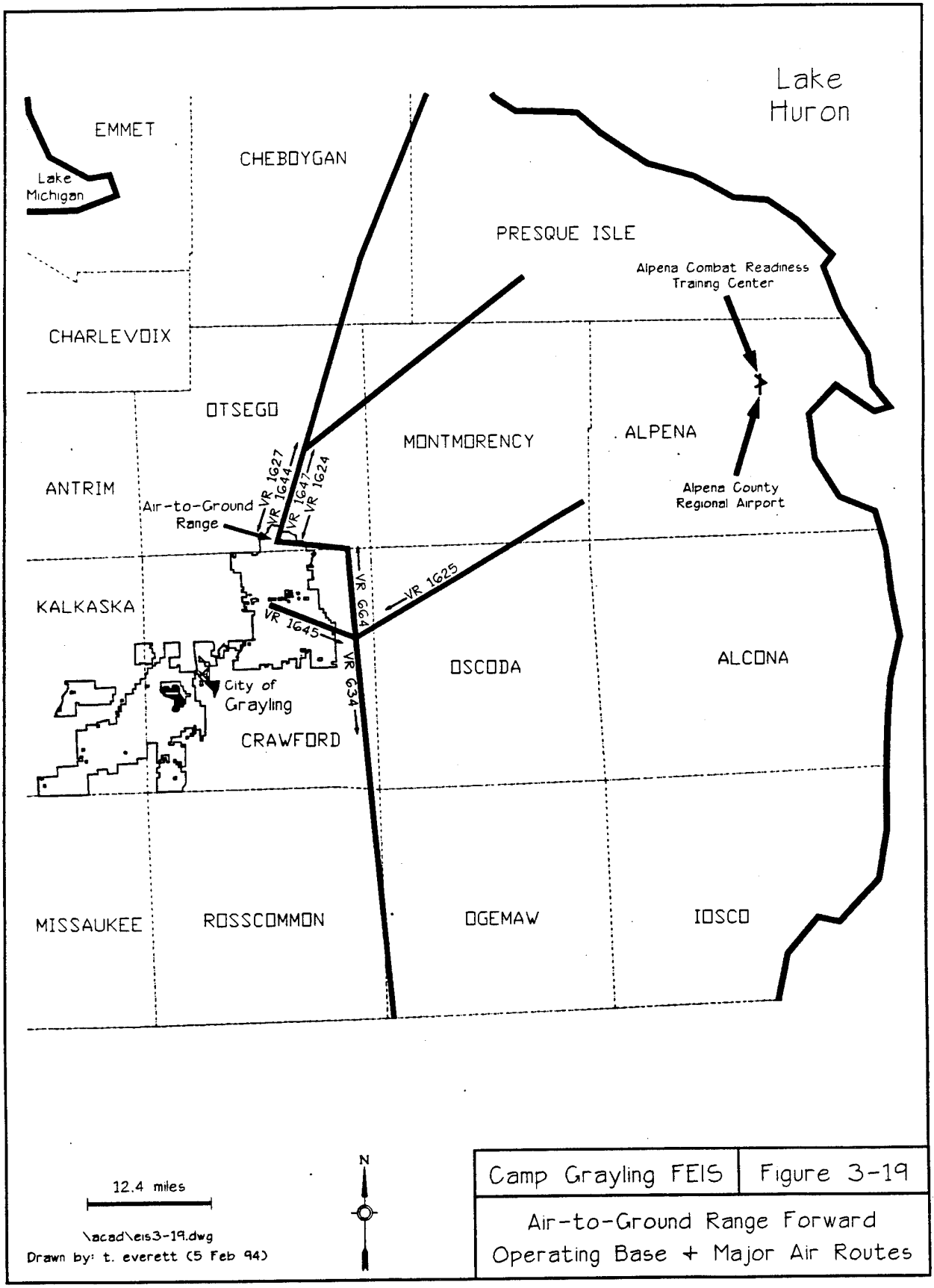
3.4.3.2 Aviation Unit Type Activities

3.4.3.2.1 Conduct of Typical Aviation Training Exercises

Described below are examples of some typical mission essential collective tasks which are normally performed by companies, platoons, sections, or individual aircraft and support personnel at some time during the conduct of either annual training or inactive duty training. As is the case for the armor and mechanized infantry descriptions provided earlier, these tasks are not all inclusive, nor is the description definitive, however, they are typical examples.

3.4.3.2.1.1 Receiving, Staging, and Deployment (RS&D) Operations

This involves setting up the unit in a predetermined location and accepting missions from higher and adjacent headquarters. The predetermined location for most Michigan Army



Camp Grayling FEIS	Figure 3-19
Air-to-Ground Range Forward Operating Base + Major Air Routes	

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National Guard units is Grayling Army Airfield, however, this could just as easily be a field or tactical site.

The missions are sorted by type and sent to a line unit, or units, for execution. Missions are extremely varied, and, collectively, represent the majority of training tasks conducted with the exception of attack helicopter training addressed separately, below. These "generic" missions include, but are not limited to those described below.

3.4.3.2.1.2 Aerial Observation

This mission involves flying over designated terrain, as stated in the mission order, and observing the actions of the unit being supported. This may be as simple as flying over a convoy and watching for obstructions that may be in front of the convoy.

3.4.3.2.1.3 Aerial Reconnaissance

This mission consists of looking at specific sites or locations for specific problems with the site (enemy situation, obstructions, terrain descriptions, etc.)

3.4.3.2.1.4 Aerial Insertions and Recoveries

This mission involves transporting troops to known locations (landing zones) and recovering personnel from pickup sites. This mission can range in scope from one single helicopter landing and taking off once at a single site to dozens of landings and takeoffs from multiple ships at multiple sites.

3.4.3.2.1.5 Flying Downed Aircraft Missions

This mission consists of flying over terrain to search for simulated or real downed aircraft.

3.4.3.2.1.6 Spotting for Artillery Units

This mission involves flying in a safe environment, away from either the shooter or the area where the round is to land, and advising the unit shooting on where the round is landing and which way to adjust the "gun" so the round will land closer to a known point (i.e., the target).

3.4.3.2.1.7 Transportation of Equipment and Personnel

Similar to Aerial Insertions, except these may be administrative missions instead of tactical missions.

3.4.3.2.1.8 Night Vision Goggle (NVG) Missions

Involves flying missions without the aid of lights at night. Personnel will be wearing goggles which enable them to see in periods of darkness without the aid of external light sources. These missions are normally flown at altitudes of 200 feet above ground level (AGL) and lower. Due to the adverse impact of light on the goggles, NVG flights are always flown as to avoid any developed areas. These areas normally have outside lighting, street lights, security lights, etc., which cause the goggles to gather too much light and, in effect, "shut down."

3.4.3.2.1.9 Nap-of-the-Earth (NOE) Missions

Done at tree-top level or lower. These missions are normally flown in areas well away from inhabitants or visitors, due to the potential for noise and safety considerations.

3.4.3.2.1.10 Airplane Missions

Flown from permanent, improved airports, of which Grayling Army Airfield is the only one at the Camp. These missions are normally administrative "people hauling" missions flown at higher altitudes and in normal commercial and private aircraft flying areas. They may involve single or multi-engine aircraft up to C-130 in size.

3.4.3.2.1.11 External Load Missions

Performed with all types of helicopters at Camp Grayling, with the exception of the AH-1 Cobra Attack Helicopter and the OH-58 Kiowa Observation Helicopter. These missions consist of rigging a variety of loads to be transported under the helicopter by means of a line. The loads vary in weight and size according to the type helicopter moving the load. These missions avoid built up areas as much as practicable due to safety considerations.

Fire fighting missions utilizing water buckets under aircraft are in this category of operation.

3.4.3.2.1.12 Refueling Operations

Varies from refueling aircraft from trucks with the aircraft shut down to refueling with the aircraft still running (also called "hot" refueling). The size of the operation varies from a single truck to multiple fuel sources with multiple hoses. "Cold" refueling refers to the aircraft shutting down and the fuel source coming to it. "Hot" refueling refers to the aircraft moving to the fuel source and refueling with the engine running and the blades turning. "Hot" refueling is normally done in tactical operations and "cold" in administrative operations.

3.4.3.2.2 Tactical Aviation Training

The purpose of tactical aviation training is to provide aviation units experience with aviation support, navigation aids, air warnings, air transportation, and air reconnaissance in a battlefield environment. Tactical aviation training is most effective when coordinated with combat arms battalion and company task force/team exercises. Tactical aviation training sites/areas serve the following functions:

- Provide areas for aircraft to group by tactical units.
- Provide locations to practice ground-based activities such as minor maintenance, refueling, rearming, and establishment of communications with ground forces. These locations are generally referred to as either a Forward Air Rearming Point (FARP) or a Forward Air Rearming/Refueling Point (FARRP), depending upon what is scheduled for the area.
- Provide areas for tactical units to occupy for several days at a time to practice setting up and shifting field operations. Units training at Camp Grayling use both a primary and an alternate site to permit them to practice shifting operations.

Camp Grayling has 14 tactical aviation training areas (see Figure 3-20); 5 more have been identified for further development. Over many years, site preparation has entailed clearing vegetation, revegetating exposed soils for dust suppression as well as erosion control, and constructing earth berms to surround parked fuel tankers and trailers.

Sites/areas used for tactical aviation training were selected through the past 45 years so as to require minimum or no clearing of forest vegetation. The actual size of the usable central site for aircraft operations at any one location vary greatly, from less than 5 acres to approximately 80 acres.

Sites/areas have been selected so they are not all within the Camp Grayling Restricted Airspaces (R4201A, R4201B, and R4202) (see Figure 3-16). Aircraft within these restricted airspaces are specially controlled by Range Control; each movement must be pre-coordinated and approved, therefore, individual aircrew training is more difficult to accomplish.

Ideally, the distance between sites should be great enough to allow realistic unit movements, or approximately 11 to 12 km (6 to 7 miles) apart. Also, sites should not normally be located with tracked vehicle maneuver corridors or other areas used by tracked vehicles, as the two uses are technically incompatible and potentially dangerous if night training by both ground and air units take place at the same time. Camp Grayling accommodates both of these concerns adequately.

Tactical aviation sites/areas are used during annual training periods, with an approximate usage of between 40 and 52 days of training, and during inactive duty training, with an approximate usage of between 28 and 40 days of training. Aviation sites/areas are used

for all types of rotary wing aircraft, including the UH-1, OH-58, CH-47, AH-1, UH-60, and AH-64 helicopter. The number of aircraft will vary depending on the size of the unit training and its mission, but could be as high as 45 aircraft for a battalion size unit.

Typically, aviation units tactically occupy the sites/areas. This includes bivouac sites surrounding the aviation parking area, where personnel will conduct 24-hour operations.

3.4.3.2.3 Utility Helicopter Units

Missions of these units, normally equipped with OH-58, UH-1, CH-47, or UH-60 helicopters, include aerial observation, aerial reconnaissance, aerial insertions and recoveries, flying downed aircraft missions, spotting for artillery units, transporting equipment and personnel, night vision goggle missions, flying nap of the earth, external load missions, and refueling.

3.4.3.2.4 Assault Helicopter Units

Missions of these units, normally equipped with either UH-1 or UH-60 helicopters, can include all missions shown for utility helicopters, however, tactical transport of equipment and personnel into the battle area is priority. Assault helicopter crews fire door gunnery exercises, firing 7.62mm machineguns from the hovering aircraft, on the aerial ranges of the Camp.

3.4.3.2.5 Attack Helicopter Units

Attack helicopters are flying combat vehicles; they fire and maneuver much the same as tanks, they are just not constrained as much by the terrain. Nap-of-the-earth flying and aerial gunnery constitute the majority of their missions.

Camp Grayling has one aerial gunnery range, with 14 firing points, for helicopter air-to-ground gunnery training. This range is located adjacent to both the artillery firing points and the Air National Guard's air-to-ground range in the center of Range 40 (see Figure 3-20).

In FY92, helicopter crews launched approximately 2,500 practice rockets and fired approximately 16,000 rounds of cannon/machinegun ammunition. Range usage is expected to continue at approximately this level in the future.

3.4.3.3 Air Force Unit Type Activities

In addition to the air-to-ground training activities already discussed, Air National Guard and Air Force units also utilize Camp Grayling's Restricted Airspace (R4201A & B) for close air support of ground maneuver forces.

This training is characterized by high-speed, low altitude, terrain following air maneuvers in support of a ground commander's scheme of maneuver.

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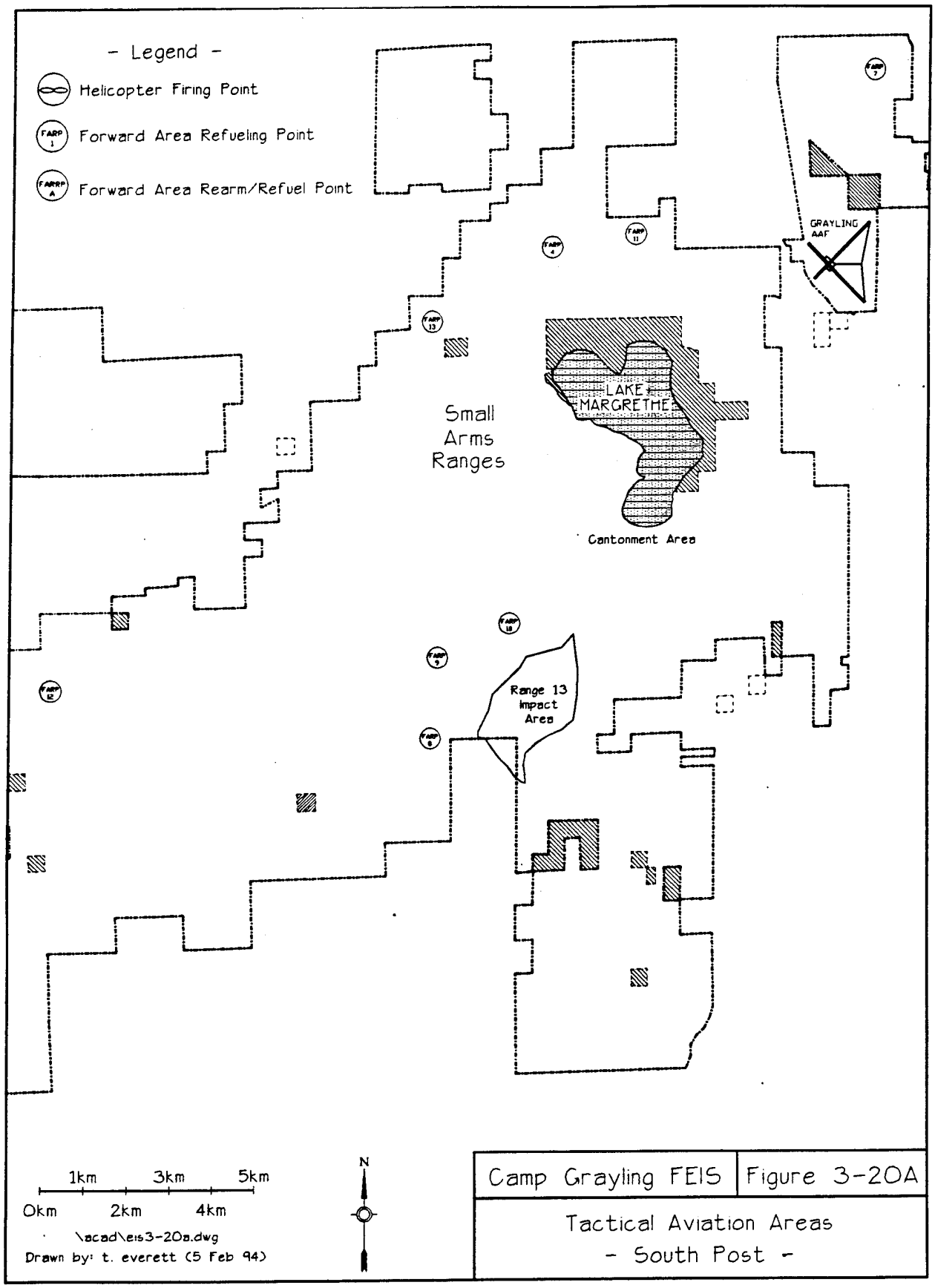
- Legend -
Helicopter Firing Point
Forward Area Refueling Point
Forward Area Rearm/Refuel Point
GRAYLING AAF
LAKE MARGRETHE
Small Arms Ranges
Cantonment Area
Range 13 Impact Area
1km 3km 5km
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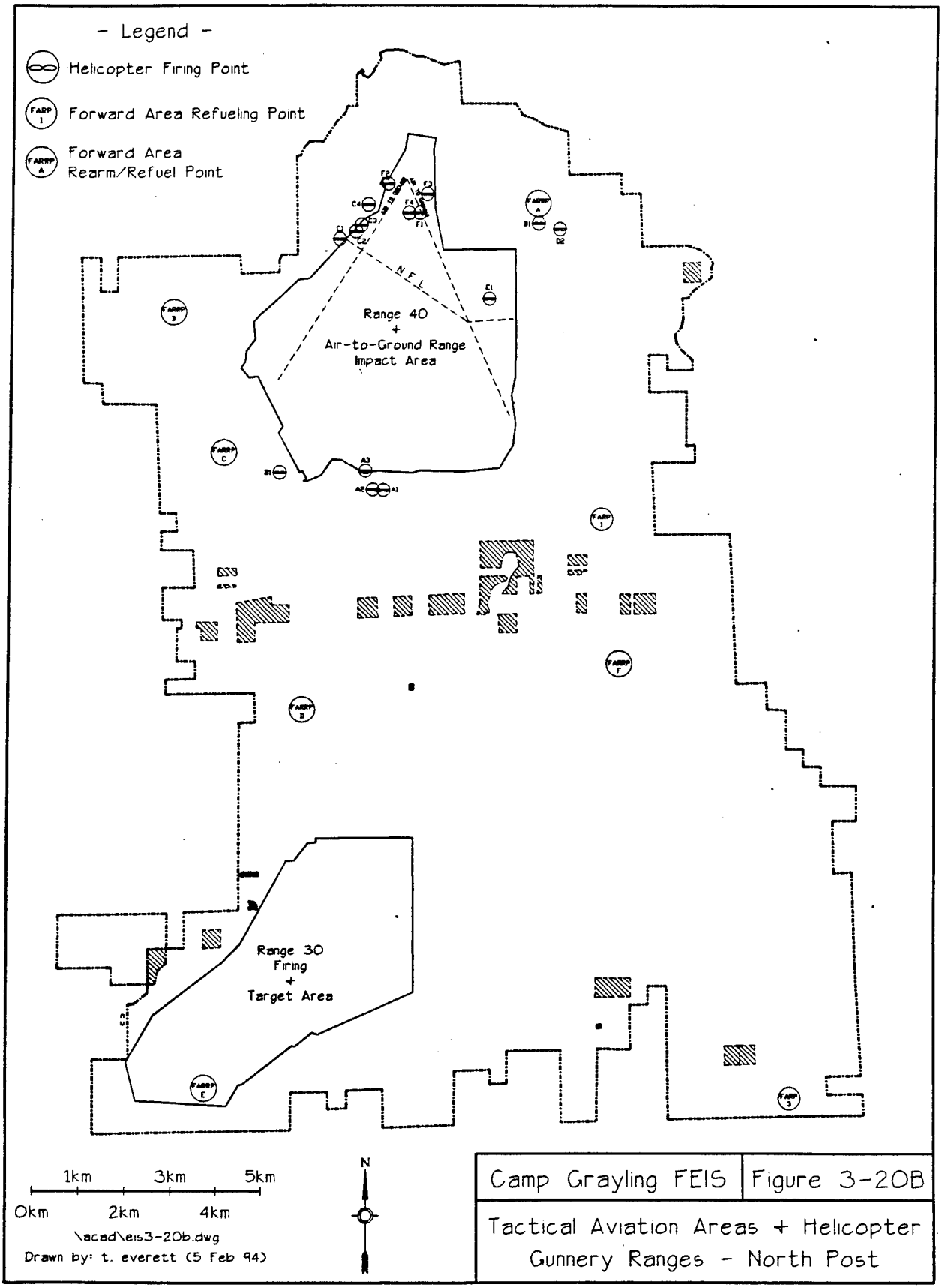
Figure 3-20A
Tactical Aviation Areas
- South Post -


- Legend -
Helicopter Firing Point
Forward Area Refueling Point
Forward Area
Rearm/Refuel Point
Range 40
+
Air-to-Ground Range
Impact Area
Range 30
Firing
+
Target Area
1km
3km
5km
0km
2km
4km
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Drawn by: t. everett (5 Feb 94)
N
Camp Grayling FEIS
Figure 3-20B
Tactical Aviation Areas + Helicopter
Gunnery Ranges - North Post

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3.4.4 Research and Development (R&D) Activities

The DMA has been supporting various research and development projects conducted at the Camp for the past 10 years. These R&D projects have been of three general types: DOD sponsored and resourced, DOD sponsored and private industry resourced, and private industry sponsored and resourced. The Camp has provided support for these R&D projects in the following general areas:

- Land Use: This can range from an acre of ground to an entire weapons range of several thousand acres, depending upon the specific need of the project and the nature of potential environmental impacts. This support is contingent upon training needs of the National Guard, which always has the first priority on any lands and/or resources at the Camp.

- Equipment Use: This too is contingent upon National Guard training needs. In addition, the equipment at Camp Grayling (mostly tactical vehicles) is loaned to the state by the federal government and can normally be loaned/leased by the Guard only to DOD agencies and not to private industry.

- Personnel: DMA provides the names of experienced National Guard mobilization day and retired personnel who have expressed interest in working on R&D projects on a temporary basis. This large pool of people (who are qualified on every type of equipment DOD owns) has proven to be one of the main resources available in Michigan to support these projects. These people's knowledge of the local environment make them especially valuable to R&D managers concerned with following all of the Camp's rules and regulations.

3.4.4.1 R&D Activities and the Environment

Only R&D activities which approximate, or mirror, military activities at the Camp are accepted by DMA. Those projects which propose to introduce "new" activities or impacts to the Camp are normally rejected.

Examples of accepted projects include firing of 105mm cannon, 0.50 caliber machineguns, and 40mm grenade launchers from armored combat vehicles and the use of the Grayling Army Airfield for anti-skid automotive brake testing.

An example of a rejected proposal is the refusal by the DMA to even entertain a proposal to use DOD inventory metallic smoke devices for a test of different military imaging devices. The refusal was based on the fact that this would constitute a "new" potentially negative impact to the Camp.

3.4.4.2 DOD Activities

DOD R&D projects constitute approximately 90 percent of all R&D projects at the Camp. Three recent projects, for which Environmental Assessments (EAs) were completed will be discussed briefly as typical examples of these activities.

3.4.4.2.1 Forward Area Air Defense System (FAADS) (Historic Example)

The United States Army expects future battles to include significant threats from fixed wing and rotary wing high performance aircraft that possess a wide range of munitions. FAADS is a proposed integrated system that will meet all predicted situations under current conditions.

The FAADS air defense concept contains four components of which LOS-FH is one. LOS-FH is a mobile air defense system that is fully contained on and in an M-113 tracked vehicle. The equipment involved includes: radar, electro-optics module with a near infrared camera and video monitor, laser rangefinder, and a beam rider laser guidance device. The M-113 vehicle is also equipped with eight mounted missiles but these tests did not include the firing of any munitions and therefore the test vehicles were not so equipped.

Camp Grayling was chosen for this testing evaluation due to its favorable environmental conditions and topography. Both of these aspects closely reflected the type of conditions that would be encountered in a European setting. This allowed a more realistic evaluation of the concept as to how it would perform in the event of implementation.

The testing of LOS-FH was conducted from 15 September through 10 November 1989. The project took place on Range 37 within Camp Grayling. The support equipment, which ranged from instrumentation vans to helicopters to latrines, were placed at ten general sites for this experiment.

The actual test included fixed wing aircraft (A-7) and rotary wing aircraft (AH-64 Apache) conducting specific flight patterns over various equipment placement sites. The equipment on the ground then tracked these aircraft under differing weather conditions (e.g., rain and fog). Each mission lasted an hour and a maximum of two missions were conducted per day. The aircraft flew in airspace that was approved for aircraft maneuvers.

3.4.4.2.2 Sensor Fuzed Weapon (Historic Example)

The United States Air Force developed a conventional munition that would eliminate the need for multiple passes per target against armored and other support vehicles. This munition was called the sensor fuzed weapon (SFW) and the scope of the project was to evaluate the performance of this munition prior to full production of the system.

Camp Grayling was one of three test sites chosen. Camp Grayling was chosen because of its realistic replication of European environmental conditions and topography. These conditions were necessary to evaluate the SFW prior to production under possible conditions that it may encounter during use.

The analysis was conducted from July 1990 through November 1991. The project at Camp Grayling included a total of four flying missions with one live munition being dropped during each. The missions were conducted at Range 40 and the munition dropped was the CBU-97/B SFW which contained 40 projectiles.

The target was a line formation of 24 armored vehicles located in Range 40. The SFW was carried and dropped by an F-16 aircraft. Other support equipment and instrumentation devices were used and located at three general sites within the testing area. The aircraft flew an approved flight pattern before and during the drop. These missions were approximately an hour long, with the drop of the munition lasting approximately 15 seconds, and were conducted once a week.

3.4.4.2.3 Aircraft Operations at Project Chicken Little (Historic Example)

The United States Air Force/Army had developed a new series of smart weapons (self-guided) to meet the threat posed by the numerical advantage of Warsaw Pact ground mobile forces. The Chicken Little project conducted tests to evaluate the sensors/ seekers and associated software from two of these smart weapon types (sensor-fuzed and precision-guided submunitions). The tests provided critical data for these two developmental systems against fixed and mobile land combat tactical arrays.

Camp Grayling was chosen due to its European type environment and topography. The testing was conducted from 7 February through 30 March 1990 on Range 37. Approximately 200 personnel, 70 vehicles, 6 helicopters and 4 fixed wing aircraft were involved in the project. The specific experiment involved a series of captive flight tests of different individual sensor/software combinations during the daytime hours. Sensors were mounted on a helicopter or fixed wing plane which flew approximately 30 passes over an array of vehicles in a tactical formation. There were about 162 helicopter and 38 fixed wing missions.

The missions lasted approximately 1 to 2 hours, and an average of four missions were conducted each day. Data was used to determine the number of false alarms and target detections versus target acquisition opportunities during a range of winter climatic conditions. These missions did not involve the firing of any type of munitions and the aircraft flew in pre-approved flight patterns over Camp Grayling.

3.4.4.3 Private Industry Activities

Support to private industry primarily involves providing land and names of interested personnel to Michigan firms seeking to use the Camp for R&D projects. As with the

support to DOD, only activities which mirror or approximate current military activities are accepted. Two examples are provided below.

3.4.4.3.1 General Motors Corporation (GM) Pick-Up Truck Test Drive (Historic Example)

Personnel from the Truck Engine Development Section of GM Powertrain Division needed to test drive four 4-wheel drive pick-up trucks on different types of cross country terrain and two-track roads. This was done at Camp Grayling over a two-day period during the first two weeks of April 1991. The principle area of operation was the area in South Camp known as "Engineer Valley." No Camp Grayling support, other than permission to use the land and a locally hired liaison officer referred to GM by the Department, was offered or used.

3.4.4.3.2 Cadillac Gage Textron Combat Vehicle Demonstration (Historic Example)

Cadillac Gage is a subsidiary of Textron Inc. and is headquartered in Warren, Michigan. The company produces combat vehicles, both wheeled and tracked, for all branches of the U.S. Military Services. In addition, these vehicles are also offered to allied countries throughout the world through U.S. Department of Defense Foreign Military Sales program. In order to provide state-of-the-art, high technology vehicles to all customers, both foreign and domestic, the company must upgrade, test, and demonstrate its vehicles on a regular basis.

Cadillac Gage demonstrated its Commando V-300 6X6 wheeled armored vehicle (26 September through 1 October 1991) to military delegations from Zimbabwe and Mexico. The vehicle's 40mm grenade launcher was fired on Range 40 and its 0.50 cal. machinegun was fired on Range 36. Range operators (guards, safety personnel, and officer-in-charge) were locally hired from the DMA's list of interested personnel).

3.4.5 Marine Corps Unit Type Activities

As a general statement, Marine Corps units using Camp Grayling consist of dismounted infantry and engineer bridging (ribbon/medium girder) troops. The operational characteristics of these units mirror those of like Army units.

3.4.6 Navy Unit Type Activities

The only Navy unit regularly utilizing the Camp's facilities is a Sea Bee (engineer) unit. Again, the operations characteristics of this unit mirrors like Army engineer units.

3.4.7 Allied Nation Unit Type Activities

Canadian Ground Forces Militia units are the single largest Allied nation user of Camp Grayling. Activities of these units, which are almost exclusively dismounted infantry and 105mm Towed artillery, are almost exactly the same as like American units. Some

Canadian Air Force F-18s also use the Air-to-Ground range on occasion; again, their activities are indistinguishable from like American Air Force units.

3.4.8 Non-military Activities

A variety of activities occur at Camp Grayling that are not military related. These include activities conducted by federal, state, and local governments as well as recreational users and community groups. Because the Post is unfenced, unlike the vast majority of military training installations around the world, many areas of the Camp are open to the public for activities such as hunting, fishing, skiing, snowmobiling, hiking, horseback riding, camping, and other outdoor activities. Facilities in the cantonment area are also utilized for training by various units of state government and police agencies.

3.4.8.1 Federal Government Activities

Several federal government agencies conduct activities on Camp Grayling ranging from development of a noise management system to recovery of a Federally endangered animal species.

3.4.8.1.1 USACERL Activities at Camp Grayling

The U.S. Army Construction Engineering Research Laboratories (USACERL) Acoustics Division is developing a comprehensive noise management system at Camp Grayling. A complete description of the system is shown in Section 3.5.4.2, Camp Grayling Noise Environment. This experimental project represents the very latest technological advances in the entire nation in this field of scientific study. The Department is wholeheartedly supporting this project as an excellent way to advance its efforts to mitigate the noise issues at the Camp and on the surrounding area.

3.4.8.1.2 Kirtland's Warbler Recovery Team

The Kirtland's Warbler Recovery Team is a group of natural resource professionals responsible for the management and continued survival of the Kirtland's Warbler. This group includes resource managers and researchers from the Michigan Department of Natural Resources, the U.S. Forest Service, and the U.S. Fish & Wildlife Service.

The DMA is an associate of the team and supportive of their efforts. DMA environmental staff attend the biannual recovery meetings and are included on the agenda. Any proposed military activities that could impact the Warbler are discussed with the team members.

3.4.8.2 State of Michigan Government Activities

State government agencies also conduct a variety of activities at Camp Grayling, including wildlife research and training of police forces.

3.4.8.2.1 The Michigan Department of Natural Resources and Camp Grayling

The Department of Natural Resources (DNR) performs a wide variety of activities on Camp Grayling, including the management of all wildlife, fisheries, forests, and other resources. A full explanation may be found in Section 3.6, Biological Environment.

DNR Conservation Officers assigned to each county enforce all game and conservation laws on state lands located on Camp Grayling.

3.4.8.2.2 Other State of Michigan Departments' Activities

The State Police periodically use Camp facilities to train in urban tactics and marksmanship. Facilities normally used include barracks, classrooms, small arms ranges, and simulated urban landscapes. The Michigan Law Enforcement Academy also conducts training for youth cadets.

3.4.8.3 Local Government Use of Camp Grayling

County Sheriff Departments from across the state also use the Camp's facilities to train deputies in investigation techniques, crowd control, emergency response, urban tactics, driving safety, and marksmanship.

The Kirtland Community College Law Enforcement Program conducts an emergency driving techniques school and may also utilize classrooms for related training.

3.4.8.4 Public Activities

The vast majority of state land located on Camp Grayling is open to the public; allowing for a great variety of outdoor recreational opportunities.

Camp Grayling is rather unique among military installations around the world in that it is not fenced (other than three fenced impact areas for safety reasons). The Camp shares over 240 miles of boundary with private landowners and other government agencies.

3.4.8.4.1 Hunting

Except for the fenced ranges/impact areas (13, 30, and 40), and the Hanson Grant Lands (which is a wildlife refuge), Camp Grayling lands are open and used for hunting of all game species according to the state rules and regulations pertaining to all public lands. As a safety precaution to everyone and as a general courtesy, all ranges are closed during the firearm deer season, November 15-30.

The principal game species hunted at Camp Grayling include white-tailed deer, rabbits, squirrels, and turkeys. The Michigan Department of Natural Resources is responsible for the management of these species and their habitat.

3.4.8.4.2 Fishing

All lakes and streams on or adjacent to Camp Grayling lands are open to public fishing, except those in the fenced ranges/impact areas. Statewide rules and regulations apply to these waters and their management is the responsibility of the Michigan Department of Natural Resources.

3.4.8.4.3 Off-Road Vehicles

The Off-Road Vehicle (ORV) law that applies to public lands in Michigan's lower peninsula also applies to Camp Grayling lands. The law states that public land is closed to ORV use unless it is posted open. Several trails, posted and designated for ORV use, pass through Camp Grayling.

3.4.8.4.4 Skiing

Downhill and cross-country skiing is available at the Hanson Hills ski area on Camp Grayling. This facility is located on Hanson Grant Land that is leased to the Grayling Recreation Authority. The rest of the Camp, (except fenced ranges/impact areas) is open to cross-country skiing.

3.4.8.4.5 Competitive Marksmanship Training/Competition

Local shooting clubs, 4-H groups, and conservation clubs use Camp Grayling's small arms ranges to conduct marksmanship training and competitions. All groups utilizing these ranges must adhere to all safety and range regulations and must enter into a use agreement with the Camp.

3.4.8.4.6 Scouting Groups

Scout troops periodically use facilities on the Camp, including barracks and classrooms, to conduct leadership, hiking, camping, and merit skills exercises. All requests for use of facilities are cleared through Range Control and a use agreement entered into. All Scout troops must be accompanied by sufficient adult leadership.

3.4.8.4.7 Refuse Disposal

Illegally dumped civilian trash on state land is a continuous problem at Camp Grayling. Sites discovered are located on maps and continuously cleaned up by Camp personnel and training units.

The Camp's Environmental Officer coordinates activities in conjunction with the Michigan Coalition for Clean Forests "Adopt-a-Forest Program" during which large amounts of "civilian" trash is cleaned up as part of Earth Week activities.

Visiting troops also assist in trash removal and, when possible, local law enforcement agencies are notified of "new" dump sites. Refuse disposal by troops and Camp activities is discussed in detail in Section 3.7.2, Waste Disposal.

3.4.8.5 Commercial Activities

A variety of commercial activities occur at Camp Grayling, mainly involving the harvest/production of natural resources. These activities are all permitted and/or controlled by the Department of Natural Resources.

3.4.8.5.1 Lumbering

Timber sales and management on Camp Grayling lands are the responsibilities of the Department of Natural Resources in consultation with Camp Grayling Operations, Facility Engineering, and Environmental staff. Because the designated primary use of these lands is for military purposes, timber management practices proposed by the Department of Natural Resources can be denied if it proves incompatible with military needs.

3.4.8.5.2 Oil/Gas Exploration/Production

A large oil and gas field is located 4.5 miles southwest of the cantonment area on lands leased by the Camp from the Department of Natural Resources. This field was established in 1947 and has over 100 active oil wells operated primarily by Union Oil of California (UNOCAL). All oil/gas wells are permitted and regulated by the Department of Natural Resources.

A privately operated oil and gas pipeline runs through a large portion of the South Camp. The pipeline system right-of-way is off limits to all military vehicle traffic.

Limited seismic testing of the geology for the potential of oil/gas exploration has taken place on the Camp with the approval of the DNR and the Facility Engineer.

3.5 Physical Environment

3.5.1 ITAM - Integrated Training Area Management Program

ITAM was developed by the U.S. Army Construction Engineering Research Laboratory (USACERL) and implemented at Camp Grayling in April 1992. This program is designed to help determine the lands' ability to support training with the least impact on natural resources, including wildlife habitats. It consists of the following five components:

(1) Land Condition Trend Analysis (LCTA) is the Army's standard for inventory, monitoring, and evaluation of natural resources on Army lands. Using LCTA, land managers collect, store, retrieve, and analyze data such as topographic features, soil characteristics, vegetation, and wildlife information. The Camp has established and continues to inventory over 200 permanent plots located across the Camp's 147,000 acres. The Michigan Natural Features Inventory in conjunction with the Nature Conservancy is performing a comprehensive floristic survey and collection, threatened and endangered species inventory, and wetlands survey. Data from these surveys and inventories and other programs in place at Camp Grayling will help to fill in data gaps brought to notice as part of the on-going EIS process.

(2) Land Rehabilitation and Maintenance (LRAM) provides a means to repair, restore, and maintain land impacted by training activities through the use of erosion control practices and revegetation.

(3) Geographical Information System (GIS), a sophisticated computer system, enables the Camp staff to process all natural resources data collected from various surveys and inventories and produce high quality color maps and management documents.

(4) Environmental Awareness (EA) is an educational package aimed specifically at military personnel. It integrates the concepts of training mission with environmental stewardship. By making use of the video tapes, posters, handbooks, and field cards, the EA program serves to make the military personnel aware of the effects of training activities on the environment and instills positive attitudes toward using effective protective measures.

(5) Training Requirements Integration (TRI) serves to improve communication/ coordination between Army training and engineering communities. Coordination between the trainer, Directorate of Plans, Training and Mobilization (DPTM), and Department of Engineering and Housing (DEH) is necessary in order to properly schedule and allocate land according to the land's ability to support training with minimum environmental damage.

3.5.2 Climate

Climatological conditions found in the Grayling area are major considerations for the design and maintenance of the training support facilities at Camp Grayling. Temperature and precipitation directly affect the supply and subsistence needs of visiting units as well as impacts on the maintenance of their equipment. Wind and cloud cover are particularly important to aviation units and may affect noise propagation. Climatic characteristics such as snow depth and temperature define the time periods available for typical training. This subsection describes the existing climatic conditions at Camp Grayling. It also includes a summary of existing atmospheric stability information, a condition that has been shown to significantly affect noise emissions.

Camp Grayling is located approximately 75 miles south of the Straits of Mackinac and equidistant between Lake Michigan and Lake Huron in Michigan's lower peninsula. As a result of its interior mid-Michigan location, the climate of Camp Grayling is predominantly continental in character. The prevailing winds are westerly during the summer as the Bermuda high pressure center pushes into the southeastern United States. The day to day weather is a result of the movement of pressure systems across the country, therefore Camp Grayling and vicinity do not often experience long periods of hot, humid summer weather or of extreme winter cold. However, climatic effects of Lakes Michigan and Huron are still discernible in their influence on snowfall and cloud cover during the late fall and early winter months.

3.5.2.1 Temperature

The annual mean temperature at Grayling is 43.5 degrees Fahrenheit (F). Extreme temperature data for Grayling include the following: a warmest monthly mean temperature of 75.5 degrees F recorded July 1921, a coldest mean monthly temperature of 4.2 degrees F February 1984, a record high daily temperature of 106 degrees F recorded June 28, 1887 and a record low of -41 degrees F on February 11, 1899.

3.5.2.2 Precipitation

The total mean annual precipitation is 33.06 inches. February is the driest month with an average of 1.26 inches, while July is the wettest with 4.14 inches. Afternoon showers and thundershowers are the major sources of summer precipitation. The record high monthly precipitation total was 9.01 inches during August 1965. Most of this precipitation was contributed by a single storm system which produced 5.02 inches on August 9, 1965, the record 24-hour total.

The average annual snowfall at Grayling is 93.1 inches, almost 40 inches more than that at Houghton Lake which is only 25 miles south. This circumstance arises because Grayling is on the backside of the "Lake Snow Belt" -- an area centered in the western section of the lower peninsula's tableland region approximately 30 miles north of Grayling. For Grayling, the greatest seasonal snowfall was 129.0 inches in 1964-65; the least was 51.3 inches in 1967-68.

3.5.2.3 Sky Cover

Cloud cover is greatest in the late fall and the winter. This characteristic is related to the cold westerlies and northwesterlies moving across Lake Michigan and picking up warmth and moisture from the lake. When forced upwards by the land, cloudiness develops. Especially remarkable is the high degree of cloudiness in November, December and January. On the average, more than 20 days each month are characterized by sky cover equal to or exceeding 80 percent. The first-order weather station at Houghton Lake is the source of the wind data, these data are not readily available for the Grayling area.

3.5.2.4 Winds

The prevailing wind direction is from the west and the highest wind speeds are also associated with winds from this direction. Secondary wind directions are generally associated with winds in the northwest through the southwest quadrant. Northeasterly winds are observed relatively infrequently.

The annual mean wind speed is 9.0 miles per hour. Wind speeds of 40 miles per hour have been observed during January, June and November and though wind gusts of higher speed do occur, this last value gives an indication of the wind-speed extremes that may be expected.

3.5.2.5 Stability

Atmospheric stability determines the degree to which pollutants or other materials entrained in the atmosphere are dispersed. It also significantly affects noise transmissions. Generally, the unfavorable periods for dispersion and conditions that can exaggerate noise are associated with a stable atmosphere. These conditions usually develop during the nighttime hours and in many instances are associated with the formation of a nocturnal radiation inversion which in turn is often associated with clear skies and light winds.

Specific data relating to atmospheric stability at Camp Grayling are not available. These data are obtained only at weather stations at which radiosonde observations are made. However, broad-scale interpolation of data from these stations allow an estimate of the amount of time stable conditions do exist in the Grayling area. A climatological analysis by Doty et al. (1976) shows that stable conditions are to be expected about 20 percent of the time during the winter and spring and about 30 percent of the time during the summer and fall in the region of the Great Lakes. These results are in agreement with those of Hosler (1961) who concludes that inversions extending to 500 feet above the surface may be expected to occur about 20 to 30 percent of the time in any season for the same region.

Compared to the remainder of the continental United States, these frequencies of occurrence are low and are a direct result of the relatively frequent storm passages characteristic of this region, especially from late fall to early spring. These storms with

their associated cloudiness and high wind speeds inhibit the formation of nocturnal radiation inversions.

3.5.3 Air Quality

3.5.3.1 Standards and Monitoring

The Michigan Department of Natural Resources Air Quality Division (AQD) regulates air emissions in the state under the auspices of the U.S. Environmental Protection Agency (EPA). Michigan's Air Pollution Act, Act 348 of 1965, as amended, is the statue that regulates air emissions. The Federal Clean Air Act, as amended, requires EPA to establish National Ambient Air Quality Standards for maximum allowable ambient concentrations of pollutants. Standards were established for six "criteria" pollutants: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead. The National Ambient Air Quality Standards are listed in Table 3-9 below. Volatile organic compounds (VOCs) are also regulated through permitting of sources. The state has also begun a new toxics regulation program. Primary and secondary standards are established for each criteria pollutant. The primary standards are set at concentrations which are ascertained to be low enough to protect the health of the public. The secondary standard protects the public welfare, such as damage to crops and animals, and impairment of visibility. Physiological changes that are due to air pollutants and that interfere with normal activity in sensitive or healthy individuals are the most important phenomena to be studied for the establishment of primary standards. For the development of secondary standards, injury to livestock and agricultural crops, damage to property, annoyance, and transportation hazards are evaluated to help determine the concentration that protects public welfare.

Particulate matter is defined as any finely divided solid or liquid material other than uncombined water that is suspended in the air. Sulfur dioxide is released during the combustion of fossil fuels containing sulfur. Carbon monoxide is primarily produced through combustion in automobile engines. The stratospheric ozone layer occurs naturally. Ground level ozone is formed from a combination of man-made organic pollutants, nitrogen oxides, oxygen and sunlight. The primary man-made sources of nitrogen oxides are automobiles, electrical power plants and industry. The exhaust from motor vehicles accounts for 88 percent of all lead emissions. These emissions consist of coarse particulates which remain in the vicinity of the source and fine particulates which remain airborne and travel away from the source.

Camp Grayling is located in the Upper Michigan Interstate Air Quality Control Region No. 126. The AQD maintains an air quality monitoring network with sites around the state; however, there are no monitoring sites in Crawford, Otsego, or Kalkaska counties. These counties, wherein Camp Grayling lies, are in attainment status for the criteria pollutants and VOCs (Rich Alexander, Personal Communication, February 1994).

Table 3-9
National Ambient Air Quality Standards

Pollutant	Primary Standard	Secondary Standard	Wording of Standard
Particulate Matter (TSP) <10 microns	50 ug/m^3 150 ug/m^3	50 ug/m^3 150 ug/m^3	Annual geometric mean Maximum 24-hr concentration*
Sulfur Dioxide (SO_2)	80 ug/m^3 365 ug/m^3	- - 1300 ug/m^3	Annual arithmetic mean Maximum 24-hr concentration* Maximum 3-hr concentration*
Carbon Monoxide	9 ppm 35 ppm	9 ppm 35 ppm	Maximum 8-hr concentration* Maximum 1-hr concentration*
Ozone (O_3)	0.12 ppm	0.12 ppm	Maximum 1-hr average
Nitrogen Dioxide (NO_2)	100 ug/m^3	100 ug/m^3	Annual arithmetic mean
Lead (Pb)	1.5 ug/m^3	1.5 ug/m^3	Maximum calendar quarter average

* Not to be exceeded more than once a year per site.

Source: Michigan Department of Natural Resources, Air Quality Division. "1992 Air Quality Report," Lansing, Michigan, 1992.

3.5.3.2 Sources of Air Emissions at Camp Grayling

There is no central power plant for the Post. Fifty-nine furnaces and 201 hot water heaters are located in buildings throughout the cantonment area, airfield, and MATES. The vast majority of these are fueled by natural gas. One furnace located at the Armory is fueled by heating oil and a few by Lp (liquid propane) gas. All are under 10 million Btu's per hour maximum total heat input rate and are exempt from permitting regulations for particulates (Per Rule 282, Act 348 (Air Quality Control Act)).

Other minor sources of particulates are fugitive dust, tear gas, and smoke generation. These are temporary and intermittent emissions generated by troops during various training activities, and are also exempt from regulation unless they create a public nuisance (Rich Alexander, Personal Communication, February, 1994). Tracked and wheeled vehicles maneuvering in the training areas can create dust during dry periods. In most training areas there is enough of a distance buffer that clouds of dust do not affect the public. Where dust may be a local nuisance, it is controlled by suppressants such as water or a calcium chloride/water mixture, which is authorized for use by Michigan environmental regulations. Most tear gas training operations are conducted inside a tear gas chamber; however, limited bivouac areas are sometimes exposed to a tear gas fog of very low concentrations for a duration of a few minutes. Small smoke

generators are used to produce a fog for use as a screen in certain training operations. The fog is created by vaporizing a petroleum blend and dispersing the vapor under pressure. The location of smoke generation operations is controlled to prevent any smoke from affecting the public.

Asbestos fibers from asbestos removal projects are prevented from becoming airborne particulates under regulation in the National Emissions Standards for Hazardous Air Pollutants. Asbestos removal as part of remodeling/demolition projects on Post is contracted out to companies that must comply with the regulations. Asbestos-containing materials have been removed from 18 Camp Grayling buildings.

Sources of volatile organic compound emissions are: the bulk fuel facility at the airfield, fuel islands in the cantonment area and at the MATES, parts degreasers in the state maintenance garage and at the MATES, and a paint spray booth at the MATES. At the bulk fuel facility, three aboveground fuel storage tanks of greater than 40,000-gallon capacity store diesel fuel, JP-4 aviation fuel, and unleaded gasoline. The JP-4 and unleaded gasoline tanks are bottom loaded and equipped with vapor recovery systems (Rule 604, Act 348 (Air Quality Control Act)). The unloading stands are equipped with the proper vents.

Each fuel island consists of two 6,000-gallon underground storage tanks that are equipped with submerged fill pipes and the proper vents. None of these facilities require permitting under Act 348. The small parts degreasers (cold cleaners) are equipped with covers and waste solvent or recycled solvent is stored in closed containers (Rule 611, Act 348). The vehicle paint spray booth at the MATES is equipped with an exhaust filter for paint solids; VOCs are controlled by paint usage (AQD Permit to Install No. 657-87).

3.5.4 Noise

Noise, generated as a by-product of various military training activities, propagates beyond the boundaries of Camp Grayling. It can annoy people occupying or residing in areas adjacent to the Post. Thus, both civilian and military personnel have a continuing concern about such noise events. The Post has been in existence since 1913 and its noise events are not unique or unusual to the area residents. The concerns are those of minimizing noise while fulfilling the Post's military training mission and avoiding inadvertent increases in noise whether due to inappropriate procedures or to changes in type and number of ordnance used.

Noise is sound subjectively described as unwanted, objectionable or misplaced. An objective evaluation of potential noise impacts requires an understanding of sound theory and measuring techniques, a literature review and a predictive means of calculating sound pressure levels for specific sources. Sound itself varies in frequency, amplitude and duration.

Sound levels are typically measured in decibels (dB) using instruments that record sound pressure levels (SPLs) as compared to a reference pressure approximately equal to the

accepted threshold of hearing of young undamaged human ears. SPLs are defined by the equation:

$$SPL = 10 \text{ LOG } \frac{p}{Po}^{2} \text{ dB}$$

Where P = Sound pressure, pascals
Po = Reference sound pressure (0.00002 pascals)
dB = Decibel

This equation highlights the fact that SPLs do not respond linearly to pressure; they are measured logarithmically using decibels. Thus, average SPLs/dBs cannot be arithmetically added without using the logarithmic expressions. As earlier stated, sound sources generally emit multiple frequencies or ranges of frequencies.

Since the human ear is more sensitive to sound of 1,000 Hertz (cycles per second) and above, than to sounds of 125 Hertz and below, it is appropriate to apply a weighting function to the noise spectrum which will approximate the response of the human ear. The A-weighting frequency response of the sound level meter more closely resembles the frequency response of human hearing, and therefore provides a good indication of the impact of continuous noise such as that produced by transportation activities. To assess the additional annoyance caused by low-frequency vibration of structures commonly associated with the impulsive noise from all weapons larger than small arms, the C-weighting frequency response of the sound level meter is normally used.

A-weighted measurements are expressed in dBA and C-weighted in dBC. The linear scale used to measure peak SPLs applies no frequency weighting to the SPL. Impulsive, or blast noise, is commonly measured with C-weighting on the linear scale.

Field observations validate several assumptions made in predicting noise occurrences. First, as one is further removed from a noise source, the amplitude (loudness) of observations is reduced. When graphically displayed on semi-logarithmic chart paper, the amplitude reduction yields a straight line. Thus, the average peak SPLs can be mathematically and graphically predicted. Also, weather conditions play an important role in the contortion of sound energy. Wind direction, in particular, tends to skew the SPL downwind of the blast. Temperature inversions and atmospheric conditions work together to provide focusing phenomena. These conditions can cause a blast to be inaudible at one time and a similar blast to cause persons to be highly annoyed at another time.

An important concept in dealing with a noise environment is the idea of exposure to noise or the possible dosage of noise to which one may be exposed. Exposure includes the concepts of the magnitude of the sound and the duration of the exposure to that sound. Of course, all real noise environments have fluctuating sound levels and the amount of time spent at different levels varies.

To account for these variations in the SPL with time, and to assess environmental noise in a consistent and practical manner, a statistical approach has been used to express the time-varying SPL in single numbers. The accepted single number evaluation is the day-night noise level (DNL).

When considering the cumulative noise exposure which occurs over the course of a 24-hour period, it is important to take cognizance of the fact that people generally are more annoyed from noise at night than during the day. A measure has been devised called the day-night level (DNL). Generally, its value is calculated by energy averaging the 24 one-hour values but weighting the night-time noise more heavily. The nine hourly values occurring between 10:00 p.m. in the evening and 7:00 a.m. the next morning are each increased by 10 dB before energy averaging them with the 15 "daytime" hourly values to create the day-night level or DNL.

Conventionally, these measurements are A-weighted and hence the DNL (often denoted ADNL) is A-weighted. If the noise exposure for several days, a week, a month or a year needs to be expressed, then the 24-hour DNL energy values are averaged over the appropriate longer period of time.

Military training also involves blast noise or high-energy impulsive noise. The DNL procedure is used with the C-weighted instead of the A-weighted Day-Night Sound Level (CDNL). This method has been adopted by the Federal government after recommendation by the American National Standards Institute (ANSI, S12.4-1986). The Committee on Hearing and Bio-Acoustics (CHABA, a National Research Council committee), 1977 and 1981, discusses the rationale for using such C-weighted quantities to assess impulsive types of sound.

3.5.4.1 Standards and Guidelines

Neither the State of Michigan, Crawford, Kalkaska, and Otsego counties, or the City of Grayling have adopted specific noise regulations. Many Federal agencies, including the Department of Defense, the Environmental Protection Agency, and the Department of Housing and Urban Development (HUD), recognize the DNL of 55 dB as a goal for noise outdoors in residential areas for protecting the public health and welfare with an adequate margin of safety. However, it is not a regulatory goal. It is a level defined by scientific consensus without concern for economic and technological feasibility or the needs and desires of any particular community.

Because the ADNL differs from the equivalent CDNL with respect to human sensitivities, a comparison is provided in Table 3-10. As expected, as the DNL increases, so does the number of highly annoyed individuals. The criteria used by the U.S. Army Environmental Hygiene Agency (AEHA) to define predicted noise zones are based on these correlations.

These Federally-accepted land use criteria are normally based on annual average. However, at facilities, such as Camp Grayling, where the noise is not continuous for the entire year, the average is based on the training cycle. Guidelines established by the

Naval Surface Weapons Laboratory (see Table 3-11) is used to evaluate the potential annoyance and damage claims in a populated area (Pater, September 1976).

The current version of AR 200-1 (paragraph 7-2c) allows installations that do not operate at the same level of activity during the entire year to base their contours on the busy period, such as the annual training cycle.

Table 3-10
Noise Zone dB Limits

		Annual Average Day-Night Level Limits	
Noise Zone	Population Annoyance	Impulsive Noise (CDNL)	All Other Noise (ADNL)
I	<15%	<62 dBC	<65 dBA
II	15-39%	62-70 dBC	65-75 dBA
III	>39%	>70 dBC	>75 dBA

Source: AR 200-1, 1990.

Table 3-11
Potential for Noise Complaints

Linear Peak Level (dB)		
Single Events	Rapid Fire	Potential for Complaints and Damage Claims
100-115	90-105	Low risk of noise complaints.
115-130	105-120	Moderate risk of noise complaints.
130-140	120-140	High risk of noise complaints. Possibility of damage claims.
>140	>140	Threshold of permanent physiological damage to unprotected ears. High risk of physiological and structural damage claims. Possible cracks in poorly mounted window panes.

Source: Pater, September 1976.

3.5.4.2 Camp Grayling Noise Environment

The noise environment in and around Camp Grayling includes the effects of various typical human activities, such as automobile traffic and railroad traffic. The military activities at the Post contribute to the overall noise environment.

Concerns related to noise from the military's activities at Camp Grayling have prompted studies of the Post's noise levels during recent years. Simulations, field measurements and formal follow-up studies were performed by the Army Environmental Hygiene Agency (AEHA) from 1982 to 1994. Noise measurements by the U.S. Army Construction Engineering Research Laboratories (USACERL) were taken in 1985. The Michigan Department of Military Affairs (DMA) has been conducting studies in an ongoing fashion since that time. These efforts are part of the Army's Installation Compatible Use Zone (ICUZ) program developed to safeguard the operational capability of Army installations from encroachment by off-post, noise-sensitive land uses such as housing. ICUZ requires noise contours to be developed around military installations to assist in effective land-use planning and to prevent community encroachment on high-noise training areas. By identifying heavily noise-impacted areas, the public, local governments, and the installation can work together to minimize noise-sensitive development. To fulfill the intent of legislation including the Noise Control Act of 1972, the Quiet Communities Act of 1978, Department of Defense Instruction 5100.50 and CG Reg. 200-1, the ICUZ process has been adopted.

As a continuing effort, USACERL has focused on assisting in characterizing and attempting to mitigate current noise concerns. To this end Camp Grayling has installed the large scale FIRE system, developed by USACERL, that integrates blast noise monitor data, weather data, range scheduling and firing data, and air traffic data. The major purpose of the FIRE system is to merge together a network of computers, noise monitors, weather stations, and traffic towers in order to predict and mitigate noise levels. A total of eight noise monitor stations operating 24 hours per day have been installed on or near the Camp. These field monitoring sites were chosen with respect to complaints received by the Camp about blast noise, predicted noise levels, and the ability of the sites to accurately monitor blast noise emissions. The eight stations are located at: Guthrie Lake area; Range 40 Observation Point #5 (directional source monitor); Lovells; Hardgrove Lake (Hunter House); KP Lake; Camp Grayling Conservation Club (Clubhouse); Headquarters Road south at Au Sable River (Department of Natural Resources site); and North Down River Road near Stephans Bridge Road. The system also includes two weather stations located at Hardgrove Lake (Hunter House) and Range 37-Building 1420. These weather stations collect wind speed, wind direction, temperature, and humidity data 24 hours per day from two different sensor heights.

Noise contours for existing conditions are predicted using the Army's computer simulation programs. The BNOISE program predicts impulse noise (C-weighted) contours for high-energy noise like explosions. This computer program considers weapon type, propellant charge, directivity of the muzzle blast, target/impact site, the day-night mix of firing and weather-related excess attenuation factors. The NOISEMAP program uses

standard acoustical practices to predict non-impulse A-weighted noise from aircraft operations.

Three noise zones are designated: Zone I, Zone II, and Zone III. They are associated with increasing noise and are based on DNLs adopted for planning purposes by the U.S. Department of Housing and Urban Development, Veterans Administration, Department of Defense, and Department of Transportation/Federal Aviation Administration. The predicted contours represent the noise environment considering individual artillery, aviation, and demolition training events. Zone I indicates acceptable areas where the noise environment is compatible with noise-sensitive uses (according to Federal criteria), including residential use. Zone II is a transitional area that is classified as normally unacceptable for noise-sensitive uses including residential use. However, under some circumstances (e.g., where certain building constructions provide enhanced isolation from environmental noise) Zone II areas may be acceptable for residential use. Zone III indicates clearly unacceptable areas for noise-sensitive land uses.

Table 3-10 shows the noise limits for the three different zones. The table also differentiates between impulse noise (measured in dBC) and other noise (measured in dBA). The noise limits listed in the table were established from the results of social surveys conducted by many government and private organizations.

3.5.4.2.1 Range 40 Complex

(1) Artillery: Prior to 1993, the C-weighted contours at Camp Grayling resulted primarily from 8-inch artillery and Air-to-Ground training (Range 40), although activities at the mortar range (Range 13) and tank range (Range 30) may have notable effects on a more localized area. The use of the 8-inch howitzer is being phased out, however. In June of 1993, the DMA was notified of a decision to inactivate the two U.S. Army Reserve units that typically fire these weapons at Camp Grayling. These units fired approximately 55 percent of all 8-inch howitzer rounds at the Post. The 1-182 Field Artillery (FA) has historically fired approximately 40 percent of the 8-inch rounds. Table 3-12 displays the artillery and mortar rounds (as well as other ordnance) expended during the last five years.

The inactivation and the recent conversion of the 1-182 FA to use of the Multiple Launch Rocket System (MLRS) has resulted in the removal of all but two 8-inch howitzers at Camp Grayling. As a result, the 8-inch high explosive munitions expended declined from 2,632 rounds in 1990 to 114 in 1993. This reduced use will continue as fewer units field the weapon. Firing of the MLRS has been postponed until further data is gathered to determine if it will have a significant effect on the environment. However, should it be fired, the firing of only 108 rockets has been authorized and neither a Zone II or III will extend off-post.

Other Army munitions (primarily hand-held missile simulators) are also fired at the Range 40 complex; however, these munitions have a relatively insignificant role in the determination of the Range 40 noise contours.

Table 3-12
Artillery and Heavy Munitions Expended at Range Complexes

Weapon / Year	1989	1990	1991	1992	1993
105mm Howitzer HE	2,592	2,292	2,949	1,527	1,994
105mm Howitzer, other	666	405	431	297	741
155mm Howitzer HE	1,598	1,004	4,498	370	808
155mm Howitzer, other	519	450	392	74	246
500 lb Bomb HE	173	212	131	0	120
2.75" Air-to-Ground Rockets (helicopter only) HE	0	0	0	136	214
2.75" Air-to-Ground Rockets (helicopter only), other	1,050	4,610	1,685	2,003	0
LAW Missile HE	66	71	59	41	0
LAW Missile, other	1,339	1,276	1,004	5,775	3,859
60mm Mortar HE	1,200	1,245	806	299	1,195
60mm Mortar, other	304	463	122	39	384
165mm Main Gun - Combat Engineering Vehicle HE	0	4	4	0	0
165mm Main Gun - Combat Engineering Vehicle, other	0	13	82	50	0
8-inch Howitzer HE	2,139	2,632	668	734	114
8-inch Howitzer, other	0	0	0	0	0
81mm Mortar HE	2,649	4,467	3,975	1,801	3,822
81mm Mortar, other	1,089	987	1,192	263	1,213
4.2-inch Mortar HE	3,240	3,306	4,386	146	3,174
4.2-inch Mortar, other	1,027	1,576	333	10	636

*HE = High Explosive, explodes upon impact
**Other = Projectile does not explode upon impact. May include a smoke or illumination charge which creates negligible noise.

Sources: Camp Grayling Ammunition Supply Point, 1993, and Camp Grayling Air-to-Ground Tower, 1992 & 1993.

A portion of the impulsive noise measurements related to Range 40 operation and reported by AEHA (November 26, 1984), were taken in the form of peak sound pressure level readings. The existence of peak-reading data permitted the statistical distribution of the peak values to be examined.

The majority, 73 percent, of these impulsive noise events created peak sound pressure levels in the range of 105 to 120 dB peak; 10 percent in the 120-140 dB peak range; none were observed to be greater than 140 dB peak at the Guthrie Lake sites. The peak data begin to allow examination of the noise environment along different lines of consideration than the CDNL approach. For example, the guidelines for rapid fire conditions by the Naval Surface Weapons Laboratory, Dahlgren, Virginia (Pater, 1976) can be used to evaluate potential noise impacts (see Table 3-11). These guidelines address the issue of structural damage to buildings in addition to physiological and psychological considerations.

The 8-inch shell is the largest used at Camp Grayling and would produce the loudest impulsive noise. It contains 37 lbs of explosive compared to 15 lbs in the next largest (155mm) shell (USACERL, 1985) and the peak sound pressure level caused by a 155mm shell will normally be less by approximately 3 dB under comparable conditions. In this report, the type of shell, the impact coordinates, the firing point coordinates, and the noise measurement sites were clearly given but meteorological data were omitted. However, as of 1994, few 8-inch howitzer rounds (approximately 200 rounds annually) are now fired.

(2) Air-to-Ground Range Activity: In addition, noise impacts are generated by the use of 500 lb high explosive bombs on the air-to-ground range. Approximately 100-200 of these bombs are dropped annually. Other noise producing ordnance used are 2.75-inch helicopter air-to-ground high explosive rockets and 20/30mm cannon. In 1993, a typical year, 214 of these rockets were fired and approximately 20,000 rounds of 20/30mm cannon fired. Other ordnance expended include inert 2.75-inch rockets, concrete-filled iron bombs ranging, from 500 lb to 2000 lb and flares. These weapons have no significant noise impacts.

3.5.4.2.2 Range 30 Complex

A second locale for noise study is the Range 30 tank range complex. Historic tank range data indicate that range usage is highly variable from year to year. Based on ammunition shipment records (Camp Grayling Ammunition Supply Point, 1993) annual range usage varied from 13 to 2,066 rounds and averaged approximately 840 rounds per year over the last five years. An average of four to five rounds are fired per hour. Only inert practice rounds are fired here.

3.5.4.2.3 Grayling Army Airfield Area

A third locale selected for noise studies was the Grayling Army Airfield located northwest and adjacent to the town of Grayling, Michigan.

Airfield noise complaints are commonly related to helicopter activity (especially at night) near the City of Grayling during periods of heavy aviation training. The favored approach and departure flight tracks used to bring aircraft in and out of the Grayling Army Airfield were over heavily populated areas of the City at lower elevations (Wells, 4 March 1987). These flight tracks for helicopters were realigned in the summer of 1987 to avoid the populated areas.

3.5.4.2.4 Range 13 Complex

A fourth area of noise study is the mortar range (Range 13) in the South Camp area approximately two miles southwest of the cantonment area. Based on historic data, the range has been active from 40 to 120 hours per year with a median of approximately 90 hours. The firing varies significantly from less than 2,100 to more than 5,700 high explosive rounds per year over the last five years (Camp Grayling Ammunition Supply Point, 1993). Approximately 80 to 100 rounds are fired per hour. Noise complaints are rarely associated with mortar range use.

3.5.4.2.5 Tank Trail Area

A fifth area of noise consideration is related to tank trail noise caused by the concentrated movement of tracked vehicles. As a result of the new MATES facility relocation into the tank range complex in October 1987, tank movement on this trail has been reduced by approximately 95 percent.

3.5.5 Landforms

The predominant geomorphic features of the Post are the result of the latest episode of continental glaciation. Thus, glacial till and outwash are the major parent materials for the soils of the Post. This discussion describes the Post's landforms and how soils are related to these features.

3.5.5.1 Geology

The Post is underlain by rock of Middle to Late Mississippian Age of the Coldwater and Michigan Formations. These interbedded layers of shale, sandstone, and limestone ranging in total thickness from 500 to 600 feet were formed 325-350 million years ago from the deposition of marine sediments from ancient seas. As these sedimentary layers were deposited, the earths crust subsided beneath Michigan forming what is today called the Michigan Basin. Since the area is covered by over 300 to 1000 feet of glacial till and outwash, no bedrock is visible.

The land around the Post has been shaped by glacial events. The glaciers created two separate moraines on-post. A southern moraine several hundred feet thick was deposited south of Lake Margrethe. A northern moraine of similar thickness was deposited north of Lake Margrethe. Figure 3-21 illustrates these features.

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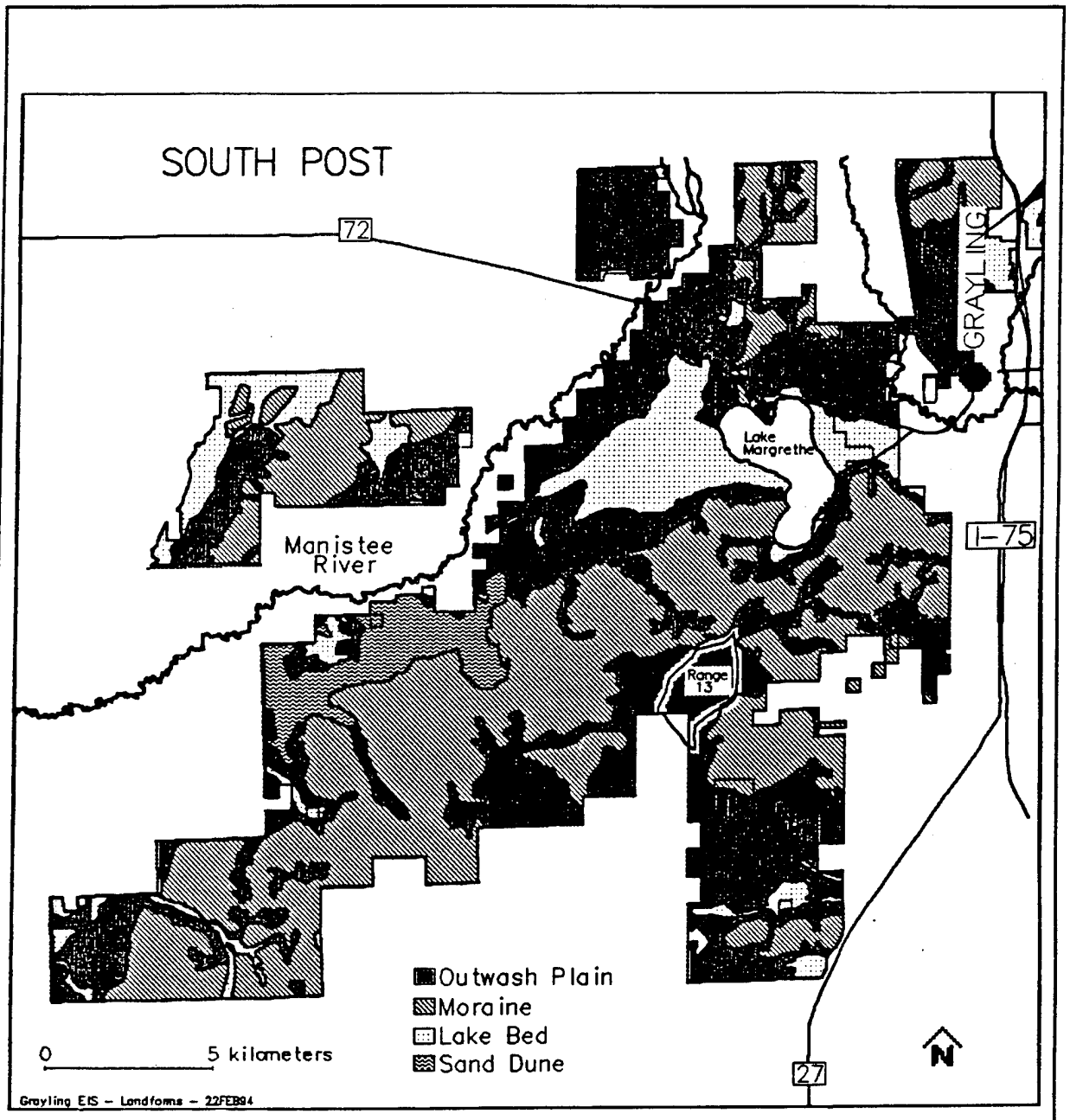

Camp Grayling FEIS	Figure 3-21A
Glacial Features	

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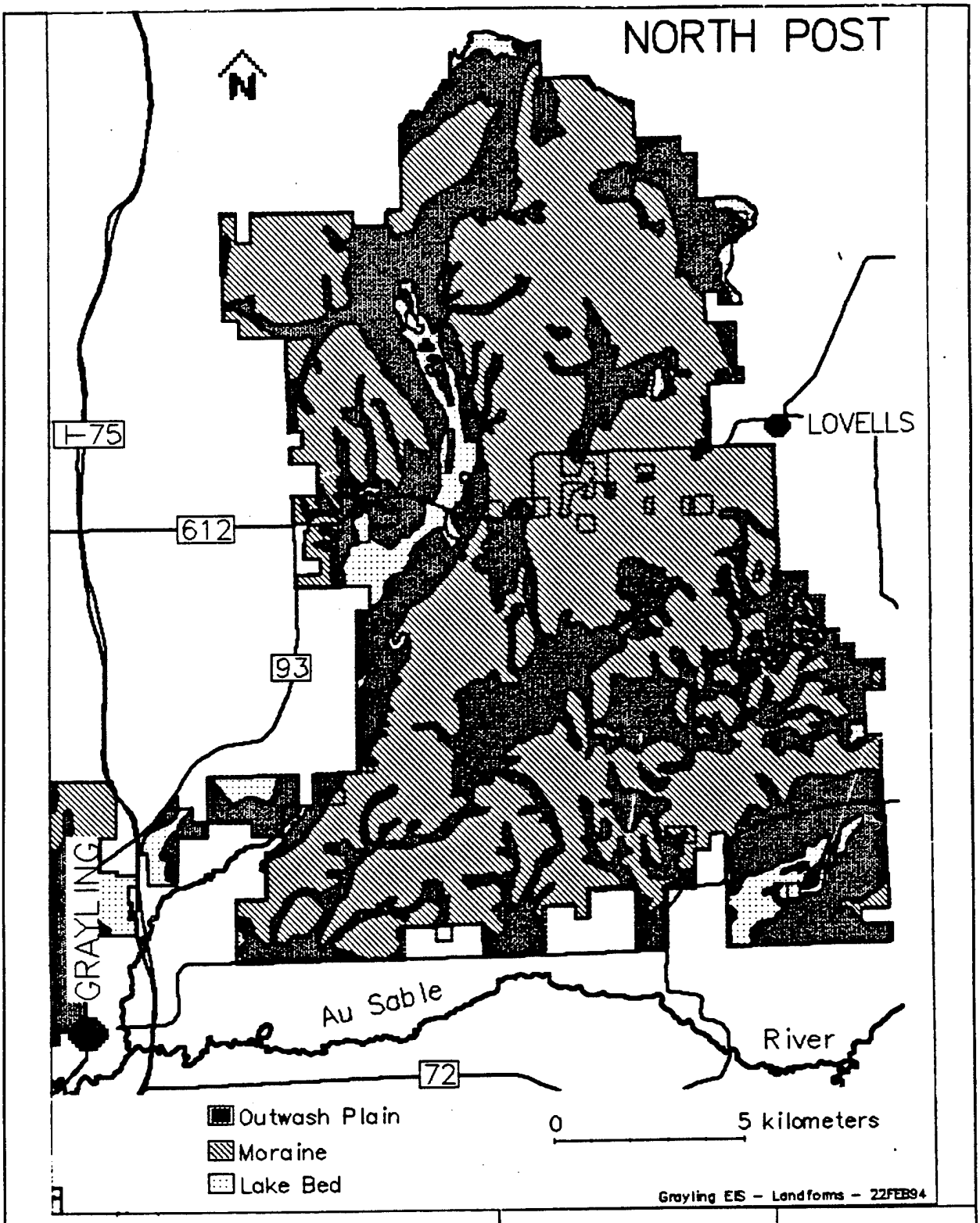

Camp Grayling FEIS	Figure 3-21B
Glacial Features	

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3.5.5.2 Minerals

The economic geology resources of Camp Grayling include those geological materials that are of practical utility or economic value. Although the term "economic geology" generally applies only to the application of geology to mineral materials, this discussion will address natural gas, oil, coal, geothermal energy, peat, metallic ores, and construction materials such as stone, sand, and gravel.

(1) Natural Gas, Oil, Coal, and Geothermal Energy

There are no known coal or geothermal energy resources within the Post's boundaries but there is a large oil and gas field 4.5 miles southwest of the cantonment area on lands leased by the Post. This field, called the Beaver Creek Oil Field was established in 1947 and has over 100 active oil wells operated primarily by Union Oil of California (UNOCAL). During 1992, per day production was 1,046 barrels of oil, 1,003,000 cubic feet of natural gas, and 3,896 barrels of brine from the Richfield Zone of the Lucas Formation (Rick Henderson, Personal Communication, 19 January 1994). Most of the gas produced is used to operate equipment in the field but a small amount of this gas is combined with production from two "deep" gas wells in the area and sent to market via pipeline. These two "deep" natural gas wells producing a total of 2 million cubic feet per day from the Prairie Du Chien Formation also are located in or near the Beaver Creek Field.

One gas condensate well producing from the Niagaran Formation at a depth of approximately 5,700 feet is located just off-post in southern Otsego county at the northeast end of the Range 40 complex. This well was completed for production in December 1989 (Andrea Sullivan, Personal Communication, 18 January 1994). The five county area located just north of the Range 40 complex, including Otsego county, has experienced a great deal of exploration and production of natural gas in the Antrim Formation, a shallow shale unit producing at depths from 1,800 to 1,900 feet. Referred to as the Antrim Shale Gas development, exploration and production began in earnest in 1987 and continues to this date, with more than 3,593 wells drilled between 1982-1992. No producing Antrim wells are located within the Post boundaries and a more complete discussion of the effects of the development on the environment may be found in the DNR "Antrim Shale Gas Development", an Environmental Impact Statement, dated June 1993.

(2) Peat

Peat is an early product in the development of coal. It consists of dead and decaying plant material, particularly sphagnum mosses, that has accumulated in poorly drained areas like bogs. Not all peat can be used as a fuel source because of the organic content. Crawford county has from 25,000 to 50,000 acres of peat (Gere, 1978) but only peat from the Loxley series can be mined profitably (Walden, 1986). There appears to be approximately 500 acres of scattered Loxley series peat deposits on Post. Since

these are only small scattered deposits, they can not be mined profitably and no mining is currently taking place.

(3) Metal Ores

There is no metallic minerals extraction in the Camp Grayling area. The land is covered by over 300 feet of glacial till and the bedrock consists of shale, sandstone, and limestone deposits from the Mississippian Formations. These formations are not associated with metallic ores.

(4) Construction Materials: Stone, Sand, and Gravel

The extensive glacial drift deposits at Camp Grayling provide some of the sand and gravel required by the Post for construction and maintenance of roads and parking lots. The Post extracts sand for use on snow-covered roads from a borrow pit located near Building 7 in the cantonment area and gravel from an area located south of the Ammunition Supply Point (ASP) complex. The amount of sand and gravel produced or purchased varies yearly depending on the amount and type of construction/maintenance at the Post. The average production for the year is from 500 to 1,000 cubic yards of sand and 4,000 to 6,000 cubic yards of gravel, but some years no sand and/or gravel is extracted. An average of 6,000 cubic yards of processed gravel and 6,000 cubic yards of topsoil is purchased each year for road maintenance and restoration projects (MAJ Lawson, Personal Communication, 24 January 1994).

3.5.5.3 Soils

The soils at Camp Grayling are largely a result of soil-forming factors operating on glaciofluvial parent materials. The soils are predominantly sandy soils that are somewhat excessively to excessively drained. The rest of the soils present on the Post range from very poorly drained to well drained soils. These can be found on the outwashes as well as the wetland and low areas. Soil can be described by a drainage class. These different classes are defined by the United States Soil Conservation Service. The following are a description of the drainage classes found at Camp Grayling:

Excessively drained:
Water is removed from the soil very rapidly. Soils are commonly very coarse textured, rocky or shallow.

Somewhat excessively drained:
Water is removed from the soil rapidly. Many soils are sandy and rapidly pervious.

Well drained:
Water is removed from the soil readily, but not rapidly. Soils are commonly medium textured.

Moderately well drained:

Water is removed from the soil somewhat slowly during some periods. These soils commonly have a slowly pervious layer or periodically receive high rainfall, or both.

Somewhat poorly drained:

Water is removed so slowly that the soil is saturated periodically or remains wet for long periods. The soils have a slowly pervious layer, a high water table, additional water from seepage or a combination of these.

Poorly drained:

Water is removed so slowly that the soil is saturated periodically. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, or a combination of these.

Very poorly drained:

Water is removed from the soil so slowly that free water remains at or on the surface. Soils are commonly level or depressed and are frequently ponded.

The 1989 Soil Survey of Camp Grayling conducted by the United States Soil Conservation Service was used to complete this section.

3.5.5.3.1 Soil Types

There are three primary soil series and four soil groups within the Post. The three distinct soil series which comprise approximately 70 percent of the Post are the Graycalm, Grayling, and Rubicon soil series.

(a) Graycalm Series: The most common soil is the Graycalm soil series. The soil comprises about 14 percent of the soil on the Post and approximately 28 percent considering its inclusion in soil complexes. Graycalm soils are excessively drained and have rapid permeability. Water erosion potential is low except on slopes greater than 18 percent and the soil is extremely erodible by wind in wide open exposed sites.

(b) Grayling Series: The second most common soil is the Grayling soil series. This soil covers approximately 23 percent of the Post and an additional 15 percent in soil complexes. Grayling soils consist of excessively drained sandy soils found on outwash plains and outwash terraces. The Grayling soils have rapid permeability, are an erosion hazard on slopes greater than 18 percent, and are highly susceptible to wind erosion in large open exposed areas.

(c) Rubicon Series: The third distinct soil series, compromising 4.8 percent of the Post and another 4.9 percent in complexes with other soil series is the Rubicon series. It consists of excessively drained soils found on outwash plains and terraces. These soils are extremely susceptible to wind erosion when exposed and are subject to water erosion on slopes greater than 18 percent.

The four soil groups, containing 18 soil series (not including Graycalm, Grayling, and Rubicon), comprise the other 30 percent of the soils on the Post. These soils are grouped together based on their drainage characteristics and organic content.

Group 1 - Au Sable, Bowstring, Dawson, Kinross, Leafriver, Loxley, Lupton, Tawas series

Group 2 - East Lake, Graycalm, Grayling, Kalkaska, Rubicon series

Group 3 - Au Gres, Brevort, Iosco series

Group 4 - Blue Lake, Croswell, Klacking, Menominee, Montcalm series

Since each soil group has its own classification each individual soil type will be discussed.

(1) Group 1

Group 1 contains the soils that are very poorly drained to poorly drained organic soils (more than 40 percent organic matter). These soils are the Au Sable, Bowstring, Dawson, Kinross, Leafriver, Loxley, Lupton, and Tawas soil series.

(a) Au Sable Series: This soil type is found on the narrow flood plains in outwash plains. It was formed in a thin mantle of organic matter and sandy alluvium. The range of slope for this soil is 0-2 percent. Au Sable soils are not noted to be a water erosion hazard, but are very highly erodible by wind. This soil type also has an erosion factor (T-value) of 5 tons per acre per year. This is the estimated maximum average annual rate of erosion by wind or water that can occur without affecting vegetation production. This soil comprises less than 0.8 percent of the Post.

(b) Bowstring: This soil type is found on the narrow flood plains in outwash plains. It was formed in a thick organic matter with thin layers of sandy material stratified within. The range of slope is 0-1 percent. This soil was not acknowledged as a water or wind erosion hazard. The soil T-value was found to be 4. Bowstring soil is found on less than 0.8 percent of the Post.

(c) Dawson: This is found on the outwash plains and lake plains. Dawson soil is formed in thick organic matter over sand. Slopes range from 0 to 2 percent. The soil does not appear to be water erosion hazard and is classified as very slightly erodible by wind. The T-value for Dawson is 4. Dawson is found on less than 0.5 percent of the Post.

(d) Kinross: Kinross soil is found on outwash plains and lake plains. This soil is formed in sandy material and found on slopes ranging from 0-2 percent. The soil was not classified as a water erosion hazard but was labelled as very highly erodible by wind. The T-value for this soil is 5. This soil covers approximately 1.2 percent of the Post and 1.7 percent more when combined with other complexes.

(e) Leafriver: This soil type is found on outwash plains and lake plains. It is formed in thin organic matter over sand. This soil is found on slopes of 0-1 percent. There is no indication of a water erosion hazard and it is very highly erodible by wind. The T-value for Leafriver is 2 and it is found on 1.2 percent of the base with an additional 1.5 percent when combined with other complexes.

(f) Loxley: The location of this soil is on the outwash plains and lake plains. Loxley is formed in thick organic matter. The general range of slopes are 0-1 percent. This soil is not categorized as a water erosion hazard and has a classification of very slightly erodible by wind. The erosion T-value is 5 and this soil covers less than 0.5 percent of the Post.

(g) Lupton: This soil is found on outwash plains and lake plains. The formation of Lupton occurs in thick organic matter. Slopes range from 0 to 2 percent. The soil is not considered a water erosion hazard but is very highly erodible by wind. This soil type covers less than 2 percent of the Post.

(h) Tawas: Tawas is found on outwash plains and lake plains. This soil is formed in organic matter over sandy deposits. This soil occurs on slopes of 0 to 2 percent. The soil was not labelled as a water erosion hazard but was found to be very highly erodible by wind. Tawas is located on less than 2 percent of the Post and on an additional 1.5 percent when combined with other soil complexes.

(2) Group 2

Group 2 contains soils that are somewhat excessively drained to excessively drained non-organic soils (containing less than 10 percent organic matter). These soils are East Lake, Graycalm, Grayling, Kalkaska, and Rubicon series. Graycalm, Grayling and Rubicon were already previously discussed and will not be further examined.

(a) East Lake: This soil type is found in outwash plains and is formed in sand and gravel material. Slopes range from 0 to 6 percent. East Lake is not classified as being a water erosion hazard and was also found to be not susceptible to wind erosion. The T-value for this soil series is 4, and this soil covers approximately 0.3 percent of the Post.

(b) Kalkaska: This soil is found on outwash plains and outwash terraces. It is found to occur on slopes of 0-45 percent. Kalkaska becomes a water erosion hazard at slopes greater than 18 percent and is also extremely erodible by wind forces. The T-value is 5 and this soil series is found on 2.7 percent of the Post.

(3) Group 3

Group 3 contains the soils that are somewhat poorly to poorly drained non-organic soils (less than 10 percent organic matter). These soils are Au Gres, Brevort, and Iosco.

(a) Au Gres: This non-organic soil is found in outwash plains. The slope range is 0-3 percent. This soil is not classified as a water erosion hazard but is extremely erodible by wind. The T-value is 5, and this covers 0.9 percent of the Post with an additional 2.7 percent when combined with other complexes.

(b) Brevort: This soil series is found in the outwash plains and lake plains on the Post. It is found on slopes of 0-2 percent. This soil is not labelled as a water erosion hazard but is very highly erodible by wind. The T-value was found to be 5 and this soil covers 0.1 percent of the Post in the form of a complex with Iosco.

(c) Iosco: This soil is located on the outwash plains and lake plains. It ranges in slope from 0 to 3 percent. This soil is not a water erosion hazard but it is extremely erodible by wind forces. The T-value was found to be 5 and this soil covers 0.1 percent of the Post in the form of a complex with Brevort.

(4) Group 4

Group 4 contains the non-organic (less than 10 percent organic matter) soils that are moderately to well drained. The soils that are in this group are: Blue Lake, Croswell, Klacking, Menominee, and Montcalm.

(a) Blue Lake: This soil type is found on remnant moraines, outwash plains and outwash terraces. The range of slopes is 0-18 percent. Blue Lake soil is not considered a water erosion hazard, but it is classified as extremely erodible by wind forces. The T-value is 5, and the area of the Post that this soil is found on is 1 percent.

(b) Croswell: This soil is located on outwash plains. Slopes range from 0 to 3 percent. This soil series is not considered a water hazard but in relation to wind erosion, it is labeled as extremely erodible. The T-value for Croswell is 5 and it is found on 4.9 percent of the Post with an additional 1.5 percent when it is combined with other complexes.

(c) Klacking: This soil is found on outwash plains, outwash terraces, and kames. The soil is found on slopes of 0-45 percent. Klacking is not labelled a water erosion hazard, but it was found to be very highly erodible by wind. This soil series has a T-value of 5 and is found on 2.6 percent of the Post with another 7.5 percent when it is combined with other soil series.

(d) Menominee: This soil series is located on outwash plains and lake plains. It occurs on slopes of 0 to 6 percent. This soil is not considered a water erosion hazard, but it was categorized as extremely erodible by wind. The T-value for this soil series is 5, and this soil type can be found on 0.2 percent of the Post.

(e) Montcalm: This soil type is found on remnant moraines, outwash plains and outwash terraces. The slopes are 0-6 percent. Montcalm is not a water erosion hazard and is classified as very highly erodible by wind forces. The T-value found for this series was 5

and this soil is found on 1.2 percent of the Post. For detailed soil maps see the Camp Grayling Soil Survey.

3.5.5.3.2 Soil Erosion

A complete list of the soils found at Camp Grayling is shown in Table 3-13. This displays the corresponding water and wind erodability classification. Soils with a "high" water erosion potential or a wind erodability index of "2" or less are very susceptible to erosion once they are disturbed. For the most part, the soils at Camp Grayling have a high wind erosion potential and a low water erosion potential.

Wind erosion is dependent on characteristics of climate, soil and vegetation. The wind velocity, direction, duration and turbulence are important determinants of erosion. As wind velocity and duration of turbulence increases, the quantity of soil loss increases. The wind erosion potential is particularly dependent on the length of unprotected area relative to wind direction and on the amount of protective vegetation on the surface.

Soils are assigned to wind erodability groups (WEG) of 1 to 8 based on the texture of the surface layer. A WEG value of 1 refers to soils consisting of very fine, fine and medium sand which erode easily. A WEG value of 8 refers to soils consisting of very wet or stony soils which are not subject to erosion.

The water erosion potential is dependent on the percent and length of slope, the rainfall intensity, the vegetative cover and specific soil characteristics like texture. Water erosion increases as slope and rainfall increase and as the vegetative cover and soil particle size decrease.

The primary regulatory basis for controlling soil erosion and sedimentation is Michigan Act 347. This Act, known as the Soil Erosion and Sedimentation Control Act, was passed in 1972. The Act requires a permit for any "earth change activity" involving more than one acre or within 500 feet of a lake or stream. The application for the permit requires information on type, size and location of the proposed earth change, distance from water bodies, date of completion and a soil erosion control plan. Camp Grayling has been designated as an Authorized Public Agency for Act 347 by the Michigan Natural Resources Commission. This gives the Camp the authority to self-regulate all earth change activities, following approved soil erosion and sedimentation control practices. According to established Department of Military Affairs procedures, applications for earth changes proposed by training units are submitted to and a permit issued by the Facilities Engineer.

3.5.6 Water Resources

This section describes the natural resources of surface water and groundwater. Surface water includes lakes, streams, rivers, and wetlands. The groundwater section describes the local subsurface geological formations resulting in aquifers, aquifer characteristics,

and use for drinking water. Impacts on specific areas of surface water or groundwater is discussed in Section 3.9.

Table 3-13
Water and Wind Erosion Potential for the Soils of Camp Grayling

Soil series, slope	Water Erosion Potential	SCS Wind Erodability Index Group
Graycalm sand, 0 to 18 percent slope	slight	1
Graycalm sand, 18 to 45 percent slope	moderate	1
Grayling sand, 0 to 18 percent slope	slight	1
Grayling sand, 18 to 45 percent slope	moderate	
Rubicon sand, 0 to 18 percent slope	slight	1
Rubicon sand, 18 to 45 percent slope	moderate	1
Group 1		
Au Sable muck, 0 to 2 percent slope	slight	2
Bowstring muck, 0 to 1 percent slope	slight	8
Dawson peat, 0 to 2 percent slope	slight	7
Kinross muck,0 to 2 percent slope	slight	2
Leafriver muck, 0 to 1 percent slope	slight	2
Loxley peat, 0 to 1 percent slope	slight	7
Lupton muck, 0 to 2 percent slope	slight	2
Tawas muck, 0 to 2 percent slope	slight	2
Group 2		
East Lake gravelly loamy sand, 0 to 6 percent slope	slight	8
Kalkaska sand, 0 to 18 percent slope	slight	1
Kalkaska sand, 18 to 45 percent slope	moderate	1
Group 3		
Au Gres sand, 0 to 3 percent slope	slight	1
Brevort-Iosco complex, Brevort 0 to 3 percent slope	slight	2
Iosco	slight	1

Group 4		
Blue Lake sand, 0 to 18 percent slope	slight	1
Croswell sand, 0 to 3 percent slope	slight	1
Klacking loamy sand, 0 to 18 percent slope	slight	2
Menominee sand, 0 to 6 percent slope	slight	1
Montcalm loamy sand, 0 to 6 percent slope	slight	2

3.5.6.1 Surface Water

3.5.6.1.1 Streams

Camp Grayling is located in the Northern Lakes and Forests Ecoregion in the northern portion of Michigan's Lower Peninsula (Omernik and Gallant, 1988). Most streams in this ecoregion are perennial and are formed from glacial lakes or wetlands. Stream density is approximately one mile per square mile. Typically, surface waters in the Northern Lakes and Forests Ecoregion carry few sediments, although they often have high levels of dissolved organic matter. Historically, logging and extensive fires have altered stream quality. The potential for impacts from some land use activities is increasing in northern Michigan. These activities include golf courses, oil/gas development, military activities and residential development.

Camp Grayling is situated within three major watersheds: the Manistee, the Au Sable, and the Muskegon. These three watersheds contain approximately 147,000 acres of DMA lands that drain through a 185 mile stream network. Pertinent data relative to surface waters at Camp Grayling are given in Table 3-14.

River Basin Overview

(1) Manistee River Basin: The Manistee River is a major tributary to Lake Michigan, draining an area of approximately 1,677 square miles (1,073,280 acres) in the northwest portion of Michigan's Lower Peninsula (Blumer et al., 1990). Seventy percent of the watershed is forested (USDA, 1983). The Manistee drops approximately 620 feet from its source 6 miles southwest of Alba (groundwater seepage and lowland marshes) to its mouth on Lake Michigan at Manistee. Major tributaries include the North Branch of the Manistee, Bear Creek, and the Pine River. Mean discharge at Manistee is 2,049 cubic feet per second (cfs) (Blumer et al., 1990).

Approximately 53,086 acres of Camp Grayling lands occur in the Manistee watershed, most being on the South Post. This land area, about 36 percent of Camp Grayling, is drained by a stream network totaling roughly 100 miles. A segment of the stem of the Manistee River parallels the western boundary of the main South Post. The North Branch of the Manistee River also forms a portion of the boundary of the Black Creek

Training Area. Prominent tributaries located on the South Post include Big Cannon Creek, Black Creek, and Portage Creek. Portage Creek is formed from the outflow of Lake Margrethe and associated wetlands.

Table 3-14
Camp Grayling Surface Waters

Watershed	Drainage Area (acres)	Stream Length (miles)	Lake Surface Area (acres)	Lake Shoreline (miles)
Au Sable	88,788	85	153	29
Manistee	51,186	100	2,226	36
Muskegon	4,977	0	0	0
Total	144,952	185	2,379	65

Source: GRASS

(a) Manistee River at Camp Grayling: Lands used by DMA at Camp Grayling are in close proximity to the Manistee River and several tributaries including the North Branch of the Manistee River, Portage Creek, Black Creek, Goose Creek, Clear Creek, Big Devil Creek, Little Cannon Creek and Big Cannon Creek. The main stem of the Manistee River parallels the western boundary of a portion of the South Post. This reach of the Manistee main stem, approximately 27 miles in length, is a third order stream, extending from near the Michigan Highway 72 bridge to the Civilian Conservation Corps (CCC) bridge on Sunset Trail (County Road 608) upstream from Sharon. The Black Creek Training Area is adjacent to approximately 11 miles of the North Branch of the Manistee River.

(b) Headwaters Main Stem Corridor: The headwaters of the Manistee River contain lowland conifer swamps, alder swamps, and scattered upland birch-aspen communities. This segment of the Manistee River is small, two to three feet in width, but widens considerably (20-40 feet) upon reaching County Road 612 bridge, west of Frederick. The river flows through conifer swamps and occasionally into open marshes (one-half to one mile wide) in the area above the confluence of Goose Creek multiple channels occur. Banks are often low (one to two feet) providing an open view of adjacent uplands. The channel often contains much woody debris and is relatively shallow, making fishing and canoeing difficult. The river gradient is approximately 5.9 feet per mile in the headwaters section.

From its source to Michigan Highway 72, the Manistee supports a high quality brook trout (*Salvelinus fontinalis*) fishery. Stream habitat components include a constant flow of high

quality water, sand-gravel substrates, and stream cover. Recent habitat improvement projects as well as some initiated in the 1930s are evident.

(c) South Post Main Stem Corridor: From County Road 612 bridge, downstream to County Road 608 (Sunset Trail) bridge above Sharon, the Manistee River becomes more readily defined into a single channel with 2-20 foot banks. Stream gradient drops to near two feet per mile between the Cameron and Michigan Highway 72 bridge. This section has many riffles with relatively little woody debris and obstructions. Swampy areas occur less frequently in this segment which is highly scenic. Stands of spruce, fir, and tamarack are visible along this section but eventually yield to red and white pine intermixed with upland northern hardwoods.

The reach of the Manistee River between Michigan Highway 72 and Sharon has been identified as providing fair to good fishing for brook and brown trout (Smith, 1994). A 7.5 mile section from Yellow Trees Landing to the CCC bridge is a state designated quality fishing area. This section of the Manistee parallels the western boundary of a large portion of the South Post, extending from north of Michigan Route 72 to the CCC bridge (USDA, 1983).

(d) North Branch Manistee River Corridor: The North Branch of the Manistee flows in a southwest direction along the western edge of South Post, eventually meeting the Manistee main stem at Sharon. This section of the North Branch is predominantly open marsh and alder lowlands. Stream width is approximately 15 feet, water depth is about 18 inches, and beaver dams and woody debris clog the main channel (USDA, 1983). Visibility is restricted by dense vegetation and access is limited. Brook trout is the dominant fish species.

(e) Portage Creek: This major tributary to the Manistee, located entirely within South Post, flows approximately six miles from the northwest end of Lake Margrethe to the Manistee River. It is considered a brook and brown trout stream. Five streambank erosion sites have been stabilized, 2 sand traps placed, and several stream crossing improvements have been completed recently with funding provided by the DMA.

(f) Other Tributaries: The other six creeks in the Manistee River watershed are less than ten miles in length and flow through small portions of the Post. These creeks are Black Creek, Goose Creek, Clear Creek, Big Devil Creek, Little Cannon Creek and Big Cannon Creek.

(2) Au Sable River Basin: The Au Sable River is a major tributary to Lake Huron, draining an area of 1,540 square miles (985,600 acres) in northcentral lower Michigan (Blumer et al., 1990). Approximately 80 percent of the watershed is forested (USDA, 1985). The river drops approximately 650 feet from its source at the confluence of Bradford and Kolka Creek near Frederick to its mouth on Lake Huron. Major tributaries include the East Branch, North Branch and South Branch. Mean discharge for the main stem of the Au Sable at Grayling is 76.1 cfs (Blumer et al., 1990). There are no stream gaging stations on the East Branch or North Branch of the Au Sable River.

Lands used at Camp Grayling for military purposes occupy a significant portion of the Au Sable River watershed. Approximately 88,788 acres of Camp Grayling lands occur in the Au Sable watershed, most being on the North Post. This land area, about 60 percent of Camp Grayling, is drained by a stream network of roughly 85 miles. Most of the North Post lies between the East Branch of the Au Sable River, a second order stream originating from Barnes Lake, and the North Branch of the Au Sable River, a third order stream originating near Otsego Lake.

The Au Sable River, and most of its tributaries, has been designated a State Natural River and is now further regulated in accordance with the adopted Au Sable River National River Plan under State Act 231, "The Natural River Act". The Au Sable River was considered for Federal Wild and Scenic River status because of its outstanding scenic values and its nationally recognized trout fishery. As a result, a 23-mile section of the river downstream of the City of Mio has been given Scenic River designation (USDA, 1982).

(a) Au Sable River at Camp Grayling: Lands used by DMA at Camp Grayling that are in close proximity to the Au Sable River include a small portion of the Au Sable main stem, the East Branch of the Au Sable, and the North Branch of the Au Sable. The latter two sub-basins contain the bulk of Au Sable waters influenced by Camp Grayling activities. The East Branch originates in the Pickett Artillery Range (impact area) at Range 40 on the North Post. Chub Creek and the North Branch of the Au Sable lie adjacent to the North Post boundary extending in an arc from Farrar Landing to Twin Bridges Road above Lovells for a total of about 21 miles.

(b) East Branch Au Sable Corridor: The East Branch of the Au Sable River emanates from Barnes Lake, flows south through River Lake and eventually meets the main stem of the Au Sable at Grayling. The East Branch is typical of a headwaters stream in this region coursing through lowland conifer swamps and alder marsh.

(c) North Branch Au Sable Corridor: The North Branch of the Au Sable River arises from marsh and groundwater seepage near Otsego Lake. It is rather small and meandering in the headwater section but widens considerably below Lower Chub Lake and Turtle Creek as it approaches Lovells. Corridor vegetation consists primarily of alder marsh, white cedar swamp, and scattered aspen, white spruce, and black spruce. Above Lovells, the North Branch contains much woody debris and is relatively shallow making fishing and canoeing difficult. The trout fishery is less productive than that section below Lovells due to warmer water temperatures (USDA, 1982).

(3) Muskegon River Basin: Approximately 5,000 acres of Camp Grayling lands occur in the Muskegon watershed. There are no streams or lakes located in the Muskegon watershed.

3.5.6.1.2 Lakes

Lakes are a prominent feature of the Camp Grayling landscape, comprising approximately 2,379 acres of surface area and creating 65 miles of shoreline habitats in the Manistee and Au Sable watersheds. No lakes occur in the Muskegon watershed. Although Lake Margrethe is the largest lake within Post boundaries, a significant portion of the lake's shore is privately owned. Table 3-14 shows the surface acreage and shoreline length of lakes in the Au Sable and Manistee watersheds.

(1) Manistee River Basin

Lake Margrethe is the largest lake within the boundaries of Camp Grayling and is located in the Manistee River Basin. The other lakes in the Manistee watershed are smaller and less significant.

Lake Margrethe is located on the South Post and is bordered by both military and private lands. The lake has a surface area of 1,924 acres, 9.6 miles of shoreline, a maximum depth of 65 feet, a mean depth of 15.4 feet, and contains approximately 30,000 acre-feet of water. The lake has 20 inlet creeks and drains a watershed of approximately 7,730 acres. Portage Creek is the outlet of Lake Margrethe (NEMCOG, 1985).

Several investigations have focused on water quality questions concerning Lake Margrethe. In 1976, Grayling Township contracted with an engineering firm to perform a water quality and nutrient budget study of Lake Margrethe. The study indicated no degradation from military facilities. It concluded that the quality of the water was good, but that some early signs of eutrophication were apparent. The lake was classified as being in an early mesotrophic state or in other words, it was showing some characteristics of an aging lake associated with higher nutrient levels. Northeast Michigan Council of Governors (NEMCOG) conducted another investigation of Lake Margrethe in 1979, the result being that the lake was again classified as mesotrophic (NEMCOG, 1979).

Continuing interest by area residents prompted another investigation of Lake Margrethe in 1985 (NEMCOG, 1985). This assessment focused on water quality issues related to concerns over nutrient (nitrogen and phosphorus) influx into the lake from nearby septic systems. Areas were identified that were suspected of discharging into the lake. The results indicated that in general wastewater systems along Lake Margrethe are not negatively impacting the lake's water quality. Four sites were identified where nutrients from septic systems were impacting the lake and recommendations for mitigation were proposed. In addition, lawn fertilization was identified as a problem in some areas.

Above investigations appear to indicate that eutrophication is caused by residential development around the lake.

(2) Au Sable River Basin

Lakes are scattered through DMA lands in the Au Sable watershed. These lakes make up a total of 153 acres with 29 miles of shoreline. The lakes in the Au Sable basin that are within the bounds of Camp Grayling include Marsh Lake, Timber Lake, Lonesome Lake, Sand Lake, River Lake, Bear Lake, Jones Lake, KP Lake, Little KP Lake, Duck Lake, Frog Lakes (2), Kyle Lake, Barnes Lake, and several unnamed lakes. Section One Lake and Guthrie Lake are bisected by the North Post boundary. The eastern shoreline of Lower Chub Lake comprises a short section of the Camp Grayling boundary.

3.5.6.2 Groundwater

(1) South Camp: Groundwater in the South Camp area occurs in the glacial drift primarily in unconfined aquifers of varying thicknesses. The underlying soils are generally composed of very fine to coarse grained sands with both gravel and clay lenses interspersed throughout. These lenses are usually relatively small and isolated; however, they can affect local groundwater conditions in a number of ways. Clay lenses can lead to the formation of perched aquifers and may impede vertical migration of contaminants as well as alter the flow direction of the shallow groundwater. Several such clay lenses have been identified in the cantonment area at depths ranging from 20 feet to over 100 feet. These lenses are generally quite thin, less than ten feet; however, thicker clay units, up to approximately 50 feet, have been logged in several areas. The altitude and lateral extent of the clay lenses have not been examined extensively. One such lense, underlying Building 314 in the cantonment area, just south of Lake Margrethe, was mapped as having an undulating surface that dipped generally to the northwest. Groundwater flowed within the shallow, perched aquifer in a northwesterly direction, following the dip of the clay unit. Groundwater flow within the unconfined aquifer beneath the perched aquifer was in a northerly direction (ESE, 1992).

Depth to groundwater in the generalized cantonment area varies from 9 to 35 feet below ground level to approximately 164 feet below ground level in the hills south of the cantonment area. Groundwater flow direction in the cantonment area is generally to the north with an average flow velocity of approximately 1.16 feet/day. Regional and local groundwater flow throughout the Post in general appears to respect the surface watershed drainage patterns. Regional groundwater divides most likely correlate to the major surface water drainage divides for the Manistee, Au Sable and Muskegon Rivers. Locally, data suggest that rainfall infiltration recharging groundwater follows a shallow flow system that discharges to lakes and streams supporting their water levels.

Water wells in the area are set at depth intervals of 25-70 feet or 100-200 feet. Deeper wells are primarily used for public supplies. Wells 10 inches or more in diameter set in the glacial deposits of this area are estimated to yield at least 500 gallons per minute (gpm). The two 8-inch diameter production wells in the cantonment area each have a reported maximum capacity of approximately 750 gpm (AEHA, 1983).

Groundwater quality information for the Camp Grayling cantonment area is available from monitoring wells at the capped landfill and the wastewater treatment plant. A monitoring well near the wastewater treatment plant contained water of excellent quality. The groundwater met the primary and secondary drinking water standards. Table 3-15 shows the sample results. In addition, the Post samples its production wells for coliform bacteria. Tests for bacteria have always been negative.

Ambient groundwater quality data is also available for two monitoring wells upgradient of the capped landfill site. This data is shown in Table 3-16.

The three wells show similar water quality conditions, within acceptable environmental variabilities. The slight differences in water quality are most likely due to different chemical compositions in the sand and gravel within the glacial drift. The groundwater from all three wells meets the primary and secondary drinking water standards.

Table 3-15
Groundwater Quality Near Camp Grayling Wastewater Treatment Plant

Parameter	Monitoring Well #1
pH	7.3
Specific Conductivity (umhos/cm^2)	485
Nitrogen Total-Inorganic, mg	2.78
Iron Dissolved, mg/L	<.01
Phosphorus-Total, mg/L	.11
Ammonia-Nitrogen, mg/L	2.33
Calcium Dissolved, mg/L	78.5
Chloride, mg/L	3.99
Magnesium Dissolved, mg/L	9.7
Nitrate-Nitrogen, mg/L	.44
Nitrite-Nitrogen, mg/L	<.01
Potassium Dissolved, mg/L	1.9
Sodium Dissolved, mg/L	1.35
Sulfate, mg/L	15.6
Bicarbonate, mg/L	200.6

Source: Camp Grayling Wastewater Treatment Plant, Monthly Operating Report, March 1993.

(2) Grayling Army Airfield Area: Groundwater also occurs in this area from the glacial drift, primarily in unconfined aquifers of varying thicknesses consisting of medium to coarse grained sands. At the Bulk Fuel Facility located just south of the Airfield near the City of Grayling, the depth to groundwater is approximately 7 to 16 feet below ground level. Groundwater flow direction is to the south-southeast at an average velocity of 2.2 feet/day.

Table 3-16
Groundwater Quality Near Camp Grayling Capped Landfill

Parameter	Monitoring Well LF2	Monitoring Well LF3
Dissolved Iron, mg/L	<0.020	<0.020
Dissolved Magnesium, mg/L	18	16
Dissolved Calcium, mg/L	79	72
Dissolved Sodium, mg/L	2.8	2.8
Dissolved Lead, mg/L	<0.003	<0.003
Dissolved Chromium, mg/L	<0.008	<0.008
Dissolved Cadmium, mg/L	<0.0002	<0.0002
Nitrate-N, mg/L	1.1	4.0
Bicarbonate Ion, mg/L	260	190
Sulfate, mg/L	8.3	5.5
Chloride, mg/L	12	32
Total Recoverable Phenolics, mg/L	<0.010	<0.010
Total Organic Carbon, mg/L	3.6	2.6
Chemical Oxygen Demand, mg/L	<3.0	3.0
Ammonia-N, mg/L	<0.05	<0.05

Source: SEG Laboratories, Inc. "Report of Analytical Results," Camp Grayling Landfill, September 27, 1993.

(3) North Camp: At the 27,000 acre North Post Range 40 complex unconfined aquifers exist in glacial outwash sediments consisting of sands, silts, and gravels. The predominant sediments consist of fine to medium grained sands that are moderately to excessively drained. Several domestic wells penetrate these sediments indicating that thick sequences of sand and gravel are present. Depth to water varies in this area from 0 to 200 feet below ground level. Groundwater in the North Post Range 40 complex area

flows generally in a south to southeasterly direction, with local variations resulting from surface drainage feature influences. In approximately two-thirds of the impact area, the groundwater flows in a southeasterly direction, to discharge points along the North Branch of the Au Sable River and in the remaining third, flows to the south with discharge points at Barnes and Timber Lakes and along the East Branch of the Au Sable River (ESE, 1993). Groundwater flow velocity is approximately 1 to 1.5 feet/day.

Information gathered from wells at the MATES facility (located on the extreme southern end of the North Post) indicate depth to water ranging from 5 to 10 feet below ground level. Well logs indicate a subsurface stratigraphy consisting of sands and gravels to a depth of 40 feet where a clay layer is present ranging in thickness from 2 to 12 feet. Two water supply wells for the facility, one 8-inch well and one 10-inch well are screened at depths of 148 to 183 feet and 152 to 177 feet respectively. Groundwater flow direction is to the southwest at a calculated flow rate of 0.22 feet/day. Background water quality tests performed February 10, 1987 from monitoring well #1 indicated excellent water quality with all analyzed parameters falling well within established limits (Camp Grayling MATES Facility Draft Permit, May 3, 1989).

The groundwater quality in some specific areas of Camp Grayling has been adversely affected by fuel spills or other activities. See Section 3.9 Environmental Investigations and Remediation for full descriptions.

3.5.6.3 Wetlands

Wetlands are distributed throughout Camp Grayling. Many of these wetlands are located in, or adjacent to, stream and river corridors. Wetlands information for Camp Grayling is based on the National Wetlands Inventory (NWI), published by the U.S. Fish and Wildlife Service (USFWS). Additional aerial photographic interpretation and ground reconnaissance by the Michigan Natural Features Inventory (MNFI), provided verification of accuracy and editing of the wetlands maps prior to finalization.

Camp Grayling has approximately 13,310 acres of wetlands. Nearly 65 percent of wetland acreage occurs in the Manistee watershed (8,773 acres) The Au Sable watershed accounts for the majority of the remaining 35 percent of probable wetland acreage (4,399 acres). Only 138 wetland acres occur in the Muskegon watershed (see Figure 3-22).

Major wetland types include:

(1) Lacustrine: These are wetlands associated with open water, lakes and deep ponds that are further defined as either littoral (shoreline to 2m depth) or limnetic (deep, open water). Camp Grayling has approximately 2,270 acres of lacustrine wetlands.

(2) Riverine: These are wetlands contained within a channel. This wetland type accounts for approximately 177 acres on Camp.

Subsystems include:

Lower Perennial: Low gradient and water velocity. Substrates typically sand and mud. Oxygen deficits may sometimes occur. Floodplain is well developed.

Upper Perennial: High gradient and water velocity. Substrates are typically rock, cobble or gravel, with patches of sand. High dissolved oxygen content.

Intermittent: Flowing water for only part of the year. When not flowing, water may remain in isolated pools.

(3) Palustrine: These are wetlands dominated by trees, shrubs, persistent emergents, emergent mosses and lichens. Palustrine also includes wetlands lacking such vegetation that are less than 20 acres, are less than 2m deep at the deepest point, and that lack wave formed or bedrock shoreline. Installation boundaries enclose 10,863 acres of palustrine wetlands.

3.5.6.4 Stormwater

The Michigan Department of Natural Resources (DNR) has federally-delegated authority for the stormwater NPDES permit program in Michigan (Public Act 203 of 1993). A new General Stormwater Permit requirement for stormwater discharges went into effect 14 February 1994. The stormwater permit applies to facilities with a point source discharge to surface waters that are related to industrial activities. General Permit applicants file a Notice of Intent (NOI) to DNR. A Certificate of Coverage is issued by DNR upon approval. General Permits require no monitoring or sample analysis, but require the permittee to prepare a Stormwater Pollution Prevention Plan (SWPs). The SWPs defines structural and non-structural stormwater controls. A Certified Storm Water Operator and an annual updating of the SWPs are also required for each stormwater site.

DNR has designated two Camp Grayling locations as stormwater sites requiring a Stormwater General Permit and a Notice of Intent. Camp Grayling stormwater sites are located at the MATES, 1400 North Down River Road, and at the State Maintenance Shop, Building 31, on the cantonment area. Department of Military Affairs (DMA) has filed NOI's for these stormwater sites and is awaiting DNR's issuance of Certificates of Coverage (COC's). Once the COC's become effective, sometime in 1994, DMA will have 18 months to prepare SWPs for the Grayling sites. Non-structural stormwater controls must be in place within 24 months and structural controls must be in place within 36 months, if required.

DMA will coordinate with DNR to determine whether stormwater permits are required for the proposed Master Plan projects and apply for permits as necessary.

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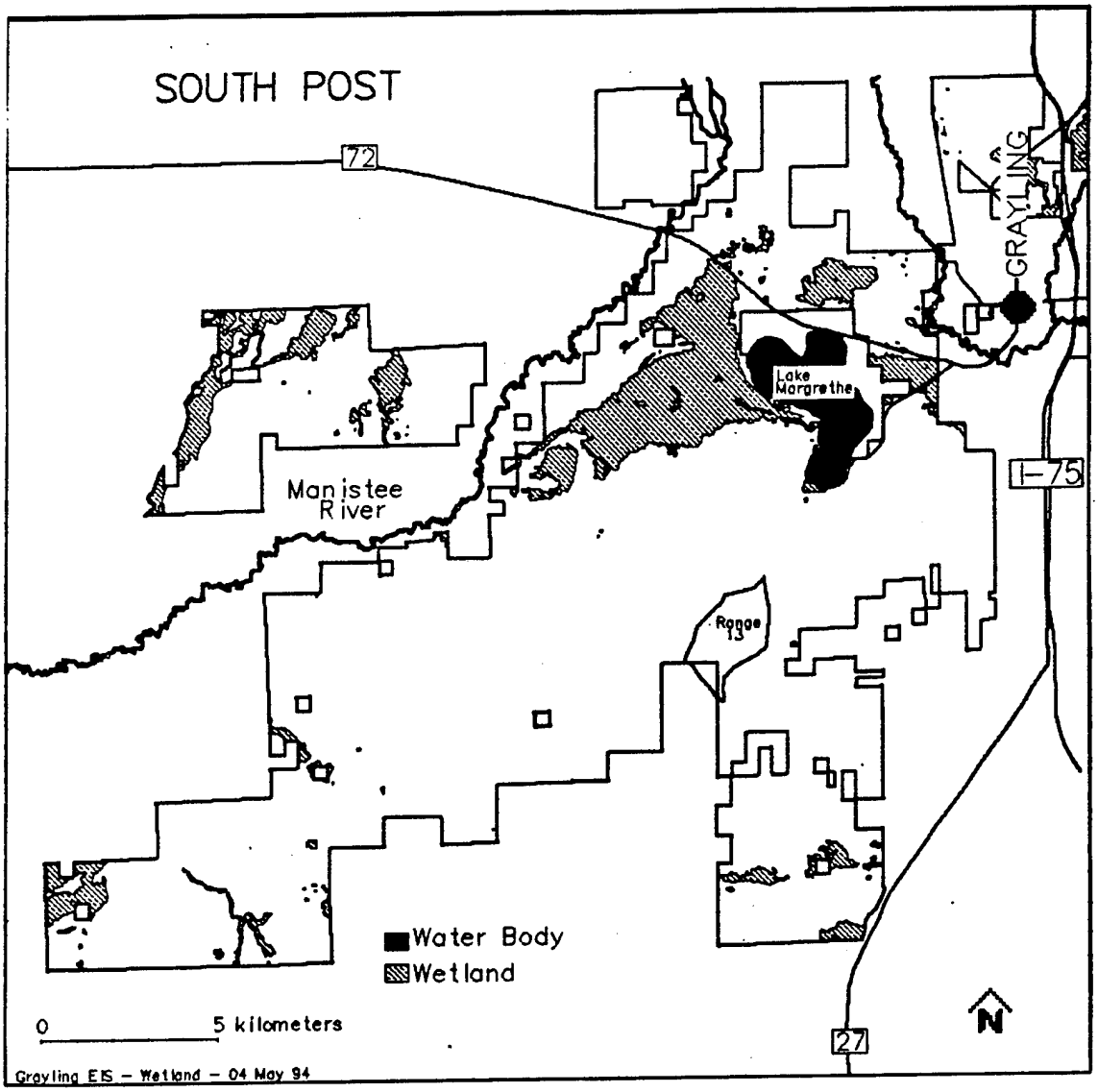

Camp Grayling FEIS	Figure 3-22A
Wetland Locations	

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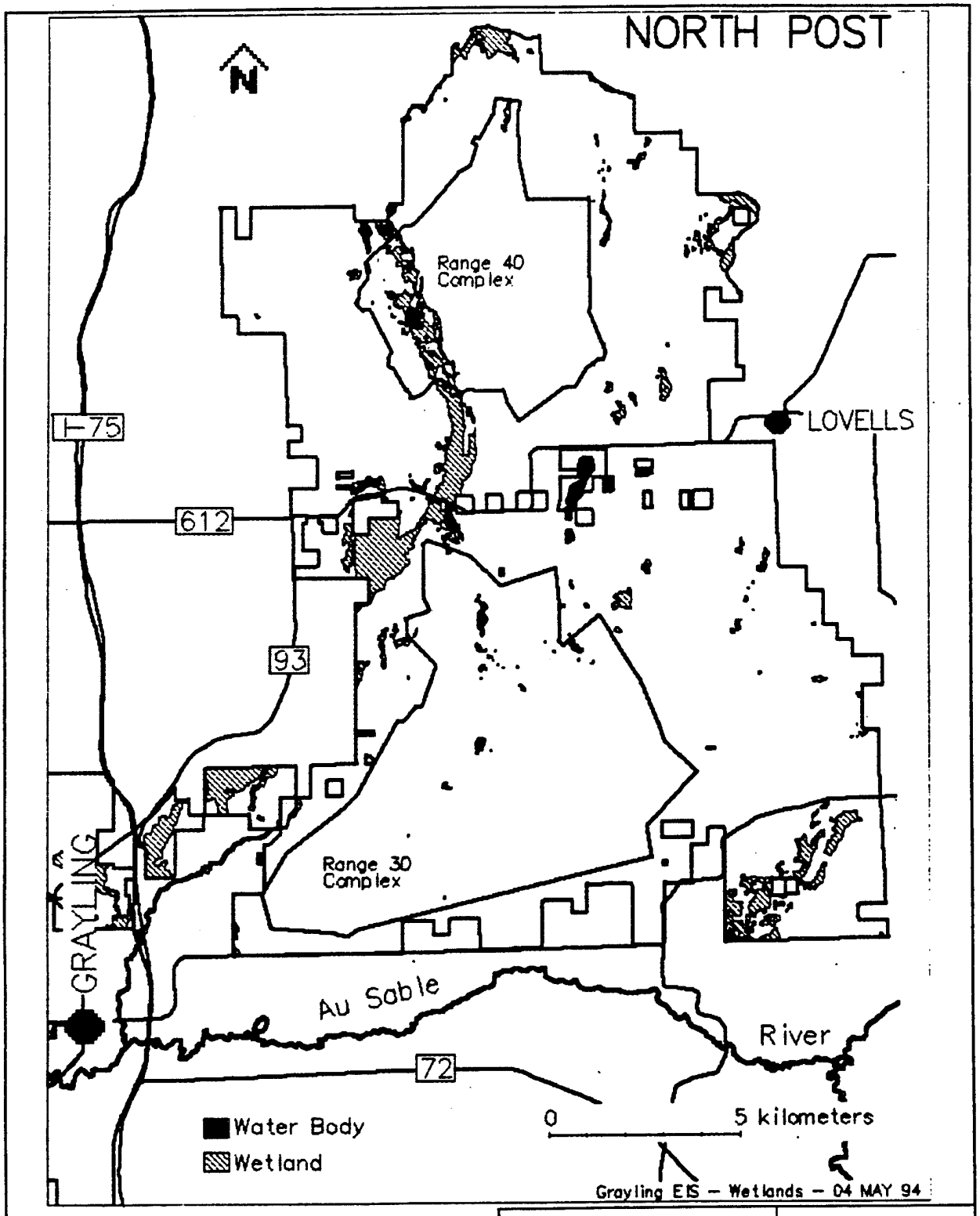

Camp Grayling FEIS	Figure 3-22B
Wetland Locations	

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3.6 Biological Environment

3.6.1 Vegetation

The Camp has established and continues to inventory over 200 LCTA plots located across the breadth of Camp Grayling (see Figure 3-23). The plots are distributed to represent the various timber stand types, age classes, and soil types, as well as the different vegetative communities that occur on the installation.

3.6.1.1 Forest Cover Types

The discussion of the vegetation at Camp Grayling is organized according to forest cover types. Upland vegetative cover primarily includes the major forest communities and open land. Aquatic communities include wetland, stream, and lake vegetation. This division of vegetation types is used because it is also applicable to forest/wildlife management and wildlife habitat at Camp Grayling.

Camp Grayling is located amidst a belt of oak and pine that occupies a two-county tier along Lake Michigan, north of Grand Rapids, and extends along a band through Crawford county to Iosco county. This band cuts through the southern portion of a major maple-birch forest north of Kalkaska county and a major aspen-birch forest extending from Cheboygan county south to Isabella county. The land within Camp Grayling contains significant areas of each of these major forest types.

There are eight major forest types at Camp Grayling that cover approximately 90 percent of the Post. The remaining land includes small stands of various trees, non-forest lands like land reserved for ranges, roads, water and marsh, and non-stocked forest lands such as cutover areas and grasslands. In their general order of predominance, the forest cover types are: oak, jack pine, aspen, red pine, upland brush, upland (northern) hardwoods and mixed swamp conifers. Oaks, jack pine and aspen together account for over 65 percent of the forest acreage.

Camp Grayling is a military installation on State land held primarily for the training of military troops. To the extent that its management practices do not conflict unreasonably with the primary use, authority for management of the Post's natural resources is placed with the respective divisions of the Michigan Department of Natural Resources. These responsibilities include the management of forestry, wildlife, and fisheries resources, as well as the regulatory review of military projects that may impact water or other environmental resources.

The DNR Forestry Division implements various management techniques and administers timber sales and fuel wood programs. Existing management techniques include performing a forest inventory, development/planting program, timber stand improvement, timber maintenance and assisting with fire suppression.

Intensive forest management of the State's suitable forest areas began in 1935 with the first forest inventory. The forest inventory is a vital part of all resource management at Camp Grayling and has provided the data necessary to plan other wildlife management actions. After each inventory is completed, the data is studied to determine which stands must be harvested, planted, or converted, and which stands require improvements such as pruning, thinning, and maintenance.

The forest inventory is conducted on a 10-year cycle with each forest management area divided into compartments composed of approximately three sections. Ten percent of each management area is inventoried each year and in 1993, 17 compartments were reviewed in Crawford county (J. McMillan, Personal Communication 13 January 1994).

Though it can vary widely between compartments, on average, less than 15 percent of the stands within a compartment are selected for treatment (McMillan, J., Personal Communication, 13 January 1994). Common management practices include: thinning or clear-cutting of oak or pine, selective cutting of northern hardwoods for mill, fuel and pulp wood, and clear-cuts of aspen and jack pine for pulp wood. The main management goal is to establish five different age class distributions. Thus, rarely is more than 20 percent of a compartment selected for management practices during a 10-year cycle (DNR, March 6, 1986).

A total of 150,955 acres of non-military and military land within and surrounding the boundary of the Camp Grayling Military Reservation have been inventoried. Of this, 138,383 acres are considered forest and brush lands. Ninety-four percent of these inventoried forest and brush lands are composed of eight cover types.

(1) The Oak Forest at Camp Grayling contains northern red oak (*Quercus rubra*), northern pin oak (*Quercus ellipsoidalis*), white oak (*Quercus alba*), black oak (*Quercus velutina*), and hybrids of black oak and scrub northern red oak. Red oak are predominant on better sites while northern pin oak and scrub northern red oak are common on poor sites. White oak and black oak are very seldom predominant (Mahalak, W.J., Personal Communication, 23 July 1986). Oaks comprise approximately 38,690 acres, 28 percent of the inventoried forest land.

Oak occurs almost exclusively on the moraines and therefore on the excessively drained Rubicon sands. The largest concentration of oak occurs in a two-mile wide belt in the South Post on a moraine composed of Rubicon sands. The belt extends from the border of the South Post area east of Lake Margrethe to the western border of the Post in the 20-year leased lands south of Sharon. Oak forests also occur in patches one-mile wide and two to three miles long in the south, north and central parts of the moraine in the North Post. The only part on-post which does not contain an appreciable amount of oak is the 20-year leased lands west of the Manistee River which are covered with northern hardwoods and aspen (DNR, June 11, 1986).

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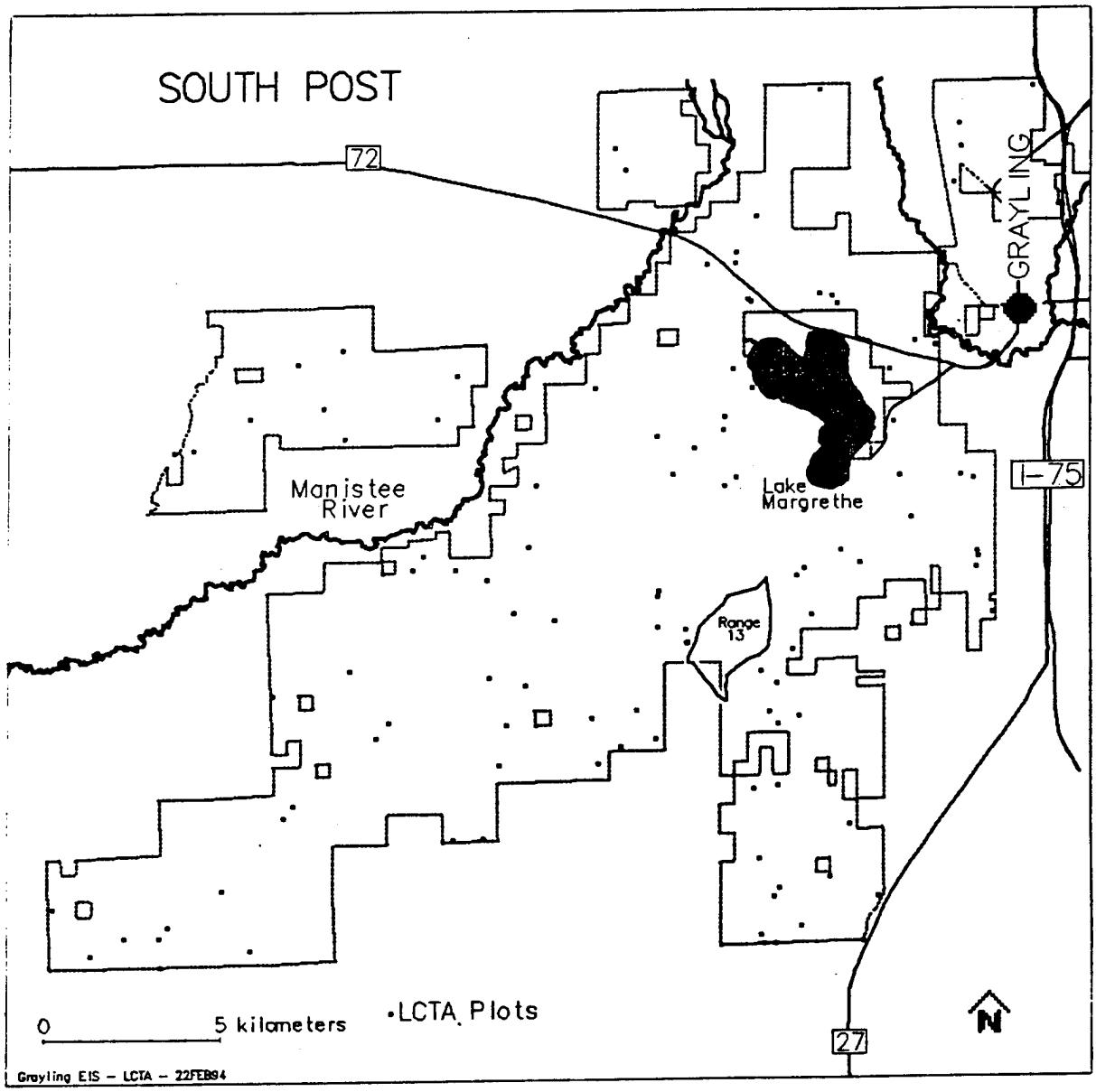

Camp Grayling FEIS	Figure 3-23A
LCTA Plot Locations	

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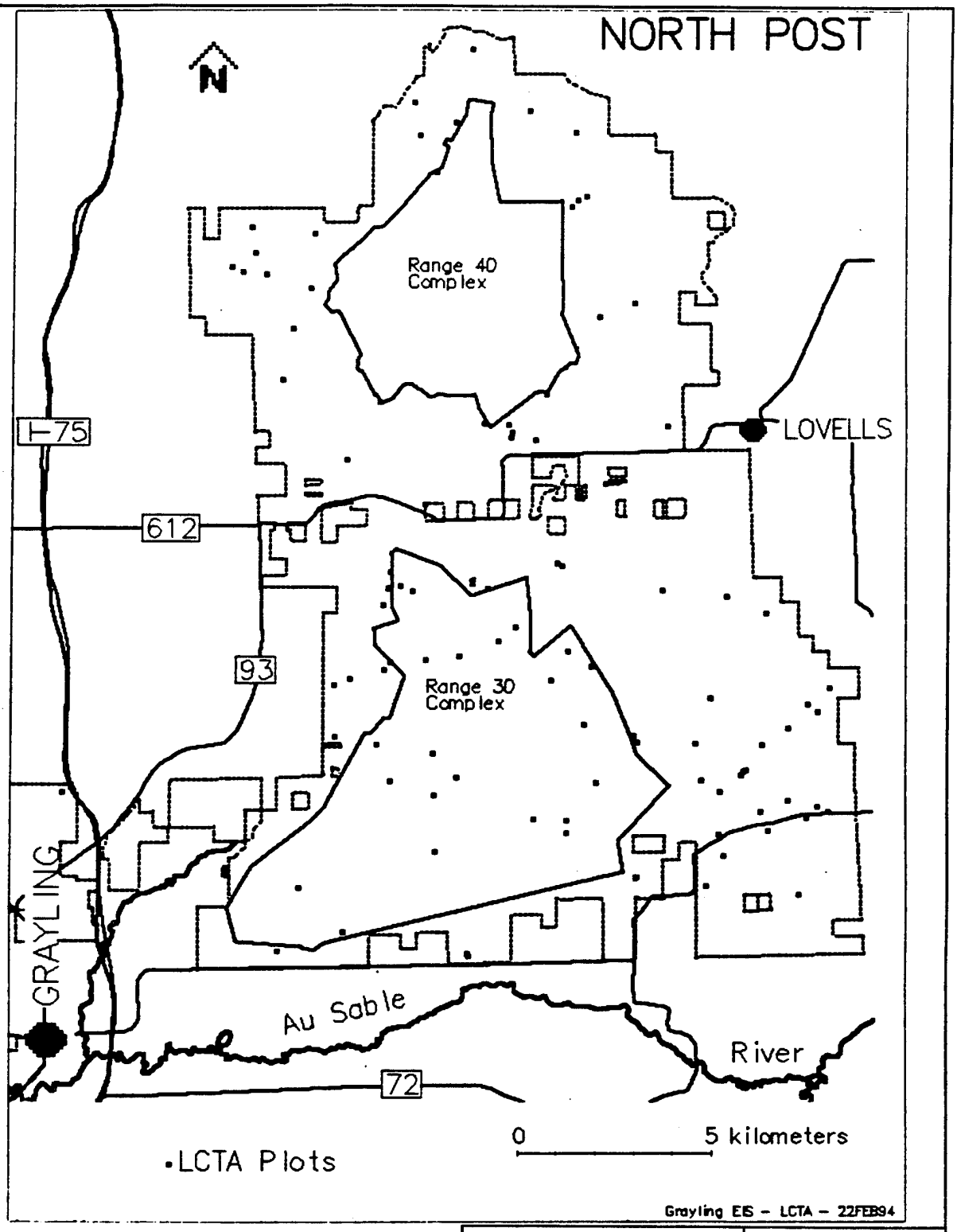

Camp Grayling FEIS	Figure 3-23B
LCTA Plot Locations	

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(2) The Jack Pine (*Pinus banksiani*) cover type includes 31,640 acres, 23 percent of the inventoried forest land. Jack pine occurs on the slopes of the moraines which are composed of excessively-drained Graycalm sands and on lowlands (glacial outwash plains) that are composed of excessively drained Grayling sands. The three major occurrences of jack pine include a one-mile wide belt along the southern side of the entire stretch of the Manistee River, a three by three-mile wide patch in the 20-year leased lands by Highway 27, and a four-mile long patch in the southcentral portion of the North Post. The jack pine stands contain twice as many pole-size trees (5 - 9.9 inch diameter) as saplings (0 - 4.9 inch diameter). There is only a negligible amount of saw timber size (greater than 9.9 inches). The 20-year leased lands west of the Manistee River contain no jack pine and lands north of County Road 612 in the North Post contain only a few small patches of jack pine (DNR, June 11, 1986).

(3) The Aspen Forest (*Populus* spp.) cover type includes 31,200 acres, 23 percent of the inventoried forest land. Aspen is found throughout the Post in individual stands or mixed in oak forests. Aspen grows on the moraines, the slopes of the moraine, and in lowlands along the rivers, and are not associated with a specific soil type. The largest concentration of aspen occurs on the east side and the northwest corner of the North Camp area and in the 20-year leased lands west of the Manistee River. The aspen on the east side of the Post have pockets of grassland, oak and red pine but otherwise is continuous for six to seven miles. The aspen stands west of the Manistee River are about 300 to 600 acres in size and occur on the slopes of the moraine and on the stream bed of Black Creek. Most of the scattered pockets of aspen are less than 600 acres in size. Aspen is generally absent only in the oak-jack pine forest running in a belt from Lake Margrethe down to the southwest border of the South Camp area (DNR, June 11, 1986).

(4) The Red Pine (*Pinus resinosa*) cover type includes 9,500 acres, 7 percent of the inventoried forest land. Red pine are fairly common throughout the Post, occurring primarily on the slopes of moraines, in excessively to well-drained soils. They also occur in the river valleys but on well-drained soils. The largest contiguous stand of red pine occurs along the east side of the North Post one to one-half mile west of the North Branch of the Au Sable River. The stand is two miles long and three-quarters of a mile wide. The other patches of red pine are usually one-half mile in length and width.

(5) Upland Brush cover type comprises 7,000 acres, 5 percent of the inventoried forest land. Upland brush occurs throughout the Post but predominantly in lower elevations along the rivers in well-drained sands. The two largest occurrences of upland brush are 700-acre patches in the 20-year leased lands west of the Manistee River and in the northwest part of the North Post by Range 40. Most of the smaller patches are from 150 to 600 acres in size and abut on grasslands. Areas that do not have upland brush are the morainal areas that are not located near a river (DNR, June 11, 1986).

(6) Lowland Brush cover type covers only 1,800 acres, 1 percent of the inventoried forest land. Lowland brush is found along rivers, streams and in wetland areas usually

on poorly drained, organic soils from Group 1 (Tawas, Lupton, Loxley). Lowland brush primarily consists of tag alder (*Alnus* spp.) and dogwood (*Cornus* spp.).

(7) The Upland/Northern and Lowland Hardwood Forest cover type comprises 6,300 acres, 4.5 percent of the inventoried forest land. About 90 percent of these forests are upland (northern) hardwoods and 10 percent are lowland hardwoods (DNR, June 11, 1986). Northern hardwood forests are composed of sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), basswood (*Tilia* spp.) and small amounts of red maple (*Acer rubrum*) (J. McMillan, Personal Communication, 18 June 1986). Some paper birch may be scattered throughout the stands.

Northern hardwood cover types occur primarily in two areas: a patch three miles long and one and one-half miles wide in the 20-year leased lands west of the Manistee River, and two patches two miles long and one mile wide in the northwest corner of the North Camp area west of Range 40. These northern hardwood occurrences are on moraines composed of excessively to well-drained Group 2 (Kalkaska, Montcalm series) and Group 5 (Kalkaska-Rubicon complex) soils. Other smaller patches occur in the area south and southeast of Lake Margrethe and south of Cannon Creek, in the southwest corner of Post (DNR, June 11, 1986).

(8) The Mixed Swamp Conifer Forest cover type comprises 4,875 acres, 3.5 percent of the inventoried forest land. The swamp conifer forests consist of northern white cedar, balsam fir, black and white spruce and minor amounts of tamarack. They are found throughout the Post along rivers, swamps and lowlands and occur in wet organic soils primarily from Group 1 (Tawas, Lupton, Loxley series). The largest concentration of swamp conifers occurs in Bear Swamp, west of Lake Margrethe (DNR, June 11, 1986). Besides occurring as a group in lowlands and swamps, each of these trees exists individually in small stands throughout the Post.

There are eight forest types which comprise the remaining 7 percent of the forest lands. These consist of individual stands of northern white cedar, white pine, black spruce, lowland poplar (Balm-of-Gilead), spruce (balsam) fir, tamarack, paper birch and hemlock. These forest types occur in scattered spots throughout the Post and are usually less than 300 acres in size (DNR, June 11, 1986).

The inventoried lands include only those lands managed by the Michigan Department of Natural Resources. Within the Post boundaries, 36 sections or about 23,000 acres have not yet been inventoried (DNR, June 11, 1986). Since the land is inventoried by compartments consisting of three sections and some compartments overlap Post boundaries, some of the inventoried lands are outside of the Post boundaries.

Table 3-17 lists all the forest types in order of decreasing acreage.

3.6.1.2 Open/Grassland

Open/grassland areas are fairly common, covering 10,871 acres of the Post's inventoried lands. Large parcels of land (640 acres or more) on the moraines are covered with grasses.

Table 3-17
Forest Types and Acreages

Forest Type (Code)	Present Acreage
Oak (O)	38,694
Jack Pine (J)	31,646
Aspen (A)	31,234
Red Pine (R)	9,475
Upland Brush (U)	7,060
Upland Hardwoods (M)	5,667
Mixed Swamp Conifers (Q)	4,875
Non-stocked (X)	2,826
Lowland Brush (L)	1,813
Northern White Cedar (C)	1,335
Local Name (I)	889
White Pine (W)	801
Lowland Hardwoods (E)	628
Black Spruce (S)	598
Lowland Poplar (P)	249
Spruce Fir (F)	227
Tamarack (T)	175
Paper Birch (B)	154
Hemlock (H)	33
Treed Bog (D)	4
Total Acreage	138,383
Source: GRASS, 1993.	

Many of these grasslands coincide with training areas. Some are a result of forest management practices (e.g., clear cuts) and subsequent military training activities and some were pre-settlement grasslands (Comer, P., Personal Communication, 14 January 1994). The Range 40 air-to-ground training area is the largest grassland area on-post, covering 1,300 acres. Range 13, a 1,079 acre mortar range, is predominately grassland, as is a large portion of the tank range (Range 30). The grasslands occur in two different types of communities: an open, dry sand plain, and a moist sand flat (DNR, June 11, 1986).

The grasslands on the moist sand flats are not as common throughout the Post because most of the sands are excessively to well drained. Some of these wet grasslands contain rare inland occurrences of the threatened Houghton's goldenrod. This species occurs in scattered populations within a band running from the north shore of Howes Lake to northeast of the confluence of Portage Creek and the Manistee River in the South Post.

3.6.1.3 Fire Ecology

In many ecosystems, fire normally occurs with sufficient frequency that both plants and animals are well-adapted to its passage; indeed, some species may require fire-maintained vegetation or habitat for their continued existence (Van Lear and Waldrop, 1989). Fires may maintain openings within forests that are important to several species of birds (Taylor and Taylor, 1979). Fire suppression activities can also retard the natural frequency of burns in such systems, which may in turn adversely affect those species whose persistence depends on its periodic occurrence (e.g., Mayfield, 1960).

Fire can have many impacts upon an ecosystem, including changes in local climate and microclimate conditions, composition and structure of the vegetation, and animal abundances and distributions. Fires may vary in intensity, duration, frequency, location, shape, and extent, and effects may differ with season, nature of fuel, and properties of the site and soil.

After humans arrived in North America, the use of fire, both purposefully and carelessly, greatly intensified its effects and frequency, particularly in grasslands (Wright and Bailey, 1982) and coniferous forests (Van Lear and Waldrop, 1989; Baker, 1992). Currently, both prescribed burning and suppression of natural fires are important management tools. In some instances, prescribed burning may mimic the effects of naturally occurring fires, while in others, effects of wildfires may be quite different from prescribed burning (Baker, 1992). When wildfires do occur after a long period of fire suppression, as a result of extra fuel buildup, they may escape to burn a larger area and at a greater intensity than they would otherwise, transforming a normal ecological event into a catastrophe.

3.6.1.4 Threatened and Endangered Plant Species

As of May 13, 1994 a total of 15 "listed" plant species had been identified and documented as occurring within Camp Grayling's boundaries. These species were located and identified by the comprehensive natural resource inventory initiated by Camp

Grayling in April 1992. All species are protected under the Endangered Species Act of the State of Michigan (Public Act 203 of 1974 as amended and/or Federal Endangered Species Act of 1973). The species were identified by either the Michigan Natural Features Inventory (MNFI), a joint project of The Nature Conservancy and the Michigan Department of Natural Resources Heritage Program, or the Land Condition-Trend Analysis (LCTA) Program implemented by the Michigan Department of Military Affairs (DMA).

The Michigan Natural Features Inventory lists endangered or threatened plant species in the tri-county area of Camp Grayling (Crawford, Kalkaska, and Otsego counties). Of the 15 plants listed, 11 are considered threatened, none are endangered, two are considered candidate species for federal listing, and two species are of state special concern. Four additional threatened plants have been found in the three counties surrounding the Post but have not yet been identified on-post even after MNFI's floristic inventory.

These four plants are: pale false-dandelion (*Agoseris glauca*), calypso or fairy-slipper (*Calypso bulbosa*), false violet (*Dalibarda repens*), and Hill's pondweed (*Potamogeton hillii*) (DNR and MNFI, 1985).

The following general habitat descriptions were taken from MNFI 1994 Draft Abstracts. The Camp Grayling location descriptions came from the MNFI floristic survey memorandums.

3.6.1.4.1 Federal Threatened Species

Houghton's Goldenrod (*Solidago houghtonii*): Houghton's goldenrod typically occurs on sparsely vegetated, moist calcareous sand beach shoreline flats, and near damp hollows or depressions between the foredune ridges of northern Lake Michigan and Lake Huron (Nepstad, 1981). Houghton's goldenrod may require relatively high amounts of calcium and magnesium (and possibly sodium and potassium) (Crispin and Penskar, 1990) and usually occurs where there is a low density of competing vegetation (Penskar, 1989). As indicated by its habitat, the species is apparently resistant to drought.

Although typically occupying wet areas (e.g., interdunal wetlands), Houghton's goldenrod is also known to inhabit seasonably dry, xeric habitats (e.g., alvar communities and backsides of dunes) (Element Stewardship Abstract for Houghton's goldenrod). On Camp Grayling it has been found in a mesic sand prairie natural community type. This rare community type is characterized by marked water table fluctuations, seasonally inundated conditions and sandy, strongly acid soils. "Listed" associates in this community type include, Clinton's bulrush (*Scirpus clintonii*), New England violet (*Viola novae-angliae*), long-leaved aster (*Aster longifolius*), prairie dropseed (*Sporobolis heterolepis*) and Vasey's rush (*Juncus vaseyi*).

3.6.1.4.2 State Threatened Species

(1) Pale False-dandelion (*Agoseris glauca*): The species is primarily found in jack pine barrens similar to those used for nesting by the Kirtland's warbler (Crispin, 1986). These nesting areas are located primarily near the tank range in the North Post. Although this species has not yet been documented on Camp Grayling, it is possible that it does occur.

(2) Prairie Dunewort (*Botrychium campestre*): This species is located in the Orchard area near the Range 40 complex. The total number of plants is unknown pending finish of the NFI survey, but it appears to be widespread in and throughout the actual orchard.

(3) Calypso (Fairy slipper) (*Calypso bulbosa*): Fairy slipper grows in cool soils, with moss ground cover in wetland forests. The mixed swamp conifer forest along the Au Sable River would provide suitable habitat (Crispin, 1986), though it has not yet been documented on-post.

(4) False Violet (*Dalibarda repens*): The false violet has only been found in Hartwick Pines State Park, Crawford county. The park contains a unique virgin forest of red and white pines and the fairly well-drained, humic, sandy soils that are essential for the false violet plant (Crispin, 1986). Because of the close proximity of the state park to the Post, it is possible that the false violet plant may grow within Post boundaries.

(5) Rough Fescue (*Festuca scabrella*): This species is fairly restricted to openings in jack pine that had remained open historically (e.g., moraines and outwash plains). This species is found throughout the entire Range 30 complex (and elsewhere on-post) with a population too large and numerous to delineate at this time. It is found mainly in small openings within jack pine areas.

(6) Whorled Pogonia (*Isotria verticillata*): One of the most significant discoveries; it is one of the northern-most colonies in North America, west of New York, and one of the few upland sites known for this species.

(7) Vasey's Rush (*Juncus vaseyi*): This species, on Camp Grayling, is associated with the mesic sand prairie community type, which is found as pockets within open jack pine areas.

(8) Appressed Bog Clubmoss (*Lycopodium appressum)*: This species is found on moist, acidic, sometimes organic sand in early successional, herb-dominated communities. This plant was found on Camp in a two-track road that had created a transitional habitat through a poor conifer swamp.

(9) Canada Rice-grass (*Oryzopsis canadensis*): This species is restricted to disturbed, wet sand and is the only known extant occurrence for this species in the Lower Peninsula.

(10) Hill's Pondweed (*Potamogeton hillii*): Hill's pondweed occurs over a broad spectrum of conditions but is most likely to be found in still or slow moving waters of streams or lakes. This species grows on sand bottoms as well as peaty, mucky shorelines, and mud flats (Crispin, 1986).

Because of the great variety of acceptable habitats, Hill's pondweed may occur within Post boundaries, though not yet found. If more occurrences of this plant are found, it could be removed from threatened status (Crispin, 1986).

(11) Clinton's Bulrush (*Scirpus clintoni*): Extensive populations of this species have been located in the mesic sand prairie habitat previously described.

(12) Prairie Dropseed (*Sporobolis heterolepis*): This is another plant associated with the mesic sand prairie habitat at Camp Grayling. One fairly large population has been found northwest of Portage Creek.

(13) Fleshy Stitchwort (*Stellaria crassifolia*): This species was found along the North Branch of the Au Sable in a cold, seepy site, typical for the species. This is a significant find in that it has been previously collected in only four counties in southwestern Michigan and one county in the Upper Peninsula.

(14) New England Violet (*Viola novae-angliae*): New England violet is a dry-land plant which apparently prefers dry to mesic-dry, circum-neutral or slightly acidic substrates, being partial to very thin soil over bedrock (Ballard, 1988). He states that New England violet is only found where forest openings have been maintained, either naturally or artificially. This species occurs with both Houghton's goldenrod and Clinton's bulrush (Ballard, 1988) and is currently classified as a State Threatened and Federal "Category 3" plant.

Refer to Table 3-18 for a list of threatened, endangered, or special concern plant species that have been confirmed on Camp Grayling and those that possibly occur.

3.6.1.4.3 Federal Proposed (Candidate) Species

Category 2 comprises taxa for which information now in possession of the USFWS indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules.

Category 3 comprises taxa that were once being considered for listing as endangered or threatened, but are not currently receiving such consideration (Department of the Interior, January 6, 1989).

Hill's Thistle (*Cirsium hillii*): This is a northern thistle that occupies dry-mesic prairies, savannas, open woods and alvar communities and is found on moraines and outwash plains in both openings and shade of aspen and/or jack pine dominated forests. This

species shows the greatest habitat variation of all species encountered on Camp Grayling and is found at numerous locations in the Range 30 complex and elsewhere on Camp. This species is classified as a Category 2 plant.

Table 3-18
"Listed" Plant Species Confirmed and Possible(*) on Camp Grayling

Scientific Name	Common Name	Status U.S.	Status MI
Aster longifolius	Long-leaved Aster		SC
Botrychium campestre	Prairie Moonwort		T
Cirsium hillii	Hill's Thistle	C2	SC
Festuca scabrella	Rough Fescue		T
Isotria verticillata	Whorled Pogonia		T
Juncus vaseyi	Vasey's Rush		T
Lycopodium appressum	Appressed Bog Clubmoss		T
Mimulus glabratus var. jamesii	James' Monkey-flower		SC
Oryzopsis canadensis	Canada Rice-grass		T
Prunus alleghaniensis var. davisii	Alleghaney Plum	C2	SC
Scirpus clintoni	Clinton's Bulrush		T
Solidago houghtonii	Houghton's Goldenrod	T	T
Sporobolis heterolepis	Prairie Dropseed		T
Stellaria crassifolia	Fleshy Stitchwort		T
Viola novae-angliae	New England Violet	C3	T
**Agoseris glauca*	Pale False-dandelion		T
**Calypso bulbosa*	Calypso (Fairy slipper)		T
**Dalibarda repens*	False Violet		T
**Potamogeton hillii*	Hill's Pondweed		T

T = Threatened
SC = Special Concern
C2&3 = Candidate
* = Not yet documented on the installation

Alleghaney Plum (*Prunus alleghaniensis davisii*): There is a very large and relatively healthy population of alleghaney plum located east of Stephans Bridge Road in a large prairie-like opening on a southeast facing slope. This species is classified as a Category 2 plant.

Both Hill's thistle and Alleghaney plum are also listed as state special concern species as well as federally proposed (candidate) species.

3.6.1.4.4 State Special Concern Species

Long-leaved Aster (*Aster longifolius*): Most populations of this species have been found in association with the mesic sand prairie habitat on South Camp. It was also found north of Little KP Lake and in Little Cannon Creek Swamp.

James' Monkey-flower (*Mimulus glabratus jamesii*): This species has been found at four sites, typically associated with seeps along cold-flowing, calcareous streams. It is the closest relative of Michigan's only endemic plant.

3.6.2 Fish and Wildlife

The text immediately following addresses the wildlife species that use habitats of a particular successional stage and community/forest type. A wildlife habitat community classification may include several "forest types" (see Table 3-19). Because wildlife utilize several forest types (often concurrently as well as at different times of the year or periods in their life cycle), this is the most effective breakdown for this type of study. Since the deciduous upland and coniferous upland communities together account for more than 116,000 acres or 85 percent (55 and 30 percent, respectively) of the Post's inventoried forest land, the discussion of forest communities will focus on these groups. Any critical species needs associated with vegetation communities of limited extent will also be addressed.

(1) Upland Wildlife

The deciduous upland includes aspen, birch, oak, and northern hardwood forests (see Table 3-19). Though this grouping contains many of the predominant forests of Camp Grayling, it is difficult to discuss wildlife use of smaller community divisions except in specific instances such as ruffed grouse or white-tailed deer. Data on relationships between wildlife and successional stages follows.

The various deciduous uplands are of the highest species richness and may be used by more than 40 percent of the wildlife species that are likely to occur. Types of deciduous uplands are four of the five most important communities based on general frequency of use, occurrence of critical habitat, and utilization by threatened, endangered, special concern, and game/fur species. More than 10 percent of the species on Camp Grayling have a critical relation to this habitat at some point in their life cycle (Mathisen, 1982).

Regenerating or young deciduous uplands, particularly aspen areas, are a vital food supply for deer, beaver, mature ruffed grouse, and also provides cover for immature grouse. Aspen is the single most important plant for grouse throughout their life. Saplings are favored roosting areas until there is enough snow cover for burrow roosting. Ten to 30-year old male aspen are also used by drumming birds in spring and fall. Young deciduous uplands may be considered critical habitat for the ruffed grouse, wood cock, cuckoo, whip-poor-wills, and beaver.

Table 3-19
Wildlife Habitat Classifications

Habitat Name	Corresponding Forest Cover Type/s
Forests	
Deciduous Upland*	Aspen, paper birch, oak, northern hardwoods (sugar maple, beech, basswood, red maple)
Lowland Deciduous* (yellow birch, elm, lowland poplar)	Swamp hardwoods (red maple, black ash)
Coniferous Upland*	Red and white pine, jack pine
Lowland Conifer and Closed Canopy Lowland Conifer	Tamarack, black spruce, cedar, balsam fir, white spruce
Openings	
Shrub/Sapling Openings	Upland brush areas
Permanent Openings	Grass
Wetlands	
Sedge Meadow Wetland	Grass
Shallow Marsh - Intermittent Wetland	Marsh
Emergent - Persistent Wetland	Marsh
Emergent - Open Water	Marsh
Shrub Swamp Wetland	Lowland brush

* Includes young, mature and old growth successional stage sub-classifications.

Source: Mathisen, John. Wildlife Association Data Base, February 21, 1982.

Based on the number of species likely to use the mature deciduous forest, this particular subtype is one of the five community types most important to wildlife. Mature deciduous uplands may be used by approximately one-third of the wildlife species on-post for

breeding or feeding (Mathisen, 1982). Mature deciduous forests include mast-producing trees like oaks that provide vital wildlife food.

The edge areas of this community that border openings are particularly important to "edge" species such as raptors, wild turkey, black bear, white-tailed deer, gray fox, coyote and bats. More than one-third of the bird species likely to occur on-post commonly use edge areas. Mature deciduous uplands are vital habitat for species that breed and feed there. Mature deciduous areas adjacent to water are of considerable importance to wildlife, particularly to herons, ducks, raptors, kingfisher, veery, woodpeckers, amphibians, weasels, raccoon, fox, bear and bats.

Old deciduous uplands contain many dying trees or trees of declining quality. They offer good nesting sites for raptors and cavity dwelling birds and mammals. The old growth deciduous forest provides vital habitat for many of the same riparian animals also found in the mature deciduous forest. The Manistee and Au Sable Rivers are in an important raptor migration route. This route is particularly important for predatory birds, including bald eagles. Raptors often hunt from perches in the tops of dead trees (snags) above the forest canopy, ideally with a commanding view of adjacent open water or a cleared field. About 40 percent of the bird species on the installation breed in riparian areas or wetlands (Mathisen, 1982). Thus, the portions of old deciduous communities in riparian areas or next to open fields can be of particular importance for both feeding and breeding.

The DNR Division of Wildlife Habitat Management Program has established general deer range improvement guidelines for management compartments and oak stands. In general terms, the Deer Range Improvement Program seeks to maintain those plant communities most beneficial to deer.

Oak stands at Camp Grayling are beneficial to deer and wildlife primarily because of their mast-producing ability. Mast includes nuts, like acorns, that accumulate on the forest floor. From this standpoint, 50 to 75-year old black or red oaks with exposed crowns on the better sites are most valuable to wildlife. The edges of oak stands adjacent to deer wintering areas are of particular importance to deer.

The coniferous upland is the other major forest cover type occurring at Camp Grayling. Approximately 30 percent (41,922 acres) of the inventoried acreage falls within this classification. Three-quarters of the upland conifer acreage is composed of jack pine stands and the remainder is almost entirely red pine stands. Less than 1 percent is white pine.

Mature and old coniferous uplands are used by wildlife in similar ways. Both are correlated with the occurrence of edge species and snag users. In addition, it provides potential habitat for the threatened bald eagle, the fisher, and possibly the pine marten. The importance of these areas is enhanced when they border wetlands or open water, as is the case with deciduous uplands. However, smaller numbers of riparian oriented species are associated with the coniferous areas.

Jack pine is the predominant conifer that is generally considered a medium preference deer food, the same as aspen. However, young trees may be heavily browsed where deer populations are high. Dense sapling and pole stands offer some wind protection and winter shelter but generally jack pine stands do not provide as good winter shelter as most other conifers, particularly lowland conifers. Since older stands of jack pine are usually less dense than other conifers, the understory shrubs and herbaceous plants have better growth and thus provide a better food supply. Some wildlife species benefit from special stand conditions such as the excellent cover that dense young stands of jack pine provide for hares. Clumpy stands of young trees with branches reaching the ground provide nesting sites for the endangered Kirtland's warbler. Most wildlife species that find food or shelter in jack pine forests will benefit from management efforts to provide a good distribution of age classes (Benzie, 1977).

Jack pine stands and adjacent lowland conifers adjacent to the Manistee and the Au Sable Rivers form corridors of forest that serve as the area's primary deer wintering areas. Preservation of these areas will provide cover vital to supporting the increasing deer population. The upland forest edges within one-quarter mile of the rivers are the major winter food sources for these areas. Shade intolerant hardwoods like aspen and red maple are critical summer and fall foods for white-tailed deer.

Red pine stands are generally considered poor habitat for game birds and animals but they provide cover and nesting sites for many species of birds. Large old-growth trees are used by the bald eagle as well as many songbirds. Many of the favored food plants are not found in the understory due to the higher density of the canopy.

Managing stands near the minimum recommended stocking will favor a greater variety of understory plants. Carefully planned wildlife openings can provide some of the additional food plants that are needed.

(2) Open/Grassland Wildlife

Regenerating clear-cut areas and permanent openings are very valuable to wildlife. These openlands (primarily grasslands) account for 11,000 acres of the Post's inventoried forest lands. Other open areas are more extensive grasslands used for training ranges or impact areas. These additional areas may account for up to another 3,800 acres.

Openings are major breeding and feeding areas for birds. More than half of the wildlife species likely to occur on the installation are also estimated to use permanent openings. Commonly occurring edge animals are also highly correlated with permanent openings. These include mourning dove, grouse, woodcock, swallow, sparrow, bluebird, skunk, badger, red fox, mice, vole, woodchuck, cottontail and bat. Openings near water host several species of waterfowl, amphibians, and several larger vertebrates from riparian habitats, particularly if banks or bare ground are present. These animals include widgeon, teal, killdeer, weasel, turtle and snake. Many important raptors feed here,

including hawks, owls and bald eagles. Permanent openings also host hummingbird, lark, meadowlark, blackbirds, and woodchuck.

Grasslands and openings within one-quarter mile of deer wintering areas are critical to sustaining the increasing deer population. Grasses are the most important spring and fall foods for deer. They provide the fat reserves necessary to get deer through the winter yarding period and replenish depleted nutrients in early spring.

The open/grasslands category also includes shrub/sapling openings. These openings are common habitats for edge species including cuckoo, woodpecker, towhee, catbird, waxwing, warbler, bunting, sparrow, and white-tailed deer.

(3) Wetland Wildlife

The following information addresses the wildlife associated with the different types of wetland habitat using descriptions from the 1956 USFWS Circular No. 39 classification system.

Sedge meadows are used by nesting waterfowl (especially blue-winged teal), but their value to waterfowl is mainly as supplemental feeding areas. Other types of wildlife nesting here include red-winged blackbirds, sparrows, and a variety of small animals. This wetland type also attracts deer, red fox, and many small reptiles and amphibians.

Shallow marshes with emergent aquatic vegetation are constantly fluctuating between wet and dry. These conditions support a variety of plants and micro-organisms highly attractive to wildlife, particularly nesting waterfowl. In combination with deep freshwater marshes, they constitute the most productive areas of nest sites for waterfowl, primarily dabbling ducks such as mallard and blue-winged teal. Blackbirds, sparrows, muskrat, mink, raccoon, and a variety of reptiles and amphibians are all common inhabitants.

Because of the abundant food supply and the cover afforded by taller emergents such as cattails, deep freshwater marshes constitute the best waterfowl brood-rearing habitat. Blue-winged teal, herons, terns, and wood ducks are commonly seen in these areas. Many species of mammals, including mink, muskrat, and weasel, are known to occur within or adjacent to this habitat type.

Open water marshes are used extensively as brood areas in mid to late summer when the less permanent marshes begin to dry out. The borders of such areas are used for nesting. Where vegetation is plentiful, they are used as feeding and resting areas by ducks, geese, and coots, especially during migration periods. In the spring and fall, diving ducks, including ring-necks frequent these areas. Mink, muskrats, and weasels are common, along with many amphibians and reptiles.

Shrub swamps are the most valuable wetland areas based on frequency of use by wildlife species. Shrub swamps attract beaver, mink, raccoon, deer, woodcock, and a variety of other animals and small birds.

3.6.2.1 Current Wildlife Management Practices

The Camp Grayling training site includes lands that contain a diversity of wildlife with representative species primarily from pine, oak and aspen-birch forest habitats. Camp Grayling lands are managed by the Michigan Department of Natural Resources (DNR) with the understanding that the primary use of the land is for military training. Camp Grayling lands include leased lands and Hanson Grant lands given to the State for military use with certain conditions (see Section 3.2.1) and lands owned by the Military Board. The Hanson Grant lands are statutory game refuges which are shown in Figure 3-24.

The DNR Wildlife Division has been actively managing the Post's wildlife since the establishment of the original Hanson Refuge in the early 1900s. Its responsibilities include: enforcement of fish and wildlife regulations, monitoring wildlife populations, managing wildlife habitat, administering special hunting and trapping programs, and assisting the military with special wildlife programs.

Currently, Post lands are managed primarily for deer and ruffed grouse. Food supply and availability are the limiting factors because of the heavy winter snow cover. Selected areas that offer food and thermal shelter during the winter and early spring are critical wildlife areas often designated as deer yards or wintering complexes (see Figure 3-25).

Winter deer complexes include deer yards with winter range areas. In general, conifer swamps are ideal deer yarding areas and regenerating early successional forest, particularly aspen within one to one-half mile of a conifer swamp provides excellent winter range. The better wildlife openings are clearings in predominantly wooded areas of one-half to 10 acres in size. Ideal openings are buffered from disturbance and oriented to permit maximum sun. These sites offer early spring grazing for deer and major breeding and feeding opportunities for a wide variety of wildlife. Food plots may also be planted to enhance wintering complexes.

The DNR management goal for the Post lands is to support 30 deer per square mile. The current deer population in the Camp Grayling vicinity is higher during winter months (more than 30 deer per square mile) in river corridors of riparian forest lands from one to one-half miles in width along the main stems of the Manistee and Au Sable Rivers, as well as their larger tributaries. A moderately populated zone often extends up to a mile beyond the river corridor. The deer population in this zone is estimated to range from 10 to 29 deer per square mile. Based on pellet surveys, the remaining areas are generally estimated to have less than 10 deer per square mile. Wetlands and undeveloped shorelines may be associated with localized concentrations of deer. Some sections along the Manistee River and Bear Swamp have over 50 deer per square mile during winter months. The average deer population on-post is estimated to be roughly 20 deer per square mile (Jerome Weinrich, Personal Communication, 18 January 1994). Deer populations are controlled by a rifle hunting season (November 15-30) and an archery season (October 1 to January 1).

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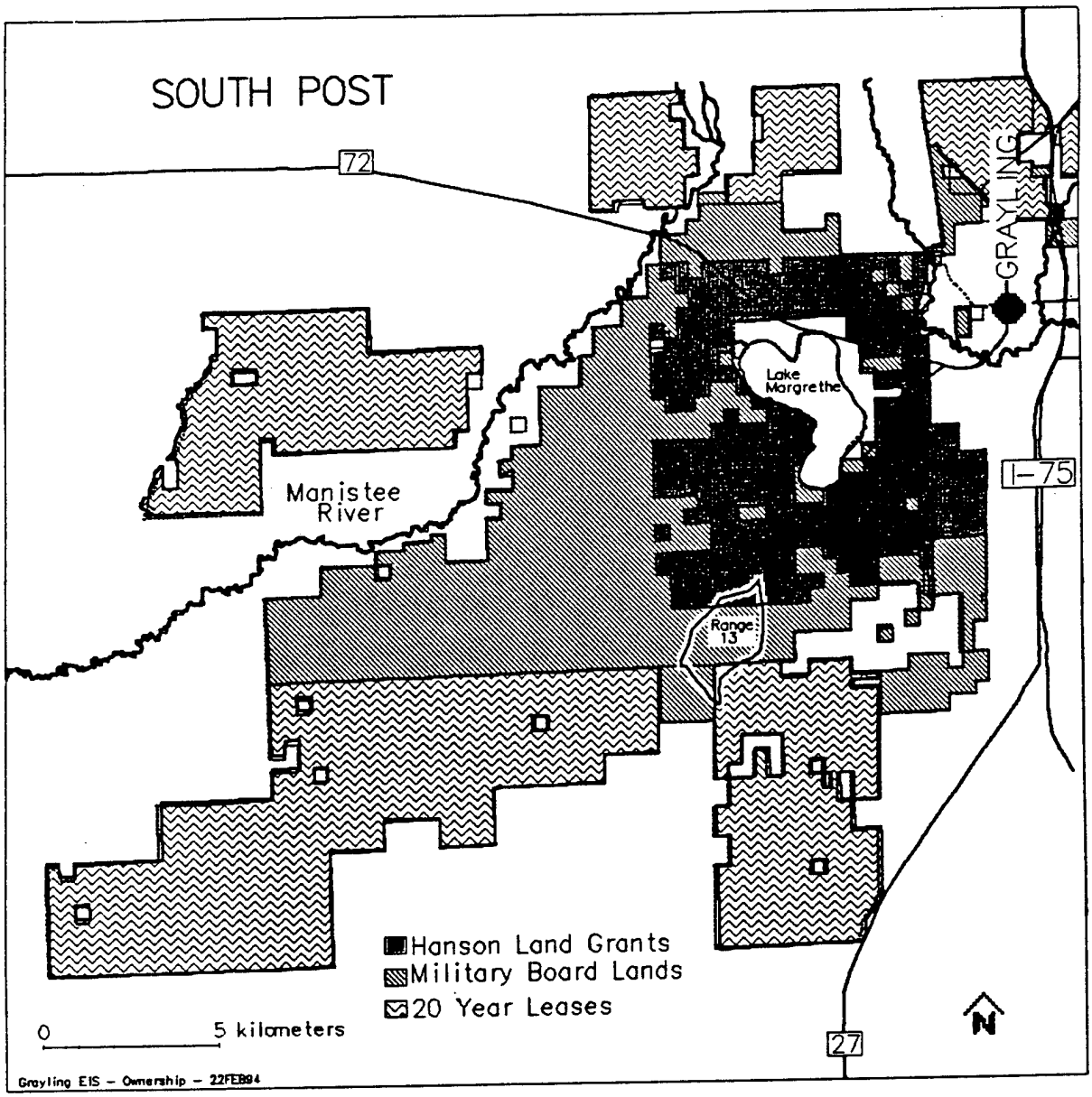

Camp Grayling FEIS	Figure 3-24A
Land Ownership Categories	

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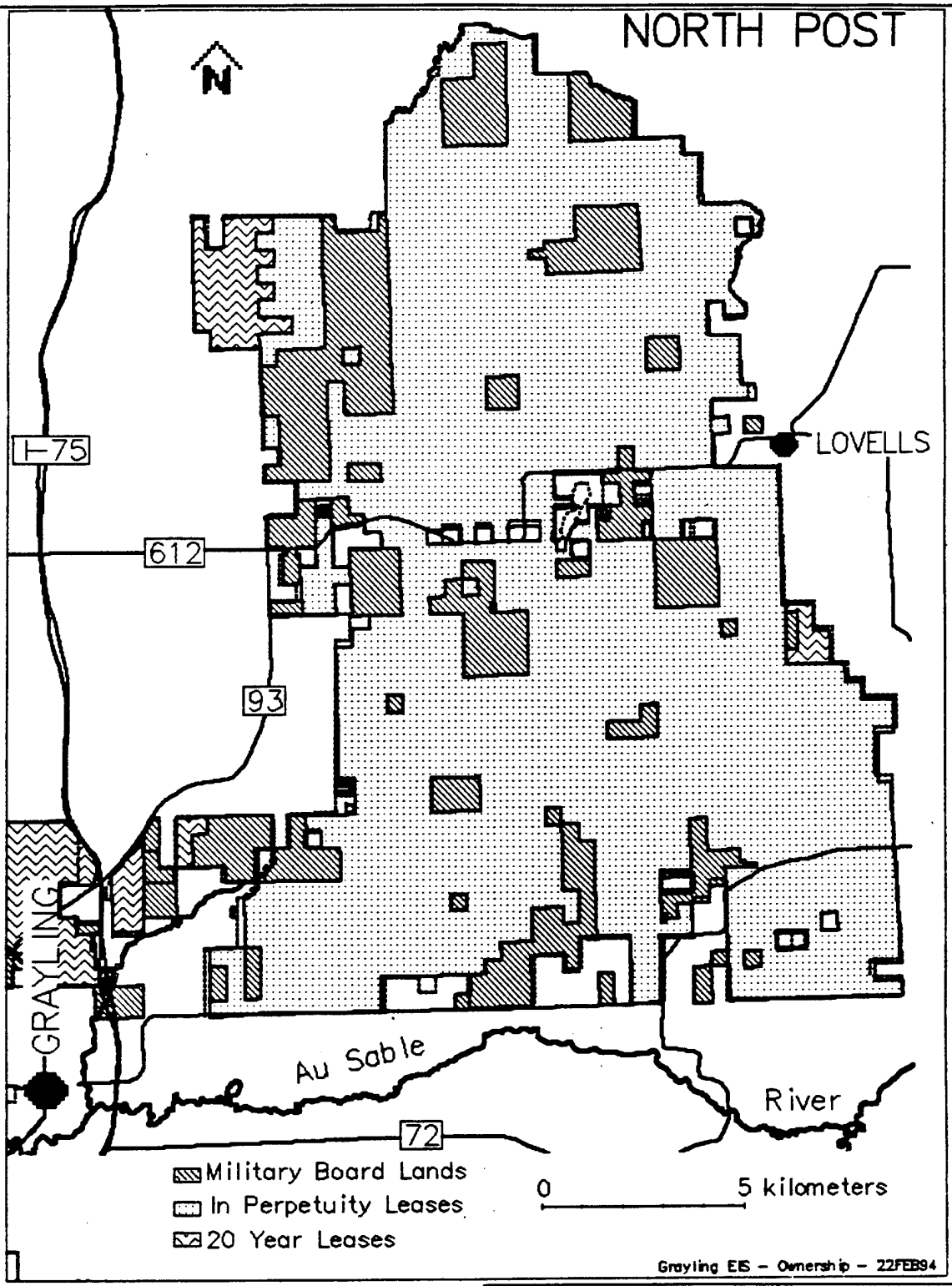

Camp Grayling FEIS	Figure 3-24B
Land Ownership Categories	

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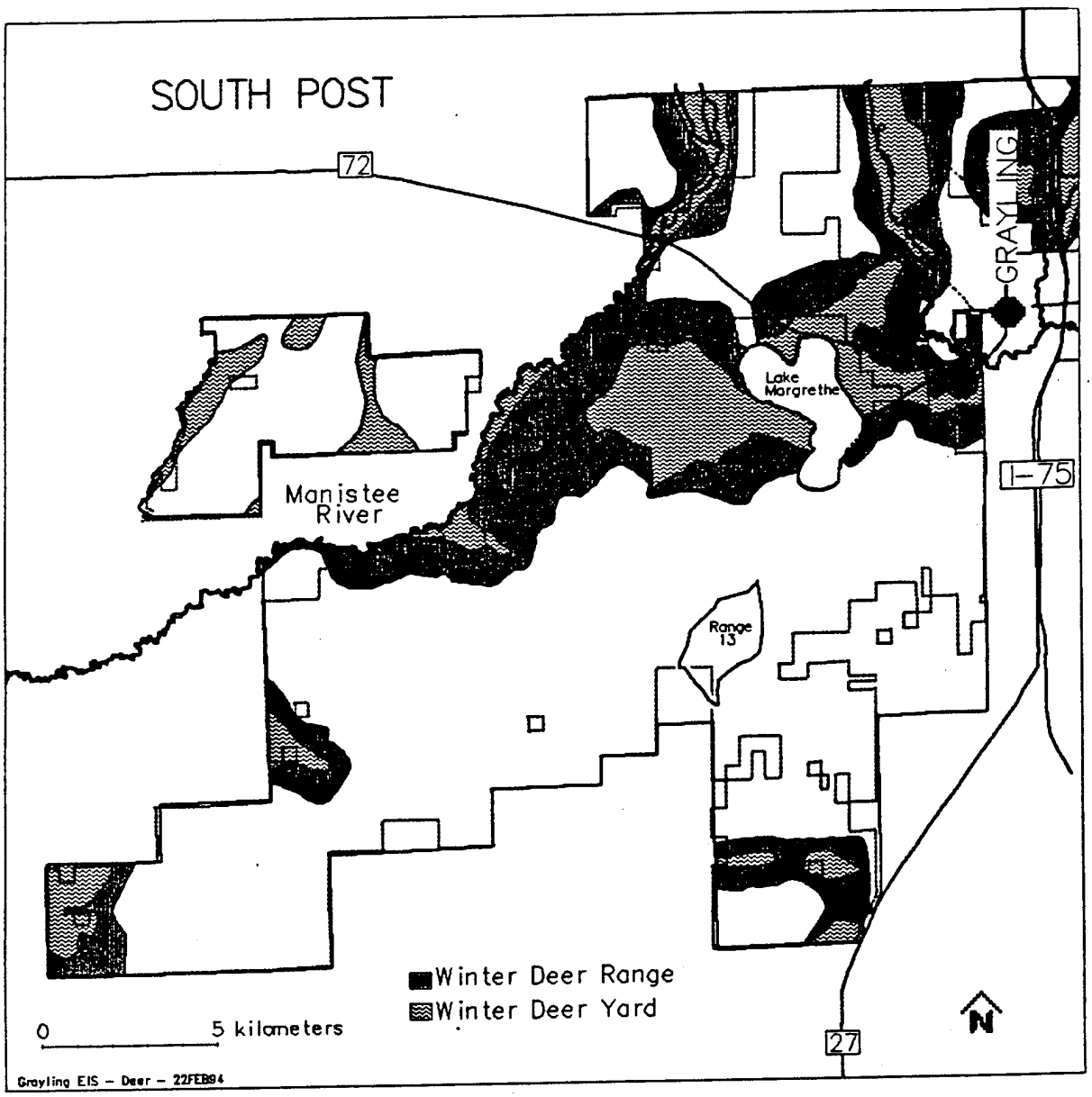

Camp Grayling FEIS	Figure 3-25A
Deer Habitat Map	

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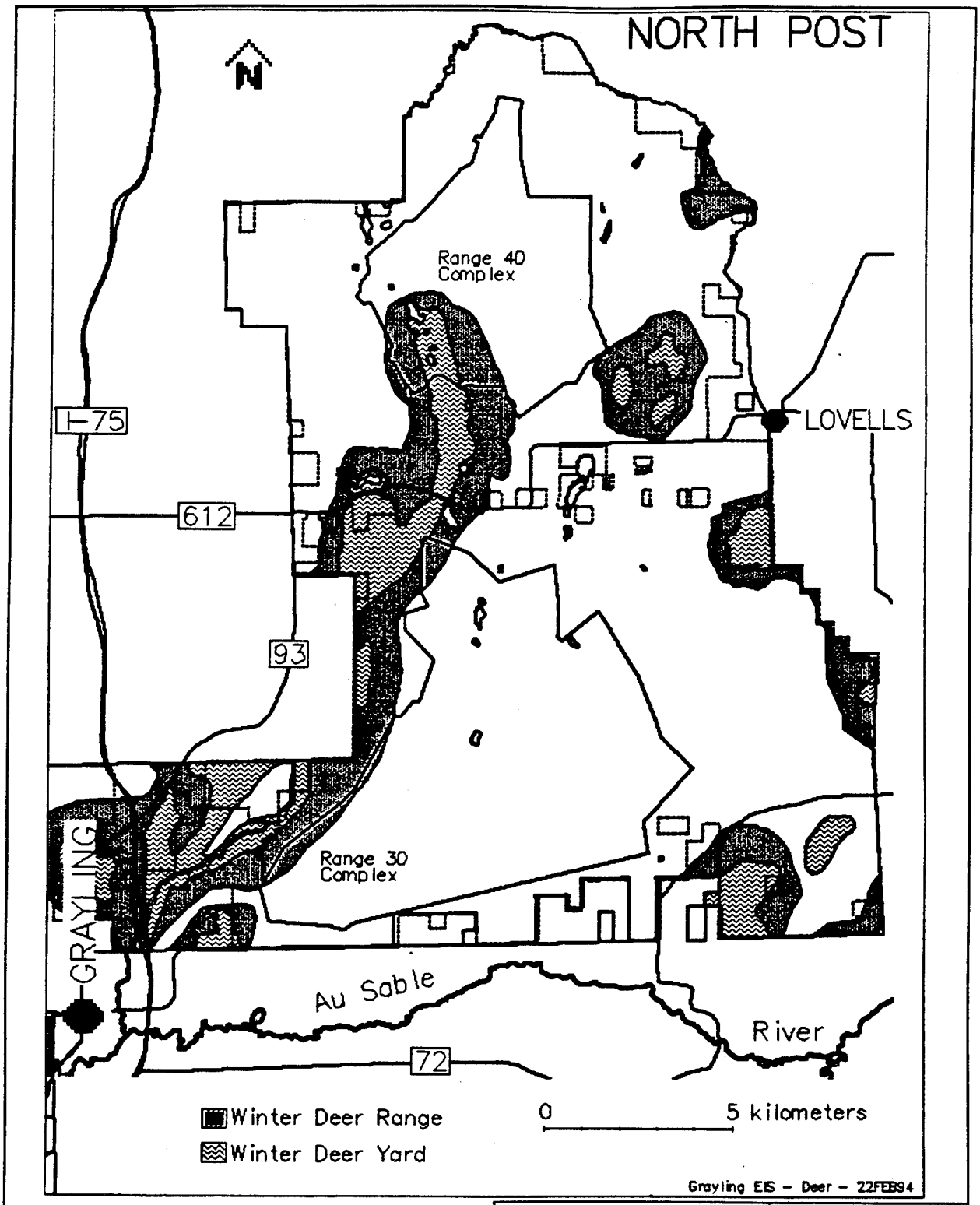

Camp Grayling FEIS	Figure 3-25B
Deer Habitat Map	

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Whether a sudden increase in animal numbers within an area exceeds its carrying capacity cannot be known with certainty in advance, but the assumption that all habitats are always at carrying capacity is not biologically substantiated. The ability of an area to support individuals of a certain species can change in a few minutes (as the result of fire, a tree being cut, or an oil spill for example), and most always changes seasonally. The quality and quantity of food and cover, water, season of the year, behavioral tendencies,

and reproductive requirements are just some of the factors used in assessing an areas' carrying capacity for a species.

The DNR Wildlife Division has had success in increasing the deer population by improving the quality of the habitat. It has a state level Habitat Management Program that establishes vegetation guidelines for forest compartments and stands and a Harvest Management Program that establishes deer population guidelines.

Ruffed grouse habitat is also receiving special attention in compartments with large stands of aspen. The timber is being cut in 20-acre blocks to enhance grouse habitat and promote the birds' growth. Ruffed grouse are expected throughout the Post and on adjacent lands. The Fletcher Sharp-tailed Management Area, in lands adjacent to the Post, is managed for sharp-tailed grouse. Sharp-tailed grouse are also expected in Ranges 13, 30 and 40. A good population of wild turkeys also occurs on-post.

3.6.2.2 Mammals

Forty-nine species representing 16 families of mammals are known to occur in the Camp Grayling region (Appendix C). The white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), beaver (*Castor canadensis*), porcupine (*Erethizon dorsatum*), and raccoon (*Procyon lotor*) are some of the most commonly observed species.

Abundant, but less conspicuous small mammal species in the Camp Grayling area include the masked shrew (*Sorex cinereus*), Southern red-backed vole (*Clethrionomys gapperi*), meadow vole (*Microtus pennsylvanicus*), white-footed mouse (*Peromyscus leucopus*), Southern bog lemming (*Synaptomys cooperi*), woodland jumping mouse (*Napaeozapus insignis*) and meadow jumping mouse (*Zapus hudsonius*).

3.6.2.3 Birds

The vegetative diversity at Camp Grayling provides habitat for many avian species, ranging from wading birds and ground-dwelling game birds to raptors, hummingbirds and the endangered Kirtland's warbler. The most frequently hunted upland game birds are the wild turkey (*Meleagris gallopavo*), ruffed grouse (*Bonasa umbellus*), and American woodcock (*Scolopax minor*). The mallard (*Anas platyrhynchos*) and the Canada goose (*Branta canadensis*) are the most commonly observed waterfowl.

In addition to the year-round resident birds, neotropical migrants (birds that breed in North America but spend their non-breeding periods in Central and South America) heavily utilize Camp Grayling each spring. Of the 102 bird species observed on Land Condition Trend-Analysis (LCTA) plots in the spring of 1992 and 1993 (Appendix D), 44 percent are considered Class "A" neotropical migrants and 29 percent are Class "B" neotropical migrants (Information and Education Working Group, 1992). Class "A" species are those that breed in North America and spend their non-breeding period south of the United States. Class "B" species breed and winter exclusively in North America but contains some populations that winter south of the United States. Many of these species are particularly sensitive to man-induced habitat disturbances, and it is therefore highly probable that the abundance of neotropical migrants today is considerably less than existed when the area was settled. A checklist of neotropical migrants and other bird species from the Camp Grayling area is in Appendix D.

3.6.2.4 Reptiles and Amphibians

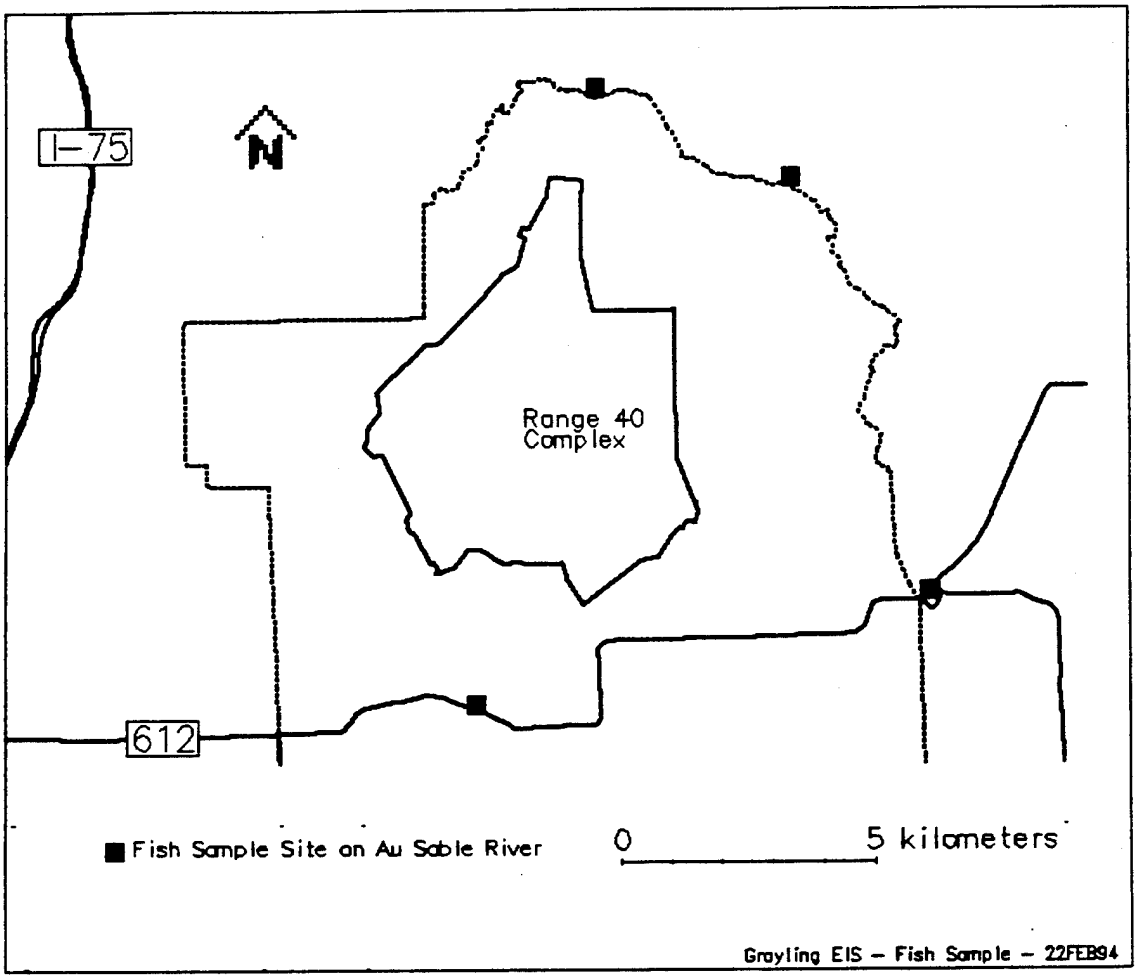
Numerous reptiles and amphibians live on Camp Grayling, including turtles, snakes, newts, salamanders, toads, frogs and one species of skink. Moist areas, such as creeks, rivers, ponds and lakes, generally support the majority of salamanders, frogs and turtles. Some snakes and the five-lined skink prefer the drier upland areas. A list of reptiles and amphibians likely to be present in the Camp Grayling area is in Appendix E.

3.6.2.5 Fish

The diversity of fish species found in the cool waters associated with Camp Grayling is not great, however, the Manistee and Au Sable Rivers support superior fisheries. Both the Manistee and the Au Sable are nationally recognized trout rivers containing brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*). Before fish introductions into these two rivers, the rivers supported a native population of grayling (*Thymallus tricolor*) as late as 1879. The last reported grayling taken from the area was in 1915 from the Manistee River. Refer to Appendix F for a list of fish present within the Camp Grayling vicinity.

The Range 40 study conducted at Camp Grayling in 1992 included sampling fish populations in several of the streams associated with the North Post. A station on the upper Manistee main stem was used as a reference site to compare with stations at other locations. Five other stations were sampled, one on the East Branch of the Au Sable and four on the North Branch of the Au Sable. One of the North Branch stations is located on the outflow of Guthrie Lake and its fish fauna are more representative of what would be expected in a lake, and will not be included as a stream station (see Figure 3-26). Table 3-20 gives a summary of fishery related statistics for the streams sampled in the Range 40 study. Individual river units are discussed below.

(1) Manistee River Basin: The reference sampling station on the upper Manistee River showed low fish diversity with only six taxa present. The site was dominated by three species representing approximately 96 percent of the fish captured, with trout being the



Camp Grayling FEIS	Figure 3-26
Fish Sampling Sites	

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most common. Brown trout composed 37 percent of the sample, brook trout 36 percent, and mottled sculpin (*Cottus bairdi*) 23 percent. The other three species included lamprey, central mudminnow (*Umbra limi*) and yellow perch (*Perca flavescens*). The low fish diversity at this station is what is normally expected in a headwater stream where resources are limited. However, the number of brook and brown trout indicate good production for these species. Population estimates for brook and brown trout at this site are 547 and 179 fish per 1,000 feet of stream (ESE, 1993).

(2) Au Sable River Basin:

(a) East Branch: The location sampled on the East Branch of the Au Sable River was dominated by white sucker (*Catostomus commersoni*) and yellow perch (*Perca flavescens*) with 40 and 32 percent, respectively, of the total number of individuals captured. This site was uncharacteristic of a second order stream due to the influence of beaver activity, thus the samples reflect community composition more like those expected in lentic habitats. Table 3-20 gives a summary of fishery related statistics for the East Branch of the Au Sable.

(b) North Branch: A total of seventeen taxa were collected from the three stations located on the North Branch of the Au Sable River (ESE, 1993) (see Table 3-21). Fish diversity, as calculated with the Shannon-Weiner method, increased along the upstream/downstream gradient as is commonly encountered in lotic systems. Table 3-21 gives a summary of fishery related statistics for the stations located on the North Branch of the Au Sable River.

Table 3-20
Range 40 Fishery Statistics

	Upper Manistee River	East Branch Au Sable River	North Branch Au Sable River (upstream -> downstream) Site 1	Site 2	Site 3
No. Individuals	235	95	154	535	400
No. Species	6	11	11	12	12
Diversity	1.73	2.17	2.08	2.21	2.69
Evenness	0.69	0.65	0.62	0.63	0.77
Catch/hour	117.5	380	168	1,070	609

Source: ESE, 1993.

Taxonomic dominance on the North Branch shifted from the upstream to the downstream sites. At the further upstream sample station, blacknose dace (*Rhinichthys atratulus*) and creek chub (*Semotilus atromaculatus*) were the dominant species (28 and 50 percent of the total number of individuals captured respectively). Fish composition was similar at the second station with blacknose dace (45 percent) and creek chub (29 percent) still dominant. At the furthest downstream location, near Lovells, several other species become more prominent, especially brook trout and brown trout (39 percent combined), and mottled sculpin (9 percent). Blacknose dace is still found in high numbers but constitutes only 24 percent of the total number of individuals captured.

Table 3-21
Fish Species Present in the North Branch of the Au Sable River
(upstream ---> downstream)

Scientific Name	Common Name	Station 1	Station 2	Station 3
Ambloplites rupestris	Rock Bass	x		
Catostomus commersoni	White Sucker	x	x	x
Cottus bairdi	Mottled Sculpin	x	x	x
Etheostoma caeruleum	Rainbow Darter		x	
Etheostoma nigrum	Johnny Darter	x	x	x
Lepomis gibbosus	Pumpkinseed			x
Lepomis macrochirus	Bluegill			x
Nocomis biguttatus	Hornyhead Chub	x		
Notropis cornutus	Common Shiner	x	x	
Percina maculata	Blackside Darter			x
Phoxinus eos	Northern Redbelly Dace		x	
Rhinichthys atratulus	Blacknose Dace	x	x	x
Rhinichthys cataractae	Longnose Dace		x	x
Salmo trutta	Brown Trout	x	x	x
Salvelinus fontinalis	Brook Trout	x	x	x
Seomotilus atromaculatus	Creek Chub	x	x	x
	Lamprey	x	x	x

Source: ESE, 1993.

Brook and brown trout populations were estimated at Stations 2 and 3 on the North Branch using the Peterson method. At Station 2, the estimated population of brook and brown trout per 1,000 feet of stream was 145 and 473, respectively. Population estimates at Station 3 were larger, with brook trout and brown trout estimated at populations of 1,513 and 295, respectively (ESE, 1993). Michigan Department of Natural Resources surveys have estimated populations at this site at 821 brook trout and 534 brown trout per 1,000 feet (ESE, 1993).

Lake fish communities were investigated for several lakes in 1992, as part of the Range 40 complex study. Refer to Table 3-22 for a list of fish species present in the lakes that were sampled in the Range 40 complex study. The investigation included River Lake, Barnes Lake, Guthrie Lake, and Lonesome Lake (ESE, 1993). Fish were captured with both passive (e.g., fyke nets, gill nets) and active (e.g., electroshocking) methods (ESE, 1993).

Fifteen taxa were represented in the four lakes sampled (Table 3-22). River Lake had the highest diversity with eleven species, Guthrie Lake had the second highest diversity with nine species, and Barnes and Lonesome Lakes had the lowest diversity with only three species collected. Yellow perch (*Perca flavescens*) and Bluegill (*Lepomis machrochirus*) were the dominant species at River Lake. Bullhead minnow (*Pimephales vigilax*), bluegill, yellow perch, largemouth bass (*Micropterus salmoides*), and northern pike (*Esox lucius*) were all common at Guthrie Lake. Samples from Lonesome Lake were predominantly bluegill and largemouth bass. Northern Pike and yellow perch were both common at Barnes Lake.

The Michigan Department of Natural Resources has been conducting annual surveys on the Manistee River to evaluate trout abundance. Four index stations have been surveyed since 1988. They are located at Deward, Cameron Bridge, County Road 612 Bridge, and the Michigan Highway 72 Bridge. Results from the 1992 survey indicate that the trout population is at the highest level recorded since 1988 with an estimated 901 trout/acre. During this period brown trout have decreased but brook trout are increasing (Smith, 1993). Results from the 1992 survey are given in Table 3-23.

To date, survey results indicate that at all stations except Cameron Bridge trout numbers are at a 5 year high. Trout populations at Cameron Bridge appear to be less stable than those at other locations. These results also indicate that the trout populations are beginning to respond to restoration activities on the Upper Manistee (Smith, 1993).

Table 3-22
Fish Species List for Lakes Sampled as Part of the Range 40 Complex Study

Scientific Name	Common Name	River Lake	Barnes Lake	Guthrie Lake	Lonesome Lake
Ambloplites rupestris	Rock Bass	x		x	x
Catostomus commersoni	White Sucker	x	x		
Esox lucius	Northern Pike	x	x	x	
Etheostoma nigrum	Johnny Darter				
Ictalurus melas	Black Bullhead	x			
Lepomis gibbosus	Pumpkinseed	x			
Lepomis macrochirus	Bluegill	x		x	x
Micropterus dolomieui	Smallmouth Bass			x	
Micropterus salmoides	Largemouth Bass	x		x	x
Nocomis biguttatus	Hornyhead Chub			x	
Notropis atherinoides	Emerald Shiner	x		x	
Perca flavescens	Yellow Perch	x	x	x	
Pimephales vigilax	Bullhead Minnow			x	
Salmo trutta	Brown Trout	x			
Umbra limi	Central Mudminnow	x			

Table 3-23
Manistee River Trout Index Survey 1992

Station	Brook Trout/acre	Brown Trout/acre
Deward	1040	133
Cameron Bridge	517	585
County Road 612 Bridge	475	88

3.6.2.6 Threatened and Endangered Wildlife Species

Consultations with the U.S. Fish and Wildlife Service and Michigan DNR have been conducted in accordance with Section 7 of the Endangered Species Act (USFWS, 1988).

The Michigan DNR Natural Features Inventory, as part of its contract for Camp Grayling, is doing field surveys and records research to confirm occurrences of threatened or endangered species. Four wildlife species: Kirtland's warbler (*Dendroica kirtlandii*), common loon (*Gavia immer*), red-shouldered hawk (*Buteo lineatus*), and bald eagle (*Haliaeetus leucocephalus*) have recorded occurrences within Post boundaries. The massasauga rattlesnake and the secretive locust, both "Candidate 2" species, have also been documented at Camp Grayling.

3.6.2.6.1 Federal Endangered Species

Kirtland's Warbler (KW) (*Dendroica kirtlandii*): All KW nests, with a few exceptions, have been found on Grayling sand soil (Kirtland's Warbler Recovery Plan, 1985). In addition to supporting jack pine and the low, sparse ground cover required by the KW, the capacity of Grayling sand to quickly drain summer downpours may be important in preventing KW nests set in the soil from flooding. KW typically begin using jack pine stands between 5 to 7 feet tall (or at an age of 6 to 13 years). Jack pine stands 8 to 18 years after regeneration by fire also provide ideal nesting habitat. However, stands less than 80 acres are seldom occupied by KW, and nesting success has been found to improve greatly with stands that are 200 acres and larger in size.

Michigan's population of Kirtland's warbler is the largest in 30 years, with 485 singing males reported after a 1993 Department of Natural Resources count of the birds completed in mid-June (DNR, 1993). This is a 22 percent increase over the 1992 count and the largest number reported since 502 singing males were counted in 1961. The numbers have increased every year since the record low of 167 Kirtland's warbler singing males were counted in 1987.

Ninety-five percent of the warblers counted in 1993 were located in Oscoda, Ogemaw, and Crawford counties (Weise, 1993). The number of singing males found in eight northern lower peninsula counties are shown in Table 3-24.

The Kirtland's warbler survey is conducted each year during the 10-day period during the first two weeks of June. The 1993 survey was a joint effort of the Michigan DNR, U.S. Forest Service, U.S. Fish and Wildlife Service, Michigan Department of Military Affairs, and citizen volunteers.

Bald Eagle (*Haliaeetus leucocephalus*): The bald eagle is typically a summer resident in the northern half of Michigan and is usually seen along lakes and streams or where waterfowl congregate. Dead or deteriorating trees in riparian areas are used extensively for perching, to rest or hunt and at times for nesting. Typical bald eagle habitat includes land within one-quarter mile of a major river or prey-supporting lakes larger than 40 acres

with mature or super-canopy trees (four to six per 320 acres) located at the edge of a forest stand with clear flight paths (USFWS, 1983).

There are several active eagle nesting areas in and around the Post. Two sites occur in Kalkaska county just north of the Post's leased lands. One nesting area in Crawford county lies partly within Post boundaries, while one of two nesting areas in Otsego county is on-post.

Table 3-24
1993 Kirtland's Warbler Census

County	Area	Singing Males	County Total
Michigan-Lower Peninsula			
Alcona	Pine River	11	11
Crawford	Bald Hill Burn Eldorado Fletcher Road Walsh Road Au Sable Area	20 6 5 2 1	34
Iosco	Pine River Tawas	2 1	3
Kalkaska	Fletcher Road	4	4
Ogemaw	Hippie Burn and Vicinity Ogemaw KWMA and Adjacent Perry Holt East Northwest Ogemaw	13 50 14 4	81
Oscoda	Big Creek LaBelle Lake Mack Lake Burn Muskrat Lake Perry Creek Red Oak Torched Skidder	34 3 295 4 2 1 5	344
Otsego	Crapo Lake	3	3
Roscommon	Forest Fire Experiment Station	4	4
Michigan-Upper Peninsula			
Schoolcraft	Steuben Vicinity	1	1
Michigan Total			485

3.6.2.6.2 Federal Proposed (Candidate) Species

Secretive Locust (*Appalachia arcana*): This species is classified as a Category 2 species. They are found in a variety of habitats, all with some sort of shrubby growth. They are most commonly found in bogs with dense growth of leatherleaf, labrador tea, tamarack, and jack pine. They also occur in jack pine, aspen and in early shrub-thicket stages of second-growth hardwood forests. They have been found in a number of locations.

Massasauga Rattlesnake (*Sistrurus catenatus*): The massasauga is typically found in bogs and swamps but also occurs in dry woodlands. This species has been documented once from Bear Swamp and twice from the Portage Creek area and has yet to be documented from North Post.

3.6.2.6.3 State Threatened Species

Red-shouldered Hawk (*Buteo lineatus*): This species is typically associated with wooded rivers and timbered swamps and has been documented at Camp Grayling. Thus far, the species has been sighted on three of the 60 LCTA wildlife plots which were established in 1992. No nest has been located.

Common Loon (*Gavia immer*): This species is a common transient and uncommon summer nesting resident in northern Michigan and a breeding pair of common loons is known to exist off-post at Wakely Lake. Common loons also frequent KP and Shupac Lakes within Post boundaries.

Refer to Table 3-25 for a complete list of listed wildlife species that are possible Camp Grayling inhabitants based on occurrence records in close proximity and the existence of suitable habitat. These species have not necessarily been documented within Camp boundaries.

3.7 Social Environment

3.7.1 Land Use Development

This section describes the on-post and off-post land use at Camp Grayling. Land use is described primarily through the use of tables in terms of land ownership, land use controls (zoning), military land use, and non-military land use.

Camp Grayling lies predominantly within the central and northeastern portions of Crawford county. Smaller portions lie within southern Otsego county and eastern Kalkaska county. The land use off-post, but within Crawford, Kalkaska, and Otsego counties, has been included in the study area since the economic effects of many Post activities occur outside the Post. (These lands have been entitled "outside the Post

boundaries.") The total land use study area is 1,062,400 acres, of which approximately 148,000 acres (14 percent) are within the Post boundaries. Table 3-26 details the study area by county acreages.

Table 3-25
"Listed" Wildlife Species that are Possible Occurrences at Camp Grayling

Scientific Name	Common Name	U.S. Status	MI Status
Martes americana	Pine Marten		T
Microtus pinetorum	Woodland Vole		SC
Dendroica discolor	Prairie Warbler		T
Accipiter gentilis	Goshawk	C2	SC
Botaurus lentiginosus	American Bittern		SC
Dendragapus canadensis	Spruce Grouse		SC
Falco columbarius	Merlin		T
Ixobrychus exilis	Least Bittern		T
Lanius ludovicianus	Loggerhead Shrike	C2	E
Picoides arcticus	Black-backed Woodpecker		SC
Rallus elegans	King Rail		E
Clemmys insculpta	Wood Turtle		SC
Emydoidea blandingii	Blanding's Turtle	C2	SC
Artrytonopsis hianna	Dusted Skipper		T
Incisalia henrici	Henry's Elfin		SC

E = Endangered
T = Threatened
C2 = Candidate
SC = Special Concern

3.7.1.1 Land Ownership

Major categories of land ownership on-post include: (1) the original Hanson Land Grant (10.8 percent) (land donated by Rasmus Hanson in 1913 to establish the Post), (2) lands held under leases in perpetuity (38.3 percent), (3) lands acquired in 1984 under 20-year leases (28.7 percent), and (4) lands owned by the Military Board (21.3 percent). A full description of these four land ownership categories follows in Section 3.7.1.2.1. Table 3-27 classifies these land ownership types by acreages held within category and county. The extent of these land ownership categories is shown graphically in Figure 3-4.

Table 3-26
Land Use Study Area County Acreage

County	Within Post Boundaries (acres)	Outside Post Boundaries (acres)	Total Area (acres)
Crawford	100,190	260,030	360,220
Kalkaska	41,711	323,624	365,335
Otsego	5,859	330,887	336,746
Total	147,760	914,541	1,062,301

Table 3-27
Land Ownership Acreages by Category and County

Ownership Type	Crawford County	Kalkaska County	Otsego County	Total Area
Military				
Hanson Land Grant	14,067	0	0	14,067
In Perpetuity	52,077	0	4,692	56,769
20-Year Leases	15,521	26,955	0	42,476
Military Board	17,649	14,756	1,167	33,572
Grayling Army Airfield				
Federal	836	0	0	836
State	40	0	0	40
Subtotal	100,190	41,711	5,859	147,760

3.7.1.2 Land Use Controls

3.7.1.2.1 Lands Under the Direct Control of the DMA

The lands in this category include the lands in the original Hanson Land Grant as well as the additions thereto under the leases in perpetuity, 20-year leases and land owned by the Department of Military Affairs (known as Military Board Lands). The location and extent of these lands are shown in Figure 3-4. The Hanson Land Grant was authorized by the State Legislature through Act 172 of the Public Acts of 1913 which became effective on May 2, 1913. The original authorization provided for the following uses: (1) permanent encampment and maneuvering area for militia, (2) game preserve, and (3) forest reserve.

Act 287 of the Public Acts of 1919 authorized recreational uses of the lands by state institutions and county and local governments, provided that such uses did not interfere with the military uses of the lands and that people with certain diseases were not permitted on the lands.

Act 28 of the Public Acts of 1934 further amended the original Act by allowing the transfer of Department of Natural Resources (DNR) lands to the Hanson military reservation and the exchange of lands. It was stipulated that hunting shall not be prohibited on any transferred lands.

Finally, Act 192 of the Public Acts of 1976 permitted the Military Board to take over highway improvements and maintenance from local governments for those highways within the Post boundaries. Act 192 further provided that the Military Board would make annual payments in lieu of taxes to those local units of government in whose jurisdiction the Post lands lay.

56,769 acres of land were leased in perpetuity from the Department of Conservation (now the Department of Natural Resources) by the Military Board under authority of Act 154, P.A. 1941 and executed on May 3, 1948. The "in perpetuity" lease allows the land to be used for military purposes by the Military Board, but the DNR retains control for hunting, fishing, timber, and mineral extraction purposes. The DNR must first obtain the permission of the Military Board before developing any conservation, recreational, or other project in order to assure that there will be no interference with military activities.

On October 11, 1984, the DMA and the DNR agreed to a 20-year lease covering over 42,476 acres of land in Crawford and Kalkaska counties. The lease is somewhat similar to the in perpetuity lease in terms of the right of the DMA to use the land for military purposes and the control of the DNR for other purposes. In addition, the lease provides for an unlimited number of optional 10-year extensions as agreed upon by the DNR and the DMA. Tanks and other tactical tracked vehicles (such as armored personnel carriers) are expressly prohibited from these lands.

Furthermore, the lease agreement requires the DMA to erect signs and/or fencing to limit or prohibit access by DMA personnel to certain sensitive areas. The agreement also prohibits access by the public into troop maneuver areas during periods of actual DMA use. The DMA must limit the use of off-road vehicles and it cannot allow the construction of roads on these lands by DMA personnel. However, the DMA is responsible for the maintenance and/or repair of all existing roads. Stream and wetland crossings are also prohibited, as is the use of designated deer ranges from December 1 to April 1. Kirtland's Warbler habitat areas cannot be used from May 1 to August 15. Finally, oil and gas lease areas containing facilities for this purpose will be protected from damage by the DMA.

3.7.1.2.2 Private Lands Within the Post Boundaries

The 20,150 acres of privately owned lands within the boundaries of the Post have been zoned for land use by the appropriate local unit of government (either township or county). The predominant zoning is recreational residential (33 percent) or residential/agricultural (37.7 percent), which is found inside the Post boundaries only in Crawford county and, despite its name, is primarily a recreational zoning. There are nine zoning classifications which can be found on the private lands within the boundaries of the Post. Table 3-28 presents acreages by zoning classifications and county. The following text defines the zoning classifications.

3.7.1.2.3 Private Lands Bordering Camp Grayling

There are 12 basic classes of zoning which have been mapped. The actual class names may vary slightly from jurisdiction to jurisdiction, but for purposes of clarity and consistency, similar zoning types were given the same class name.

Single family residential is the same in all of the governmental units with zoning and provides for a single home on a lot. The minimum allowable size of the lot may vary from jurisdiction to jurisdiction, but in all of them, only a single home is allowed.

Multiple family residential provides for higher density housing, such as duplexes, apartments, townhouses, or condominiums. All uses other than duplexes must get a special land use permit from the appropriate planning commission. This zoning is found only in the City of Grayling and Grayling Township.

Residential/agricultural zoning provides for single family housing, duplexes, and/or agricultural activities in Kalkaska, Otsego, and Crawford counties. Crawford county also allows for recreational uses. This zoning is intended for large tracts of land to insure proper development of those tracts should subdividing occur.

Recreational residential zoning is found in the same counties as residential/agricultural. In Grayling Township, this zoning is called forest recreational. Although a forest recreational zoning is mapped elsewhere, in Grayling Township, this zoning is shown as recreational residential because the zoning requirements were closer to the other

residential recreational zonings than to the other forest recreational zonings. The only recreational residential zonings in Crawford county are found in Grayling Township and Lovells. The intent of this zoning is to provide for resort and/or summer cottage types of uses. In Kalkaska county, this zoning classification is called resort-residential. Recreational residential zoning is the largest single zoning classification found outside of the Post boundaries.

Table 3-28
Zoning on Private Lands Within Camp Grayling

Zoning Classification	Crawford County (acres)	Kalkaska County (acres)	Otsego County (acres)	Total Area (acres)
Single Family Residential	1,278	0	0	1,278
Multi-Family Residential	1,054	0	0	1,054
Residential/ Agricultural	7,593	0	0	7,593
Recreational Residential	5,106	1,512	40	6,658
Forest Recreational	0	572	730	1,302
Commercial	202	0	0	202
Green Belt	1,296	0	0	1,296
Deferred Development	700	0	0	700
Planned Unit	67	0	0	67
Totals	17,296	2,084	770	20,150

Forest recreational zoning is the second largest zoning classification mapped outside of the Post boundaries. It is, however, found only in Kalkaska and Otsego counties. The purpose of this zoning district is to preserve these areas for specifically forest-oriented recreation (hunting, fishing, archery and shooting ranges for personal use, public parks, etc.) and industry (timber production and tree farms). Cabins, mobile homes, and single family dwellings are allowed without a Special Use Permit (SUP).

Commercial zoning is found in Kalkaska and Crawford counties and its purpose is obvious. Commercial zoning provides for general business uses such as stores of all types; personal services such as insurance agencies, doctors' offices, plumbers, etc.; and

uses catering to highway and tourist traffic. The different types of commercial zonings in various communities are all shown as general commercial.

Light industrial and heavy industrial zoning is found only in the City of Grayling and Grayling Township. These zonings apply to various kinds of manufacturing or value added activities.

Green belt zoning is found in Crawford county (except for the City of Grayling and Lovells). The intent of this zoning is to preserve the water quality of surface waters and extends 300 feet from the water's edge of all rivers, tributaries, and lakes. It allows single family houses, guest houses, and pertinent detached structures.

Deferred development zoning is found only in the Grayling Township. Its purpose is to reserve large areas for future development when it is appropriate, planned, and when utilities can service the areas. It also provides for a "native protection strip" which extends 400 feet from the water's edge for any body of water and within which the land must be kept in a strictly native state. The deferred development zone, outside of the native protection strip, allows the land to be used for land, water, and wildlife conservation, education and some agricultural activities (crop growing, but not the keeping of livestock, farm animals, or fowl).

Planned unit development zoning is found in Grayling Township of Crawford county (within the Post boundaries) and in Otsego county. Planned unit development (PUD) provides flexibility for the development of land. It allows residential, limited commercial, religious, cultural, and/or recreational uses of the land. The area must be master planned and have the approval of the planning commission before actual development can occur.

Office/Service zoning is found only in the City of Grayling. Its purpose is to allow the development of office buildings and associated personal services.

3.7.1.3 Land Use

3.7.1.3.1 On Post

The predominant land use within the boundaries of the Post is training areas and other army specific uses (80 percent) which overlap with public forest lands and other public areas (64.2 percent).

3.7.1.3.2 Bordering Camp Grayling

The predominant land use outside the Post boundaries is public lands, especially public forest lands. The second most common land use is private lands. Of the private land uses, recreation is the most common with forest close behind.

3.7.2 Waste Disposal

There are six general types of waste currently generated at Camp Grayling. They are solid waste, hazardous waste, nonhazardous liquid industrial waste, waste water, medical wastes, and toxic wastes. This section discusses procedures for their generation, handling, and disposal.

3.7.2.1 Solid Wastes

Typical solid wastes generated at Camp Grayling include paper, cardboard, newsprint, messhall scraps, glass, and scrap wood and metal. White office paper and scrap wood and metal are recycled. The vast majority of the volume is generated during the training season, from April to September, with the major portion generated by troops in the field. Operation of the cantonment area generates the remainder. Solid wastes generated in the field are collected at identified locations or returned to the cantonment area trash compactor by the troops. Transportation of solid waste is contracted with the landfill where it is disposed of. Camp Grayling's solid wastes are disposed of in the nearest licensed landfill, City Environmental Services of Waters, Inc., a privately operated landfill. The landfill is located off-post on Sherman Road in Maple Forest Township, Crawford county, approximately 1 mile west of Range 40.

Other types of solid wastes generated include contaminated soil from fuel spills, demolition or remodeling debris from renovation of buildings (may include asbestos material), leaves, tree limbs, and brush from groundskeeping, and unexploded ordnance on the ranges. Contaminated soil requires special approval from the landfill prior to transporting, including sampling and characterization of the waste. Asbestos material is handled in accordance with 40 CFR, Part 61, Subpart M, National Emission Standard for Asbestos. Dud ammunition in the impact areas of ranges is periodically cleared by explosive ordnance demolition personnel. The scrap metal left after detonation is recycled.

A small solid waste landfill was operated at Camp Grayling until 1981. The former landfill is located adjacent to the southwest edge of the cantonment area, and covers an area of 3 acres. The type of wastes disposed of were wood, demolition debris, and general trash from the Post. The landfill was covered and capped with clay in 1987. The landfill was fenced and seven groundwater monitoring wells were installed as directed by the DNR. The monitor wells are sampled and analyzed annually in accordance with a monitoring agreement worked out with the Department of Natural Resources Waste Management Division. Groundwater sample analysis indicates that groundwater quality within the vicinity of this site has not been affected.

3.7.2.2 Hazardous Wastes

Camp Grayling generates hazardous wastes from several of its operations and processes, such as wheeled, tracked and aviation equipment maintenance, fuel transfer, painting, military training, and other operations essential to running the installation.

Waste is generated by the full time installation staff and the weekend units during training.

The U.S. EPA and the State of Michigan consider a waste hazardous if it contains one or more of the approximately 400 substances the U.S. EPA or State of Michigan have listed as hazardous (40 CFR Part 261, Subpart D; R 299.9213-9226) or exhibits one of four characteristics (ignitability, reactivity, corrosivity, or toxicity)(40 CFR 261, Subpart C; Michigan Act 64, R 299.9212).

The Federal hazardous waste law is the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984. Regulations concerning hazardous wastes are codified in the Code of Federal Regulations, Title 40 (40 CFR). State hazardous waste regulations are contained in Act 64 of 1979, Part 3, Rules 101 through 1107. The State of Michigan, Department of Natural Resources, Waste Management Division, enforces the Federal hazardous waste laws.

Certain Army regulations detail the military's compliance with the hazardous waste laws. These include:

AR (Army Regulation) 420-47, Solid and Hazardous Waste Management
AR 200-1, Environmental Regulations
MIARNG (Michigan Army National Guard) 420-4, Regulated Waste
CG (Camp Grayling) Regulation 55-1, Environmental Protection
CG Regulation 200-1, Environmental Regulations

Camp Grayling has three separate sites that generate hazardous wastes and are considered to be small quantity generators. Each of these, the cantonment, the Army Aviation Support Facility #2 (AASF2), and the Mobilization and Training Equipment Site (MATES), has an EPA hazardous waste identification number (40 CFR 262.12; R 299.9303). Each generates less than 1000 kilograms (kg) per month of hazardous waste (refer to Table 3-29 for typical waste generated) and never accumulates more than 6000 kg of hazardous waste at any one time (40 CFR 262.34(d); R 299.9306(4)).

Hazardous wastes at Camp Grayling are characterized by using knowledge of the material plus laboratory testing (40 CFR 262.11; R 299.302). Table 3-29 shows Camp Grayling's current regulated waste streams and how they are characterized. Table 3-30 shows the types and amounts of regulated waste which have been generated over the last five years.

Hazardous waste generated at each of the three sites is turned into that site, and not transported between sites (MIARNG 420-4, 4-3). Field units and the state garage (Building 31) turn in their waste to the cantonment site. AASF2 receives waste from the 1071st Maintenance unit, the bulk fuel site, and the airfield. MATES has several shops which turn in to their site, including the wheeled vehicle shop, the tracked vehicle shop, and the paint room.

Table 3-29
Camp Grayling Regulated Waste Streams (Compiled 1993)

Waste Stream	Waste Code	Type of Waste
Waste Paint Related Materials (Paint Gun Cleaner)	F005 D006 D007 D008 F003 D001	solvent cadmium chromium lead solvent ignitible
Waste Paint Related Materials	D001 D008 D018	ignitible lead benzene
Parts Washer Solvent	D001 D039 D018	ignitible tetrachloroethylene benzene
Waste compounds, cleaning, liquid (carb cleaner)	D006 D018 D039 D040 D027 D007 D008	cadmium benzene tetrachloroethylene trichloroethylene 1,4-dichlorobenzene chromium lead
Waste antifreeze	D008 D039 D036	lead tetrachloroethylene nitrobenzene
Fuel cell filter material	D001 D018	ignitible benzene
Waste hydrochloric acid	D002 D006 D007 D008 001D	corrosive cadmium chromium lead copper
Paint filter media	D007	chromium
Protective mask filters	D007 001D	chromium copper
Waste silicone brake fluid	D018	benzene
Propellant residue	D008	lead
*Waste aviation fuel	D001 D018	ignitible benzene
*Waste JP-4	D001 D018	ignitible benzene

*Waste gasoline	D001 D018	ignitible benzene
*Waste fuel oil, diesel	D001 D018 or 021L	ignitible benzene or other oils
Waste oil, engine or crankcase	017L	crankcase oil
Waste lube oil, aircraft turbine engine, synthetic	020L	lubricating oil
Waste synthetic oil	020L	lubricating oil
Waste hydraulic oil, FRH, aircraft	021L	other oils
Waste hydraulic oil, OHT, howitzer	021L	other oils
Transmission fluid	021L	other oils
Gear oil	020L	lubricating oil
Washwater	029L	other wastes
Washwater sludge	029L	other wastes
*These are a waste when not re-usable as a fuel or recyclable.		

The type and quantity of waste produced at each generation site is recorded at that site (MIARNG 420-4, Chapter 8). Each site has a workplace generator who is responsible for record keeping and the day to day actions involving hazardous waste. This person's duties are outlined in MIARNG 420-4 (1-6)(h).

A hazardous waste storage building designed to environmental and safety standards is located at each site. These are Building 560 (cantonment), Building 1103 (AASF2) and Building 1401 (MATES). All wastes are stored in approved containers according to 40 CFR 265 Subpart I and R 299.9306 (4)(b). When any quantity of a waste is moved into the hazardous waste storage building, it is immediately labeled and dated (40 CFR 262.34 (d)(4); R 299.9306 (4)(c) & (d)). Wastes are stored in these buildings for no longer than 270 days, since the distance to the nearest disposal site is over 200 miles. (40 CFR 262.34(e); R 299.9306(5)).

There are also several satellite accumulation areas at Camp Grayling. These are areas where hazardous wastes are accumulated at or near the point of generation, such as in a shop near where maintenance is conducted. These areas are managed in accordance with 40 CFR 262.34 (c) and R 299.9306 (2). Containers are labeled with the proper notation, but not dated. When 55 gallons of a waste is collected at a satellite accumulation area, it is moved within 3 days to the hazardous waste storage area and the accumulation start date is added.

Table 3-30
Camp Grayling Regulated Waste Generation, 1989-1993

Waste	1993	1992	1991	1990	1989
solvent	674 g	476 g	466 g	356 g	531 g
antifreeze	248 g	1176 g	844 g	840 g	749 g
asbestos	none	1250 lb	none	1005 lb	405 lb
battery acid	21 g	1940 g	440 g	504.5 g	360 g
brake fluid	none	2 g	none	none	none
break free	none	6 g	none	none	none
diesel fuel	3550 g	2355 g	1872 g	1638 g	1705 g
floor sealer	none	9 g	none	none	none
gear lube	none	none	22 g	15 g	none
hydraulic fluid	50 g	67 g	16 g	355 g	165 g
JP-4	none	410 g	73 g	185 g	265 g
mogas	530 g	241 g	225 g	265 g	150 g
waste oil	5187 g	3899 g	5091 g	6771 g	5095 g
transmission fluid	none	12 g	none	none	none
wood preservative	none	30 g	none	none	none
paint thinner	440 g	65 g	58 g	164 g	165 g
synthetic oil	50 g	50 g	none	none	none
carburetor cleaner	23 g	none	none	none	none
fuel cells	440 lb	705 lb	none	300 lb	120 lb
washwater	168,300 g	169,900 g	121,925 g	145,225 g	148,800 g
waste paint	1095 lb	none	none	none	none
PCP ammo boxes	none	none	none	none	53440 lb
potassium nitrate	none	none	none	none	30 g
white soda flake	none	none	none	none	300 lb
combustible liquid	none	none	none	none	38 g

Waste is disposed of either through the Defense Reutilization and Marketing Service (DRMO) or a private contractor. All waste is shipped in accordance with the U.S.

Department of Transportation (DOT) rules which are codified in 49 CFR, including approved packaging, labeling, and manifesting with the uniform hazardous waste manifest (40 CFR 262 Subpart B; R 299.9304). Waste is transported by the United States Property and Fiscal Office (USPFO), which has a DOT hazardous waste transporter license, or a private licensed transporter. It is taken to a licensed transfer facility or directly to a licensed treatment, storage, disposal facility (TSDF). Land Ban regulations are followed when disposing of hazardous waste (40 CFR 268).

3.7.2.3 Liquid Industrial Wastes (non-hazardous)

Camp Grayling generates certain wastes which are not hazardous but are non-hazardous liquid industrial wastes. These are regulated under Michigan Act 136, the Liquid Industrial Waste Act of 1969. These are generated by vehicle and aircraft maintenance on the installation.

Spent oil is not considered a hazardous waste if it is recycled or reclaimed, even if it has hazardous characteristics (40 CFR 261.6). Waste oil includes engine oil, synthetic turbine oil, fuel oil (diesel), synthetic oil, hydraulic oil (FRH and OHT), transmission fluid and gear oil. Waste oil is picked up by a contractor licensed under Act 136 and taken to a licensed facility for recycling.

3.7.2.4 Wastewater

The Post's cantonment area generates sewage and graywater from offices, messhalls, bathhouses, and other buildings. Vehicle washwater is generated from a wash pad. No industrial type wastewaters are generated. Most wastewater is generated during the training season (April to September) when the population of the cantonment area can increase to 10,000 troops. Wastewater is collected and routed to the Post's wastewater treatment facility. The treatment facility is located northwest of the cantonment area on the south edge of Bear Swamp.

In 1991 a new wastewater treatment facility was constructed to replace the old sand filter treatment system that had failed to adequately treat the effluent. The pump stations in the collection system were also upgraded as part of the project. The treatment facility is comprised of a series of three treatment/storage lagoons, two aerated and one facultative. The total yearly flow is approximately 75 million gallons. Total capacity of the lagoons is 22 million gallons. Final discharge of the effluent is by spray irrigation to a 40-acre forested area adjacent to the lagoons. A state groundwater discharge permit was required and obtained to discharge the effluent. The permit allows a maximum of 1,100,000 gallons per day to be discharged during the months of April through October. In addition to effluent testing requirements, 13 groundwater monitoring wells were installed around the facility. Concentration limits and groundwater monitoring requirements are described in the permit.

Wastewater generated at the commander's private residence and the Ammunition Supply Point is treated with septic tanks. The airfield buildings are served by the City of Grayling wastewater collection system.

The MATES facility located on North Down River Road has its own septic system for sewage and graywater. Vehicle washwater is also generated at the MATES. Washwater generated inside the building is collected via floor drains and stored in a 20,000-gallon underground tank. The tank is periodically pumped and the contents hauled to the cantonment area treatment facility. Sampling is conducted to insure the suitability of this waste stream for the treatment facility. There is also an outside tank washing pad at the MATES. This washwater is collected in a series of basins and discharged through sand filters. A state groundwater discharge permit was obtained to discharge the effluent. Eight groundwater monitor wells were installed around the facility.

Field operations also generate wastewater during the training season. The Jones Lake Base Camp, located just south of County Road 612, provides a semi-permanent shower and latrine facility for troops. The sewage and graywater is collected in a sump and pumped out onto the ground from a discharge point at the end of a hose. This procedure has been approved by the local health department. Self-contained, portable toilets are used in several locations around the training site. These are pumped out by Post personnel using a small tank truck. The sewage is disposed of in the cantonment area treatment facility or land applied in the case of those toilets located far away in the North Post. Military mobile water purification units generate a slurry residue of water, diatomaceous earth, and low concentrations of ferric chloride. The slurry is discharged to the ground through the end of a hose. A setback distance of 200 feet from any surface water body is required for the discharge. A permit exemption was obtained from the state for these groundwater discharges. Military mobile shower and laundry units generate graywater. These units discharge to either a seepage pit dug in the ground or through the end of a hose on top of the ground. These temporary discharges are unregulated by the state or local health department. Other minor unregulated discharges of graywater occur at field kitchen sites, where soakage pits, soakage trenches, or evaporation beds are used for disposal of liquid cooking wastes.

3.7.2.5 Medical Wastes

Medical wastes generated at Camp Grayling are produced at the Troop Medical Clinic (TMC) or individual units training in the field. These include Sharps, blood sample tubes, bloody rags, gauze, materials stained with blood or body fluids, and non-hazardous waste controlled drugs and pharmaceuticals. No hazardous waste regulated medical waste products are generated at Camp Grayling. All the above listed medical wastes generated by the TMC or individual units training at Camp Grayling are stored within Sharps containers and/or appropriately marked and secured biohazard bags as required by Act No. 368 and Camp Grayling TMC SOP of 10 January 1993.

Camp Grayling is registered with the Michigan Department of Public Health (DPH) as a Producing Facility of Medical Waste and has written, submitted, and implemented a

current Medical Waste Management Plan as required by Michigan Act No. 368 of the Public Acts of 1978; Part 138 Michigan Medical Waste Regulatory Act.

All medical wastes are placed in appropriate Sharps containers and/or biohazard bags located throughout the TMC. Ninety-five percent of these containers are mounted and locked into the wall. When these containers are full they are exchanged for an empty container. In nonpatient areas, these containers are freestanding and when these containers become full they are to be exchanged on a one-for-one basis. The full containers are then turned in to the logistical support facility (Building 560) where they are stored within a high security vessel with approved high security locks. This container is located outside and in the rear of the logistical support facility and no medical wastes enter Building 560. All waste, including Sharps containers turned in to the logistical support facility are in biohazard bags. Medical wastes are stored on Camp for a period not to exceed 90 days. Yearly generation of medical wastes at Camp Grayling averages 65 bags per year.

No on-site or off-site decontamination occurs. All medical wastes generated are stored as described and transported by private contractor to an approved facility where all wastes are incinerated. No actual wastes are disposed at any sanitary landfills, cemeteries, or other disposal sites.

3.7.2.6 Toxic Substance Control Act Wastes

Camp Grayling generates small amounts of toxic wastes, primarily asbestos and polychlorinated biphenyls (PCBs). These are handled in compliance with the Toxic Substance Control Act (TSCA).

Camp Grayling inventoried all transformers on Camp property for PCB content in 1990. Any transformers found to have PCBs were disposed of according to the regulation in the TSCA. Small amounts of PCBs are now generated in light ballasts. These are collected in a 30 gallon drum, which is placed inside a 55 gallon overpack drum with proper labeling and markings. When this is full, it is disposed of through a licensed facility.

3.7.3 Archeological and Historical Resources

Under several historic preservation laws and Executive Order 11593 the Department of the Army has the responsibility to identify and preserve cultural resources, or mitigate losses thereto, on lands under its jurisdiction. The pertinent authorities for this responsibility include the Antiquities Act of 1906, the Historic Sites Act of 1935, the National Historic Preservation Act of 1966, as amended, the Reservoir Salvage Act of 1960, as amended, Executive Order 11593, the Archeological Resources Protection Act of 1979, the National Environmental Policy Act of 1969, and Army Regulation 420-40, Historic Preservation.

3.7.3.1 Prehistoric and Historic Background

The Camp Grayling area was both prehistorically and historically one of the least densely populated areas of the state. The native pine forests of this region had a very low carrying capacity and the headwater streams which are located here did not support abundant fauna. The sandy soils are poor and the growing season is too short to grow most crops successfully. Most Indian groups appear to have avoided the area and it was not settled until the 1870s when loggers arrived to harvest the abundant white pine. Farmers who tried to work the soil after the region was logged failed. Recreation and military activities are now the principal means of making a living in this still sparsely settled area (Robison and Seckinger, May 29, 1987).

3.7.3.2 Programmatic Agreement and Historic Preservation Plan

A cultural resource assessment for the development of a programmatic agreement and historic preservation plan (required by Army Regulation 420-40) was conducted at Camp Grayling by the Army Corps of Engineers, Mobile District, in May 1987 (Robison and Seckinger, May 29, 1987). The assessment included a literature search and records review followed by field investigations to determine archeological potential and level of disturbance. Cantonment area structures were inventoried and examined for significance. The Historic Preservation Plan has been prepared and was coordinated with the Michigan State Historic Preservation Officer (SHPO). A Programmatic Agreement and the Historic Preservation Plan are awaiting approval by all signatories (MIARNG, Michigan State Historic Preservation Officer (SHPO) and the Federal Advisory Council on Historic Preservation (the Council).

The Historic Preservation Plan includes an overview with a description of the Camp and the area's prehistoric and historic background; an initial inventory and description of the inventory process; and cultural resources protection program recommendations.

The cultural resource assessment called for future archeological surveys to be restricted to several Camp areas: (1) those areas adjacent to streams or lakes, (2) a selected portion of the areas which lie alongside of old railroad grades (thought to be prime locations for old lumber camps) and areas where extinct communities are known to have been located. All impact areas and ranges, firepoints, the cantonment area, the airport, the oil field, tank maneuver areas and the interior sand areas away from any water sources need not be surveyed (Robison and Seckinger, May 29, 1987).

3.7.3.3 Prehistoric and Historic Sites

Two confirmed and one unconfirmed archeological sites have been recorded for Camp Grayling. One confirmed site, consisting of surface lithic scatter, was located by a survey conducted in 1965 by the University of Michigan Museum of Anthropology along the western periphery of the Camp. This site was revisited by Corps of Engineers investigators in 1987, and was found to be impacted by borrow pit activities (Historic Preservation Plan, 1988).

The second confirmed site, consisting of small flakes of chert (a rock commonly used to form arrowheads), was found by Department of Natural Resources, Natural Features Inventory personnel in 1992. These artifacts indicate a prehistoric site of undetermined age where stone tool-making occurred. The artifacts are curated by the Bureau of History, Michigan Department of State (Mead, Barbara, letter, 8 June 1992).

The unconfirmed site consists of small flakes of chert found by Department of Natural Resources personnel in July 1993. These materials have been sent to the State Bureau of History for examination.

Within the cantonment area, one structure, Building 311, the Officer's Open Mess, is on the State Register of Historic Sites. This building is presently Michigan Historic Site Number 508. The SHPO has determined that Buildings 103, the original Camp hospital, and 117, the original Camp headquarters, are eligible for the Register. These three buildings have also been recommended as being eligible for the National Register of Historic Places (Historic Preservation Plan, 1988). (None of these buildings are proposed to be modified by actions addressed in this EIS.) Since most of the older structures have been altered to some degree, they may prove to be of little interest to the state (Robison and Seckinger, 29 May 1987).

3.7.4 Recreation Availability

The primary function of Camp Grayling is military training. However, the Post does offer on-post recreational opportunities to employees and trainees.

Access to Lake Margrethe is available via boat launch located in the cantonment area (south end of the lake) and another launch site located at the DNR Forest Campground on the northwest side of the lake, just off of McIntyre Road. Several other lakes are wholly or partially within the Post boundaries and are available for water-based recreational activities. Rowboats, paddle boats, canoes, and kayaks are available for use through the in-post special services warehouse. No designated swimming areas are provided on Lake Margrethe.

Athletic areas are located on-post and include softball fields, basketball, volleyball and tennis courts, and the parade field. Equipment for these and other activities, including footballs, badminton, horseshoes, table tennis, frisbees and darts are available for use through the special services warehouse.

Service clubs are provided for military personnel training at the Post. An officers Open Mess, NCO Club, Enlisted Persons Club and liquor store provide opportunities for socializing and relaxing. Religious services, including weddings, are held in the Post chapel.

The DNR has lead responsibility for natural resource management of Camp Grayling. The Post is generally open to public recreation similar to that of state forests. Though no formal access points are provided, hunting, fishing, horseback riding, hiking and berry

picking occur on Post property. Winter activities include cross-country skiing, snowmobiling, and ice fishing.

Camp Grayling is situated in a portion of Michigan noted for an abundance of natural resource-based recreation opportunities. The entire northern portion of Michigan's Lower Peninsula is noted for its excellent stream fishing, downhill skiing, snowmobiling, and large expanses of accessible forests. Within the immediate seven county area of the Post there are numerous public and privately operated facilities for both summer and winter activities.

The area of Michigan including and surrounding Camp Grayling attracts both Michigan and out-of-state residents. The abundance of lakes, streams and publicly-owned forests makes the area attractive as a destination for weekend and longer vacation trips. Cabins and summer homes are popular in this area and are used for both summer and winter activities.

Two rivers of high recreational significance bound near portions of the Post. As part of the federally administered National Wild and Scenic River System, the Manistee River (portions designated as wild) and the Au Sable River (portions designated as scenic) are recognized as recreational resources worthy of federal protection. These rivers offer a spectrum of recreation opportunities that vary with the seasons. The heavy use periods include midsummer canoeing, year-round fishing, fall hunting and mid-winter snowmobiling.

The Au Sable River, in particular, is recognized nationally as one of the premier trout streams in America and attracts an estimated 72,000 anglers annually (USDA, 1982). Canoeing is also extremely popular on the Au Sable and Manistee Rivers. Perhaps one of the heaviest canoed rivers in the country, the Au Sable accommodates an estimated 200,000 canoeists annually (USDA, 1982). Public access points are provided along the Au Sable, with most located near the heavily used Grayling area. Private canoe liveries are provided along the entire run. In the stretches centered around the Crawford county area, 11 liveries were in operation during the summer of 1993 (Grayling Area Visitors Council, 1993).

A stretch of the Upper Manistee River flows in proximity to portions of Camp Grayling's western boundaries. The cool and notably high-quality water offers prime habitat for trout and has earned a national reputation as blue ribbon trout water. The river is also known for its wilderness-like setting and offers excellent canoeing, camping, hunting, and fishing opportunities.

Three state forests account for sizable land holdings in and near Camp Grayling: Crawford county - Au Sable State Forest (748,458 acres including 12 State campgrounds), Kalkaska county - Pere Marquette State Forest (621,052 ares including four State campgrounds), and Otsego county - Mackinaw State Forest (663,843 acres including seven State campgrounds). State forests provide large expanses of land and are managed for multiple uses -- one of which is recreation. Popular activities include

hunting, hiking, horseback riding, mushroom hunting, blueberry picking, fishing, and trail touring. Dispersed activities are also accommodated at state forests. Special areas and trails are designated for dirt bike and off-road vehicle use -- some with designated campgrounds.

Also in Crawford county, immediately east of Camp Grayling, is the Huron National Forest. It contains two national campgrounds with a variety of amenities. The forest provides camping, hunting, fishing, hiking, swimming, boating, and berry picking. Winter activities include snowmobiling and cross-country skiing. Mio Mountain Ski Area, located in Huron National Forest, is approximately 20 miles from the Post.

Most of the activities in a state forest center around the designated campgrounds and are adjacent to lakes or rivers and offer water-based recreation opportunities. Forest campgrounds are generally small, ranging from 5 to 50 campsites. The character of these campgrounds is quite diverse and range from "social interaction" settings to "get away from it all" environments.

The three-county area also includes three state parks: Crawford county - Hartwick Pines (187,188 total attendance FY93), North Higgins Lake (205,954 total attendance FY93), and Otsego county - Otsego Lake (133,334 total attendance FY93) (DNR, 1994). In contrast to state forests, state parks are generally expressly designated for recreational use. Facilities are generally more highly developed and of greater diversity than those in state forests.

Hartwick Pines State Park, adjacent to Camp Grayling on the Post's western border of North Post, is one of Michigan's most heavily used parks. Hartwick Pines is one of Michigan's larger parks (9,672 acres) and provides a total of 62 modern and rustic campsites. The park's most noteworthy feature is the stand of virgin white pine. Michigan's logging museum and historic lumber camp are also featured in the park.

South of Camp Grayling is Higgins Lake North State Park. This park (429 acres) offers 218 modern campsites. A wide range of facilities are offered, and it is noted for wooded campsites and fine beaches.

Otsego Lake State Park is located just north of Camp Grayling. This relatively small park (62 acres) has 203 modern campsites and facilities for water-based recreational activities. The park is noted for its sandy beach and excellent fishing.

The three state parks draw visitors to the area for outdoor recreation. In FY93 the three parks recorded 526,476 visitors (DNR, 1994). During heavy use periods, these parks have on occasion refused admittance to day users and/or campers because capacities were reached.

The economic consequence of state park visitors, though a small part of local retail and service sales, is noteworthy to the local area. Based on an average expenditure of $5.10

per visit (Michigan Department of Commerce, 1985) visitors bring approximately $2.68 million to the local economy.

The DNR also provides facilities for specific use. One such resource is the Michigan Cross-Country Cycle Trail. This trail is designated for dirt bikes and loops through the northern portion of the lower peninsula. Portions of this trail are in Grand Traverse, Kalkaska, Otsego and Roscommon counties. The St. Helen Motorsports Area in Roscommon county is a special area designated for motor sports use. Nearly 1,280 acres are available for off-road vehicle use. The area sports a large network of state designated and marked snowmobile trails, including 200 miles of trails in Crawford county (see Figure 3-27).

Recreation opportunities near Camp Grayling are also offered by private operators. Within 50 miles of the Post, 13 private campgrounds were in operation in 1993 (Grayling Area Visitors Council, 1993). These campgrounds offer a wide variety of facilities and can usually accommodate all types of camping vehicles.

Downhill skiing is a popular recreation activity in the Grayling area. Five privately operated areas and one publicly operated area (Hanson Hills - Grayling) are within 50 miles of the Post. Hanson Hills Recreation Area, located off M-93 near the entrance to Camp Grayling and Lake Margrethe, offers inexpensive downhill skiing plus 34 miles of available cross-country ski trails.

Counties, townships and municipalities provide numerous recreation facilities in the area. Facilities include small roadside parks, water access sites, larger day-use facilities, golf courses and campgrounds. Local governmental units, often in conjunction with local clubs and organizations, commonly provide horse trails, snowmobile trails and ORV routes. These parks are typically patronized by local residents and occasional travelers.

Camp Grayling itself is an important provider of recreational opportunities. The Post function is similar to that of a State Forest in providing natural resource-based recreation activities such as berry and mushroom picking, hunting, bird watching, and fishing. A DNR-maintained snowmobile trail crosses the Post in several locations. Informal access is allowed to lakes and streams within the Post. Two designated access sites are provided to Lake Margrethe. Two State Forest campgrounds are located adjacent to the Post boundaries but are not on military property. These areas are Jones Lake Forest campground in the northern portion of the Post and Lake Margrethe campground on the northwest shore of the lake. These areas accommodate trailer and tent camping and offer water-oriented recreation opportunities.

Information on recreation and tourism visitation is limited. Consequently, it is difficult to quantify the importance of the area's natural resources and facilities for recreational purposes. Much of the resource defies easy collection of this information because of open access and the dispersion of activities. The importance of the area for recreation and the contribution of these amenities to the local economy must be acknowledged.

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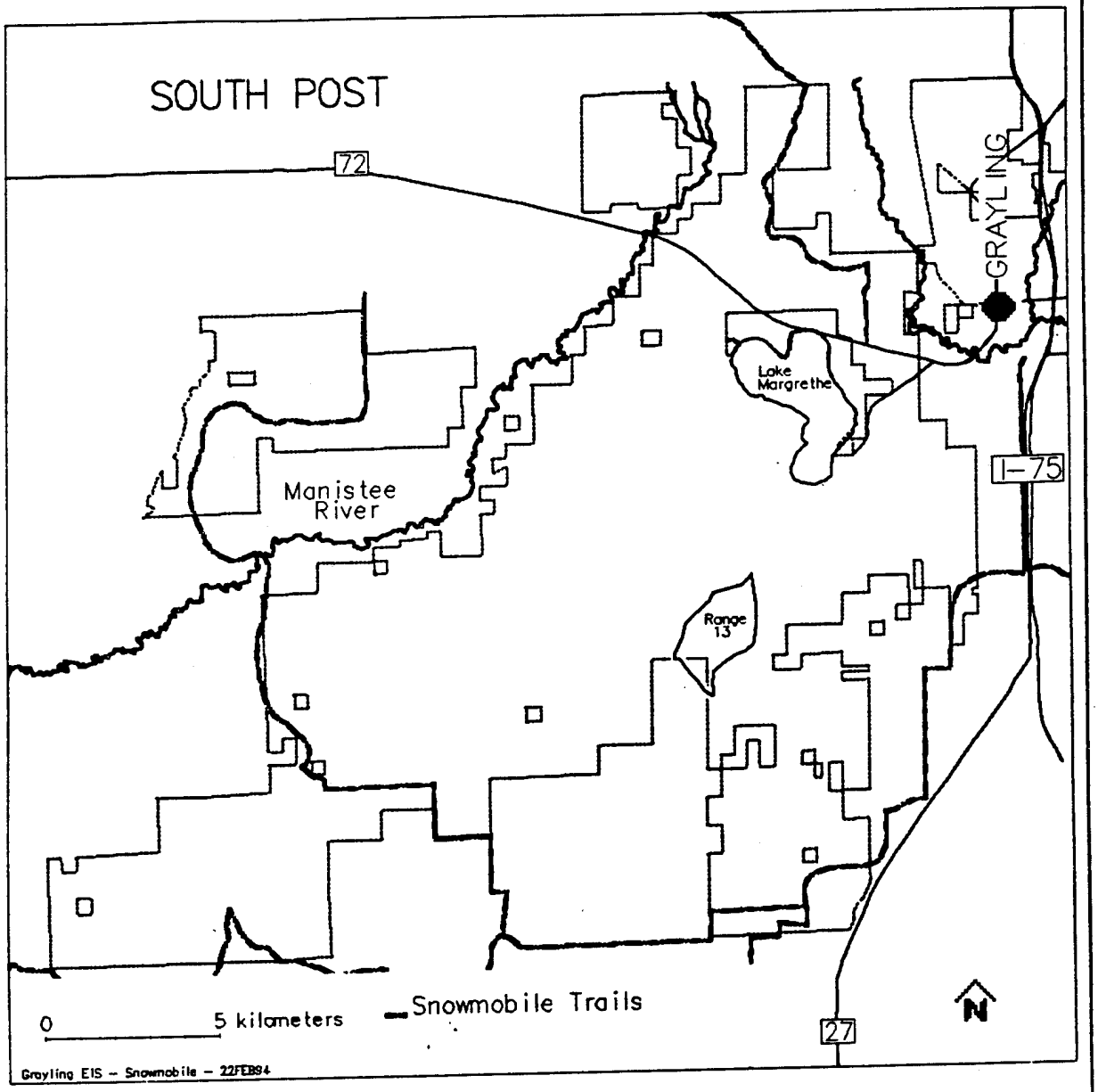

Camp Grayling FEIS	Figure 3-27A
Snowmobile Trails	

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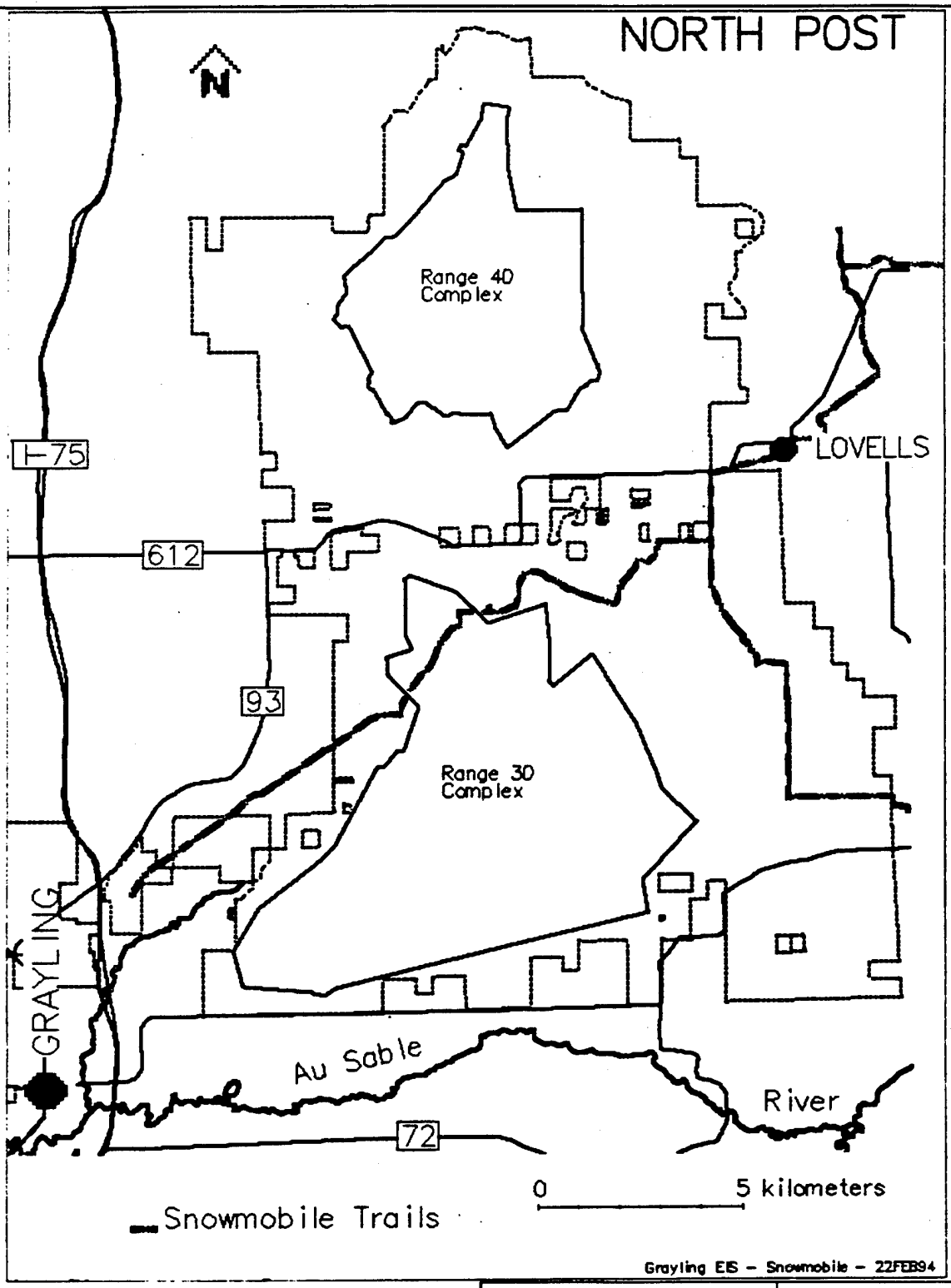

Camp Grayling FEIS	Figure 3-27B
Snowmobile Trails	

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During the Public Involvement process (see Section 1.2.3) questions were raised about military training activities at Camp Grayling that interfere with outdoor recreation. To address these public concerns, a special 1-year study of the outdoor recreation opportunities and experiences of persons in the Camp Grayling area was undertaken. The key objective of this study was to identify the type and magnitude of outdoor recreation use of the area, especially dispersed recreation use (e.g., hunting, fishing, trail and pathway recreation, etc.).

Thus far, summer, fall, and winter recreational surveys have been completed. A total of 543 vehicles were noted by researchers during the summer sampling period, and 287 questionnaires were returned by respondents. The summer survey suggests an estimate of 490,856 dispersed user hours. This equates to approximately 3.6 user hours per acre for the summer season. In the summer of 1992, it was estimated that on the Au Sable State Forest there were approximately 1.8 user hours per acre while on the Huron Manistee National Forest there were 0.8 user hours per acre (Nelson, 1994).

A total of 343 vehicles were sampled during the fall. Unlike the summer data, no "retreat" groups of 500 or more individuals were encountered. Therefore, the data is based on a wide range of small groups. After the data were analyzed, a fall estimate of 173,718 dispersed user hours were determined. This accounts for approximately 1.3 user hours per acre. In fall 1992, it was estimated that on the Au Sable State Forest there were approximately 1.8 user hours per acre while on the Huron Manistee National Forest there were approximately 1.7 user hours per acre.

A total of 93 vehicles were sampled during the winter. A winter estimate of 74,402 dispersed user hours were computed which equates to approximately 0.6 user hours per acre. There were no comparable estimates for the Au Sable State Forest or the Huron Manistee National Forest as no dispersed use studies were conducted during the winter.

The estimates reported from the surveys are conservative, since they do not include those individuals who did not park a vehicle on or near the sample compartments but did use the area for recreational activities.

3.8 Economic Environment

An analysis of the economic and social effects of Camp Grayling on the surrounding region requires delineation of a geographic area of influence within which the Post's actions would have meaningful effects. For purposes of analysis, an economic effects area has been delineated and is broadly defined as the area where civilian and military personnel and their dependents associated with a military facility live and shop. The delineation of such an area is somewhat arbitrary. The economic effects area consists of Crawford, Kalkaska and Otsego counties (see Figure 3-6). These counties provide the majority of services to Post personnel and have been defined as the area of influence in

past socioeconomic studies. To remain consistent with these past studies, this document focuses on the socioeconomic impacts to these three counties.

Though socioeconomic characteristics and impacts are rarely constrained by political boundaries, a county-level delineation is necessary to obtain both census data and other economic information since, in many cases, the county is the smallest unit of analysis.

3.8.1 Employment Profile

Tables 3-31a and 3-31b shows employment trends in broad occupation categories. The number of proprietors has increased steadily each year from 1979, with all of the increases in non-farm proprietors. Private employment has been relatively stable. Manufacturing employment showed a slight, but steady increase in the years 1985-1990. Services employment in the same time period increased by approximately 34 percent. Government enterprises increased approximately 20 percent. All employment categories shown rose to the highest levels in the five-year period (Bureau of Economic Analysis, 1992).

3.8.2 Regional Economy

3.8.2.1 Present Status

The number of business proprietors has increased steadily each year from 1979, with all of the increases in non-farm proprietors. The number of farm operators decreased slightly. Mining has decreased approximately 10 percent since 1978 and construction has steadily decreased a total of 29 percent from a peak in 1979. Manufacturing has fluctuated over the 5-year period but overall has remained stable since 1978 (Bureau of Economic Analysis, 1990). The income figures for the economic effects study area indicate that the average personal per capita income is 20 to 30 percent below that of the State for the same period.

The importance of this area as a provider of recreation related services is evident from the steady growth in tourism related jobs. From 1980 to 1984, the Camp Grayling region realized a 7.6 percent increase in jobs related to the tourism industry (Michigan State University, 1986).

Table 3-31a
Employment Trends Area: aggregated, 3 county area

Industry	1985	1986	1987	1988	1989	1990
Total Employment	14,910	15,338	16,390	17,364	18,404	19,599
Manufacturing	2,177	2,281	2,473	2,645	3,071	3,090
Wholesale Trade	338	349	404	446	521	591
Retail Trade	2,973	3,091	3,315	3,455	3,534	3,800
Services	3,553	3,512	3,796	4,141	4,486	4,777
Government & Govt. Enterprises	2,318	2,388	2,457	2,528	2,592	2,772
Federal, Civilian	251	259	257	267	265	306
Federal, Military	84	84	91	94	96	94

Source: Table CA25, Regional Economic Information System CD-ROM, Data Released May 1992 Regional Economic Measurement Division, Bureau of Economic Analysis, Economic & Statistics Administration, U.S. Dept. of Commerce.

Table 3-31b
1990 County Business Patterns - Employment
Area: aggregated, 3 county area

Sic	Employment	Key	Industry
19--	2,893	D	Manufacturing
2400	773	D	Lumber and Wood Products
3700	731	D	Transportation Equipment
3710	731	D	Motor Vehicles and Equipment
50--	783	D	Wholesale Trade
5000	430	D	Durable Goods
5100	353	D	Non-durable Goods
52--	3,985	D	Retail Trade
5400	1,088		Food Stores
5500	511		Auto Dealers & Service Stations
5800	1,320		Eating and Drinking Places
70--	3,208	D	Services
7000	680		Hotels and Other Lodging Places
8000	1,131	D	Health Services
91--	2,772		Government (BEA)
9100	400		Federal Government (BEA)
9110	306		Federal Civilian (BEA)
9120	94		Federal Military (BEA)
9200	2,372		State and Local Government (BEA)
----	16,228		Total

*Remainder of Table continued on next page.

Where employment figures from CBP are suppressed, NPDC uses a mathematical technique known as "Iterative Proportional Fitting" (IPF) to arrive at estimates for employments.

CBP Non-disclosure keys for number of employees (minimum-maximum):
A: 0- 19 E: 250- 499 H: 2,500- 4,999 K: 25,000- 49,999
B: 20- 99 F: 500- 999 I: 5,000- 9,999 L: 50,000- 99,999
C: 100-249 G: 1000-2499 J: 10,000-24,999 M: 100,000 or more
D: Aggregated non-disclosures

Source: National Planning Data Corporation, Enhanced County Business Patterns, 1990 derived from Bureau of the Census, County Business Patterns, 1990 Bureau of Economic Analysis.

Tables 3-32a and 3-32b show the primary industries in the economic study area by number of establishments.

Table 3-32a
1990 County Business Patterns - Establishments
Area: aggregated, 3 counties

Sic	Establishments	Industry
19--	83	Manufacturing
2400	19	Lumber and Wood Products
3700	3	Transportation Equipment
3710	3	Motor Vehicles and Equipment
50--	84	Wholesale Trade
5000	50	Durable Goods
5100	26	Non-durable Goods
52--	348	Retail Trade
5400	37	Food Stores
5500	62	Automotive Dealers & Service Stations
5800	74	Eating and Drinking Places
70--	369	Services
7000	32	Hotels and Other Lodging Places
8000	64	Health Services
---	1,209	Total

Source: National Planning Data Corporation, Enhanced County Business Patterns, 1990 derived from Bureau of the Census, County Business Patterns, 1990 Bureau of Economic Analysis.

Table 3-32b
1987 Economic Censuses - Wholesale, Retail, Sales
Area: aggregated, 3 counties

	Wholesale	Retail	Services	Total
Sales	191,372	244,331	63,979	499,682
Employment	606	2,902	1,808	5,316
Income	12,027	25,247	20,843	58,117
Establishments	82	300	263	645

Dollar values are in thousands.

* Services data are for establishments with payroll. Establishments without payroll (e.g., single-owner, partnerships) were not included in the 1987 Census of Service Industries. Missing data may be significant in some areas.

Source: Censuses of Wholesale Trade, Retail Trade and Service Industries on CD-ROM 1-D, 1987: Geographic Area Series. Issued by the Bureau of the Census, November 1991.

The socioeconomic implications of Camp Grayling funds flowing into the communities comprising the economic effects area are significant. An analysis of economic issues for the three-county economic effects area is necessarily complex. To assist in the evaluation process, an economic impact analysis system developed by the Corps of Engineers was used as the primary mechanism of analysis. Other socioeconomic data are also used in conjunction with the model to establish the present economic relationship of Camp Grayling to the economic effects area.

The Economic Impact Forecast System (EIFS) (Webster et al., 1976, 1978) was developed to provide a systematic means for calculating social and economic changes caused by Department of Defense (DOD) actions. The model's equations and much of the requisite socioeconomic data resides in the EIFS system. This extensive data base also functions as a valuable source of socioeconomic information for descriptive purposes. The model data base contains information obtained from a variety of sources including: 1990 Census of Population, Census of Housing, Census of Manufacturers, Bureau of Economic Analysis (BEA) estimates, County Business Patterns (CBP) reports, and private marketing data firms. Because of this extensive data base, input variables required to be provided by the user are limited.

The EIFS model provides the capability to evaluate four military action functional areas: (1) Construction, (2) Operations and Maintenance/Missions Change, (3) Training, (4) Contractor/Industrial-Type Activities.

These areas represent military functions that may create different economic and social effects on the primary effects area. The differences in these socioeconomic effects are chiefly due to differences in procurement and consumer expenditures for locally produced goods and services associated with each functional area (U.S. Army Corps of Engineers, 1984).

An integral component of the EIFS is the model's use of "multipliers" to evaluate the effects of an army action on the socioeconomic characteristics of a study region. A multiplier accounts for the initial economic change as well as all subsequent changes. The size of the multiplier is directly related to the (1) size of the region, (2) diversity of its industrial and commercial base, (3) size of its population, and (4) type of expenditure. As these factors increase, the region's economic base becomes more diverse, and the more likely purchased products are produced locally rather than imported. Therefore, money flowing into the economy is "recycled" more often, causing multiple increases in income (U.S. Army Corps of Engineers, 1984).

Multipliers are considered indicative of the total effect to be gained by adding new personnel or expenditures to a region. For example, a dollar spent at a local retail store goes towards salaries and benefits of employees, the wholesale purchase of the goods sold, store overhead (utilities, maintenance, rent, taxes, licenses) and profit.

Each portion of the original dollar that is subsequently spent again by these recipients on other goods, services, taxes, etc. has an added effect. A multiplier accounts for both initial and subsequent expenditures that occur in the primary effects area. Hence, the more often portions of the dollar are cycled within the primary effects area, the larger will be the multiplier.

Money introduced into an economy may be expended and re-expended in a variety of ways. The impact to the economy of each use depends on the application of that use (a dollar expended for payroll will have different economic implications than one spent on raw materials). To account for some of these differences, the EIFS model calculates and uses employment, income, and sales multipliers to provide estimates of regional economic impacts. The multiplier calculated by EIFS for the primary effects areas are as follows:

Employment Multiplier: 2.1376
Income Multiplier: 1.8709
Sales Multiplier: 2.1376

The EIFS incorporates a variety of economic components in the modeling equation in addition to the multiplier. These are based on national and regional indicators of social and economic significance and can be generally described as follows:

- Personnel Characteristics (wages, salary, residence type, personal local procurements).

- Propensity to Consume (housing and consumer goods and services).
- Local Investments (housing and non-housing expenditures).
- Local Prosperity (local business volume).
- Local Government Functions (education and non-education).

A detailed description of the assumptions on which the model is based are provided in Construction Engineering Research Laboratory Technical Report N-69, 1984.

EIFS is used for the purpose of establishing an indicator of the existing socioeconomic effect of Camp Grayling on the primary effects area. Baseline input values of recent year annual dollar amounts are used. Model results based on data reflecting proposed changes in military actions will be compared to the baseline conditions.

The following is a description of each component:

Total Sales Volume: Represents both direct and induced changes in local business volume attributable to the military presence. Includes changes in sales volume at local retail and wholesale trade merchants and at local businesses, personal and professional service establishments where civilian and military personnel spend their wages and salaries and where local procurements are made.

Total Employment: Represents total change in local employment resulting from the military presence. Includes direct and secondary employment of local retail, wholesale, and service establishments. Also included are military and civilian personnel.

Total Income: Accounts for local personal income of residents attributable to the military presence. Direct and secondary affects of local personnel income, and income of civilian and military personnel are included.

Net Change to Local Government Costs: Indicates the total economic relationship of the military presence on local government finances. It is essentially the net financial impact of the military presence on the expenditures and revenues of governments within the primary effects area. Government revenues are calculated and include taxes and state and federal aid to schools.

Expenditures attributable to the military presence are determined and compared to revenues. The result is a value representing the net change in costs to local government.

The model was used to assess the effects the Post has on the economic effects area through locally produced goods and services that are purchased either by Post personnel or by its procurement of services and supplies. Model results are reported in Chapter 4.

Model input requirements supplied by the user include the annual expenditures for services and supplies and the number and average annual salaries of both civilian and military personnel involved with Camp Grayling's operation and maintenance. The model estimates the propensity to expend funds locally for Post operations and maintenance items by calculating the effects of operations and maintenance related income spent in the local area (direct effects) and the effects of those dollars as they are cycled through the economic effects area (induced effects).

3.8.2.2 Trends

Employment trends in the economic effects study area for the most part reflect those of the State. Differences appear in manufacturing where the three-county area has remained steady while the state continually decreased. All categories of income have increased over time, including non-farm, private, government and personal income with the largest income increase for personal income (Bureau of Economic Analysis, 1990). Per-capita income is projected to increase from $9,144 in 1989 to $10,819 in 1994. Average household income is projected to increase from $25,132 in 1989 to $28,896 in 1994.

3.9 Environmental Investigations and Remediation

Ten Camp Grayling sites are listed on the state's Final List, Michigan Sites of Environmental Contamination for Fiscal Year 1995. The list is prepared pursuant to the Michigan Environmental Response Act, Public Act 307 of 1982, as amended. The purpose of the list is to identify, rank, and track known sites of contamination. Act 307 also provides for procedures to conduct cleanups of contaminated sites. The Leaking Underground Storage Tank Act, Public Act 478 of 1988, also regulates releases from underground tanks. Nine sites located in the cantonment area and at the Grayling Army Airfield are discussed in Section 3.9.1 below. The tenth site is the Range 40 complex which is discussed in Section 3.9.2 below.

Of the ten sites, only the Grayling Army Airfield is on federal land. As federal land, this site falls under the National Guard Bureau Installation Restoration Program (IRP). A preliminary assessment has been completed for this site and has identified further site investigation work to review past practice actions.

3.9.1 Contamination Sites

No surface water bodies or domestic drinking water wells have been affected by groundwater contamination or soil contamination at any of the following sites. All groundwater contamination plumes are contained within Camp Grayling's boundaries, except for a small portion of a plume located just south of the Bulk Fuel Facility that is undergoing remediation.

3.9.1.1 Bulk Fuel Facility

The bulk fuel facility is located on the south end of the Grayling Army Airfield. The facility is comprised of three aboveground bulk storage tanks, three tank truck loading stands for issuing fuel, and three tank truck unloading points for receiving fuel. The tanks store diesel fuel, JP-4 aviation fuel, and unleaded gasoline; the largest tank has a capacity of 57,000 gallons.

In 1984 it was discovered that a leak in an underground railcar feed line to the diesel tank had resulted in a release of approximately 10,000 gallons of diesel fuel. About 5,000 gallons of free product were recovered. An activated carbon pump-and-treat system was installed to remediate contaminated groundwater resulting from the release. The carbon system was operated for 4 years until it became apparent that residual fuel present in the soil was continually flushing out and recontaminating the groundwater. The carbon system was replaced with an enhanced bioremediation system that incorporated spray irrigation of the contaminated soil and reinjection of fuel-consuming bacteria into the aquifer via an infiltration gallery (drain field). The bioremediation system reduced the concentration of diesel in the soil and groundwater to acceptable levels in 1 year. The delivery of fuel into the storage tanks is now via aboveground hoses from tank truck to piping equipped with backcheck valves.

However, in 1989 a second, larger groundwater contamination plume of tetrachloroethylene (PCE) and trichloroethylene (TCE) was discovered at the site. The source of the contamination is suspected to be the old up-gradient MATES facility. The bioremediation system continued to be operated but was unable to reduce concentrations of TCE/PCE to acceptable levels. A new carbon pump-and-treat system was installed in 1992, and will continue operation until the TCE/PCE contamination is cleaned up. A state groundwater permit exemption was obtained to discharge the effluent from the system into the infiltration gallery. The perimeter of the plume is monitored on a schedule by sampling 39 groundwater monitor wells.

3.9.1.2 Building 8 / Former Fuel Island

Six underground tanks were located at the former fuel storage area just east of Building 8 in the cantonment area. In 1990, a release was discovered from a 6,000-gallon diesel tank. The tank was removed and as much contaminated soil as possible was excavated. The leak had been occurring for several years and resulted in contamination of groundwater. The remaining five tanks were eventually removed in compliance with underground tank regulations and a new fuel island facility was constructed nearby. An extensive hydrogeologic study was conducted to determine the nature and size of the contaminant plume. A bioremediation system similar to that used at the bulk fuel facility will be installed to clean up the plume. The discharge will be to an infiltration gallery for which a state groundwater permit exemption has been obtained. The system is scheduled for construction during the spring of 1994. Seventeen monitor wells around the perimeter of the site provide for sampling to track the plume.

3.9.1.3 Building 616B

This site is a bathhouse on Eighth Street in the cantonment area. In 1989 there was a release of about 50 gallons of heating oil from an aboveground storage tank located outside the building. As much contaminated soil as possible was excavated (approximately 100 cubic yards), however, groundwater was affected in a very limited area at the point of release, approximately 50 feet down-gradient. An activated carbon pump-and-treat system was installed and will continue operation until acceptable concentration levels of heating oil in the groundwater are achieved. The effluent from the treatment system is discharged to an infiltration gallery for which a state groundwater discharge permit exemption was obtained. Seven monitor wells at the site are sampled on a schedule. All heating oil tanks in the cantonment area have been replaced with piped-in natural gas.

3.9.1.4 Building 314

This site is the Post chapel on Howe Road in the cantonment area. In 1989 there was a release of an unknown quantity of heating oil from a 275-gallon aboveground storage tank located outside the building. Contaminated soil was excavated from the site but the fuel had reached the groundwater and contaminated a small area beneath the point of release. An activated carbon pump-and-treat system was installed to remediate the contamination. The system will operate until acceptable levels of heating oil in the groundwater are achieved. The effluent from this system is also discharged to an infiltration gallery that is exempted from state permitting requirements. Seven monitor wells were installed and are sampled on a schedule to track the plume. The heating oil tank was replaced with natural gas.

3.9.1.5 Building 1176M

This site is a messhall located at the Grayling Army Airfield. In 1988 a release of heating oil from an aboveground tank located outside the building contaminated a limited area of soil near the release point. The contaminated soil was excavated and a hydrogeologic study conducted to determine if groundwater had been impacted. Seven monitor wells were installed at the site. Subsequent sampling and analysis of groundwater has been inconclusive as to whether a groundwater contamination plume exists. Most of the results of sampling events have not shown any detectable levels of heating oil in the groundwater. Monitoring of the groundwater will continue until a sufficient number of clean samples allows closure of the site. The heating oil tank was replaced with LP gas.

3.9.1.6 Building 104A

This site is an administrative building on Kitchen Road in the cantonment area. In 1989 a release from an aboveground heating oil tank located outside the building was discovered. As much contaminated soil as possible was excavated until the foundation of the building was endangered. Three groundwater monitor wells were installed to determine if groundwater had been impacted. Results of all sampling and analysis

events except for one sample indicated that no detectable levels of heating oil were present in the groundwater. The lab report for one sample indicated a very low level of contamination; however, this result has been determined to be a lab error or use of a contaminated bailer to obtain the sample. The site will continue to be monitored until a clean closure can be obtained from the state. The heating oil tank was replaced with natural gas.

3.9.1.7 Building 1101 / 1,000-Gallon Waste Oil Tank

This site is located at the Grayling Army Airfield adjacent to Building 1101. In 1990 an underground tank formerly used for storing waste crankcase oil from vehicles was removed in compliance with underground tank regulations. Contaminated soil was found to be present in the excavation and was removed. Soil samples from the excavation were analyzed and no remaining fuel was detected. Soil sampling procedures and required tests have since changed and additional sampling and analysis will be conducted at this site to obtain a clean closure from the state.

3.9.1.8 Building 1106 / 5,000-Gallon Diesel Tank

This site is located adjacent to Building 1106 at the Grayling Army Airfield. In 1990 an underground diesel fuel storage tank was removed. A minimal amount of contaminated soil was removed from the excavation and soil sampling and analysis indicated that no fuel remained. However, sampling procedures have since changed and additional samples must be taken to obtain a clean closure from the state.

3.9.1.9 10,000-Gallon Used Oil Tank

This site is a former tank washing facility located at the Grayling Army Airfield adjacent to the bulk fuel facility. An underground tank at the site stored waste engine oil from vehicle oil changes. In 1990 the tank was removed in compliance with underground storage tank regulations. A release was detected and contaminated soil was excavated until the groundwater was reached. Soil borings and five monitor wells were installed at the site and a hydrogeologic study conducted. Trace contamination was detected in one groundwater sample and the study determined that the existing groundwater clean-up system at the bulk fuel facility would draw in and treat any contamination from this site. Requirements for clean closure have since changed and additional soil and groundwater sampling and analysis will be conducted to obtain a clean closure for the site.

3.9.2 Range 40 Study and Results

During the scoping for this document an issue surfaced regarding potential impacts due to weapons firing on the North Post artillery/air-to-ground range (Range 40 complex).

This complex consists of approximately 27,000 acres to include a 7,000 acre impact area situated basically in the middle. Firing points for mortar and artillery weapons are located at various sites circling the outside of the impact area. Additionally the Air National

Guard utilizes the northern most portion of the impact area for fighter staffing and practice and live bomb drops (See Figure 3-14).

To address this issue the Department of Military Affairs (DMA) tasked the Army Environmental Hygiene Agency (AEHA) to conduct a preliminary investigation of Range 40 to determine any environmental effects.

The study consisted of a data gathering effort concentrated in the southwestern portion of the Range 40 complex. This area is where most mortar/artillery activities take place and also where the East Branch Au Sable River headwaters begin. The study consisted of limited groundwater, surface water, soils, sediment and fish tissue sampling and analysis. The conclusion of the study was that "overall there has been no adverse environmental impact on the water quality of the Firing Range 40 area" (AEHE, 1988). However, it was determined by the DNR that a much more detailed study should be conducted in that the portion of Range 40 studied was so small.

To ensure that such a study would be conducted, the Department of Natural Resources (DNR) insisted that the work effort be included in the 1991 consent order entered into between the DNR and DMA, to address open burn/open detonation issues from training activities on the Post. Interpretations of data collected during investigations are based on environmental statutes promulgated by the State of Michigan. The DNR has established quality standards for soil, sediment, groundwater, and surface water under Authority of Act 307, Michigan Environmental Response Act.

In 1992, Environmental Science and Engineering, Inc. (ESE) began a comprehensive investigation of the Range 40 complex, at a cost of one million dollars. This investigation included the 3 separate watersheds within the complex, and also included limited soil sampling and groundwater monitor well installation within the impact area. Analysis was completed for 172 different substances at 67 different locations. Media tested included groundwater (53 monitor wells), surface water (10 wetlands, 8 lakes, 10 streams), soils (varying depths at both the impact area and firing points), sediment (10 streams, 8 lakes, 10 wetlands), fish species and fish tissue (11 locations and several species), micro invertebrates (11 locations in streams and lakes, and extensive background sample locations. In all over ten thousand different analyses were performed.

The ESE report of this study, completed in February of 1993, concluded that "little overall impact on the natural environment can be assigned to the present use of the North Post 40 complex." However, the study reported four potential areas of concern related to soil and groundwater. These were: (1) phthalates in select soil and groundwater samples; (2) trichloroethene in groundwater samples collected around the all air-to-ground range practice bomb burn pits; (3) explosives and lead in soils at a excess propellent metal burn pan site; and (4) metals and nonmetals in soil and groundwater samples above background levels.

The fisheries and surface water portion of the study revealed that general fish condition and community population diversity was consistent between sampling locations and/or

the control stations or the variation was able to be explained due to variables not related to the North Post 40 activities. Invertebrate sample evaluations indicated a diverse group of specimens and found that one of the control stations possibly indicated stress on the invertebrate population while those at other stations had very little indication of impact due to North Post 40 activities. Contaminant analyses of fish tissues did not detect any PCB's or other organic chemicals. Inorganic analyses detected two metals, zinc and manganese, at significant levels and mercury, selenium, and aluminum at low levels. These metals were all at levels that pose no health risk based on the results from this study. Complete results of this 1992 study are contained in the "Environmental Evaluation and Assessment for the NP40 Complex Camp Grayling Training Facility" issued February 5, 1993. This extensive study served as a baseline for follow-on future assessments now underway.

To address the issues raised in ESE's initial effort and to gather additional data to answer unresolved and new questions triggered by the original work, a third investigation, approved by the DNR, was conducted in 1993 by ESE, Inc., at a cost of $240,000. The study addressed the following soil and groundwater quality issues: (a) More accurately determine background levels and/or establishment of exposure levels associated with inorganic compounds detected in soil and groundwater; (b) full evaluation of areas used for open burning and detonation including the burn pits and burn pan that had levels of organics and/or metals above acceptable DNR clean-up standards; and (c) characterization of locations that in 1992 indicated levels of Bis (2-ethylhexyl) and diethyl phthalates that exceeded limits specified by the DNR. The results of this third study are documented in ESE's "Report of Findings for 1993 Hydrogeologic Investigation at NP 40 Complex, Camp Grayling Training Facility" issued May 1994. This study concluded the following regarding the four areas of concern identified in the 1992 study:

(1) Phthalates in select soil and groundwater samples are not a significant environmental consideration at Range 40: All nine monitor well samples detected containing phthalates in 1992 were resampled in 1993, using improved sampling equipment and techniques. None contained phthalates concentrations above the detection limit of 5 ug/l. Soil samples were also collected from the same locations as the 1992 samples that contained phthalates, but at a slightly greater depth. Phthalates were not detected in any of the deeper samples, thus demonstrating that phthalates concentrations decrease with depth. Based on the fact that no phthalates were detected in groundwater above the detection limit and that phthalates concentrations do not exceed the direct contact hazard level set by the DNR for soils, phthalates do not appear to represent a significant environmental concern at Range 40.

(2) Trichloroethene in groundwater samples collected from the burn pit can be attributed to sampling or lab error: Eight additional monitoring wells were installed at the location that in 1992 had trichloroethene (TCE) detected in two wells. The levels detected in 1992 were barely above DNR standard. Groundwater samples collected from the eight new wells and the original four wells, including those that contained TCE did not contain detectable levels of TCE in 1993. Another round of sampling will be conducted to verify these results.

(3) Explosives and lead in soils at the metal burn pan site pose no threat to public health or safety: Explosive compound 2,4-DNT, lead, and silver were found in soils near the burn pan on Kinney Road during the 1992 study. As a result, Camp Grayling ceased all open burning of propellant at this pan and other sites in March 1993 immediately after sample results from the 1992 study were made available. An extensive investigation of the burn pan site to determine the nature and extent of the impacted soils and any possible impact to the groundwater was performed as part of the 1993 study. It was determined that soils in close proximity to the pan were impacted by 2,4-DNT and lead above Act 307 standards, to a maximum of 5 feet below ground level. Silver, nitrite, and nitrate levels in soils are below their respective applicable Act 307 criteria at the burn site and groundwater samples collected at the site did not contain detectable levels of explosives or nitrogen compounds above their respective health-based criteria. Total lead and total silver were detected in groundwater samples, however, total concentration values cannot be compared directly to their respective regulatory standard because the criteria are based on the dissolved fraction only. Therefore, the three monitoring wells at the burn pan site will be resampled for dissolved lead and silver in the spring of 1994. A workplan is being submitted to the DNR for approval, that identifies the steps required to remove the contaminated soils around the burn pan and it is expected that cleanup of soils will begin during FY94. The occurrences of these chemical constituents in soils and waters are within the fenced North Post 40 impact area that is closed to public entry.

(4) Metals and non-metals in soil and groundwater samples above background levels are still under investigation: Inorganic compounds and elements were also detected in some of the soil and groundwater samples from the North Post 40 in 1992. The significance of metals and nonmetals in soil and groundwater above background levels is difficult to assess because of the natural occurrence of inorganics in soils and sediments and normally wide-spread distribution. It is difficult, without further study and/or testing, to determine whether inorganic compounds detected in soils are due to natural phenomenon, are caused by non-military activities, or can be attributed to Camp Grayling military training.

This particular assessment is further complicated by low confidence, by all concerned, in the accuracy of the background levels themselves. This low confidence is based on the fact that:

(a) Sites for initial background sampling were originally best guesses based on available information. However, the 1992 study has now determined directions of aquifer flow that will allow siting of more accurate sampling locations in future work being proposed.

(b) Laboratory analysis of certain analytes of interest (e.g., phosphorous and potassium) only quantify the total of all types of these analytes. To determine which regulatory standards apply, or if Camp Grayling is the source of the element, future work will determine which form of the individual analyte (particularly valence states) is present.

(c) Current background estimates were based on a limited number of sample locations, and only one sample from each location.

(d) All background samples were taken during the same season and same year. Principles of statistical certainty require more samples and established EPA procedures require more diversity in background conditions.

(e) Some of the background samples were taken from residential wells in an effort to reduce costs. This caused an unexpected problem since there was no control or knowledge of materials used to construct these wells, nor was there any knowledge of potential influences from residences themselves.

The DMA is working with the DNR to design and conduct follow-on studies that will: (1) establish more accurate background levels against which our preliminary finds can be compared, (2) ensure that all other out-standing concerns are resolved, and (3) ensure that any clean-up that may be required is completed. Additionally, the DMA is conducting a further study approved by the DNR that focuses on issues related to surface water and fisheries habitat quality. This investigation was implemented in the spring of 1994 and will be completed by January 1995, at a cost of $730,000. All studies and results will be made to the public and interested parties.

Chapter 4
ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES

4.1 Physical Environment

4.1.1 Climate

Military training activities at Camp Grayling do not affect climate.

4.1.2 Air Quality

(A) Baseline Conditions: Crawford, Otsego, and Kalkaska counties, wherein Camp Graying lies, are classified as being an air quality attainment area for the criteria pollutants and volatile organic compounds (VOCs) (Alexander, Richard, Personal Communication, February 1994). The following existing sources have the potential to create conditions irritating to the public.

(1) Smoke Operations: Obscurants are man-made or naturally occurring particles suspended in the air that block or weaken the transmission of a particular part of the electromagnetic spectrum, such as visible light. Fog, mist, dust, and smoke are all examples of obscurants. Smoke is an artificially created obscurant normally produced by burning or vaporizing some product. An example is the vaporization of fog oil in a mechanical fog generator to produce smoke. Armies use smoke to confuse and deceive their enemies, and troops must train for the uses of smoke.

It is the responsibility of the Smoke Unit Commander to plan and map air or ground reconnaissance. The Smoke Unit Commander coordinates the mission with supported and adjacent units as well as with Camp Grayling Range Control. CG Reg. 200-1 (January 1993) and 385-1 (April 1992) and Field Manual 3-50 are followed for such missions.

(2) Dust: Dust is generated by moving tracked and wheeled vehicles. The density and size of the dust cloud generated depends, in part, on the moisture in the road bed and the number and type of vehicles moving at one time. The dust cloud may enlarge and thicken when multiple convoys occur. Winds across the installation may cause dust clouds to blow into areas adjacent to the travel route. If there is no wind, the dust particles thrown into the air will settle back to the ground within a few minutes.

(3) Other Emissions: Other existing sources of air emissions include motor vehicle exhaust, heating units, and explosives. These emissions include particulates, nitrogen dioxides, sulfur dioxide, hydrocarbons and carbon monoxide. All emissions meet ambient air quality standards.

(B) Present Mitigation: Camp Grayling Regulations and Field Manual 3-50 are followed for all smoke missions. Smoke operations must be handled like any other range operation, with permission obtained from Range Control to generate smoke and contact made again when the mission is completed.

Under CG Reg. 385-1 (April 1992), Range Control will authorize or deny requests to make smoke based on current weather and other conditions. Under CG Reg. 200-1 (January 1993), smoke generators are not to exceed two hours of continuous operation. Smoke operations are to be scheduled so that smoke is discontinued for a time period greater than or equal to its generating time (i.e., if smoke is generated for two hours, it is to be discontinued for two hours). CG Reg. 385-1 also delineates certain areas as "No Smoke Areas" and requires that training units insure military and civilian safety is not compromised by the use of smoke.

As stated in Section 4.1.2 (A), above, density, duration and size of dust clouds depends on the number and type of vehicles moving along a trail as well as the amount of moisture in the road bed. When conditions warrant, trails are sprayed with water or calcium chloride to reduce dust formation.

4.1.2.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A and Project 1B - Construct MATES Vehicle Storage Buildings and Bulk Fuel Facility: The Master Plan projects will involve the use of construction vehicles which will temporarily contribute additional vehicle exhaust. Clearing of vegetation and excavation required for construction will expose soil. Increased fugitive dust from disturbed soil surfaces is possible, since the soils in the cantonment area have a high wind erodibility index (1-2); but actual wind erosion is dependent on factors such as wind velocity, direction and duration, and most important, the size of the area containing disturbed soils. The two projects will not disturb a large area of land, thus soil disturbance should be minimal. The air quality effects resulting from the projects within the cantonment area are expected to be insignificant.

Once built, operation of the cantonment area projects should have no impact on air quality. The Bulk Fuel Facility has the potential to release volatile organics to the air, but a State-required vapor balance system and submerged fill pipes will be constructed in accordance with Michigan Air Pollution Control Commission Rule 336.1704, so no significant impacts are anticipated.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Approximately 25 acres is anticipated to be cleared (some trees cut to provide line of sight to targets) and approximately 350 acres disturbed to facilitate construction of the

MPRC-H-R. As the clearing will expose some soil to erosive forces, this action has the potential to encourage the formation of fugitive dust. In addition, the use of construction vehicles will temporarily increase vehicle exhaust emissions within the area of the MPRC-H-R.

Operation of the MPRC-H-R will have some beneficial impact of reducing dust generation, due to the use of improved trails. Use of the MPRC-H-R will constrain vehicles to certain routes of travel during training comparable to that on the current Range 30. Less vegetation will be disturbed on the range (and consequently less soil exposed) than at present. Soil that has been disturbed in the past will be revegetated and stabilized. The MPRC-H-R is designed to be built approximately 1 mile further from the Camp boundary toward the Camp interior than the current firing range, reducing the possibility that dust generated from training would travel off-post.

4.1.2.2 Alternative 2 - Implement Master Plan Projects at Different Locations

With implementation of Alternative 2, air quality impacts would be similar to those resulting from Alternative 1. Construction of the Master Plan projects at other locations on-post would result in additional vehicle exhaust and potential increased fugitive dust at those locations.

4.1.2.3 Alternative 3 - Do Not Implement Master Plan Projects

With implementation of Alternative 3, air quality impacts would remain at approximately the same level as at present. Continued use of the Range 30 complex would forego the potential benefits of moving Range 30 use approximately 1 mile further away from the Camp boundary. Range 30 use and off-range maneuver activity would remain as at present.

4.1.2.4 Cumulative Effects

No significant cumulative impacts are anticipated to result in the air quality environment with implementation of any of the alternatives.

4.1.3 Noise

Three noise zones are designated: Zone I, Zone II, and Zone III. The higher zone numbers are associated with increasing noise. Zone I indicates acceptable areas where the noise environment is compatible with noise-sensitive uses (according to Federal criteria) including residential use. Zone II is a transitional area that is classified as normally unacceptable for noise-sensitive uses including residential use. However, under some circumstances, (e.g., certain building constructions providing enhanced isolation from environmental noise) Zone II areas may be acceptable for residential use. Zone III indicates clearly unacceptable areas for noise-sensitive land uses.

4.1.3.1 Existing Environment

(A) Baseline Conditions:

4.1.3.1.1 Range 40 Complex

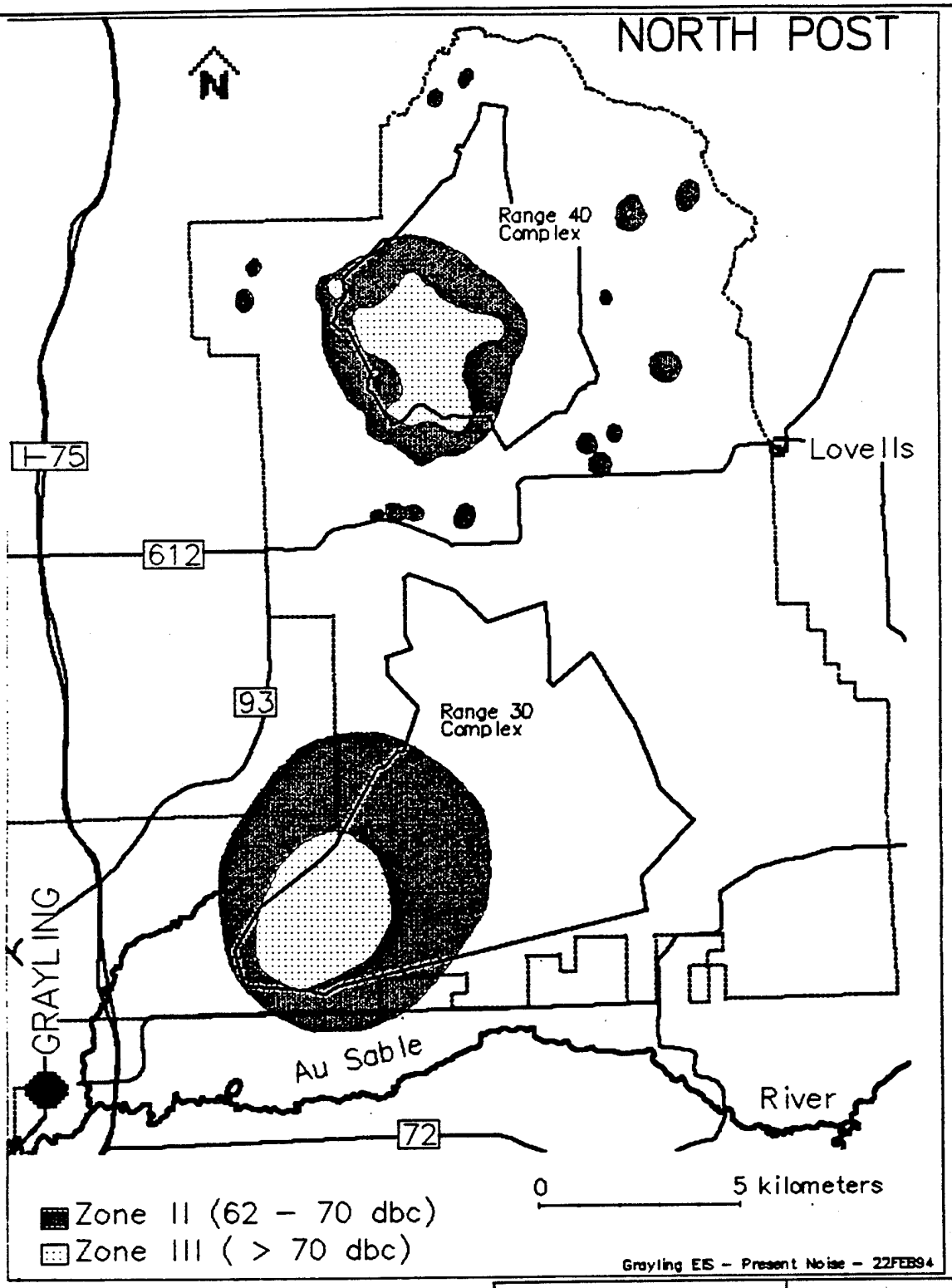
(1) Artillery: Current contours were calculated to represent the noise produced by the mortar and howitzer firing events originating from 18 firing points surrounding the Range 40 impact area (AEHA, 1993). During training, many different firing points surrounding the Range 40 complex are utilized. These noise contours include the firing of the remaining two 8-inch howitzers. These contours include the proposed MLRS; however, the decision to fire this weapon at the Post has been postponed until an emissions study is completed. If the emissions study is acceptable to the DNR, a supplemental environmental document will be completed for public review.

The predicted impulsive noise Zone II contour for Range 40 shown in Figure 4-1 does not extend beyond the Camp Grayling boundary in the vicinity of Guthrie Lake or Lovells (the closest residential areas). Additionally, due to the decreased use of 8-inch howitzers, the number of peak noise events has been significantly reduced. In the past, large portions of the Post's noise complaints associated with Range 40 use came from the Guthrie Lake area and the Lovells area. Zone II predicted contours generated from the impact area extend to within approximately 1,500 meters of the Post boundary in the vicinity of Guthrie Lake, and within approximately 7,700 meters of the Post boundary in the vicinity of Lovells (the side of the impact area opposite Guthrie Lake). Zone III contours generated from certain firing points modeled occur as near as 700 meters to the Camp boundary. No residences occur within these Zone II or III noise contours.

Impulsive noise measurements were taken at Camp Grayling during the firing of 8-inch guns on May 11, 1985 (USACERL, 1985). The objective was to determine if seismic signals from either firing or impact would be large enough to possibly cause structural damage to houses in the Guthrie Lake area. The results clearly indicated that the seismic signal was much too small to cause problems. However, the airborne acoustic impulses from projectile explosion on impact were responsible for complaints of vibration caused by the firing. The highest measured peak sound level was reported to be about 140 decibels (dB). It was also concluded that repeated events of this magnitude of noise will not damage basements or walls but might cause advanced aging of dry walls or plaster and might crack dry wall tape.

(2) Air-to-Ground: The Grayling Air Gunnery Range occupies approximately 1,800 acres in the northern portion of the Range 40 complex. Aircraft movement generates noise impacts. An average of 4,500 sorties (combining one take off and one landing) are flown a year. In 1993, 4,687 sorties were flown, with each sortie typically consisting of eight passes over the range. See Figure 4-2 for noise contours produced by aircraft movement.

During 1985, approximately 100 250 lb bombs and 100 500 lb bombs were dropped at Range 40. Noise measurements were taken by the U.S. Army Construction Engineering Research Laboratories (USACERL) to measure acoustic and seismic levels from high



Camp Grayling FEIS	Figure 4-1
Ranges 30 and 40 Noise Contours	

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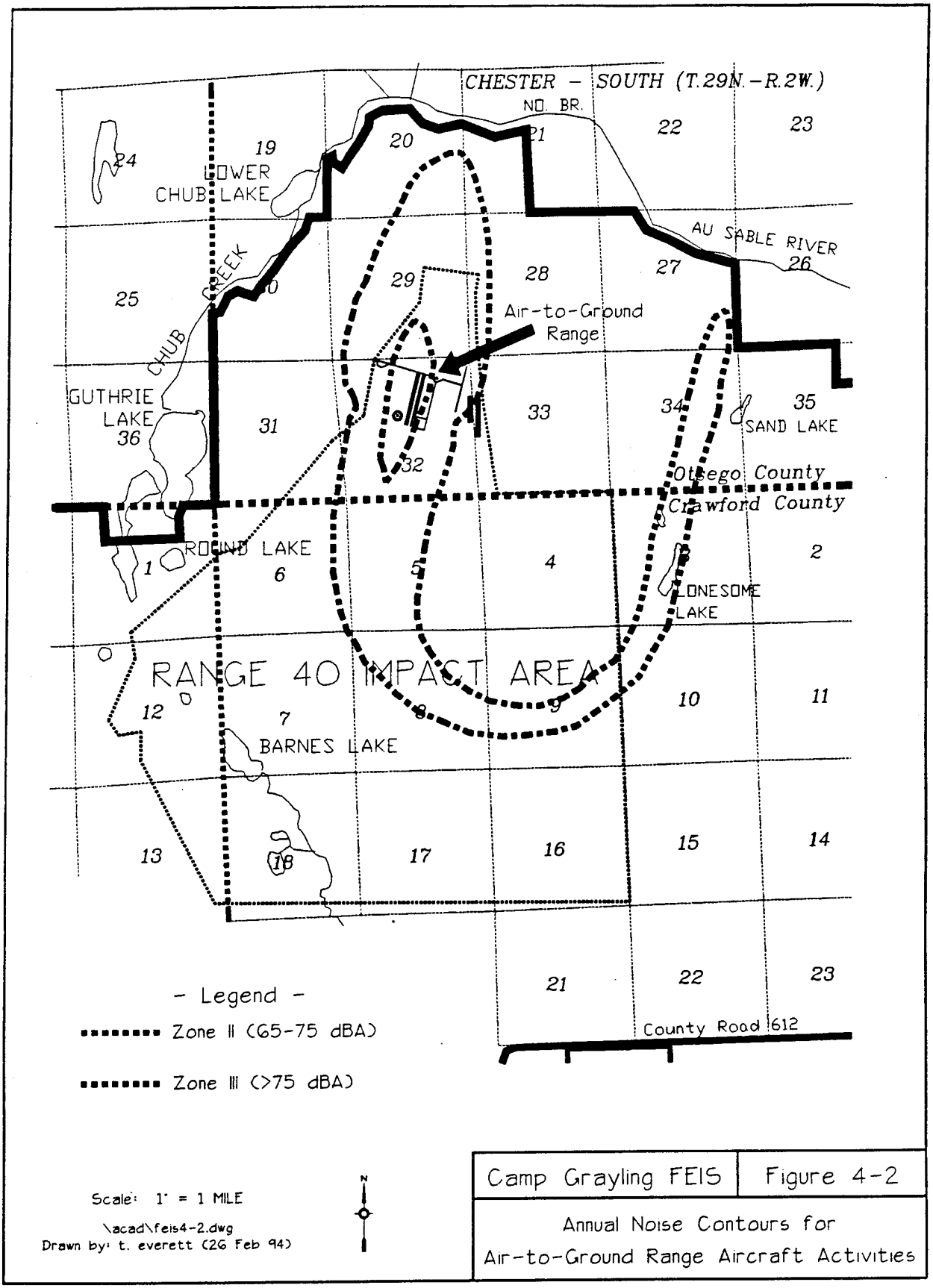
CHESTER - SOUTH (T.29N.-R.2W.)
NO. BR.
LOWER CHUB LAKE
CHUB CREEK
AU SABLE RIVER
Air-to-Ground Range
GUTHRIE LAKE
SAND LAKE
Otsego County
Crawford County
ROUND LAKE
LONESOME LAKE
RANGE 40 IMPACT AREA
BARNES LAKE
County Road 612
- Legend -
Zone II (65-75 dBA)
Zone III (>75 dBA)
Scale: 1" = 1 MILE
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Drawn by: t. everett (26 Feb 94)
Camp Grayling FEIS
Figure 4-2
Annual Noise Contours for
Air-to-Ground Range Aircraft Activities

explosive (HE) 500 lb bomb drops on the Range 40 air-to-ground range. Measurements indicated that related seismic waves were quite low and well below damage criteria for houses at Guthrie Lake. Acoustic waves at Guthrie Lake's western shore were measured at 125 decibel, C-weighted (dBC) under good weather conditions (USACERL, 27 August 1985).

Other measurements were also taken by Camp Grayling Environmental staff of impulsive noise due to 250 lb and 500 lb bombs dropped at the air-to-ground site of Range 40 during 28 August and 11-15 September 1985. Measurements of peak impulsive noise levels were made at Guthrie Lake, near Lovells, and at Observation Point 5 (approximately 2 miles west, 2 miles southeast, and 2 miles southwest, respectively, from the impact point). Favorable meteorological conditions were reported. Peak sound pressure levels were observed at Guthrie Lake from the explosions of 250 lb bombs in the range of 113.5 to 119.5 dB (averaging 116 dB) and 110 to 117.5 dB (averaging 115 dB) at different times. At the two other locations within Camp Grayling, peak levels of 100 to 105 dB near Lovells (averaging 102 dB) and 116 to 122.5 dB at observation post number 5 (averaging 119 dB) were noted.

On another day, 500 lb bombs were dropped, and measurements at the west edge of Guthrie Lake, the nearest residential community (2 miles from the impact point) yielded peak sound levels of 125 to 132 dB (averaging 127 dB). At a location 3 miles due south of the impact point within Camp Grayling, levels of 122 to 132 dB (averaging 125 dB) were observed. The largest peaks of 132 dB coincided with multiple bomb drops. However, multiple bomb drops are not now conducted at the Camp Grayling air-to-ground range as part of normal training. The multiple bomb drops that were conducted were performed solely for purposes of gathering worst case peak sound pressure level data which upon analysis resulted in the limiting of one bomb at a time on this range. Wind and temperature gradient effects on excess attenuation probably account for much of the variation in peak level from one measuring site to another.

The AEHA observations reported on November 26, 1984 included continuous monitoring of the Guthrie Lake area with automated instrumentation for non-impulsive noise from general training during the period August 12-23, 1984. Little or no active military training occurred at Range 40 during the first week of observations and active division artillery training occurred in the period August 20-23, 1984. The continuous monitoring instrumentation scarcely responds to impulsive noise, so even during the active training period these data were only slightly increased by artillery or mortar use. However, the increased non-impulsive noise attending active training produced by vehicle traffic, helicopter overflights, etc. is fully evaluated in the data.

For the complete period of August 12-23, 1984, day-night level (DNL) values from about 49 to 58 decibel, A-weighted (dBA) were obtained at Guthrie Lake. However, when these are broken down, the values were about 49 to 51 dBA in the absence of training activities and 54 to 58 dBA during training. Thus, the non-impulsive noises attending training activities produced an increase in the day-night levels of 5 to 7 dB. However, the Guthrie

Lake area has a quiet environment in the absence of training activities, and it remains relatively quiet even during some training activities as long as impulsive noise is excluded from consideration. It should be noted that these observations do not incorporate active use of the air-to-ground range located in Range 40.

The data regarding the effects on the noise environment near Guthrie Lake due to air-to-ground range activities indicate that live bomb drop exercises can produce significantly elevated peak sound levels. However, air-to-ground training exercises capable of producing these peak sound levels only occur 10 to 12 days per year. Peak sound levels of this magnitude are not known to cause physical damage to structures. On the days when drop exercises take place, advance notification is made to Guthrie Lake residents and reported in the local paper. The Guthrie Lake locale is normally rather quiet. The average day-night levels (ADNL) increase (5 to 7 dB in the one reported study) when active training occurs at Camp Grayling, but even then the ADNLs are still relatively quiet.

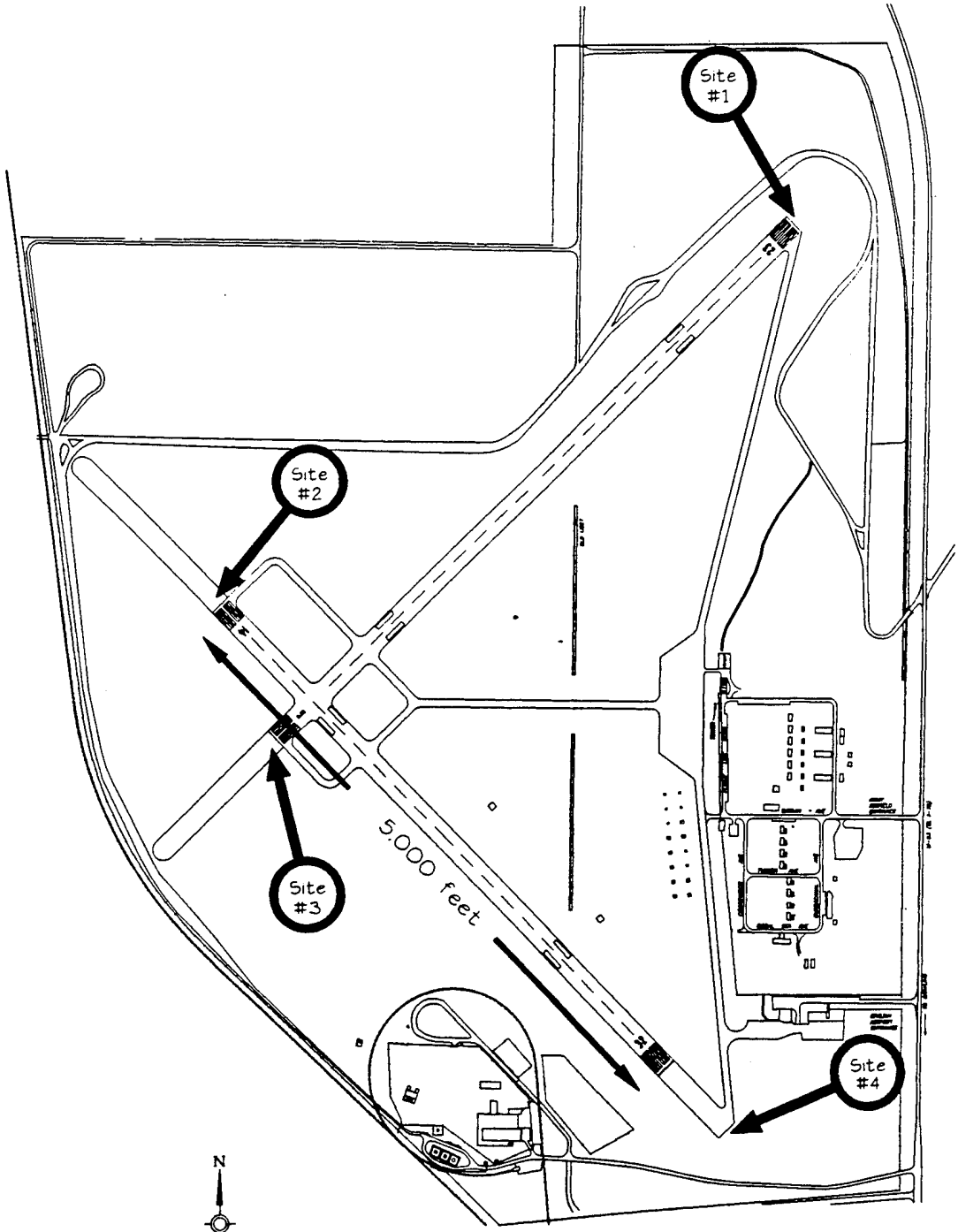
4.1.3.1.2 Range 30 Complex

Activities at the tank range (Range 30) have notable effects on a localized area. As shown in Figure 4-1, the Zone II (normally unacceptable for noise-sensitive land uses) contour extends northwest approximately 1,700 meters off-post in the direction of Hartwick Pines State Park, approximately 350 meters off-post southwest along the Grayling-Jones Lake Road Truck Trail and approximately 350 meters off-post south near North Down River Road. Noise complaints associated with activities occur periodically along North Down River Road between Grayling and its junction with the Stephans Bridge Road (Wells, 4 March 1987). The Zone III covers roughly half of one private inholding along the Grayling-Jones Lake Road Truck Trail. However, no Zone III contours, resulting from use of Range 30, occur outside the Post boundaries.

4.1.3.1.3 Grayling Army Airfield Area

This airport is used by both military and civilian aircraft. The military aircraft are helicopters, C-130 transport and smaller twin-engine aircraft; the civilian users are business jets and private aircraft. Railroad tracks and highways are adjacent to the airport and close to noise monitoring sites. A previous report (AEHA, November 1984) indicates that some of the maximum values observed were due to railroad noise, highway traffic noise, and bird noise. This was especially apparent during hours when the airport was not operating, but the operational hours were not stated. Data regarding the mix of aircraft, distribution between civilian and military flights, weather considerations, identification of the runway used, whether the airport activity was training related, etc. were not kept at the time of this study.

The AEHA (April, 1984) reported briefly on some measurements related to airport noise activities from four sites (see Figure 4-3); close to the airport tower, at the airport-town boundary, and on the far north edge of the airfield. Daytime Leq values of 74 dBA (90



Scale: 1" = 1,250'

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Drawn by: t. everett (26 Feb 94)

Camp Grayling FEIS	Figure 4-3
GAAF Noise Study Monitoring Sites	

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dBA maximum) were found at the control tower site, 65 dBA (98 dBA maximum) at the airport-town boundary and 56 dBA (74 dBA maximum) at the far edge of town. The noise around the airport was examined in more detail later in 1984 and reported by AEHA in November, 1984. Automatic monitoring equipment, producing 10 minute Leqs operated during the period of July 30-August 10, 1984 at four sites located just beyond the ends of the two crossed runways. Over a 12-day period, the DNLs ranged from about 62 to 68 dBA; the individual 24-hour DNLs ranged from 50 to 75 dBA. It can be concluded that Zone II noise extends into the Town of Grayling and other areas adjacent to the airport. In terms of the 10-minute Leqs, the daytime values only occasionally exceeded 80 dBA and rarely at night. Time-of-day plots of the maximum, mean and minimum 10-minute Leq data for the airport suggest a rather quiet noise environment, presumably in the absence of specific airport activity, a pattern of mean values which increases in the early morning from 40-45 dBA to 50 dBA and remains fairly constant from about 0800 through about 2330 hours before dropping to low values again. The maximum Leqs show a similar but more scattered pattern.

4.1.3.1.4 Range 13 Complex

A fourth area of noise study is the mortar range (Range 13) in the South Camp area approximately 2 miles southwest of the cantonment area. Noise contours for Range 13 and the South Camp small arms firing ranges are shown in Figure 4-4. Based on historic data, the firing varied significantly from 2,100 to more than 5,700 high explosive rounds per year over the last five years (Camp Grayling Ammunition Supply Point, 1993). On days when firing occurs, approximately 80 to 100 rounds per hour are typically fired. Noise contours, based on 1993 firing data, indicated no Zone II contours resulting from use of Range 13 occur outside the Post boundaries. No residences are affected by and Zone II noise (62-70 dBC).

4.1.3.1.5 Tank Trail Area

A fifth area of noise concern identified in the DEIS was tank trail noise caused by the concentrated movement of tracked vehicles from the MATES to tank training areas. As a result of the new MATES facility relocation into the tank range complex in October 1987, tank movement on this trail has been reduced by approximately 95 percent (Leask, CPT, Personal Communication, 13 January 1994).

4.1.3.1.6 Effects of Noise on Wildlife

Noise on Camp Grayling is generated from a variety of sources, including vehicles, aircraft, weapons, construction activities, and forestry operations. Certain frequencies and types of noise are more disturbing to wildlife than others, and how consistent the noise pattern is also appears to be a major factor.

The effects of human, vehicular, and aircraft noise are difficult to determine because it is often unclear whether the animal is responding to the sight of the "human", the "vehicle",

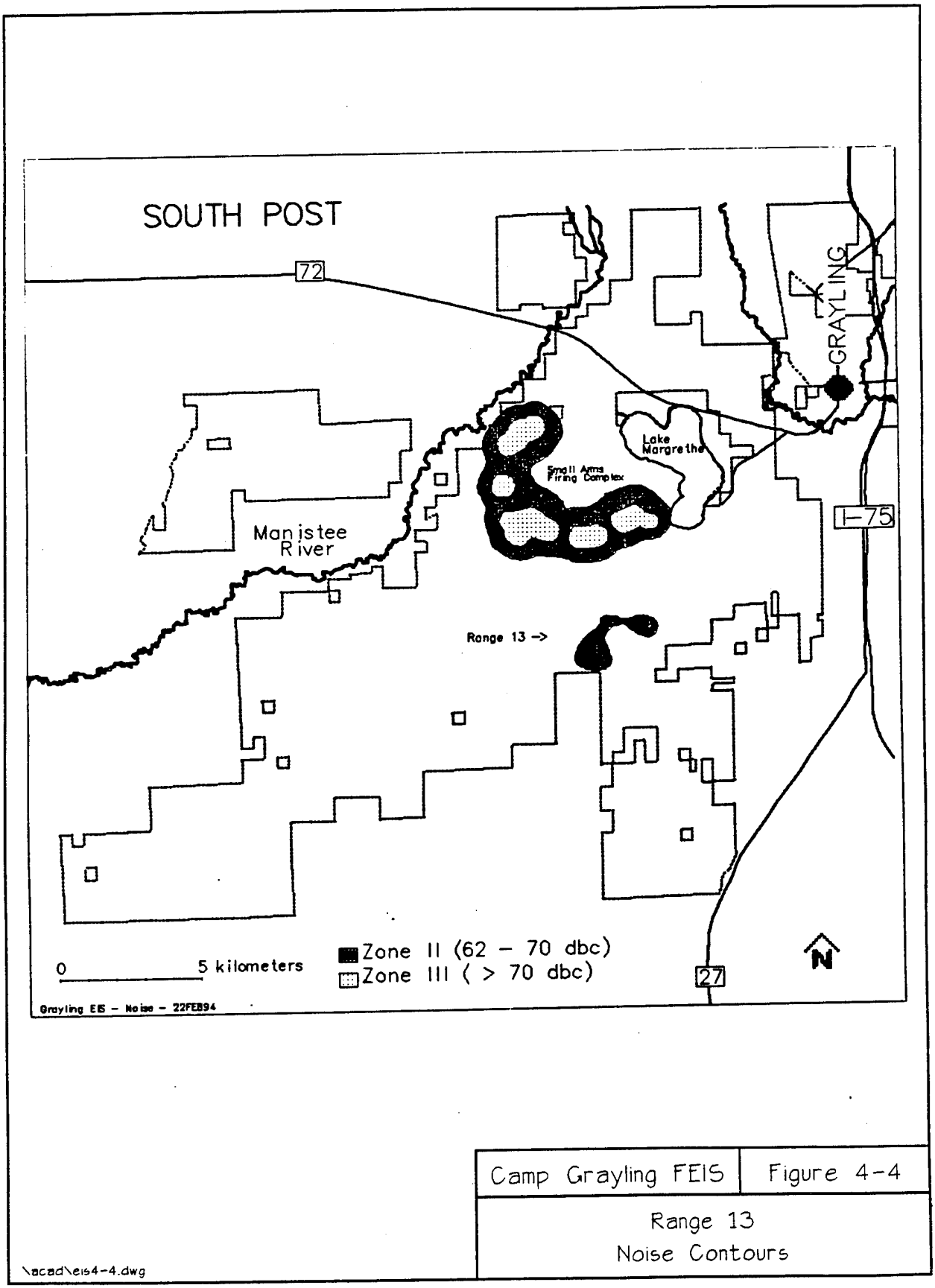
or the sound generated from them. Therefore, "noise" will be referred to not only as the sound produced, but also its source, and in many cases no attempt has been made to differentiate the impacts from each.

Reviews of literature prepared by the U.S. Air Force/U.S. Department of Interior (Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife, June-August 1988), the U.S. EPA (Effects of Noise on Wildlife and Other Animals, July 1980), and an independent review of current wildlife literature conducted for this project (including approximately 180 related published articles) indicated that no research concerning the effects of artillery or impulse noise on white-tailed deer has been conducted. Limited research has been conducted regarding the effects of sonic booms (impulse noise) on other hoofed mammals (ungulates) including wild horses. It should be noted that the extrapolation of noise effects from one species of mammal or even individuals within the same species to another species involves a large amount of uncertainty.

An individual sonic boom is similar to impulse noise related to individual artillery or tank firing in that the predominant frequency of the sound energy is between 15 and 50 hertz (Hz), and occurs at comparable sound pressure levels for similar durations. Impulse noise characteristic of firing at the Range 30 and 40 areas frequently involves more repeated and smaller noise events than those characteristic of studies regarding sonic booms. Janssen (1980) in an U.S. Air Force/U.S. Department of Interior publication by Manci et al. (June 1988) categorized the noise effect on wildlife and other animals including humans as primary, secondary, or tertiary. Primary effects are direct physical auditory changes, such as eardrum rupture, temporary and permanent hearing threshold shifts, and the masking of auditory signals. Masking is the inability of an animal to hear important environmental signals including noises made by potential mates, predators or prey. Secondary effects of noise, including impulse noise on wildlife, include such non-auditory effects as stress, behavioral changes, interference with mating, and detrimental changes in the ability to obtain food, water and cover. Tertiary effects result from both primary and secondary effects, and include population declines, destruction of important habitat and in extreme cases, potential species extinction.

Moen (1976) in Dufour (July 1980) indicates that potential secondary effects exist for white-tailed deer under stress. Moen investigated the adaptive responses of deer to cold weather stress by observing their behavior. He found that between January and early March, deer tend to conserve thermal and other types of energy by reducing their activity and thus their metabolic rate. He suggests that it is possible that snowmobiles and other similar disturbances during this critical period may prevent successful energy retention, resulting in increased deer mortality.

Several authors referenced in the U.S. Air Force/U.S. Department of the Interior report (1988) (e.g., Bond et al., 1963; Ames and Arehart, 1972; and Espmark et al., 1974) conclude that sound levels above 90 dB are likely to be adverse to mammals and are associated with behaviors including retreat from the sound source, freezing of motion, or a strong startle response. Sound levels below about 90 dB usually cause much less notable behavior.



Camp Grayling FEIS	Figure 4-4
Range 13 Noise Contours	

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However, they note that laboratory studies of domestic mammals have indicated that behavioral responses will vary (among species and individuals within a species) with noise types and levels. Domestic animals, for example, appear to acclimate to some sound disturbances. Bell (1972) in Manci et al. (June 1988) also states that specific reactions to noise differ according to the species involved, whether the animal is alone, or perhaps whether the individual has been previously exposed to sonic booms. Also, reactions vary from boom to boom and do not appear to be predictable.

Dufour (July 1980) states that the responses of animals to noise are related to their reactions to the humans who are directly or indirectly responsible for the noise. If an animal sees a person shooting a gun or riding a snowmobile, it would become frightened of humans. A domestic animal such as a hunting dog would probably not be afraid of either the person or the noise. Thus, care should be taken in interpreting animal responses as to whether they are elicited by the noise itself, or by the noise as a signal of another threat. Cottereau (1978) reported that deer near Eglin Air Force Base, Florida showed no response to high-level sonic booms. Rylander et al. (1974) studied the sonic boom exposure effects to humans and animals. He concluded that the reactions among animals were small, with slight startle responses among all species studied. A strong habituation effect was observed.

Helicopter noise is another factor which may be disruptive to wildlife. The literature suggests that among all types of aircraft studied, helicopter noise may be more disruptive to birds and other wildlife than fixed wing or jet aircraft (Klein, 1973; White and Sherrod, 1973; Fleischner and Weisburg, 1986; Ward et al., 1986; Awbrey and Bowles, 1990). The unique sounds associated with helicopter flight, combined with very low altitudes, seems to bother wildlife more than normal high-flying jet aircraft. Helicopters hovering at or below tree level could have negative impacts on nesting birds (e.g., frightening an adult bird incubating eggs into temporarily abandoning its nest, and young birds being blown from the nest or prematurely jumping). Because of the many variables and uncertainties, it is not possible to quantify mortality or reduction in fitness caused by the disturbance from low-flying helicopters, but the potential of negative impacts to breeding birds is acknowledged.

Deer in dense coniferous forests are less likely to flee than deer in open hardwood stands, which in turn would be less likely to flee than deer in an open or treeless area (Eckstein, 1979; Richens, 1978). It is likely that helicopters maintaining an elevation of 500 feet above ground level would not disturb wintering deer in deer yard areas. However, responses of individuals or groups of individuals are subject to a large number of contributing factors which may modify responses.

For raptors and most likely all birds, the nest building and egg laying phases are probably the periods most sensitive to noise disturbance (Grier and Fyfe, 1987). Disturbance to nesting birds has the potential to result in nest abandonment, inadequately incubated eggs resulting in death of the embryo, or hatchlings being startled and prematurely jumping from their nest. Minor human disturbances may cause long-term effects on

lifetime reproductive success of birds by increasing energy and time expenditure in non-reproductive activities and by reducing condition of nestlings (Fernandez, 1993).

It is common for relatively mobile animals to respond to noise by running or flying away from the source(s) to another area. This type of response, however, does have the potential to produce some negative consequences. A disturbance occurring in any region may cause an individual to expend energy towards moving away from the source of the noise. For territorial species (e.g., carnivores), this energy loss may be compounded if the displacement results in increased intraspecific and interspecific conflicts. That is, conflicts arise as resident animals and the displaced animals meet. The net effect is a reduction in the energy reserves of not only the displaced but the resident animals as well.

It is evident that in areas of similar habitat and land use that species can respond to the same disturbance differently, and that the maturity and current reproductive stage of each individual are likely major factors in determining the direction and magnitude of that response. Long-term effects of military or civilian noise on the wildlife at Camp Grayling is unknown. The majority of the training areas are open to sport hunters, fur-trappers, and fishermen for much of the year with no apparent shortage of game animals reported. Many animals become habituated to repetitious or consistent noise patterns within a relatively short period (Krzysik, 1987 and 1989; Lee, 1981). In other words, the animals simply "get used" to the noises.

Several studies have been done relating to the effects of noise on wildlife. A few examples are shown below.

(A) The most comprehensive study of the response of a bird species, the prairie falcon (*Falco mexicanus*), to impulsive noise was performed by Holthuijzon (1989) for the Idaho Power Company, the Bureau of Land Management, and the Pacific Gas and Electric Company. The following paragraphs describe the experimental procedure used and the results of this 4-year study.

(1) The behavior reaction to the impulsive noise was evaluated by the type of pre-event behavior compared with post-event behavior. The falcons were exposed to peak sound levels between 129 and 141 dBP. Each aerie was exposed to an average of 90 events over a period of 62 days. Common pre-event behaviors, including perching, incubating, brooding, flight, and preening. The falcons usually responded to the impulsive noise by continuing their pre-event behavior or by a short flight followed by their pre-event behavior.

(2) During the study, there was no evidence of habituation to the noise. However, the occupancy of the nesting areas exposed to the noise remained the same the year following the impulsive noise events.

(3) In general, this study found that construction and recreation activities lacked detectable adverse effects on nesting prairie falcons. It appears that the prairie falcon is

sometimes annoyed by the impulsive noise events, but not annoyed enough so that they will permanently abandon an established nesting area with a readily available food supply.

(B) At a U.S. Navy bombing range in Mississippi, hunting behavior of a female northern harrier (*Circus cyaneus*) was observed with regard to low-level jet aircraft bombing (Jackson, 1978). During the bombing, the harrier continued normal hunting at a height of 15 to 20 feet, even when 25 lb practice bombs exploded within 200 feet of the bird. In fact, the harrier seemed to focus on the target area. The authors hypothesized that the bird was probably taking small mammals flushed from cover by the bombing.

(C) Incubating wild turkey (*Meleagris gallapavo*) hens were observed during real and simulated sonic booms (Lynch and Speake, 1978). The hens displayed a few seconds of head alert response to the sonic boom sound. No hen flushed off the nest, and brood productivity showed no effect from the noise. Teer and Truett (1973) observed 20 brood groups reaction to sonic booms. No hen abandoned her poults, nor did the poults scatter. Observations of bobwhite quail (*Colinus virginianus*) found no difference in hatching success when exposed to simulated sonic booms.

(D) Among wild ungulates, behavioral reactions appear to be related to history of human disturbance on the individual or group. In a study conducted at the Wichita Mountains Wildlife Refuge, Oklahoma (USAF, 1973) of low-level jet overflights, general observations were made of American buffalo (*Bison bison*). At a noise monitoring site with levels approaching 90 dBA, the buffalo appeared oblivious to the aircraft noise. They continue grazing throughout all aircraft passes.

(E) Another study examined the effects of low-level jet and sonic booms on nesting peregrine falcons and other raptors in Arizona (Ellis, 1981). Though birds were noticeably alarmed by the noise (82-114 decibels A-weighted) the data showed no associated reproductive failure. In addition, no significant changes in heart rate were noticed.

(F) In northcentral Michigan, the responses of 6 pairs of bald eagles to over 700 events of potentially disturbing human activity were recorded (Grubb et al., 1993). The highest frequencies of response was from anglers, automobiles, and gunshots. The authors suggest that the wide disparity in response frequencies for noise types (0 percent for artillery, 76 percent for gunshots) implies that eagles near military bases habituate to distant artillery noise. The response to gunshots (small arms) is likely representative of the effects of abrupt loud noise, or associating with past experiences. Eagle responses to gunshots and sonic booms were 52 percent and 63 percent, respectively, in Arizona (Grubb and King, 1991).

(B) Present Mitigation: In consideration of local residents and recreation users of the Camp Grayling region, noise abatement procedures have been established for Ranges 30 and 40 and for aviation activities. These procedures include limiting tank maingun and artillery firing, aircraft bombing and the detonation of certain demolitions to no earlier

than sunrise and no later than three hours after sunset. These same activities are also prohibited from 4:00 p.m. Friday until sunrise on the following Tuesday for the Memorial Day, Fourth of July, Labor Day, and opening weekend of trout season. In addition, all ranges are closed during the firearm deer hunting season (15-30 November) (CG Reg. 350-10, March 1990).

Military aircraft are required to maintain a minimum altitude of 500 feet above ground level when outside the boundaries of the Post. The only exception occurs when aircraft are operating on a nap-of-the-earth (NOE) course approved by the MIARNG State Aviation Officer (CG Reg. 350-10, March 1990). In addition, aircraft overflights are prohibited over Hartwick Pines State Park and the Wakely Lake Nature Area at all times and within distance restrictions near active eagle nests (CG Reg. 350-10, March 1990).

All existing air-to-ground range flight paths were carefully designed to avoid populated areas as much as possible. These flight paths were designed for aircraft traveling to and from the range as well as while on the range. The low level training routes used to enter the range were developed to avoid towns, towers, populated areas, farms, etc. They were all approved by the Federal Aviation Administration prior to first use. All users of these routes are briefed on proper procedures prior to every flight (CG Reg. 385-1, April 1992). Once on the range, flight paths are designed to optimize weapon delivery as well as to avoid populated areas. These paths are closely monitored by the range officer at the on-site range control tower.

Camp Grayling has maintained a noise complaint management program since 1989. This program provides a toll-free telephone number to receive all noise complaints. The details of the complaint are recorded and the geographic location of the incident plotted. To assist in their identification, helicopters using Camp Grayling display numbers on the underside of the aircraft. The circumstances of the incident are investigated and the unit involved is notified. The complainant is contacted regarding the resolution of the complaint and this contact is followed up with a letter. In 1993, 116 noise complaints were logged. Of those, three activities accounted for a majority of the complaints. Approximately 37 percent were complaints about rotary wing aircraft (helicopters), 16 percent resulted from artillery firing at the Range 40 complex, and 18 percent from live drops of 500 lb bombs at the Range 40 complex.

4.1.3.2 Alternative 1 - Implement Master Plan Projects as Proposed

Noise impacts include the effects of noise associated with training and the construction and operation of facilities. This discussion will address the proposed cantonment area facilities upgrades, training area, and new training and operational activities separately. Construction noise will be addressed as well as training and operations noise.

Project 1A and 1B - Construct MATES Vehicle Storage Buildings and the Bulk Fuel Facility (BFF): These projects involve the construction of structures or facilities with normal construction practices. The planned construction projects will both involve the use of some construction machinery which will temporarily contribute to noise within the

cantonment area and tank range vicinity. These projects will not be built simultaneously. The construction noise within the cantonment area should be indistinguishable from the noise associated with normal activities. Off-post, the construction noise associated with these projects will be transient, confined to daylight hours, and should be indistinguishable from the noise associated with the daily movements of trucks and heavy equipment typical of ambient conditions within the community. Neither of these projects are anticipated to significantly affect the noise environment.

There are no operational aspects of these two projects that would contribute substantially to the Post's noise environment.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): The noise impacts of the MPRC-H-R will include the effects of range construction and its operation. The proposed firing range area includes approximately 5,000 acres. In general, the site is a valley that runs northeast/southwest in the central portion of the existing tank range. This location will move firing points approximately 1 mile further into the interior of the Post than the current tank range, and is separated from the southern installation boundary by a large hill mass.

Two looped road courses, movable and fixed targets and established firing points will be constructed. The construction noise will be temporary and largely confined to daylight hours. These sounds should be indistinguishable from the existing noise of maneuvering tracked vehicles and substantially less than the noise levels of normal range operation.

Approximately 350 acres of woods occur on the slopes along the northwestern side and in the northeastern third of the area. The remainder of the range area is valley floor. All this land is currently devoted to tank range use and receives heavy training use. The lands immediately adjacent to the MPRC-H-R are all owned by the military, however, there are three parcels of private land along the border of the military reservation and the Hartwick Pines State Park to the northwest within a mile of the northwestern edge of the firing range. Other private lands are more than a mile and a half away.

The noise impacts associated with training activities involve incorporating use of the MPRC-H-R. The noise impacts within the training areas are produced by weapon firing, aircraft movement, and vehicle movement.

The proposed MPRC-H-R is capable of operating year-round, 16 hours per day with 2 to 4 hours of maintenance time. The course can accommodate a full company of 12 tanks simultaneously with infantry and helicopters. Usage will be comparable to the existing use of the Range 30 complex. The available usage time will be predominantly booked by units who currently train at Camp Grayling, and ammunition allocations are anticipated to be reduced from recent distributions. All ammunition will be inert rounds including sub-caliber firing. New impacts will be similar to those generated by current operations. In addition, the MPRC-H-R will allow for increased use of laser weapons simulators, decreasing current noise generation.

Even though the MPRC-H-R will be used in combined arms scenarios, computer -generated noise contours prepared for the proposed MPRC-H-R (see Figure 4-5) indicate a reduction from the existing noise contours (see Figures 4-1). The Zone II contour extends only a minimal amount off-post to the northwest. This is achieved because the weapons used (other than the tank main gun currently used) are of a small caliber. In the case of helicopter weapons (e.g., 2.75-inch rocket or TOW missile), inert rounds which make very little noise when fired and no noise on impact are used.

4.1.3.2.1 Effects of Noise on Wildlife

Project 1A - Construct MATES Vehicle Storage Buildings: Construction and operation of the MATES storage buildings will have no additional noise impact on wildlife.

Project 1B - Construct Bulk Fuel Facility: Construction and operation of the BFF will have no additional noise impact on wildlife.

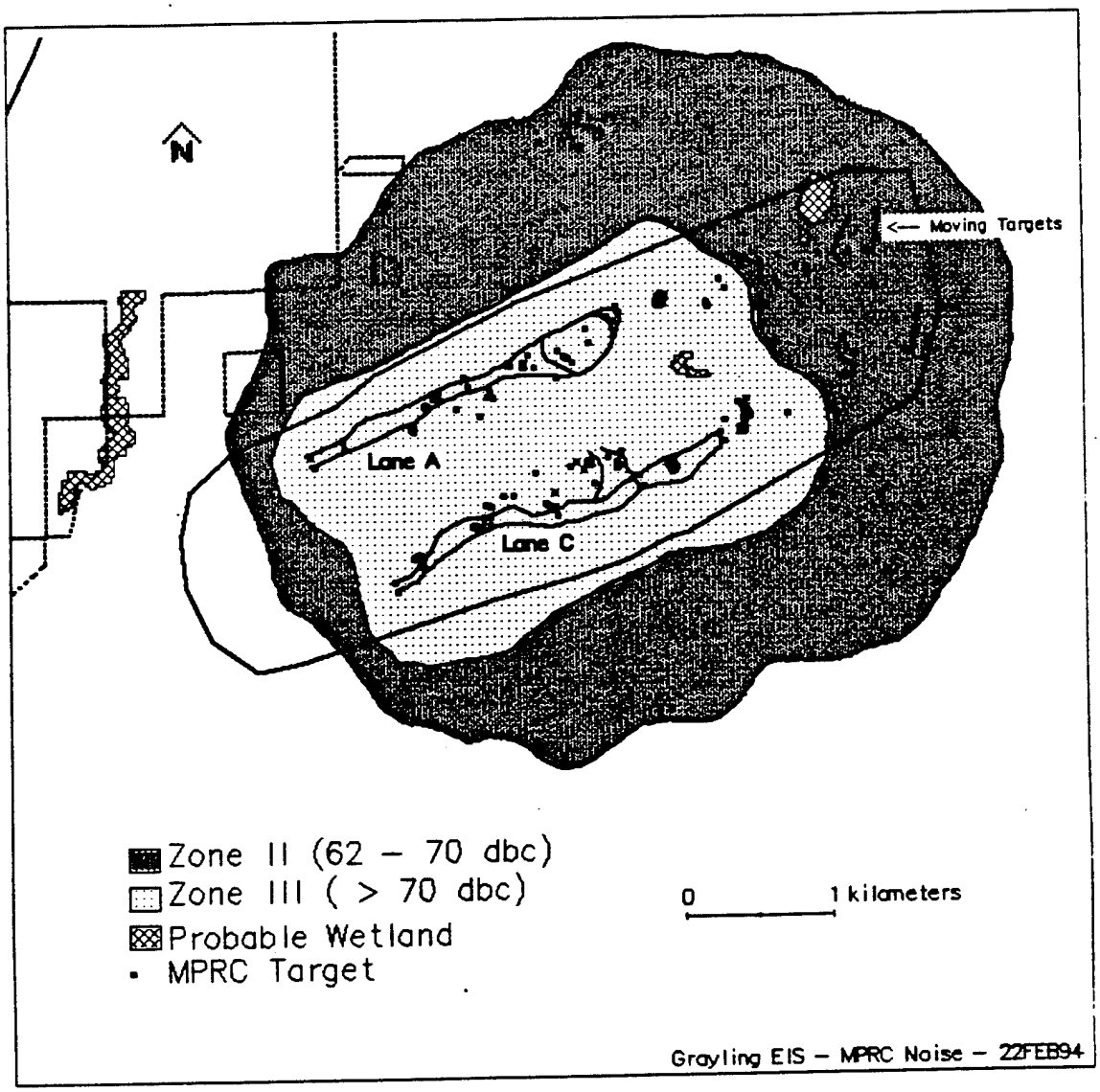
Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): The construction of the MPRC-H-R will result in additional noise impacts on wildlife. Dozers and other heavy equipment, which will be used for clearing lanes and areas for target movers, are extremely noisy and will cause several noise-sensitive animals (e.g., deer, song birds) to disperse to other locations during construction. The potential for short-term negative impacts to wildlife exists if the disturbance occurs during a critical period (e.g., nesting season).

Proposed Mitigation: Proposed mitigation activities related to noise are essentially no different from those currently in place. As previously described, to minimize the effect of training activities on nearby residents and recreation users, mitigation measures include: (1) restrictions imposed in CG 350-10, Facility Scheduling and Management, and (2) CG 385-1, Range Safety Regulation. Training units will continue to adhere to current established noise abatement procedures for tank maingun and artillery firing, aircraft bombing and the detonation of certain demolitions. Noise disturbances from clearing and construction of the proposed MPRC-H-R will be confined to daylight hours. Aircraft overflight restrictions currently in place will continue. Camp Grayling will continue to operate its noise complaint management program.

Camp Grayling will coordinate with planning and zoning agencies to ensure that nearby land uses that may be proposed are compatible with the noise environment created by the Post.

4.1.3.3 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A and Project 2B - Construct MATES Vehicle Storage Buildings and Bulk Fuel Facility at Different Location: With implementation of Alternative 2, noise impacts would be similar to those resulting from Alternative 1. Construction of the Master Plan projects at other than the proposed locations would result in similar construction noise at those optional sites.



Camp Grayling FEIS	Figure 4-5
MPRC-H-R Noise Contours	

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Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Noise impacts on wildlife will be less to that described for the proposed location in that all tank maingun firing would be conducted at out-of-state locations.

4.1.3.3.1 Effects of Noise on Wildlife

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: Construction and operation of the MATES vehicle storage buildings will have no additional noise impact on wildlife.

Project 2B - Construct Bulk Fuel Facility at Different Location: Construction and operation of the BFF will have no additional noise impact on wildlife.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: If MPRC-level training is conducted at an out-of-state location, construction, training, and operational noise impacts would occur at that site. Noise studies would have to be carried out for that specific out-of-state site. Noise from other operations at Camp Grayling would stay the same (i.e., aircraft, artillery).

4.1.3.4 Alternative 3 - Do Not Implement Master Plan Projects

Existing noise levels near the proposed facilities are generated by aircraft operations and the daily movements and firing of training equipment. If the projects are not implemented, noise impacts will remain approximately the same as at present.

4.1.3.4.1 Effects of Noise on Wildlife

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no additional noise impact on wildlife from not building. Noise will be similar to present conditions.

Project 3B - Do Not Construct Bulk Fuel Facility: There will be no additional noise impact on wildlife from not building the BFF.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: Noise impacts on wildlife will be identical to those described in Section 4.1.3.1.6.

4.1.3.5 Cumulative Effects

Aircraft movement generates noise impacts. In addition, noise impacts are generated by the use of high explosive ordnance at the Air-to-Ground Range. The association of these noise effects may have a greater impact than if the activities occurred independently.

The Grayling Army Airfield is used by both military and civilian aircraft. The military aircraft are helicopters, C-130 transport and smaller twin-engine aircraft; the civilian users

are business jets and private aircraft. Railroad tracks and highways are adjacent to the airport. These activities in combination, occurring in close proximity, may result in a more annoying noise environment than would be indicated by considering only military aviation operations.

Off-post, the vehicle noise associated with the MATES and BFF Projects will be transient, confined to daylight hours, and should be indistinguishable from the noise associated with the daily movements of trucks and heavy equipment typical of ambient conditions within the cantonment area. No vehicle movement associated with the planned projects or in combination with any other project or activity are anticipated to significantly affect the noise environment.

Noise disturbances to wildlife resulting from clearing, construction, and operation of the proposed facilities are considered relatively minor, as many species appear to have already become habituated to military activities. The proposed facilities are very similar, with regards to noise on wildlife, to those currently in operation.

Noise impacts from weapons firing on the MPRC will have a small beneficial impact in that firing points will move approximately 1 mile further into the interior of the Range complex.

4.1.4 Soils

(A) Baseline Conditions: Soils at the Camp are affected by the forces of nature as well as by the various military and civilian activities that occur. There are two natural causes of soil erosion: water and wind. Water erosion is a process involving an excess of snow melt and/or rainfall that produces surface runoff. This is caused by a rainfall or melting rate exceeding the rate of infiltration (movement of water into the soil) or when rainfall exceeds the soil saturation limit. Drainage classes, defined by the U.S. Soil Conservation Service, represented in these training areas indicate a high rate of infiltration. This property will reduce the amount of surface runoff and limit the distance a soil particle is transported. Due to the type of soil that the training activities occur on, the potential for water erosion will be slight for slopes <18 percent and moderate on steeper sloped (18 to 45 percent) areas.

Wind erosion is another natural process influenced by soil properties as well as vegetation. The Soil Conservation Service has a classification system to label the Wind Erodibility Group (WEG) for different soils. This WEG is based on the physical soil characteristics with values ranging from 1 to 8. The majority of the soils at Camp Grayling, 92.4 percent of the total area are in WEG 1 or 2, extremely erodible, and very highly erodible, respectively (Werlein and Kroell, undated). This general equation is used by Soil Conservation Service to estimate total wind erosion:

$$E = f(I, C, K, L, V)$$

where E is a function of the following values:

- I: soil erodibility value
- C: adjustment value for area not included in the original data collection that contain different wind and/or rainfall patterns
- K: soil ridge roughness value
- L: distance of unsheltered area along the prevailing wind direction
- V: vegetative cover (quantity, type, and orientation)

These factors directly affect the amount of soil transported during the erosion process. A large I (easily erodible) and L value will increase the total wind erosion, whereas, a large K (rough surface) and V (abundant vegetation) value will limit the total wind erosion.

When an activity causes the damage or removal of vegetation, typically, soil erosion rates increase. However, this conclusion describes only a part of the process. The other values as shown above also contribute.

Certain areas of the installation are designated for military training activities that are highly disruptive to soils (e.g., Engineer Valley, Range 30 off-road tank maneuver areas). Since these areas do not impact water resources, there is no intention to restore these sites.

Current activities that affect soils involve both administrative and tactical maneuvering. Most maneuvering activities are conducted on trails, improved roads, or off-road sites and may contribute to the disruption or dislodgement of vegetation. Tactical maneuvering employs the use of both wheeled and tracked vehicles. Since tracked vehicles are not allowed to travel or maneuver on improved roads, impacts to trails and off-road sites are increased. These vehicles disturb the soil and damage the vegetation. However, the tracks caused by the vehicles reduce the potential for wind erosion by increasing the soil ridge roughness value (K). Considering the types of soils where this occurs, water erosion should not exceed a rating of moderate.

Artillery rounds have the potential to disrupt the soil upon impact and explosion. This disruption typically forms a circular depression and random dispersement of the soil. This will cause a loss of vegetation (primarily grass), which in turn may increase the potential for water and/or wind erosion. The potential for water erosion through this action will be insignificant. Wind erosion will not increase significantly due to the artillery impact on the soil because it will not produce large, flat, bare areas. In areas where there is a high concentration of artillery (the impact area), the area disturbed may slightly increase the wind erosion potential due to the lack of vegetation.

Other areas of concern are firing points and protective berms located near the targets. Firing points are designated by geological survey points, and troops must fire within the general vicinity. Heavily used firing points cause the area (up to several acres) to become rutted with vehicle tracks and denuded (EMAP document, 1986). The removal of

vegetation will increase the potential for wind erosion, but the unevenness of the rutted ground will tend to offset this. Since firing points are typically associated with flat areas, impacts to water erosion should be insignificant.

Engineering units include activities related to combat, construction, and utilities. Combat and construction engineers impact the soil through construction of fortifications, obstacles, and bunkers. Protective berms are often constructed to protect the sensitive components of targets. These berms are constructed using earth moving vehicles. During training, these structures receive artillery fire which causes a disruption to the soil and vegetation. Since the soil is located on a slope, the impacts will be different than previously discussed. More soil will be transported down the slope to the base of the berm due to the continual disturbance, causing a smoother surface. Wind erosion will be more prevalent on the berms that "face into" the prevailing winds. Also, lack of vegetation will promote wind erosion which will require the berms to be re-constructed on a regular basis. Utility engineers construct and support activities such as electrical power for fixed facilities. The magnitude of impacts can only be generalized since each project would need to be individually evaluated. When the soil is disturbed, the potential for erosion exists. Water erosion is typically not a concern, since the soil has an erosion rating of slight to moderate. Wind erosion may not be a concern if these training "projects" are small in size, do not extensively damage surrounding vegetation, and produce a rough soil surface.

Bivouacking and concentrated activities include training exercises that require a unit (e.g., quartermaster, hospital) to set up facilities and occupy a location for an extended period of time. Areas of concern are sites where vegetation is cleared to set up training equipment and heavy equipment is concentrated for extended periods. The potential impact would occur at the conclusion of the training activity (site vacated) and prior to the establishment of new vegetation. This would produce a bare and relatively large, open area exposed to the possible forces of nature (wind erosion).

Petroleum related training activities include refueling and maintenance unit sites. Refueling sites would potentially encourage heavy vehicles to remain in one location for extended periods of time. This may compact the soil but will not typically damage the soil structure nor significantly alter the infiltration properties due to the predominant soil being sand. Currently, permanent refueling sites have a cement pad. However, at times, refueling is accomplished without pads. A fuel spill at these locations would impact the soil through contamination and would affect soil erosion because the soils in that site would then have to be disturbed in order to remove the contaminated soil.

(B) Present Mitigation: The first line of defense in protecting soils from erosion is vegetal cover. The role of vegetation in retarding soil erosion cannot be over-emphasized. Vegetation protects surface soils by preventing wind, splash, and rill erosion. Specifically at Camp Grayling, vegetation plays an important role in reducing wind erosion through limiting open space. This reduces the effectiveness of the wind to transport soil because the vegetation present retains or traps the soil particles.

Ground cover intercepts raindrops, absorbs rainfall energy, reduces particle detachment, and lowers runoff velocities. Vegetative cover is relatively inexpensive to achieve and is often the only practical, long-term solution to stabilization and erosion control on most disturbed soils at Camp Grayling.

Camp Grayling has an erosion control and land restoration program. This erosion control program outlines and prioritizes specific sites that contain erosion problems. Each site is prioritized based on the potential impact to the surrounding areas. The four categories in order of priority are: (1) eroded areas where sedimentation to surface water or wetlands is occurring, or has the potential to occur (2) bare and/or eroded areas where fugitive dust may affect off-post areas or essential habitat, (3) large eroded and/or denuded areas where natural native revegetation is unlikely, and (4) areas perceived as aesthetically unpleasing.

As part of the Camp Grayling Soil Erosion Plan, problem areas were identified and remedied as listed below:

(1) Eroded areas where sedimentation to surface water is occurring, or has the potential to occur:

Erosion problems that have been identified were located at: (a) King's Ponds (UTM coordinates 688424), (b) Little Bear Point on Lake Margrethe (753448), (c) the pipeline crossing at Portage Creek (685458), (d) the tank crossing on Portage Creek (678453) and (e) several small lakes on the Camp, including Hardgrove, Sand, Howes, Kyle, and Lonesome Lakes.

(a) King's Ponds do show the effects of erosion due to water. Gullies have formed along the slope south of the pond. It has been speculated that the erosion was caused due to tightly compacted gravel located south of the pond that reduced the infiltration rate and promoted runoff. No work is planned for this site at this time because it is very small and shallow (1-2 acres) and does not support a fishery.

(b) Little Bear Point on Lake Margrethe has experienced heavy civilian recreational use. This has promoted denuding and erosion in several sites along the shore. Camp Grayling has recently closed this area to all vehicular traffic (civilian and military). However, it is still heavily used by civilians arriving by boats. Remaining sand delivery has no negative impact on the lake and could be beneficial to some fishes for spawning (S. Sendek, Personal Communication, 9 September 1993).

(c) The pipeline crossing at Portage Creek had been identified as a major source of sedimentation. This site was continuously disturbed by civilian (all terrain or 4-wheel drive) and some military vehicles. This disturbance caused an increase in sediment deposition and shoreline damage to Portage Creek. In 1991, this problem was corrected through the installation of extensive stream bank control measures.

(d) The culvert crossing at Portage Creek and bridges and culvert crossings at other locations contributed sediment loads to the water source as well as degradation to the adjacent shoreline. This activity was detrimental to streams, and had the potential to destroy the tank crossing site if repair was not completed. Gully erosion also formed alongside the culverts and the road. These sites have since been improved by culvert upgrades, sediment control devices, and flow restriction barriers.

Other work conducted along Portage Creek included the installation of two sand traps, five stream bank stabilization sites, road and pipeline crossing improvements, and two sets of survey monuments to monitor the stream channel effects of the sand traps. These improvements were completed in 1993.

(e) Many lakes at Camp Grayling have been used as bivouac and shower points by troops. These activities (both civilian and military) over the past years have caused the lake shores and vegetation to become damaged due to activities taking place too close to the lake. The results from these past actions increased sedimentation into the lakes.

To avoid this, Camp Grayling does not allow military activities within 200 feet of all water bodies. Along the Au Sable River and its tributaries, a 400 feet buffer zone has been established. However, water-related training activities are authorized at Howes, Duck, Sand, and Kyle Lakes, but are confined to designated launch and maneuver sites. Launch sites located at Sand and Kyle Lakes will be improved in 1994. Permits were issued by the DNR in 1993 approving these projects designed to minimize erosion and sedimentation.

(2) Large eroded and/or denuded areas where natural native revegetation is unlikely:

Existing erosion problems include sites: (a) Engineer Valley (708432), and (b) the POW Camp (733433). These sites have a third priority because water quality is not degraded and off-post fugitive dust is not a problem.

(a) Engineer Valley is designated as a training site for excavation and earthwork activities and is used frequently. The valley floor is basically unvegetated and does not experience a high level of erosion. However, past activities within the semi-forested side slopes of the valley have left some of the hillsides denuded, which encourages erosion along the slopes. If left unchecked, this training area would expand over the slopes into adjacent areas. Therefore, Post staff have been working on a plan to define the training area to contain training within it. To date, one access road into the training area has been established by placement of guard rails where unlimited access used to occur and twenty acres of denuded soil has been planted and revegetated with grasses, trees, and shrubs.

(b) The Prisoners of War (POW) Camp at Camp Grayling is a sandy, flat area surrounded by hillsides within the interior of South Post. These hillsides contain only sporadic vegetation and are susceptible to erosion. The POW Camp itself does not

display any erosion problems because of its flat topography, and there are no water resources nearby which can be affected. Therefore, no mitigation is proposed.

(3) Generalized potential erosion areas:

Many of the training activities conducted at Camp Grayling disturb vegetation and some leave open erodible areas. However, the areas that do not cause sedimentation to water bodies or contribute to migration of fugitive dust off-post receive the lowest priority for rehabilitation. Training activities that cause soil disturbance include: (a) bivouac sites, (b) assembly areas, (c) firing points, (d) tracked vehicle maneuver areas, (e) infantry training areas, and (f) roads and trails.

(a & b) Bivouac sites and assembly areas that are frequently used denude the grass cover and defoliate bushes. These areas are prone to erosion. Water erosion is typically minimal because most sites are located on flat surfaces and a minimum of 200 feet from surface waters. The bivouac site at Portage Creek was restored in 1990 due to potential impact to the surface water (before the 200 foot buffer was established).

(c) Firing points are located around the impact area of Range 13 in the South Camp, around the impact area of Range 40 in the North Camp, and at certain locations within Range 30. Heavily used firing points may cause the area (up to several acres) to become rutted with vehicle tracks and denuded (EMAP document, 1986). The removal of vegetation will increase the potential for wind erosion, but the unevenness of the rutted ground may offset this.

(d) The majority of tracked vehicle maneuver areas are located within the North Camp area. These usually involve tracks that criss-cross and cause the ground to be rutted and vegetation disturbed. Related concerns include the erosion of trails on sloped areas and the aesthetics of these sites.

(e) Infantry training areas do not show significant signs of erosion since most activities are small excavations (foxholes). However, a disturbance to the ground does promote erosion if corrective measures are not implemented. Camp regulations require that all foxholes be filled after the training is completed. As long as these regulations are followed, no additional erosion control measures are needed.

(f) Roads and trails in Camp Grayling are primarily unpaved except in the cantonment area. As previously mentioned, trails on slopes are subject to erosion and new trails are not permitted. Unnecessary existing trails are being closed and revegetated. The roads and trails that contribute to sedimentation of water bodies have been discussed above.

The Land Rehabilitation and Maintenance (LRAM) Program, a component of ITAM (Refer to Section 3.5.1), provides guidance and technology for the planning, design, and implementation of land restoration projects and the establishment of a long-term land maintenance program.

Camp Grayling began gathering baseline data during 1992 and 1993 which will continue to provide a basis for future analysis and prioritization of problem areas. Camp Grayling is in the early stages of formal assessment and design within LRAM. However, the Post continues to rehabilitate portions of its land when potential impacts are noted in high priority areas (priority 1 or 2). In 1992 and 1993, 97 acres of land were rehabilitated and 5 miles of roadside revegetation/stabilization were completed.

4.1.4.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the two buildings, collectively, will be an additional 71,000 square feet of storage and may have some impact on the soil. The site was cleared when the MATES complex was built in 1987 and is being used for equipment storage. Water erosion will not greatly affect the site because the area is relatively flat. Wind erosion is not a concern because the area is almost entirely covered with equipment.

Project 1B - Construct Bulk Fuel Facility: The potential for wind and water erosion will increase during construction. During construction, topsoil will be stripped away, some small trees may have to be cut down, and soil will be disturbed. However, these impacts will be remedied upon completion of the facility.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Reconstruction of the current tank range complex will disturb the soil. Approximately 25 acres will be cleared for roads and approximately 350 acres will be disturbed, with some tree cutting for construction of target mechanisms. Significant vegetal cover will be removed from the firing lanes which will increase water and wind erosion. The stationary and moving target sites will produce the highest potential for water erosion, because berms will be constructed and excavations made to install target equipment.

Proposed Mitigation: Training activities will always have the *potential* to damage soils, similar to the potential associated with movement of construction equipment. However, active planning, sound decisions during training, and appropriate rehabilitation of critical areas will mitigate most effects. Appropriate decision making and training plans will be utilized to mitigate soil damage in the proposed training areas on Camp Grayling.

Erosion control of bivouac sites and assembly areas will include a rotating training schedule of the sites. Upon completion of training, sites will be revegetated if necessary, and/or left undisturbed until the conditions are returned to a satisfactory level. Once the site has returned to a "healthier" condition, training activities will resume.

To control erosion on sloped areas, many existing vehicle trails are being closed, except the ones essential to training, to allow for re-establishment of vegetation. When necessary, vegetation will be planted and maintained in these areas to protect the ground from wind and water erosion.

Camp Grayling will continue to execute all components of ITAM, including the Land Rehabilitation and Maintenance (LRAM), and Training Requirements Integration (TRI) programs. USACERL and other technical agencies will provide necessary professional assistance.

4.1.4.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: Although the vehicle storage buildings could be built in a slightly different location on the existing MATES, it is not possible to build them anywhere else on the Camp (Refer to Section 2.4.1). Therefore, this alternative is not evaluated.

Project 2B - Construct Bulk Fuel Facility at Different Location: The proposed construction of the Bulk Fuel Facility at a different location will have added impacts to the soil since this site is located on an open, sandy area, has no topsoil, has very little vegetation, and is closer to Lake Margrethe.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: If the MPRC is not built at Camp Grayling, some reduction in activity will take place. Maneuvering activities will continue, however since the level at which these activities are conducted will be reduced by approximately one-third, there will be less soil disruption and dislodgement of vegetation.

Proposed Mitigation: Similar mitigative measures as described for Alternative 1, above will be implemented to control erosion during construction of the Bulk Fuel Facility at a different location.

4.1.4.3 Alternative 3 - Do Not implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: If the vehicle storage buildings are not constructed, the site will remain open and covered with grass. The area will continue to be used for parts and equipment storage outdoors. Since the current equipment storage area does not have concrete pads, an accidental fuel spill could contaminate the soil.

Project 3B - Do Not Construct Bulk Fuel Facility: If the BFF is not constructed, the site will remain undisturbed with grass and secondary growth.

Project 3C - Do Not Construct MPRC-H-R; Continue to train at Camp Grayling: If the MPRC-H-R is not constructed, soils within this area will continue to be damaged by on-going armor training and the level of impact will be consistent with current use.

Proposed Mitigation: Camp Grayling has an erosion control plan and a land restoration program. Under this plan, erosion control practices will continue to be followed for specific problem sites. Integrated Training Area Management program will continue to be implemented (Refer to Section 3.5.1).

4.1.4.4 Cumulative Effects

The cumulative effects resulting from this alternative will not be significantly different from current activities. However, soils will be significantly impacted during construction of the proposed facilities.

4.1.5 Surface Water

Water resources include streams, lakes, groundwater, and wetlands. These resources are affected by current military training and support activities, but the degree to which each is affected varies. Due to the inherent differences in susceptibility of impacts from military activities, the discussion of water resources will be subdivided to provide better coverage. In addition, military activities that tend to be similar in how they impact water resources will be grouped together.

Lotic (moving water) and lentic (still water) ecosystems are impacted to some degree by military and civilian activities occurring at Camp Grayling. While many activities are not of great consequence, others have the potential to impact both the chemical and physical character of these resources and the biota they sustain. This is particularly true where training activities occur in one area repeatedly (bivouacking) or are associated with a specific environment (bridging/rafting on lakes); additionally, specific activity (refueling) or type of equipment (tracked vehicles) utilized must be considered. In some situations a combination of training scenarios occur that may contain some or all of the above.

4.1.5.1 Streams

(A) Baseline Conditions: Current training activities that affect streams are most associated with specific ground and air training events, on-going road and trail usage and maintenance. Regulations prohibit water-borne activities such as stream crossings, thereby eliminating most impact to streams. Vehicles must remain on established roads and trails, and therefore do not impact stream resources directly except at various bridge and culvert crossings. However, other land and air based activities may indirectly impact streams at Camp Grayling.

Broadly speaking, all forms of land based training activities have the potential to affect surface waters. This is due to the fact that whenever vegetative cover and soils are disturbed erosion can take place. The movement of soils and their deposition in streams can adversely affect water quality by transporting chemicals attached to soil particles. However, Camp Grayling soils are dominated by rather coarse materials (sand) that are not as problematic as smaller particles (clay) in transporting bound chemicals (Refer to Section 3.5.5.3).

Of greater importance is the negative impact that occurs when soil particles are deposited in streams and rivers and cause cloudiness or turbidity. This impact is physical in nature causing habitat degradation that can severely impact biota that colonize stream beds (e.g., macro-invertebrates) or require clean substratum to complete

a specific life history function (e.g., reproduction). Potential sedimentation is a major concern for land managers at Camp Grayling because of the value of trout fisheries in the Au Sable and Manistee River watersheds.

Soil surface damage and the potential for erosion are dependent on many factors, several of which are site specific. Soil permeability determines the amount of surface runoff that will occur. The very permeable soils that dominate Camp Grayling result in relatively little runoff. The relative amount of disturbance and the remaining ground cover is critical. Sites that retain some vegetative cover are less prone to erosion than severely disturbed sites with little or no cover. Localized topography is another critical factor because erosion potential is heavily influenced by slope angle and length.

Camp Grayling training activities that most impact terrestrial environments and subsequently expose soils are primarily related to tracked vehicle use. Although all vehicles tend to impact vegetative cover and disturb the soil surface by compaction and/or wheel slip, tracked vehicles are the greatest contributors. Damage from tracked vehicles is especially noticeable where tight turns are made during maneuvering. This action tends to crush vegetation and "plow" the soil surface leaving furrows and berms of exposed soils. These "plow marks" are found throughout the installation where tracked vehicles are used in many different training scenarios.

Erosion is recognized as an on-going concern at Camp Grayling. Disturbed soils are commonly encountered on tracked vehicle training areas and are widely distributed. However, they do not pose a serious threat to water resources because tracked vehicle training is restricted to areas away from most water resources and are often concentrated on designated roads and trails. Although there is some movement of soils, they often are only transported locally and typically do not reach streams. In addition, many of the areas most heavily used by tracked vehicles have rather limited stream networks.

Sediments are also carried in ditches along roads and trails and reach streams particularly at bridge and culvert crossings. This is an on-going problem at Camp Grayling but is not limited to roads and trails supporting military activities; other roads in and near the Post also contribute sediment to local streams.

Bivouacking indirectly impacts streams due to the intensity and localization of activities. Soldiers and their support equipment and supplies remaining in one area for prolonged periods tends to disturb vegetation and soils. Compaction and vegetative cover removal exposes soils and accelerates runoff velocities which results in soil deposition below these sites. Although bivouacking often takes place in the same area year after year and is of special concern, impacts to streams are relatively minor because bivouacking normally takes place away from water resources.

Refueling is another activity that occurs throughout the installation and can impact streams. If fuel is spilled during transport, when transferred between containers (bulk dispenser to a 5-gallon can), or from any container to a vehicle or other receptacle (e.g.,

generator) streams can be impacted. Refueling follows strict procedures, but spills do occur. Contamination is generally localized and contained before reaching waterways.

Other training activities carried out by individual soldiers or small units can also indirectly impact streams. This would include activities involving foot training or the building of defensive positions or other temporary structures (e.g., fox holes). This tends not to be a problem because these activities are not permitted to occur in close proximity to streams, but minor area wide impacts are generated.

Firing activities, especially land based, are in many ways identical to non-firing and maneuver activities (e.g., same training scenarios and vehicles) and are responsible for many of the same environmental impacts as outlined previously (e.g., erosion and sedimentation). The difference in live-fire exercises lies in the use of live ammunition and other ordnance.

As a rule, exploding ordnance (e.g., mortar round) creates a localized but severely impacted area by destroying vegetation and forming soil depressions. Because of the dangers involved in live-fire exercises, there are only certain areas at Camp Grayling that allow this activity. The Range 40 artillery impact area (7,000 acres), the tank firing range north of North Down River Road (3,000 acres), and the mortar impact range (1,100 acres) are all restricted areas. The concentration of firing activities on these ranges results in three types of impact to water resources: (1) incidental firing into streams, lakes, or wetlands, (2) overland and subsurface transport of combustion residuals and associated metals to surface waters, and (3) sedimentation.

Stream water quality at Camp Grayling is generally quite good but is being studied for possible effects associated with training activities at Range 40, on the North Post. The Range 40 complex receives ordnance from both ground-based (e.g., mortars and artillery) and air-to-ground (e.g., 20mm cannon to 500 lb bombs) training activities. It has yet to be determined whether training activities are affecting the stream quality of the Range 40 area and an environmental assessment is being conducted under the approval of the Department of Natural Resources (see Section 3.9.2 for a complete discussion).

Combat service and support units are also involved in training activities at Camp Grayling. Several units provide a wide variety of sources that can impact water resources including supply and service units, ordnance demolition, hospital, and engineering activities.

Explosive Ordnance Detachment (EOD) supports units by using "unserviceable ammunition and unexploded ordnance" while conducting training at Camp Grayling. However, this training does not occur near streams and is tightly controlled.

Hospital units can contain laundry facilities. The wastewater generated in laundering activities is located away from water resources and therefore has little impact. A similar situation exists for supply and service units that provide laundry, mess, toilet, and bathing

facilities in the field. These units are also located away from water resources, and therefore do not affect surface waters significantly.

Engineering units also support combat training and can have a very large potential impact on streams. Combat engineers often engage in construction activities to emplace obstacles and fortify positions, and create water crossing sites, bunkers and other utilities. Although these activities take place during training exercises, they do not impact surface waters directly. Soil erosion is the major concern, and because these activities are restricted to areas away from water resources their impact is considered to be minimal. Combat engineering activity takes place primarily in Engineer Valley on the South Post. This area receives considerable impact from engineering training and can be characterized as a sand pit. Although most of the site is without vegetative cover, soil movement is contained within an area of approximately 60 acres and does not impact streams due to the absence of nearby streams and site topography.

Construction engineering units are similar to combat engineering units but have a greater opportunity to prevent environmental impacts. Construction engineers do not operate under the same time constraints as combat engineers and can therefore plan and employ state-of-the-art practices to prevent impacts. Construction impacts therefore have little impact on stream resources.

Combat Arms Unit Type activities combine many of the components contained in training activities previously discussed at varying levels of intensity and involvement. Impacts to streams are again most associated with the effects of overland travel by soldiers and vehicles, especially armor. These activities take place over wide areas on the installation thereby affecting surface waters indirectly. However, the effects from this type of training on the water resources at Camp Grayling are minimal.

(B) Present Mitigation: Environmental regulations adopted at Camp Grayling by the Michigan Department of Military Affairs are designed to establish policy, procedures, and guidelines to insure that environmental concerns are addressed. These regulations also facilitate the identification of offending individuals/units who violate environmental regulations (CG Reg. 200-1, January 1993).

Water resources at Camp Grayling are protected by policies that restrict activities in or near streams, lakes, and wetlands. Mitigation procedures have also been devised and applied at Camp Grayling for activities known to affect water resources. These take several forms including those developed to address specific emergencies (e.g., pollution spills) while others are more general in scope and function to mitigate multiple activities simultaneously (e.g., LRAM).

(1) Regulated Activities and Environmental Policies:

(a) Pollution Spills: When spills occur the Post Environmental Protection Officer is notified immediately. Following a spill, a series of emergency procedures are initiated to: (1) stop the spill flow immediately, (2) contain the flow of material using whatever means

available (e.g., sandbags or absorbent materials), and (3) prevent flow into drainage ditches, storm and sewer drains, and surface waters (CG Reg. 200-1, January 1993). In accordance with U.S. EPA Regulations, the Department of the Army Regulations and the Michigan Water Resources General Rules, a Spill Prevention, Control and Countermeasure Plan (SPCCP) and an Installation Spill Contingency Plan (ISCP) have been developed for Camp Grayling. These plans have been developed to protect the water resources of the state from contamination by oil and/or hazardous substances. For a complete description of the SPCCP/ISCP, refer to Section 4.1.6 (B).

(b) Vehicle Restrictions: Tracked vehicles are prohibited from utilizing and crossing certain areas of Camp Grayling and must remain on established roads and trails especially when crossing wet areas. Entering streams or wetlands is prohibited (CG Reg. 200-1, January 1993).

All vehicles must remain 200 feet away from all waterways except for using existing roads and trails that are within this buffer zone. The width of the vehicle exclusion zone expands to 400 feet for the Au Sable River and its tributaries (CG Reg. 200-1, January 1993).

Washing vehicles is permitted only at designated wash racks on Post or in the City of Grayling. Washing vehicles in lakes, streams and other water supply points is prohibited (CG Reg. 200-1, January 1993).

(c) Field Sanitation: All field sanitation and mess sites are to be placed a minimum of 300 feet from any water body. This includes waste generated from kitchen and bathing facilities and human waste. Depending on the type of waste, specific disposal methods are required including soakage pits, grease barrel traps, soakage trenches, and latrines (CG Reg. 200-1, January 1993). Camp Grayling has received a permit exemption from the DNR to discharge graywater.

(d) Water-Borne and Water Supply Operations: Camp Grayling Operations must give approval prior to any use of surface waters for water-borne operations. Several lakes are designated as water-borne operation sites including Howes Lake, Duck Lake, Lake Margrethe, Sand Lake, and Kyle Lake. The latter two require notification to the DNR when proposed for use.

Water supply operations such as water purification, laundry, and bath units also must obtain approval for sites prior to initiation of any activity. Discharges from purification and shower/laundry units must be at least 300 feet from any surface waters (CG Reg. 200-1, January 1993). Camp Grayling has received a permit exemption from the DNR to discharge graywater.

(e) Refueling: Six concrete refueling pads are located throughout the training site at Camp Grayling and are to be used when refueling. All refueling sites must have spill/leak control and response materials on site and must be a minimum of 400 feet from all water resources (CG Reg. 200-1, January 1993).

(2) Land Management and Water Resources:

As discussed earlier, erosion and sedimentation are recognized as an on-going concern at Camp Grayling. Roads and trails contribute to the delivery of sediments to water resources. Sediment basins in the cantonment area and many road ditches reduce or eliminate sedimentation from roads. These impacts are reduced by the training buffers that are maintained in riparian areas and other mitigation activities that are broadly encompassed in the ITAM program.

The ITAM program contains several components vital to the mitigation of potential impact to water resources. Most relevant of these is the LRAM program (see Section 3.5.1) that when fully implemented will reduce erosion and subsequent transport of sediments into lakes, streams, and wetlands.

Regulations and other environmental policies also serve to protect water resources by excluding activity in riparian areas. In addition to minimizing impacts near surface waters and wetlands, training area exclusions help maintain the ecological integrity of riparian habitats. Riparian systems, as narrow as 30 to 50 feet, effectively reduce both surface and subsurface pollutants moving from terrestrial uplands. Streamside vegetation also stabilizes channels, thereby lowering the incidence of bank failure, further reducing sediment loading in streams.

In-channel retention basins, more commonly known as sand traps, are probably the most efficient and cost effective means of reducing bed loads and "degrading" overloaded gravel beds (UMMRC, 1993). Sand traps are a featured component of the restoration plan currently being implemented in the Upper Manistee River by the Upper Manistee River Restoration Committee (UMMRC). As part of this committee, Michigan Department of Military Affairs has taken an active part in the Upper Manistee River restoration effort. Sand traps have been proposed for installation in the Manistee Main Stem from Cameron Bridge to Sharon. Portions of this reach lie west of Camp Grayling and contain many seriously aggraded sites (UMMRC, 1993). In addition, the DMA has erected 12-foot high earthen berms behind Ranges 7, 8, 9, 18, and 19 that will provide better safety protection as well as capturing any "stray" bullets that may have entered Portage Creek and nearby wetland areas.

Portage Creek, which lies entirely within Camp Grayling is also impacted by sediment and has been the focus of stream restoration efforts on the installation. Currently two sand traps are located in Portage Creek and are maintained regularly. Installation and maintenance of these sand traps has and continues to be contracted by UMRRC. Other restoration projects have included the stabilization of five sites where stream banks were failing, several stream crossing improvements, and a monitoring project to evaluate the effects of the sand traps on the stream channel. DMA has contributed $45,000 for these improvement projects in Portage Creek (UMMRC, 1993).

(3) Water Resources Research:

The continued collection of environmental data relative to water resources is an important and continuing activity at Camp Grayling. In the past, several studies have been conducted to identify areas where military activities may be affecting water resources. These studies are the cornerstone from which mitigation plans are developed and ultimately implemented. Basic field assessments and monitoring projects are essential to the identification of environmental problems and the subsequent development of mitigation efforts. Continuing research, monitoring, and follow-up evaluations allow installation officials to ascertain how well their programs are working and how they can be modified to provide greater environmental protection.

The most recent example is the water resources assessment at Range 40 complex on the North Post. This project was initiated in 1991 by DMA. An initial study was conducted during 1992 which sought to broadly assess the condition of soils, wetlands, and surface and groundwater in and near Range 40. This study characterized environmental conditions and successfully identified several potential problems. The findings were essentially preliminary in nature, which is often the case when sweeping environmental assessments are undertaken. Certain problems (e.g., burn pans) have been addressed by changes in practices that are to be followed by installation personnel. Other areas that were identified as potentially problematic were examined further during the completion of a second, more focused assessment (see Section 3.9.2) that was designed in cooperation with and approved by the DNR. This project alone represents a significant commitment of human and financial resources by DMA.

4.1.5.1.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will not affect stream resources. There are no streams close to the construction site.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will not affect streams as there are none near the site. Following the construction phase, the BFF will serve the same function as the old facility but will have design features that will further reduce potential for spills to surface waters.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Streams will not be affected by construction of the MPRC-H-R. Construction activities will cause the disturbance of vegetation and soils at some locations and involve the piling of excavated materials. These locales will be temporarily subject to erosion but will not pose a sedimentation threat because there are no surface waters in these areas.

Following the construction phase at the MPRC-H-R, surface waters should be affected in a similar manner as that associated with current activities at Range 30. Soil erosion and sedimentation associated with vehicular training at the MPRC-H-R site on Range 30 will be slightly different than that which occurs now. There will be no change in the quantity

of training conducted at Range 30. However, there will be changes in where training activities take place. Range 30 usage will change (relative to intensity) across three different levels; that which will occur within the MPRC-H-R firing box (Lanes A and C and target areas), inside the fenced area, currently containing Ranges 35, 36, and 37, and training lands outside the fenced area (i.e., the remainder of Range 30).

Within the firing box of the MPRC-H-R, the area encompassing the targets will be fenced precluding intensive maneuvering on approximately 3,000 acres, thus protecting this area from tracked vehicle damage and reducing indirect effects on water resources.

The consolidation of three lanes to two lanes within the firing box will further concentrate tank traffic on established roads and trails to gain access to firing positions. This will be generally beneficial (inside the fenced area) by reducing the area available for free maneuvering.

This change will effectively force approximately 20 percent of the maneuvering that once occurred within the firing box and fenced area to other locations. This will undoubtedly increase trail usage and free maneuvering activity outside the area currently fenced on Range 30. Maneuvering damage at Range 30 will therefore be distributed across a larger area, but should not significantly affect water resources. This is due to the fact that stream occurrence is minimal in the Range 30 complex.

4.1.5.1.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The construction of the MATES vehicle storage buildings at a slightly different location will not affect stream resources. No streams are in close proximity to the proposed sites.

Project 2B - Construct Bulk Fuel Facility at Different Location: The construction of the BFF at a different location will not affect stream resources. No streams are in close proximity to the proposed.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Moving the MPRC-H-R training to another State will not affect stream resources at Camp Grayling.

4.1.5.1.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no effect on stream resources by not building the MATES.

Project 3B - Do Not Construct Bulk Fuel Facility: There will be no effect on stream resources by not building the BFF.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: There will be no effect on stream resources by not building the MPRC-H-R. Training impacts on water resources will be minimal and similar to that occurring at Range 30 currently.

4.1.5.1.4 Cumulative Effects

Cumulative effects on water resources (streams, lakes, wetlands) at Camp Grayling are due primarily to erosional processes. Erosion is a natural process that is accelerated by any activity that impacts terrestrial vegetation and disturbs the soil surface. While it is an admirable goal to completely eliminate water resources impacts associated with erosional processes, this is not feasible, even with the most aggressive protection and mitigation program. Military training is only one activity among many taking place in the Grayling area that causes erosion and sedimentation. Mitigation has, and will continue to minimize impacts to water resources at Camp Grayling to a level where they are not threatening the integrity of aquatic ecosystems.

4.1.5.2 Lakes

(A) Baseline Conditions: The impacts of current training activities on lakes are, in general, similar to those affecting streams and again are relatively minor. Sedimentation and water quality issues predominate but are restricted to a few lakes in close proximity to selected training activities. Specific training and support activities that directly impact lakes include engineer training (e.g., open water bridging and rafting) and potential water quality degradation due to explosives and ordnance residuals.

Open water engineer training takes two forms. One consists of the construction of bridges to carry loads over open water or wetlands. The other involves the operation of rafts and boats to carry personnel, supplies, and equipment over water. Water-borne operations are restricted to five water bodies: Howes Lake, Duck Lake, Lake Margrethe, Sand Lake, and Kyle Lake. The latter two lakes require notification to the DNR when proposed for use.

Impacts from bridging and rafting are dependent on lake geomorphology. Training activities in shallow lakes and the littoral zone of larger lakes often uproots aquatic vegetation and increases turbidity by agitating bottom sediments. Wave action, brought about by maneuvering watercraft in near-shore environments, increases and accelerates shoreline erosion and also elevates turbidity. These impacts in turn affect biota that are intolerant to these disturbances. Shallow, small lakes used for this type of training are impacted to a much greater extent than their larger counterparts.

Several lakes within the boundaries of Camp Grayling have been examined to determine potential impacts related to military training and associated installation activities. Several studies have found no impacts to Lake Margrethe (see Section 3.5.6.1.2). The Range 40 study (ESE, 1993) now in progress is evaluating Range 40 firing activities to determine if any impact has occurred to these lakes. This study is being conducted in close

coordination with the Michigan DNR and upon completion, will be made available to all interested parties.

(B) Present Mitigation: Mitigation will be similar to that mentioned in Section 4.1.5.1(B), above.

4.1.5.2.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will not affect lake resources. There are no lakes close to the construction site.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will not affect lakes as there are none near the site. Following the construction phase, the BFF will serve the same function as the old facility but will have design features that will further reduce potential for spills to surface waters. The proposed facility will be safer, more convenient to use, and farther away from surface and groundwaters than the current facility. The BFF will therefore reduce the risk of impacts to surface waters.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Lakes will not be affected by construction of the MPRC-H-R. There is only one small lake in close proximity to the construction area, and equipment will be restricted from 500 feet of its shoreline.

As discussed in Section 4.1.5.1.1, changes in training activity across Range 30 will occur due to the reduction of free maneuvering inside the area currently fenced. Those lakes in Range 30 will not be impacted by the redistribution of training, due to setback restrictions in place.

4.1.5.2.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The construction of the MATES at a slightly different location will not affect lake resources. No lakes are in close proximity to the site.

Project 2B - Construct Bulk Fuel Facility at Different Location: The construction of the BFF at a slightly different location will not affect lake resources. Following the construction phase, the BFF will serve the same function as the old facility. The alternate site will still be approximately 1/4 mile from Lake Margrethe, thereby reducing the risk of impacts to surface waters.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Moving the MPRC-H-R training to another State will not affect lake resources at Camp Grayling.

4.1.5.2.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no effect on lake resources by not building the MATES.

Project 3B - Do Not Construct Bulk Fuel Facility: There will be no effect of lake resources by not building the BFF.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: There will be no effect on lake resources by not building the MPRC-H-R. Training impacts on water resources will be minimal and similar to that occurring at Range 30 currently.

4.1.5.2.4 Cumulative Effects

See Section 4.1.5.1.4 Cumulative Effects on Streams.

4.1.6 Groundwater

(A) Baseline Conditions: The groundwater resources of the Post are generally of very good quality. The groundwater in the area is abundant and meets all State standards. The primary effect that the Post has had on the groundwater resources is a slight drawdown of the groundwater table in the vicinity of the Post due to normal groundwater withdrawal. Because of the high storage capacity of the local aquifer and the relatively low level of groundwater usage by Camp Grayling, excessive groundwater withdrawal has not been a significant problem in the Grayling area.

On a local level, groundwater quality has been adversely affected in several areas of the Post due to several contamination incidents. The majority of such incidents consist of small petroleum leaks or spills related to vehicles or above and below-ground fuel tanks. These have affected only the shallow soil or the shallow groundwater over small areas.

Camp Grayling at one time had approximately 200 aboveground fuel tanks for furnaces and water heaters. All of these tanks have now been eliminated and equipment converted over to cleaner burning and more efficient natural gas. Prior to 1992, 7 of the former tanks developed leaks resulting in discharges ranging from 50 to 250 gallons. Locations of the Buildings included 1176 and 1177 at the Grayling Army Airfield and Buildings 616B, 405, 314, and 642 in the cantonment area. The DMA has an on-going contract which allows for the spill response coordinator to call in an outside contractor (24 hours/day) to respond immediately to spills. All of the above sites have had cleanups finalized or are currently undergoing cleanup actions.

Another petroleum release occurred at the Cantonment Area Fuel Dispensing Point. This release was discovered following a failed tank tightness test conducted in 1990. Six underground storage tanks (UST) were removed along with approximately 3,000 cubic yards of petroleum contaminated soil. Shallow groundwater contamination was detected, and remedial activities were undertaken to correct and eliminate the contamination. A

series of withdrawal wells were installed downgradient of the UST location, and an above-ground bioreactor is being used to treat the contaminated water.

The types of military vehicles present on-post during training periods include: armored tanks with two 300-gallon fuel tanks each; 5,000-gallon tank trucks that serve as stationary refueling stations; trucks equipped with 1,200-gallon fuel tanks or 600-gallon fuel pods for mobile delivery of fuel in the field; and various smaller flatbed trucks, pickups, jeeps, etc. Types of fuels used are diesel fuel, unleaded gasoline, and JP-4 aviation fuel. Spills may result from hose rupture, leaking hose connections, fuel tank puncture, spillage during refueling activities, or from vehicle accidents. The amount of fuel released has ranged from 1 gallon to several hundred gallons due to ruptured fuel tanks. All fuel spills of this type have been cleaned up.

Vehicle fuel spills in the field have been of minimal amounts and have been adequately controlled through prompt cleanup response. Six concrete fueling pads have been installed in key locations throughout the Post. The improved reporting procedures and an on-call contractor has allowed prompt soil excavation before fuel has reached the groundwater. Military units with appropriate equipment also assist in cleanup of many fuel spills in the field. Other measures taken to protect the groundwater and surface waters include: education of troops through environmental briefings; use of several types of absorbent materials issued to the troops; restriction of refueling points to locations away from wetlands and surface waters; and plans to construct additional containment structures for the larger tank trucks that serve as stationary fueling points.

The largest spill incident occurred in June, 1984, when Camp Grayling discovered a release of an estimated 10,000 gallons of diesel fuel from an underground dispensing line at the bulk fuel facility adjacent to the GAAF facility. The leaking line was removed and replaced, and excavation of the contaminated soil was begun immediately. A Pollution Incident Report was prepared and submitted to the State, and an engineering firm was hired to evaluate the spill and take remedial action. All of these actions were performed in accordance with the Spill Prevention Control and Countermeasure Plan (SPCCP) and the Installation Spill Contingency Plan (ISCP). Further remedial activities related to this incident are discussed in the mitigation, below.

Another potential area of groundwater impact is the North Post Range 40 complex. Concerns have been raised related to the long-term use of the Range 40 complex and the potentially adverse affects of munitions related compounds and residues. In order to address these concerns, Camp Grayling commissioned an assessment of the Range 40 complex. The study is being conducted by Environmental Science and Engineering (ESE) and includes sampling and laboratory testing of shallow soils, groundwater, and surface waters for a wide variety of organic and inorganic pollutants (see Section 3.9.2 for a complete discussion of Range 40 study results and on-going assessments).

(B) Present Mitigation: Current mitigation activities related to the groundwater of Camp Grayling center around the assessment of potential groundwater contamination,

remediation of existing contamination and the prevention of future contamination incidents.

In accordance with the U.S. EPA Regulation (40 Code of Federal Regulations (CFR) 112), the Department of the Army Regulations (AR 200-1) and the Michigan Water Resources General Rules (Part 5), a Spill Prevention, Control and Countermeasure Plan (SPCCP), and an Installation Spill Contingency Plan (ISCP) have been developed for Camp Grayling. These plans have been developed to protect the water resources of the State from contamination by oil and/or hazardous substances.

The spill plans designate responsible parties and actions that must be taken in the event of a spill. The normal course of action is to attempt to stop the spill if possible, report the spill to the Installation On-Scene Coordinator (IOSC), and then contain the spill. The IOSC is responsible for determining the type of cleanup necessary, the appropriate Installation Response Team (IRT) to clean up the spill, and the necessity of reporting the spill to the Federal or State authorities (CG Spill Control and Counter-Measure Plan, June 1993).

To help prevent spills in the future, the Post has partially renovated the existing fuel storage facility. The facility contains three aboveground storage tanks which hold JP-4 fuel (50,000 gallons), diesel fuel (47,000 gallons), and motor gas (57,000 gallons). The tanks contain all vapor recovery devices as required by law, and all piping has been moved aboveground.

The Post also possesses a considerable amount of equipment necessary to handle a spill and has a trained staff educated through training sessions on spill cleanup.

In June 1993, the DMA revised its SPCCP and its ISCP. These two documents are required under Federal EPA regulations for the Post. They were written so that combined, they meet the State of Michigan requirement for a Pollution Incident Prevention Plan (PIPP). Both agencies have reviewed this document and found it to meet provisions of the law, provided that all recommendations for improving certain storage and containment areas are accomplished within the agreed upon specified schedule.

Under provisions of these documents, the DMA has an approved management plan. Implementation of the SPCCP assures that the effects of spills to the environment are minimized.

The ISCP assures that should a spill occur, a plan of action is in place to deal with it. The revised SPCCP and ISCP now include several new provisions to address both on-going and proposed activities and facilities.

A key provision of the SPCCP is the DMA-regulated waste management plan (MIARNG Reg. 420-4). The document describes, in detail, the specific requirements placed on

waste generators at shop facilities and also upon troops during field training. Additionally, all unit commanders utilizing the Post are required to receive an environmental briefing prior to moving into the field. This briefing emphasizes the importance of preventing spills whenever possible and emphasizes the proper steps to take as outlined in the ISCP should a spill occur.

An integral part of the ISCP is the provision for an on-call (immediately available) private contractor if needed to support the installation staff. The number of recorded fuel spills from vehicles is as follows, 6 in 1988; 10 in 1989; and 38 in 1990. Records were not kept prior to 1988. The increase in spills during 1990 was due to improved reporting procedures which required all spills to be reported regardless of quantity. During FY93, a total of 15 minor leaks or spills occurred either through operation of Post facilities or through training activities. Three involved spills of greater than 20 gallons and the largest was 50 gallons. These spills occurred during June through September. In all cases, spill response, as indicated in the ISCP, was affected immediately and follow-up measures were taken as required under EPA and DNR regulations. The majority of materials spilled were vehicle fuels. A single one gallon fog oil, one gallon motor oil, and a three gallon antifreeze spill also occurred. A total of 158 gallons of fluid was spilled and recovered including 85 3/4 yards contaminated soils recovered and disposed.

Whenever training is conducted, the units in training are in direct radio contact with the Operations and Training Staff. The ISCP clearly instructs troops in training to report spills to the Operations and Training Staff who, in turn, initiate the response actions. The appropriate Camp Grayling Spill Response Team will also respond to an aircraft accident or crash on-post and will be supported if necessary by a private contractor who is on call to the installation for spill contingencies. An aircraft accident or crash off-post would be treated similar to any other civil accident. The DNR and/or local authorities, including fire and sheriff department staff, would be supported by Army National Guard personnel and equipment in accordance with the policy stated in the existing Installation Spill Contingency Plan.

The DMA is aware that an installation the size of Camp Grayling, with the magnitude of training being conducted, provides the potential for spills and leaks. The DMA has therefore implemented several plans, policies and/or actions to minimize this potential or to effectively remediate spills which have occurred. These include:

(a) Implementation of a spill control and countermeasure plan (SPCCP).

(b) Implementation of an installation spill contingency plan (ISCP).

(c) Implementation of the regulated waste management plan (RWMP).

(d) Strict adherence to both state and federal water quality laws.

(e) Strict adherence to both state and federal storage tank laws.

The SPCCP discussed the various facilities and/or actions within Camp Grayling which have the potential for a release to the environment. The following text provides a discussion of the releases which have occurred to date at the bulk fuel facility. It details responses taken to remediate the releases, and outlines actions taken to provide against reoccurrences.

Bulk Fuel Facility and Old MATES: In June of 1984, it was discovered that a buried portion of pipe utilized by commercial distributors for filling the 47,000-gallon above-ground diesel fuel tank was leaking. There was no way of determining the actual amount of fuel loss, but an estimate of 10,000 gallons was established based on amount of free product recovered and from the size of the contaminated plume. The cleanup to remediate the spill has been continuous since its discovery and has consisted of:

(a) Removal of underground piping and replacement with new aboveground piping.

(b) Excavation of contaminated soil to the maximum extent possible. (Excavation was limited by the bulk fuel tanks to the north and the Detroit Mechanic Railroad to the south).

(c) A detailed hydrogeological study which has defined both the horizontal and vertical extent of the contamination.

(d) Recovery wells for the removal of free product (diesel fuel floating on the water table) and also for drawing the contaminated groundwater into a zone of depression whereby it is then able to be pumped to the surface.

(e) The installation of a groundwater treatment system.

The treatment system initially consisted of water being pumped through a carbon filter system. The effluent was then injected back into the soil through a tile field. Although effective in containing the plume and removing contaminants to low levels, this mode of treatment takes many years to remediate an area completely (the pollutant was still slowing leaching from the contaminated soil above the groundwater table). To address this deficiency, in 1988, the DMA hired a new contractor with considerable expertise in bioremediation.

A bioremediation treatment system capable of treating groundwater was then installed to reduce the cleanup time from an estimated 20 plus years to 1-2 years. Progress reports are available from the DMA, which describe this system in detail.

During August of 1989, the DNR split-sampled with the DMA contractor at the bulk fuel contamination site. The DNR ran a more detailed scan of analyses which showed that certain monitoring wells contained chlorinated hydrocarbons (TCE and PCE). Upon this discovery, the DMA directed its contractor to conduct a more intensive hydrogeological study to define the extent of the TCE/PCE plume. It was determined that the TCE/PCE plume was semi-overlapping the diesel plume and that it originated from the old MATES facility directly upgradient. Both TCE and PCE have specific gravities heavier than water

or diesel fuel. Thus, these contaminants were identified to be at a lower elevation than the diesel plume.

The source of contamination is suspected to be the old up-gradient MATES facility. Although the MATES has since been replaced with a new facility, approximately five miles to the east, the old MATES location is still utilized by the Grayling Army Airfield for helicopter maintenance and repair. To prevent further impacts, the dry well has been removed and replaced with a double-walled steel underground storage tank to capture all effluent which passes through the maintenance bay floor drains. Work on vehicles or helicopters is restricted to the building interior. In addition, TCE-based solvents have now been replaced with non-chlorinated solvents. The new MATES operates with these same provisions to ensure its site integrity.

To provide effective treatment for the TCE/PCE plume, three additional recovery wells were installed at the leading edge of the plume and were tied into the existing bioreclamation system already in place. The bioreactors were then inoculated with a culture grown specifically to degrade chlorinated hydrocarbons.

The bioreclamation system to date has reduced the diesel fuel contamination to virtually nondetectable levels in all wells. The TCE/PCE plume being treated, is effectively isolated, and the perimeter of the plume is monitored on a schedule by sampling 39 groundwater monitoring wells. This entire cleanup consisting of 39 monitoring wells, 40 soil borings, 8 recovery wells, and the carbon and bioremediation treatment systems, has to date cost approximately $950,000. All funds have been provided by either National Guard Bureau or the U.S. Army Toxic and Hazardous Materials Agency (USATHMA) from funds delegated through the Defense Environmental Response Act (DERA).

4.1.6.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: Construction of the new MATES storage buildings will have a significant beneficial impact, because heavy equipment prone to leaks will be stored in buildings with concrete floors. In the event of future minor leaks, any leaked material will be contained.

Project 1B - Construct Bulk Fuel Facility: Construction of the new Bulk Fuel Storage Facility will have potentially a significant beneficial effect on groundwater resources. The facility will be constructed in accordance with applicable regulations. The facility will comply with the flammable liquids code (NFPA 30-1981) in order to receive a permit from the State Fire Marshal's Office. The permitting process requires the contractor to submit an application complete with information on the storage tank capacity and specifications, materials being stored, and safeguards. The safeguards are designed to preserve surface and groundwater and consist of two major requirements: (1) a continuous impervious dike or wall around the facility that can store the volume of liquids contained in the largest storage tank, and (2) an impervious bottom under the site to prohibit movement of the liquids down into the soil and groundwater, and (3) leak detection

devices. The tanks will be registered with the State Fire Marshall within 30 days of installation. This facility will also be included in the Post's SPCCP and ISCP.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): The proposed MPRC-H-R activities could potentially have a minor impact on groundwater resources related to potential minor fuel spills such as are currently experienced on occasion at Camp Grayling. These potential impacts, as they relate to the MPRC-H-R, are experienced under present training conditions and are not expected to change.

Construction of the MPRC-H-R will result in the consolidation of three current tank gunnery ranges thereby minimizing the area on which tank gunnery training occurs. Because the basic tank training activities are expected to remain essentially unchanged, the effects of the proposed activities will not change significantly from what is currently experienced. The clearing of timber for firing lanes and line-of-sight requirements will likewise not have a significant effect on groundwater conditions as only a relatively small area, approximately 25 acres, will be cleared. Infiltration of precipitation may be reduced slightly due to increased runoff; however, the porous nature of the soils will result in a high degree of infiltration even in sparsely vegetated areas.

Proposed Mitigation: The DMA has shown that it has a proven system for addressing both on-going training actions and proposed Master Plan training actions. Currently, new facilities to be constructed, such as the Bulk Fuel Dispensing Facility is only designed in concept. When these new facilities are designed, the SPCCP and ISCP will be updated, as necessary, to address all site specific operational or maintenance aspects.

4.1.6.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: Since it is not possible to build the vehicles storage facilities anywhere else on the Camp, this alternative is not evaluated (Refer to Section 2.4.1).

Project 2B - Construct Bulk Fuel Facility at Different Location: Construction of the BFF on a different location will have similar impacts to those resulting from Alternative 1, above.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Training at a MPRC out-of-state will somewhat reduce the training activities at Camp Grayling, however, it will not affect groundwater.

Proposed Mitigation: Site-specific impacts resulting from the construction of the BFF will be mitigated in the same manner as described above under Alternative 1.

4.1.6.3 Alternative 3 - Do Not implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no impact on groundwater if the vehicle storage buildings are not built.

Project 3B - Do Not Construct Bulk Fuel Facility: If the existing BFF is not replaced, there is a greater potential for groundwater contamination from an accidental leak from the old facility.

Project 3C - Do Not Construct MPRC-H-R; Continue to train at Camp Grayling: If the MPRC is not constructed, current training activities will continue at the same level and groundwater quality of the Camp will remain unchanged.

Proposed Mitigation: In case of an accidental spill, mitigation actions will be performed in accordance with the Camp Grayling Spill Prevention Control and Countermeasure Plan and the Installation Spill Contingency Plan.

4.1.6.4 Cumulative Effects

Construction of the new MATES facility and the Bulk Fuel Facility will have little or no impact on groundwater resources of the Post. Each of these are conventional construction projects and will only temporarily affect the surface environment during construction. The only anticipated impact to groundwater will be a slight reduction in surface water infiltration due to site improvements. Because of the relatively small size of each project, such a reduction in groundwater recharge will be insignificant.

Based on the proposed actions described in Section 4.1.6.1 above, and the present and proposed mitigation activities related to each, the various alternatives are not expected to have significant cumulative effects on the groundwater resources of the Post or the surrounding area. In several areas of the Post where groundwater has been adversely affected in the past, remedial measures have been successfully implemented to reduce the associated hazard to a negligible level.

4.1.7 Wetlands

(A) Baseline Conditions: Many of the training activities discussed previously in Section 4.1.5 are contributing minor impacts to wetlands on Camp Grayling. Current training activities have resulted in erosion processes that have caused sedimentation in some wetlands. Again, this is most associated with areas that support heavy tracked vehicle use or occur along established roads and trails crossing wetlands (see Section 3.9.2 for a complete discussion of possible impacts to wetlands from associated training activities at the Range 40 complex).

(B) Present Mitigation: Mitigation will be similar to that mentioned in Section 4.1.5.1(B), above.

4.1.7.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will not affect wetland resources. There are no wetlands close to the construction site that could be affected.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will not affect wetlands as there are none near the site.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Wetlands will not be affected by construction of the MPRC-H-R. A site survey has shown that there are no wetlands near the areas that will be disturbed during construction.

As discussed in Section 4.1.5.1.1, changes in training activity across Range 30 will occur due to the reduction of free maneuvering inside the area currently fenced. Wetlands in Range 30 should not be impacted by the redistribution of training as there are few in the area, and those that exist are protected by maneuvering restrictions.

4.1.7.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The construction of the MATES vehicle storage buildings at a slightly different location will not affect wetland resources.

Project 2B - Construct Bulk Fuel Facility at Different Location: The construction of the BFF at a slightly different location will not affect wetland resources. No wetlands are located near the alternate BFF site.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Moving the MPRC-H-R training to another State will not affect wetland resources at Camp Grayling.

4.1.7.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no effect on wetland resources by not building the MATES vehicle storage buildings.

Project 3B - Do Not Construct Bulk Fuel Facility: There will be no effect on wetland resources by not building the BFF.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: There will be no effect on wetland resources by not building the MPRC-H-R. Training impacts on wetland resources will be minimal and similar to that occurring at Range 30 currently.

4.1.7.4 Cumulative Effects

See Section 4.1.5.1.4 Cumulative Effects on Streams.

4.2 Biological Environment

4.2.1 Vegetation

(A) Baseline Conditions: The training activities that could potentially cause damage to the herbaceous vegetation at Camp Grayling are: tracked and wheeled vehicle maneuvering, bivouacking, refueling, engineer training, water related training, and various other special firing activities (e.g., EOD, NBC, ammo supply).

Damage caused by these activities varies depending on the number of times a training area receives each type of use, the number and type of troop activity, and the type of vehicle utilized. Current training and maneuver activities that cause the most damage to plant cover include off-road tracked and wheeled vehicle movement, bivouacking, and weapons firing.

Tracked and wheeled vehicles driving off-road impact the soil and vegetation to some degree after just one pass. Repeated passes, especially with wet soil conditions, can reduce the amount of vegetative cover and species composition due to soil compaction, and/or physical damage to the plants themselves (Goran et al., 1983). Tracked vehicles are more detrimental than wheeled vehicles due to the mere weight of the vehicle and the degree to which the tracks spin and turn, tearing at the vegetation. Additionally, the proportion of the time tracked vehicles spend in off-road training accounts for increased disturbance to vegetation.

In certain areas that have been disturbed by intense tracked maneuvers, native vegetation has been supplemented with winter annuals and other agricultural grasses. Vegetative ground cover provides cover and food for wildlife, reduces soil erosion, allows the soil to absorb water, and assists in maintaining ecosystem integrity. Disturbance and erosion are considered important factors in influencing the ecosystem, especially at the local (microhabitat) level. Based on 1993 LCTA data (see Section 3.5.1 for description), approximately 1,464 of the 20,000 data collection points were classified as being man-induced disturbances (7.3 percent). These disturbances included roads (0.09 percent), passes (5.69 percent), and trails (1.54 percent). Another type of ground disturbance, "other", accounted for an additional 1.23 percent of the total ground disturbance. This type of disturbance could have resulted from a variety of different factors including wildlife, but it could not be verified as man-induced. The remaining 85 percent of the collection points were undisturbed.

Unlike some natural disturbances, human (military or civilian) induced disturbances appear to have a greater potential to disrupt or alter ecosystem processes, functions, or species distributions. This disruption is more likely to occur because the "artificial" disturbance frequently does not closely approximate a similarly occurring natural event. The magnitude or frequency of disturbance is different, the area involved is a different size, or land use is more/less permanently changed by removing the naturally occurring recovery cycle. Some of these impacts occur from current military activities. Accidental

fires started by training activities may have altered the vegetative structure and species composition in small areas (see Section 4.2.2). Most of these effects are short-term, but nonetheless can be either disruptive or beneficial to wildlife and plant communities dependent upon the species.

Impacts to vegetation also occur when vehicles (especially tracked) conduct tactical maneuvers off existing roads and trails. These off-road movements are only authorized during tactical training exercises conducted mainly on Range 30 or at bivouac sites, staging areas, or firing points.

Off-road tracked vehicle use is primarily confined to the North Post area, Range 30 (approximately 30,000 acres). Tracks are not permitted in large portions of the Camp at all, including the 42,476 acres of 20-year special use lands located primarily in the South Post area (see Figure 3-4).

Bivouacking is another factor contributing to the potential for vegetative destruction. Bivouac sites are areas in the field where soldiers camp during their annual and weekend training. The degree to which the vegetation is affected depends on how often these areas are frequented and the number of troops utilizing each site. Bivouacking typically results in open wooded areas with little vegetation or brush.

(B) Present Mitigation: Mitigation procedures now in place at Camp Grayling to protect the cutting of trees are shown in CG Reg. 200-1, January 1993. The regulation states:

(1) Tree branches within 6 feet of the ground and less than 3 inches in diameter may be cut in the conduct of training. Live weeds and grasses may be used for camouflage. Care should be taken to ensure that the trees and the ground are not stripped bare of vegetation.

(2) By permit only, other trees may be cut in designated areas. Priority will go to engineer units undergoing ARTEP missions. These permits will be issued through Post Operations at Building #12. Operations will coordinate with the Post Facility Engineer as a part of the approval process and prior to issuing any permits.

Winter camouflage netting is issued to substitute for natural vegetation during winter encampments and troops are supplied with straw and other non-vegetation materials for insulation and bedding. However, only limited training is conducted during winter months.

The Camp Grayling Environmental SOP Regulations (CG Reg. 200-1, January 1993) addresses vegetation protection. The regulation states:

> "All wheeled vehicles and tracked vehicles will use only established roads, trails, firing points, fire breaks, and training areas on the ranges. Tracked vehicles will avoid improved road surfaces. Use of ditches and shoulders for tank trails is prohibited. Off-road, cross-country shortcuts through trees or across grass, any wildlife plots and planted areas are prohibited. New trails will not be established."

In summary, off-road vehicle maneuvers are only authorized during tactical training exercises on orders of the Unit Commanders. Tactical training exercises for tracked vehicles take place primarily in the North Post and are focused on the Tank Range (Range 30) area. All vehicles conducting normal field training movements from one training area to the other must move on established roads and trails.

Strict enforcement of vegetation protection regulations is critical to establishing good habits. Enforcement is assisted by limiting the number of bivouac sites to be utilized during annual training periods. These areas are closely supervised by the environmental protection staff and range regulations are enforced. Sweeps of training areas are conducted before, during, and after troops utilizing training areas to ensure that the site is located in an appropriate area and that environmental regulations are being followed. Additionally, commanders of troops training at the Post are now required to sign a training agreement which states that he has been informed of all environmental regulations and agrees to follow them. He must also insure that if damage occurs, appropriate repair, replacement, or payment will be provided.

The DMA has also initiated the Land Condition-Trend Analysis (LCTA) Program at Camp Grayling to establish an ecological baseline and a vegetation monitoring program to monitor military activities. Refer to Section 3.5.1 for a complete description of the LCTA Program.

The program has established 200 permanent LCTA plots which are distributed throughout Camp Grayling (Figure 3-23) and represent the various timber stand types, age classes, and soil types as well as the different vegetative communities occurring on the installation. Thus far, from the surveys, 105 families, 379 genera, and 866 species have been documented (Refer to Appendix B) (MNFI, April 30, 1994).

Five special use plots have also been established in areas likely to be subjected to heavy training use and will be monitored to identify any species or areas requiring special management restoration or rotation of land use.

The DMA will work with DNR experts and use this baseline data to ensure minimum impacts to natural resources. Remedial actions as defined in ITAM (see Section 3.5.1), -- rotating training areas, restoration, and soil stabilization projects -- will be conducted to maintain a quality training site.

4.2.1.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The area in which the two MATES vehicle storage buildings will be constructed was cleared several years ago when the MATES was built; it is sparsely vegetated. These areas are currently being used as a parking area and will have no impact on vegetation.

Project 1B - Construct Bulk Fuel Facility: The vegetation in the immediate area will be affected by clearing and leveling the site in preparation for construction. However, the

location for the proposed bulk fuel facility is an open grassy area with small secondary growth trees. Impacts from this facility will be minimal, and no significant impacts are expected.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): During the initial construction phase, the MPRC-H-R will have the most impact on vegetation. The site will involve clearing approximately 25 acres for roads and disturbing approximately 350 acres of woods, with some selective tree cutting for construction of target mechanisms and firing lanes. The maximum amount of forest possible will be retained to provide a realistic battlefield setting for the troops that will be utilizing the MPRC-H-R.

The construction of Lane A, which is almost entirely wooded, will account for most of the acreage to be cleared (Everett, LTC, Personal Communication, 27 January 1994). Following construction, the vegetation within the MPRC-H-R box and around the targets will be better protected since these areas will be off-limits and tanks will be more confined to the lanes. However, additional impacts on vegetation can be anticipated as tanks begin utilizing areas outside the fence for off-road training.

Proposed Mitigation: In the areas where timber is cut good grass cover will be established in the areas where timber is cut to stabilize the soil and minimize erosion. Other mitigation measures will be similar to that mentioned in Section 4.2.1 (B).

4.2.1.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The area proposed as an alternative location lies in the same general vicinity as the proposed location. The only variation is that of where the buildings will be located. The area has already been cleared and is currently covered with sand. These areas are currently being used as a parking area and will have no impact on vegetation.

Project 2B - Construct Bulk Fuel Facility at Different Location: The vegetation in the immediate work area will be affected by clearing and leveling the sites in preparation for construction. However, the alternative location for the bulk fuel facility is an open sandy area. Impacts from this facility will have no impact on vegetation.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: It is estimated that there would be a reduction of approximately 50 tank crews of four men each per year which would normally utilize the Range 30 complex. However, the remaining tank crews would continue maneuver training and would more likely train longer and possibly utilize those weekends lost by the units training at another location. Therefore, the effects of training activities are considered to be very similar to that at present (see Section 4.2.1).

4.2.1.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: The area has already been cleared and will continue to be utilized as a storage area for parts. Therefore, the vegetation for the proposed MATES buildings will be unaffected.

Project 3B - Do Not Construct Bulk Fuel Facility: The continued use of the present BFF will have no additional affect on vegetation from that mentioned in Section 4.2.1.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: The effects of training activities on the vegetation in the Range 30 complex will be similar to that mentioned in Section 4.2.1.

4.2.1.4 Cumulative Effects

The cumulative effects of past and present training activities on vegetation at Camp Grayling will at times be measurable. However, based on the proposed actions described above, the various alternatives do not have any significant cumulative effects on vegetation. In certain areas that have been disturbed by intense tracked maneuver activities, native vegetation has been supplemented with winter annuals and other agriculture grasses.

4.2.2 Fire Ecology

(A) Baseline Conditions: Camp Grayling does not have full-time fire fighters. This activity is manned by National Guard soldiers during the annual training periods under an Active Duty Support Worker (ADSW) program.

Firefighting is only directed at wildfire occurrences on ranges and maneuver areas. The military firefighters are not properly trained in the suppression of structure fires; therefore, should a structure fire occur, the fire department from the City of Grayling is called.

DNR has the responsibility for the suppression of forest fires within the State. This responsibility cannot be delegated; however, a negotiated Mutual Aid Agreement between Camp Grayling and the DNR allows Camp Grayling to conduct wildfire fighting activities on the installation. The DNR is kept informed and called upon for support only in serious situations.

On the average, there are approximately 90 fire calls during the annual training season (Lawson, LTC, Personal Communication, 17 December 1993). The number of calls did reach a high of 127 in 1987, which was a very dry year. Most of these calls were to observe small fires within the impact area. Due to pre-burn activities, fires usually burn themselves out before the firefighters arrive at the scene to suppress them. In 1993, there were only four reported fires outside the impact area, consisting of approximately 11 acres. In 1992, there were 10 fires consisting of approximately 20 acres, and in 1991 there were 19 fires consisting of approximately 25 acres. In 1989, the unit responded to

18 fire calls. There were 11 fires (involving approximately 13.5 acres) were from training-related causes, and 7 fires (involving approximately 16.5 acres) were of other or unknown causes. The largest fire affected 8 acres, and the average area affected was less than two acres. Only once in recent years has a fire of significant size from training activities occurred. This occurred in 1988 when approximately 500 acres of mature jack pine burned in the South Post, requiring the assistance of the DNR and other surrounding fire departments.

Carefully used, fire can be an important tool in the regulation and manipulation of vegetation. Fire can be used to improve forest stands and to increase net productivity of grasslands. Fire can also reduce the hazard of destructive forest fires by removing litter (dead vegetation) before it accumulates to a great degree, and fire can improve the seedbed for regeneration of certain forest types and tree species. Fire can be used to improve or create wildlife habitats, to maintain certain fire-controlled ecosystems, to maintain wilderness areas, and even improve the aesthetics of the natural landscape.

(B) Present Mitigation: The primary means of controlling range fires during the training season is the preburning of the three impact areas (Range 30, Range 40, and Range 13) and known distance (KD) ranges. Preburning is done as soon as possible after the snow melts in the spring. By eliminating the dead grasses and branches, fuel for potential fires is minimized. Preburning acreage typically consists of the following:

Range 30 complex	2,700 acres
Range 40 complex	1,900 acres
Range 13 complex	1,050 acres
KD Ranges	100 acres

The Post has also constructed a series of fire breaks around its ranges to reduce the potential of fires. Furthermore, several roads in both the North and South Camp have been radically upgraded to provide ready access for firefighters. Open fires by troops are expressly prohibited without the written permission of the Camp Commander (CG Reg. 200-1, January 1993).

Fire breaks are clear-cut to a minimum of 200 feet wide, except where designated otherwise, and trees are cut at ground level and stumps dug up and removed. Surface cover is reduced by cutting, disking, or roller chopping.

The DMA has established a protocol whereby the DMA will immediately cease use of pyrotechnics at Camp Grayling upon notification of critical fire danger by the DNR staff. The DMA firefighting unit maintains annual records of all fire calls. This information is evaluated to identify additional measures which can be taken to increase the effectiveness of fire control actions at Camp Grayling.

Fire breaks are constructed along existing roads, wherever possible, and compartmentalize Military Training Areas in order to:

(1) Facilitate movement of fire suppression equipment

(2) Retain fires within specific sized land areas

(3) Allow for staging lines

(4) Allow for the possible directional control of an existing fire

Extensive fire prevention activities are conducted each year to minimize the losses of training time and forest land. The DNR conducts refresher training for all of the assigned military firefighters when they arrive in April.

The threat of fires is ever present, especially during dry weather. The best way to eliminate serious fires is by strict adherence to CG Reg. 200-1 which prohibits open fires by troops. Commanders are expected to closely monitor their personnel during such periods. Should a fire be started or sighted, range control should be immediately notified and appropriate actions taken to eliminate the problem (CG Reg. 200-1, January 1993). For safety purposes, personnel are not allowed to enter high explosive impact areas, or Ranges 9, 13, or 40, to fight fires.

In 1988, Camp Grayling established an automated phone system that improves public access to the Camp staff with regards to wildfires. When training is being conducted at Camp Grayling, outside callers are able to reach a staff member 24 hours a day.

To help assist in future fire control, the Post has three "BAMBI-Buckets" (185-gallon airlifted containers) for ready access to remote locations.

Four dry fire hydrants have also been installed on Camp Grayling to fill tanker fire trucks. Dry hydrants are constructed by placing a perforated "L-shaped" 6-inch pvc pipe just under a stream or lake bed. A gravel pack and screen is situated to keep sand, gravel and other debris from plugging the pipe. Water enters the pipe and is pumped into a tanker by inserting a hose into the top portion of the pipe. These readily accessible hydrants are located so that tankers will not enter into or disturb any water bodies. The hydrants are located at:

(1) Bear Lake - Just north of County Road 612 in North Camp

(2) Kyle Lake - In Range 30

(3) Portage Creek - At the end of Arrowhead Road

(4) Portage Creek - At the culvert tank crossing

The locations and construction of the four hydrants has been approved by the DNR and the hydrants are jointly used by both the DNR and the DMA. These hydrants are located

in remote locations, and areas that are most susceptible to fire (Hunt J., Personal Communication, 4 February 1994).

Cumulative Effects: Even though fire breaks are confined to certain areas, they provide critical habitat for several wildlife species. Numerous species (e.g., deer, turkey, grouse, woodcock, and bats) utilize these open areas (e.g., feeding, breeding, sunning, and as a means of dispersal). Wildfires are typically extinguished and do not account for large acreages on Camp Grayling. However, fire is an important component of a well-maintained ecosystem, and prescribed burning is typically the means of maintaining open areas.

4.2.3 Threatened and Endangered Plant Species

(A) Baseline Conditions: Current training activities have not had an appreciable effect on threatened and endangered (T&E) plant species because most occur in wetland areas or areas closed to tracked or wheeled vehicle maneuvering. Since wetlands are off-limits to most military training, other than foot maneuvers, direct negative impacts to these species and the structural integrity of the wetland is avoided. In the absence of mitigation, it is possible that activities outside the wetland's buffer zone could have indirect effects from nutrient (e.g., nitrogen) or sediment overloading.

Military activities at times prove to be beneficial to certain plant and animal species. Two plant species that have likely benefitted from military activities include rough fescue (state threatened), and Hill's thistle (federal proposed candidate and state special concern). Military activities on the Range 30 complex that have created openings (e.g., tracked and wheeled vehicles and fire) have provided ideal habitat for these two particular species.

According to the MNFI progress report of Camp Grayling, March 15, 1993, Canada rice-grass (state threatened) was identified in a disturbed habitat (abandoned two-track). This artificial disturbance created a habitat for a rare native species whose natural habitat has been diminished or eliminated elsewhere.

(B) Present Mitigation: The LCTA program will enable DMA, as land steward, to take a proactive posture towards the conservation of natural resources. Camp Grayling contains a wide variety of wildlife, plants, and unique habitats as identified during the Post's inventory. This on-going natural resource inventory will allow development of a comprehensive land stewardship plan designed to assist the Camp in meeting its training goals and missions while affording adequate protection to the environment.

Measures have been and are continually being taken to protect Federal and State listed species. The recent implementation (1991) of the U.S. Army's Land Condition-Trend Analysis program on Camp Grayling will also assist in the management and protection of threatened, endangered, and special concern species.

Houghton's goldenrod: Camp Grayling has initiated the following actions to assist in protection:

(1) Protection of all know occurrences within Camp Grayling. The USFWS and DNR have been informed immediately of all new sites confirmed by the MNFI survey conducted in 1992-1993. All sites that fall within the Camp boundaries have been fenced or "posted" no entry, and the Range Control Officer continues to address protection measures.

(2) Field surveys for new occurrences. The MNFI finished their two year floristic survey in the Fall of 1993 but will continue to survey surrounding State lands. LCTA field crews will also continue to survey the Post for new occurrences.

(3) Monitoring of occurrences to determine trends, potential and current impacts from surrounding land use, and aspects of natural history. As part of a Legacy Program project initiated in 1993, monitor plots and water level instruments (piezometers) have been installed and will be inventoried, monitored, and researched by the MNFI in conjunction with LCTA and Camp Grayling Environmental (CGENV) staff. This data will document impacts from land use, and gather habitat dynamics and plant community information.

(4) Education of land managers and the public. The USFWS, DNR, and military trainers are informed of all new occurrences and signs have been "posted" to limit entry by the public. The military training managers will continue to receive environmental briefings addressing protection measures.

(5) Conducting research on the species. Efforts will continue to help support local universities and individuals associated with research into Houghton's goldenrod through future Legacy Program projects and/or funding assistance.

All other threatened, endangered, or special concern species: Camp Grayling has initiated the following protection measures to protect "listed" species sites.

(1) Strict adherence to CG Reg. 200-1, January 1993, which restricts all vehicles from creating new trails and prohibits operating vehicles (wheeled or tracked) from running over trees larger than 3 inches in diameter. This rule also states that damaging any other form of vegetation is to be minimized in all areas.

(2) All vehicles are restricted to existing roads and trails when crossing wetland areas (CG Reg. 200-1, January 1993). The majority of "listed" plant species occur in wetland areas.

(3) Minimized use of "locked track" turns in all training areas, especially those known to contain "listed" species.

(4) Periodic site inspections by the Environmental Officer and Environmental Staff to assure compliance with existing regulations and training procedures. Any deviation from normal standard training practices or start up of any new construction should be addressed appropriately prior to commencement of action.

(5) Established "special use" plots within areas of concern and inventory as part of the existing LCTA program. Five special use plots were also established in 1993 and centered around T&E species. These special use plots will provide long-term quantitative data to assist installation personnel in management decisions.

(6) Review all sites of concern prior to beginning of annual training periods, after annual training, and whenever deemed necessary.

(7) Have entered into informal consultations with both Federal and State endangered species coordinators as required by the State and Federal Threatened and Endangered Species Acts.

(8) New sites are continually entered into the Geographic Resources Analysis Support System-Geographic Information System (GRASS-GIS) database and reviewed by CGENV staff and operations and training managers.

(9) Environmental briefings are given to all units training near T&E sites. This is part of the EA component of ITAM (see Section 3.5.1).

4.2.3.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will not affect T&E plant species. Site surveys have been conducted and no threatened, endangered, or special concern plant species have been identified.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will not affect T&E species. Site surveys have been conducted and no threatened, endangered, or special concern plant species have been identified.

Project 1C - Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Rough fescue and Hill's thistle have been documented on the proposed MPRC-H-R site. Although these species do not occur within the proposed firing lanes there is a small population of rough fescue near Lane C. There are also small populations of rough fescue and Hill's thistle near a few of the proposed firing targets, and they are scattered throughout the Range 30 complex. Those species located close to the firing targets could potentially be affected during construction. In the long-term, T&E plant species located near the targets will be even better protected since tanks will not be allowed to enter those areas. The targets are very expensive and commanders do not want to take chances on accidentally running them over.

On the other hand, tanks will be conducting more off-road maneuvering activities outside the fenced area. This could potentially affect those T&E plant species located outside of the fence, depending on where concentrated activities would occur. There is a population of Alleghaney Plum (federal proposed candidate and state special concern) just southeast of the fence which must be protected.

Proposed Mitigation: During construction, rough fescue and Hill's thistle populations will be marked to insure protection. Once constructed, the area concentrated near the targets will be off-limits to tank activities. This will provide additional protection to those T&E plant species that are located near the targets. The Alleghaney plum site will also be marked to insure protection during and after construction.

4.2.3.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: Site surveys have been conducted and no threatened, endangered, or special concern plant species have been identified at alternative location.

Project 2B - Construct Bulk Fuel Facility at Different Location: Site surveys have been conducted and no threatened, endangered, or special concern plant species have been identified at alternative location.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: The impacts on T&E plant species will be similar to that at present (see Section 4.2.3, above). However, there will be fewer tank gunnery units operating at the Range 30 complex.

4.2.3.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: This will have no impact on T&E plant species.

Project 3B - Do Not Construct Bulk Fuel Facility: This will have no impact on T&E plant species.

Project 3C - Do Not Construct MPRC-H-R at Camp Grayling; Continue to Train at Camp Grayling: The impacts on T&E plant species will be identical to that at present (see Section 4.2.3).

4.2.3.4 Cumulative Effects

Threatened and endangered species management guidelines will continue to be followed under each of the alternatives, and no negative impacts to T&E plant species are expected. Suitable habitat will be maintained and protective measures will continue under any of the proposed alternatives.

4.2.4 Wildlife

Baseline Conditions: Training activities and facilities that may affect wildlife include: tracked and wheeled vehicle movements, bivouacking, firing activities, maneuver activities, explosive ordnance demolition, engineer training, general flying activities, and aviation unit activities at the air-to-ground range.

The effects on resident wildlife at Camp Grayling are difficult to quantify. However, as a general rule, activities on military installations tend to open up the canopy of forested areas, creating a moderate to dense understory in areas that are not subject to foot-traffic, and a fairly open understory in bivouac sites and around firing points. Lumbering activities, permitted and managed by the DNR, account for the majority of open/grassland areas on Camp, other than the impact areas (approximately 11,000 acres).

The clearing and thinning of timber, either by DNR logging activities or to provide training enhancements such as firing lanes around the perimeter of the impact area, has benefitted those species that require open fields dominated by herbaceous plants and low-growing shrubs. Other species that have benefitted from these activities include those that require forested areas with an open canopy and a moderate to dense understory. The expansion of edge-like habitat into the forest does not benefit those species requiring conditions more representative of the forest interior (e.g., ovenbird, least flycatcher, american redstart, and the black-and-white warbler). However, northern bobwhite quail and the eastern wild turkey depend on edge-like habitat areas as a source of insects to feed their young, as do many other species.

Forest fragmentation is a major factor in the decline of many bird species in this country and world-wide. A growing body of evidence indicates the potential of forest fragmentation to adversely affect the presence and reproductive success of area-sensitive species (Rosenfield et al., 1992). In other geographic areas, the creation of edge has allowed other species, such as the brown-headed cowbird (a brood parasite) and the blue jay (a predator) to expand their populations and distributions at the expense of other species.

However, the documentation of high numbers of ovenbirds on the Post would suggest that Camp Grayling lands are not being significantly fragmented. The ovenbird, which is intolerant of habitat fragmentation, was documented on 45 of the 60 LCTA wildlife plots, for a total of 189 occurrences in 1992, and 238 occurrences in 1993. Several other species with a high sensitivity to habitat fragmentation also occur at Camp Grayling. These species include the broad-winged hawk, least flycatcher, yellow-throated vireo, black-and-white warbler, mourning warbler, american redstart, brown creeper, and veery (Herkert et al., 1993). Since so many highly sensitive bird species occur on Camp Grayling lands, military activities and timber removal activities associated with fragmentation appear to be minimal.

Camp Grayling activities have, to varying degrees, altered animal distribution. Perhaps the most serious impact from military training activities on wildlife is noise. Loud or frequent noise generated from military activities has the potential for negative consequences on wildlife. A separate discussion of the potential effects of noise on wildlife can be found in Section 4.1.3.1.6.

4.2.4.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will have insignificant impacts on the wildlife at Camp Grayling. The area has already been cleared, but some displacement of small mammals living amongst the equipment, which are spread out on the site, may result. However, this displacement will not have any significant impacts.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will have insignificant impacts on the wildlife at Camp Grayling. Small mammals (e.g., mice, voles, shrews, and ground squirrels) will be displaced to other areas. However, the impacts associated with these activities will be minimal.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Impacts to wildlife will result from timber removal and the structural alteration (earth-moving) of the land required to develop the MPRC-H-R. Construction activities will destroy or alter existing habitat, create new habitat (at least in the short-term), and increase the susceptibility of less mobile animals to direct mortality in the immediate work zones. Construction activities will also result in the loss of some woody and herbaceous cover, and potential nesting, perching, and foraging sites. Species tolerant of human activities or those preferring a more open habitat will most likely benefit since approximately 350 acres will be disturbed by selecting cutting.

Proposed Mitigation: To mitigate the effects of construction noise on wildlife, clearing and construction activities will be confined to daylight hours. Other mitigation measures will be similar to those mentioned in Section 4.1.3.2.1.

4.2.4.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The construction of the MATES vehicle storage buildings will have insignificant impacts on the wildlife at Camp Grayling. The area has already been cleared, but some displacement of small mammals living amongst the equipment, which is stored on the site, may result. This displacement will not have any significant impacts.

Project 2B - Construct Bulk Fuel Facility at Different Location: The construction of the BFF will have insignificant impacts on the wildlife at Camp Grayling. Small mammals (e.g., mice, voles, shrews, and ground squirrels) will be displaced to other areas. However, the impacts associated with these activities will be minimal.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Impacts to wildlife will be similar to that mentioned in Section 4.2.4.

4.2.4.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: Wildlife will be unaffected by not building the MATES vehicle storage buildings. Small mammals will continue to utilize the area where parts are now stored as shelter and to feed on the vegetation growing between them.

Project 3B - Do Not Construct Bulk Fuel Facility: Small mammals and other wildlife will be unaffected.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: Impacts to wildlife will be the same as for present conditions (see Section 4.2.4, above). Wildlife (especially deer) will continue to be displaced when tanks utilize the area.

4.2.4.4 Cumulative Effects

It is difficult to accurately quantify how the military has impacted wildlife over the years, because little work had been done on the lands prior to the formation of Camp Grayling. Training activities have undoubtedly impacted wildlife species to varying degrees. However, the proposed facilities, including the MPRC-H-R, should not negatively affect the wildlife at Camp Grayling.

4.2.5 Fish

Baseline Conditions: Some military related training activities and facilities have a slight negative affect on fisheries. Environmental consequences of military related activities on fisheries do occur at Camp Grayling. Sedimentation associated with erosion from various training land uses and road networks is primarily responsible. This problem is not only limited to military activities but is also associated with non-military activities and land uses that occur within Camp Grayling boundaries.

Historically, widespread logging and the rafting of timber down streams significantly affected in-stream habitats as well as channel characteristics. Currently, timber harvesting continues to contribute to sedimentation because of vegetation removal and soil disturbance. Steam bank deterioration also adds large amounts of sediment to these streams in many areas. Roads constructed and maintained by other agencies (e.g., state, county, and township) on and adjacent to the Post contribute to stream sedimentation as well.

The Au Sable and Manistee Rivers and their tributaries support a particularly important and valuable trout fishery. These fisheries suffer from some habitat degradation caused by increased sediment loads in streams and rivers. The smothering of critical trout reproduction sites (e.g., gravel substratum) and habitats that support food resources utilized by trout is acknowledged to be the biggest challenge in maintaining the productivity of these streams. The reduced productivity found in the Au Sable and Manistee Rivers is the result of cumulative long-term degradation. Military training

activities have, in a limited way, contributed to this problem, but represent only one among many factors associated with this historic decline. Even though these problems exist, many sections of these rivers support populations of brook, brown, or rainbow trout. These streams could be more productive and are now the focus of restoration efforts.

4.2.5.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will not affect fishery resources at Camp Grayling. No streams or lakes are located near the site.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will not affect fishery resources at Camp Grayling. No streams or lakes are located near the site.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): Fishery resources at Camp Grayling will not be affected by construction of the MPRC-H-R. Only one small lake (approximately 5 acres) is located near the site. This lake is in a dedicated impact area, which is off-limits to the public.

4.2.5.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The construction of the MATES vehicle storage buildings at a slightly different location will not affect fishery resources at Camp Grayling. No streams or lakes are located near the site.

Project 2B - Construct Bulk Fuel Facility at Different Location: The construction of the BFF at a slightly different location will not affect fishery resources at Camp Grayling. No streams or lakes are located near the site.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Moving the MPRC-H-R training to another state will not affect fishery resources at Camp Grayling. Only one small lake (approximately 5 acres) is located near the site. This lake is in a dedicated impact area, which is off-limits to the public.

4.2.5.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no effect on fishery resources at Camp Grayling by not building the MATES vehicle storage buildings.

Project 3B - Do Not Construct Bulk Fuel Facility: There will be no effect on fishery resources at Camp Grayling by not building the BFF.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: There will be no effect on fishery resources at Camp Grayling by not building the MPRC-H-R.

4.2.5.4 Cumulative Effects

Construction of the projects should not affect the fishery resources at Camp Grayling. The proposed bulk fuel facility will likely benefit fisheries by virtually eliminating the risk of accidental loss of fuels to lakes and streams. The facility will be located in a safer and more convenient location, farther away from water resources than the current facility. Updated design features will further reduce the potential for spills to surface waters which would in turn affect fish.

4.2.6 Threatened and Endangered Wildlife Species

Baseline Conditions: Camp Grayling's comprehensive natural resources inventory program, initiated in April 1992, has located and identified six wildlife species that are on the State or Federal Endangered, Threatened, or Special Concern list. These species have been verified by the Michigan Natural Features Inventory, a joint project of The Nature Conservancy and Michigan Department of Natural Resources Heritage Program, in conjunction with the LCTA program implemented by the DMA. All species are protected under the Endangered Species Act of the State of Michigan (Public Act 203 of 1974 as amended, and the Federal Endangered Species Act of 1973).

In cooperation with the DNR, the USFWS, and the U.S. Forest Service, the DMA has successfully implemented programs and management plans to protect habitat and assure population stability of the Kirtland's warbler and bald eagle. Similar plans are presently being developed to protect newly identified species.

(1) Kirtland's warbler: The DMA has been aware of the sensitivity of the Kirtland warbler habitat for many years. Documentation began in the late 1950s with a complaint from a wildlife biologist that units trespassed into KW nesting habitat in the Fletcher Area.

Other correspondence indicates tank maneuvers in nesting areas as early as 1964 when a squad of tanks and other vehicles deployed into a nesting colony of warblers near Buck's Crossing. Subsequent correspondence documented military activities resulting in actual habitat destruction or disturbance during the breeding season. Habitat destruction was caused by armored vehicles running over young jack pine or by fires started during military exercises. Disturbance included low-level flights by jets and helicopters, as well as helicopters landing in occupied habitat (Perez and Huntington, 1986).

For several years the DNR and the military met to resolve the various issues and conflicts of KW on the tank range. Both agencies ultimately supported a plan to shift breeding habitat to more compatible areas of the range. As a result of relocating the KW management area away from the Range 30 complex, current military activities no longer impact KW.

Throughout the period of Kirtland's warbler nesting on military lands, management efforts have been in the form of protection. In 1986, the DMA and the DNR developed a detailed management plan. This management plan has in most part eliminated the

military conflict with KW. The plan basically states that as existing KW habitat on-post land reaches an age or height where KW no longer use it, the military will no longer need to restrict training in that area. Additionally, if these lands or other Post lands burn or are cut so that new jack pine is expected, the military will be allowed to discourage the growth from reaching that which KW utilize it. In return, Camp Grayling gave up primary use rights to over 4,000 acres of prime KW habitat for a permanent KW management area. Military training is severely limited as to training allowed in this area.

Section 7 consultation was completed with USFWS to address this management plan, and a resultant Biological Opinion indicated concurrence with the plan with only minor adjustments which have been agreed to (refer to Section 3.6.2.6.1).

(2) Bald eagle: Active bald eagle nesting sites are most sensitive to disturbance during courtship and nest building, which extends from late February to early May in this area. A moderately critical period extends through chick development until early June.

Present training activities have not had appreciable negative impacts on the bald eagle due to strict land and aircraft buffer zone constraints around all known nest sites. A more in-depth discussion of the habitat requirements, management, and conservation recommendations for the bald eagle can be found in the Northern State Bald Eagle Recovery Plan (USFWS, 1983) and a Bald Eagle Report, 1991, by Bill Bowerman.

A 4-year study to determine the breeding history of bald eagles at Camp Grayling was initiated in 1989. A total of 839 bald eagle-human/animal interactions, including 722 with aircraft, 120 with weapons fire, 23 vehicles, 13 hikers, and 11 other interactions (e.g., hawks, squirrels, etc.) were recorded. Responses by adult eagles to interactions included: for aircraft -- increased awareness, 467 (64.7 percent), and flights, 8 (1.1 percent); for weapons -- increased awareness, 66 (55 percent), and flights, 1 (0.8 percent); for hikers -- increased awareness, 6 (46.2 percent), and flights, 1 (7.6 percent); and other -- increased awareness, 10 (90.9 percent), flights, 0 (Bowerman et al., 1991). According to Dr. Bowerman's 1991 progress report, it appeared that bald eagles were becoming acclimated to military activities.

(3) Massasauga: The massasauga rattlesnake was documented by the MNFI survey and LCTA crews during 1992 in three locations at Camp Grayling. These areas include sitings from Portage Creek, Bear Swamp, and the Portage Creek Prairie. Current military activities should not affect this species since these wetland areas are off-limits to all training activities except foot traffic.

(4) Red-shouldered hawk: The red-shouldered hawk has documented occurrences on 3 of the 60 LCTA wildlife plots. Present military activities are not expected to adversely affect red-shouldered hawks since they are typically associated with rivers and timbered swamps at Camp Grayling. These areas are off-limits to military training except for foot traffic. No nesting areas have been sited, so the birds may be transients.

(5) Common loon: A pair of common loons has been documented at Wakely Lake and have also been known to frequent KP and Shupac Lakes. Since these areas are off-limits to military training, no negative impacts are expected.

(6) Secretive locust: This species has been found on-post at a number of locations and is most commonly found in bogs with dense growth of leatherleaf, labrador tea, tamarack, and jack pine. Current military activities should not affect this species due to restrictions on training around wetland areas.

4.2.6.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A - Construct MATES Vehicle Storage Buildings: The construction of the MATES vehicle storage buildings will not affect T&E wildlife species. Site surveys have been conducted and no threatened or endangered wildlife species have been identified.

Project 1B - Construct Bulk Fuel Facility: The construction of the BFF will not affect T&E wildlife species. Site surveys have been conducted and no threatened or endangered wildlife species have been identified.

Project 1C - Construct Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): The construction of the MPRC-H-R will not affect T&E wildlife species. Portions of this area have, in the past, been habitat for Kirtland's warblers, a federally endangered species since 1976. However, the quality of the habitat has declined due to its advanced age, and the birds no longer use this area. For these reasons the DNR no longer conducts censuses on these lands. No other T&E animal species have been documented in the Range 30 complex.

4.2.6.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A - Construct MATES Vehicle Storage Buildings at Different Location: The construction of MATES vehicle storage buildings at a slightly different location will not affect T&E wildlife species. Site surveys have been conducted and no threatened or endangered wildlife species have been identified.

Project 2B - Construct Bulk Fuel Facility at Different Location: The construction of the BFF will not affect T&E wildlife species. Site surveys have been conducted for the alternative site and no threatened or endangered wildlife species have been identified.

Project 2C - Do Not Construct MPRC-H-R at Camp Grayling; Train at MPRC Out-of-State: Moving the MPRC training to another state will have no affect on T&E wildlife species at Camp Grayling.

4.2.6.3 Alternative 3 - Do Not Implement Master Plan Projects

Project 3A - Do Not Construct MATES Vehicle Storage Buildings: There will be no effect on T&E wildlife species by not building the MATES vehicle storage buildings.

Project 3B - Do Not Construct Bulk Fuel Facility: There will be no effect on T&E wildlife species by not building the BFF.

Project 3C - Do Not Construct MPRC-H-R; Continue to Train at Camp Grayling: There will be no effect on T&E wildlife species by not building the MPRC. Training will continue at present levels (see Section 4.2.6, above).

4.2.6.4 Cumulative Effects

According to the DNR, the 1993 Kirtland's warbler population is the largest in 30 years, with a total of 485 singing males in nine Michigan counties (Table 3-24). The counts have shown a steady increase since 1987 when a low of 167 males were recorded. Protection of the Kirtland's warbler and all other threatened and endangered wildlife species will continue receiving a high priority status. Since there have been no T&E wildlife species documented in the areas proposed for construction, T&E species will be unaffected.

4.3 Social Environment

4.3.1 Land Use

Baseline Conditions: The existing land uses at the Post are primarily a result of the designation of the area as a military reservation. The cantonment area is an urban-like area used for equipping and housing troops training at the Post. The areas currently used for training are essentially committed to various types of training. A small percentage of the training areas contain impact zones which comprise approximately 11,000 acres of Camp Grayling. Because these zones contain projectiles and unexploded ordnance, they are irreversibly committed to this use, or no use. However, this area still provides valuable habitat for wildlife, and some species (e.g., sharp-tailed grouse) benefit from the habitat created by regular occurrence of fires within the impact area. Areas near the Post are zoned agricultural, forestry, recreation, and residential.

Impacts on land use will include the effects of proposed activities within the Post that create conditions unacceptable for existing land uses or commitments of new areas that affect uses of adjacent lands. Impacts on transportation are also addressed.

4.3.1.1 Alternative 1 - Implement Master Plan Projects as Proposed

Project 1A and 1B - Construct MATES Vehicle Storage Buildings and Bulk Fuel Facility: The construction of these two projects will not increase military use near areas of sensitive land use, and therefore will not increase impacts on lands surrounding the Post. The cantonment area will retain its urban-like setting. The housing, administrative, and utility areas will retain their respective land uses.

Project 1C - Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R): The area proposed for the MPRC-H-R is currently committed to training as the tank range, and the land within the safety fan is leased for the purposes of military training. There will be no change in land use within the safety fan as a result of the establishment of the new range. Forests and grasslands have been allocated for training areas as the Post has expanded. These land use changes have been coordinated with the DNR to minimize impacts while still fulfilling the Post's training mission.

The operation of the MPRC-H-R will bring about a change in the traffic patterns in the Range 30 area during weapons firing. The current tank range safety fan has required traffic to avoid the use of Stephans Bridge Road during weapons firing. The MPRC-H-R safety fan will extend further to the east, causing the additional temporary closing of Damon Truck Trail and Bald Hill Road during firing activities. This will occur anywhere from 20 to 80 days per year, depending upon the firing schedule of any particular year. Travelers will be forced to detour outside the Post through Lovells, south on Lovells Road, or take the Jones Lake Truck Trail. This detour will involve an added distance of approximately 8 miles and travel over a paved road. It is not anticipated that this detour will affect frequently used traffic routes or significantly alter traffic patterns on Jones Lake Road.

4.3.1.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Project 2A and Project 2B - Construct MATES Vehicle Storage Buildings and Bulk Fuel Facility at a different location: Construction at the alternative sites will not increase military use near areas of sensitive land use, or increase impacts on lands surrounding the Post. The cantonment area would retain its urban-like setting. The housing, administrative, and utility areas would retain their respective land uses.

Project 2C - Do not construct the MPRC-H-R at Camp Grayling; train at MPRC out-of-state: This would reduce traffic impacts at Camp Grayling due to fewer units training on-site. However, only a small portion of the tank gunnery units would rotate to an out-of-state MPRC each year. Therefore overall change would not be noticeable.

4.3.1.3 Alternative 3 - Do Not Implement Master Plan Projects

With implementation of Alternative 3, land use and traffic impacts would remain approximately as at present.

4.3.1.4 Cumulative Effects

No additional impacts related to land use are anticipated in association with any of the proposed actions.

4.3.2 Archeological and Historical Resources

(A) Baseline Conditions: Within the cantonment area, one structure, the Officer's Open Mess, is on the State Register of Historic Sites. The SHPO has determined that Buildings 103, 117, and 311 are eligible for the Register. None of these buildings are proposed to be modified by actions addressed in this EIS. Since most of the older structures have been altered to some degree, they may prove to be of little interest to the state (Robison and Seckinger, 1987).

(B) Present Mitigation: Entry into the impact areas is restricted and archeological surveys or excavations are extremely dangerous. However, none of the impact areas or ranges are considered to have archeological potential due to their highly disturbed state (Historic Preservation Plan, 1988).

4.3.2.1 Alternative 1 - Implement Master Plan Projects as Proposed

Archeological and historical resources plans and programs will continue as present. A site specific survey of the MPRC-H-R is scheduled for June 1994. No significant impacts are anticipated.

4.3.2.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Archeological and historical resources plans and programs will continue as present. Site specific surveys of project sites in areas of high archeological or historical potential will be carried out prior to any construction. However, no significant impacts are anticipated.

4.3.2.3 Alternative 3 - Do Not Implement Master Plan Projects

Archeological and historical resources plans and programs will continue as present. No significant impacts are anticipated.

4.3.2.4 Cumulative Effects

No cumulative impacts related to archeological and historical resources are anticipated in association with any of the alternatives.

4.3.3 Recreation

(A) Baseline: The primary function of Camp Grayling is military training. However, the post does offer on-post recreational opportunities to employees and trainees. Refer to Section 3.7.4 for a discussion of the recreational opportunities that center around Camp Grayling.

(B) Present Mitigation: In consideration of local residents and recreation users of the Camp Grayling region, noise abatement procedures have been established for Ranges 30 and 40 and for aviation activities. These procedures include limiting tank maingun

and artillery firing, aircraft bombing and the detonation of certain demolitions to no earlier than sunrise and no later than 3 hours after sunset. These same activities are also prohibited between 4:00 p.m. Friday until sunrise on the following Tuesday for the Memorial Day, Fourth of July and Labor Day weekends. The restrictions established above also apply on the opening weekend of trout season (last weekend in April). In addition, all ranges are closed during the firearm deer hunting season (15-30 November) (CG Reg. 350-10, March 1990).

Military aircraft are required to maintain a minimum altitude of 500 feet above ground level when outside the boundaries of the Post. The only exception occurs when aircraft are operating on a NOE course approved by the MIARNG State Aviation Officer (CG Reg. 350-10, March 1990). In addition, aircraft overflights are prohibited over Hartwick Pines State Park and the Wakely Lake Nature Area at all times (CG Reg. 350-10, March 1990)

4.3.3.1 Alternative 1 - Implement Master Plan Projects as Proposed

The proposed locations for the MATES vehicle storage buildings and the Bulk Fuel Facility will have no affect on recreation. However, operation of the MPRC-H-R will at times close a portion of the Damon Truck Trail and the Stephans Bridge Road. However, this will not significantly affect recreational opportunities.

4.3.3.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Impacts on recreation will be similar to that mentioned in Alternative 1, above.

4.3.3.3 Alternative 3 - Do Not Implement Master Plan Projects

Recreational opportunities will continue as present. No significant impacts are anticipated.

4.3.3.4 Cumulative Effects

No cumulative impacts related to recreational opportunities at Camp Grayling are anticipated with implementation of any of the alternatives.

4.4 Economic Environment

4.4.1 Employment Profile

Baseline Conditions: Military personnel employed at the Post (not including troops in training) in FY93 included:

- 107 full-time federal technicians, associated with Army National Guard, with a total payroll of $4,299,107.
- 7 full-time federal technicians, associated with Air National Guard, with a total payroll of $262,474.
- 24 Active Guard Reserve (AGR) employees, with a total payroll of $828,000.
- 5 temporary technicians, with a total payroll of $200,892.
- 51 Active Duty Special Work (ADSW), with a total payroll of $1,118,843.

The 107 federal technicians are also required to hold membership in the Michigan National Guard and receive compensation for annual and weekend training.

Civilian personnel employed at the Post (not including troops in training) in FY93 included:

- 51 full-time permanent employees, with a total payroll of $1,464,780.
- 4 environmental full-time permanent employees, with a total payroll of $175,648.
- 29 temporary full-time employees, with a total payroll of $627,771.

For the purposes of analysis, the 29 temporary employees were considered to have worked 6 months and were evaluated as the equivalent of 14 full-time employees.

4.4.1.1 Alternative 1 - Implement Master Plan Projects as Proposed

Under Alternative 1, the number of troops using the Post will not be allowed to change significantly for at least 5 years. Staff and expenses related to training and operations and maintenance will remain stable.

4.4.1.2 Alternative 2 - Implement Master Plan Projects at Different Locations

As with implementation of Alternative 1, employment would remain stable at Camp Grayling. Staff and expenses related to training and operations and maintenance will remain stable.

4.4.1.3 Alternative 3 - Do Not Implement Master Plan Projects

As with Alternative 1, employment would remain stable at Camp Grayling. The number of troops using the Post will not change significantly and staff and expenses related to training and operations and maintenance will remain stable.

4.4.1.4 Cumulative Effects

No cumulative effects are anticipated to occur in the employment profile under any alternative.

4.4.2 Regional Economy

Baseline Conditions: Camp Grayling has been an integral part of the local economy since 1913, and many of the benefits related to Post activities are built into the existing economic structure. This section attempts to indicate the relative economic importance of current Post activities.

The Camp Grayling socioeconomic evaluations will discuss the variety of ways in which Camp Grayling affects the economy of the State of Michigan and, more specifically, the economic effects area directly associated with the Post. The most recent Federal and State Camp Grayling expenditure data were used when available. Sources for this information included the Michigan Department of Military Affairs and the Camp Grayling Installation Support Unit. Camp Grayling's operating budget is funded through both State and Federal sources. However, all State funds are reimbursed by the Federal Government.

The Post's total operating budget for 1993 was $21,746,642 (see Appendix G). Personnel (not including troops in training) accounted for approximately 46 percent of the Post's total operating budget. Training supplies categories (petroleum products, subsistence supplies, ammunition, and miscellaneous supplies) comprised 38.6 percent of the Post budget. Ammunition was the largest category of supplies expenditure and accounted for 27.7 percent of Camp Grayling's total 1993 operating budget. A breakdown of Camp Grayling's 1993 budget is provided in Appendix G.

The total economic contribution from military activities at Camp Grayling for the selected indicators is shown in Appendix G. Based on these analyses, the Camp Grayling training site generates $19.3 million (2.7 percent) of the three county economic effects area retail, wholesale and service sales (443 jobs are directly supported, 96 jobs (2.7 percent of employment) indirectly supported), and supplies $11,773,000 (2.2 percent) of the 3-county personal income. Though this would appear to be a small portion of the total local economy, it is a very significant contribution for one employer. The Post is a stable component of the local economy and continues to import meaningful amounts into the State and three county area economies. The Post creates a constant demand for local goods and services and brings new people to the area.

Expenditures in 1993 for operations and maintenance at the Post were $2,043,635. The average annual salaries of the 69 (full-time equivalent) civilian and 194 (full-time equivalent) military personnel involved in Post operation and maintenance were reported as $48,170 and $34,584, respectively.

An input to regional sales volume of $10,316,000 is gained because of operations and maintenance at the Post. This positive impact is realized by direct and indirect/spinoff expenditures at local retail and wholesale suppliers, manufacturing and professional service establishments. This influx of income results in added consumption of goods and services and added investments in the economic effects area.

Troop expenditures occur primarily during weekend and evening free time periods. Establishments in close vicinity to the Post provide a convenient source of goods and services for troops while on free time. Establishments somewhat farther away offer a greater diversity of goods and services and are generally patronized during the longer weekend free periods. Examples of these are resorts, hotels, and tourist-related attractions.

From 1984 to 1993 an annual average of 25,656 troops participated in annual training and 24,986 participated in weekend training (Camp Grayling Files, Tables A-3, A-4). The Michigan Department of Military Affairs (DMA) estimated that a guardsman on annual training spends an average of $200, and troops on weekend training spend $20.00 (DMA, 1985). Using these estimates, troops on annual training at Camp Grayling on the average spent $5,131,200 and weekend troops spent an estimated $499,720 annually. In total, Camp Grayling troops spend approximately $5.6 million annually. It is unknown how much of this money is actually spent while enroute to Camp Grayling. The DMA estimates are total estimates and include all forms of expenditures regardless of proximity to the training site.

4.4.2.1 Alternative 1 - Implement Master Plan Projects as Proposed

The Post's proposed facilities upgrades, training, and operational activities are components of an effort to increase the training capability and the effectiveness of operations and maintenance support on-post. It is the collective impact of the proposed projects that may have a limited benefit to the economic environment of the three county area. However, it is not possible to quantify those impacts at this time.

4.4.2.2 Alternative 2 - Implement Master Plan Projects at Different Locations

As with Alternative 1, it is the collective impact of the proposed projects that may have consequences for the economic environment of the three county area. Constructing the MATES Vehicle Storage Buildings and BFF in other locations on-post would have no effect different from Alternative 1.

Project 2C - Conducting MPRC-level training out-of-state: This would preclude the possibility of bringing the heavy construction company and crews required to build the MPRC-H-R to the area. The associated benefits, although short-term, would be foregone.

4.4.2.3 Alternative 3 - Do Not Implement Master Plan Projects

In the short-term, the number of troops using the Post will not change, and staff and expenses related to training and operations and maintenance will remain constant. The current effect of economic benefits will continue, especially on nearby communities.

In the long-term, as Post facilities become obsolete and other training facilities have enacted improvements, the amount of Post use may decrease if training units use other training installations. Since sales volume from troops training at the post provides a large part of the economic benefits, decreased troop usage would adversely affect the local communities. As troop use decreases, operations and maintenance expenditures will decrease. The combination of the decrease in benefits from troops in training and from operations and maintenance could be a significant adverse impact.

The regional economy would probably be stable under these conditions; however, the local economic stability would likely be significantly disturbed, particularly that of the City of Grayling and other nearby communities.

4.4.2.4 Cumulative Effects

A positive cumulative impact to the regional economy will result from implementation of Alternative 1. Local construction firms and suppliers are expected to participate in the building construction projects, as well as to a limited degree in the construction of the MPRC-H-R. However, it is not possible to quantify those impacts at this time.

4.5 Waste Disposal

Wastes are generated primarily at the MATES and field training sites. Under each of the alternatives, waste disposal procedures and programs would continue as at the present. The impact upon waste disposal would be insignificant because existing channels are capable of handling current and anticipated waste volumes.

4.6 Irreversible and Irretrievable Commitment of Resources

Irreversible Effects: Irreversible effects primarily result from use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Many military activities, especially those including usage of tracked vehicles and aircraft, consume large quantities of petroleum products when operating. Such consumption may be termed an irreversible commitment of resources since they are not recoverable or renewable. Other resources such as fuels and electricity used to produce oil and gas reserves would also be irreversibly committed.

Irretrievable Effects: Irretrievable commitments are difficult to distinguish from irreversible commitments but are distinctly different. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site). Also, vegetation removed from a site cannot be put back on the site in its original state, therefore, the loss of vegetation is irretrievable. However, vegetation is a renewable resource and can be re-established on the site within a reasonable period of time. This, of course, assumes that the site is still capable or can be made capable of producing vegetation.

Soils: Use of the ranges at Camp Grayling do not readily affect soil resources. Erosion may occur, but this process technically moves the soil and does not alter its structure. Contamination of the soil could occur during the event of a fuel spill. The affected soil would need to be either removed or "cleaned". If a significant amount of soil is affected, the potential for supporting vegetation may be altered in that area.

Water Resources: Currently available information indicates that no resources associated with aquatic systems at Camp Grayling have been, or will be, irreversibly or irretrievably impacted. Continuing research will help determine whether ordnance related residuals have the potential to generate these types of effects. However, at this time the relationship between ordnance residuals and environmental effects has not been determined.

Vegetation: The impacts from current and proposed training activities at Camp Grayling will not irreversibly or irretrievably impact the Camp's vegetation.

Fish and Wildlife: Current biological studies indicate that there are no fish and wildlife at Camp Grayling that would be irreversibly or irretrievably impacted.

T&E Species: T&E plant and animal species are not anticipated to be irreversibly or irretrievably impacted by either current or proposed training activities.

Recreation: Four areas of the post are closed to the public and most troops training at all times. These areas are: (1) The artillery range (Range 40) impact area consists of 7,000 acres of fenced land on the extreme northern edge of the Camp, (2) The tank range firing/target area consists of 3,000 acres of fenced land just north of North Down River Road, (3) The mortar range (Range 13) impact area consists of 1,100 acres of fenced land on the southeastern corner of Camp and (4) Range 9B is also restricted (fenced) due to the range being utilized in the past for the firing of 66mm Light Anti-Tank Weapons.

Impact Area: The past and current use of impact zones associated with Range 13 and the Range 40 complex represent an irretrievable commitment of land use resources. The impact areas contain unexploded ordnance (duds) and therefore are unsafe for human access and use. Although it is technically feasible that these areas could be cleared, it is not realistic from an economic standpoint. Therefore, these impact zones are

constrained to this use, or to the option of not being used for any purpose. Either way, these areas will remain undeveloped and will continue to support a wide variety of flora and fauna into the foreseeable future.

Permanent Facilities: Permanent facilities may be considered an irreversible commitment of resources to the extent that these facilities are permanent in nature. While it is possible to demolish the facilities, once constructed, this is not likely to take place. For all practical purposes, such permanent construction can be termed irreversible.

4.7 Summary by Alternative

Short-term (<10 years) uses at Camp Grayling include direct construction-related disturbances and direct impacts associated with training and operational activities. Long-term sustainability of the environment is assessed in terms of impacts that would extend beyond a 10-year period. It is noted that "short-term" and "long-term" are quite relative. For certain resources, such as groundcover and certain small game species, the short-term may be realized well within 10 years - perhaps no more than four to five years. For others, such as groundwater, the long-term may only be approached in 40 to 60 years. Ten years is thus an arbitrary, but useful, dividing line.

Tables 4-1 and 4-2 provide a graphic representation of potential impacts. The scale represented on these tables ranges, from "++" (having significant benefits), "+" (having some benefit), through "0" (meaning no change from present conditions), to "-" (meaning having some negative impact). We must also note that a score of zero "0" does not mean there is no effect or problem. The remaining problems or impacts may well be the same as at present. The "0" means simply that there is expected to be no change in the type or level of impact.

4.7.1 Alternative 1 - Implement Master Plan Projects as Proposed

Noise: The proposed actions will result in minor short-term noise impacts related to construction. No new short or long-term noise impacts are anticipated following construction. The short and long-term effects of the operation of the MPRC-H-R may be beneficial. The noise contours are slightly realigned from those produced from the use of the present range complex, resulting in less Zone II off-post noise. Noise modeling indicates a Zone II contour would occur on approximately 200 acres off-post with use of the MPRC-H-R. This will affect two residences. However, the Camp's operational abatement procedures in place, will continue to minimize these noise impacts.

Soils: Soils will be affected in the short-term by the proposed actions, particularly the construction of the MPRC-H-R. The soil disturbance and excavation required for construction have the potential to increase erosion. No change is expected after construction of the cantonment area projects are complete. In the event of a fuel spill at the Bulk Fuel Facility, a negative impact to soils would occur. This could potentially

occur throughout the life of the structure. A long-term site specific benefit will be realized from the construction of the MPRC-H-R on the Range 30 complex, as vehicles will be constrained to only certain well defined routes of travel and firing points, limiting soil disturbance. However, vehicles will continue to conduct off-road maneuvering activities on other parts of Camp Grayling.

Water Resources: Short and long-term impacts to water resources are not anticipated in relation to the MATES. Positive impacts to water resources are anticipated for the BFF in the short-term, because it represents improvements over the existing facility. Since the BFF will be located farther from surface waters and with groundwater at a greater depth, it will be a safer facility than its predecessor. The new BFF will also have state-of-the-art secondary containment and other features that will virtually eliminate spills to the groundwater. In the long-term, water resources will continue to be impacted at the current level by activities at Camp Grayling. Although the BFF will lower the probability of impacts to water resources, accidents can not be ruled out. Therefore, water resources was scored as a "0" (Refer to Table 4-2).

The MPRC-H-R was also scored as a "0". Water resources related impacts will continue even though they are minor and indirect. As long as this site is used for training, increased runoff and percolation can be expected. Since there are no water resources in close proximity to the proposed MPRC site, except Kyle Lake, (which is restricted from public use due to it being in an impact area), training activities do not constitute a significant threat to these resources.

Table 4-1
Environmental Impacts due to Construction
of Master Plan Projects as Proposed
(With Mitigation)
Short-Term (<10 Years)

	Noise	LF	Water	Veg	F&W	T&E	LU	Rec	Econ
MATES	-	-	0	0	0	0	0	0	+
BFF	-	-	0	-	0	0	0	0	+
MPRC-H-R	-	-	0	-	-	0	0	0	++

Vegetation: The MATES vehicle storage buildings and the bulk fuel facility will result in minor short-term impacts on vegetation since the areas in question are so small. The vegetation will be disturbed, although quite minimal. Following construction, these facilities will not have any short-term or long-term impacts.

During the initial construction phase, the Multi-Purpose Range Complex-Heavy-Reduced will have the most impact on vegetation, since it involves clearing approximately 25 acres, and disturbing approximately 350 acres. The construction of Lane A, which is currently almost entirely wooded, will account for most of the acreage to be cleared (Everett, LTC, Personal Communication, 27 January 1994). Following construction, no additional impact on vegetation is anticipated. Off-road maneuvering activities will continue outside the fenced areas but target areas will be off-limits.

Table 4-2
Environmental Impacts due to Operation
of Master Plan Projects as Proposed
(With Mitigation)
Short-Term (<10 Years)

	Noise	LF	Water	Veg	F&W	T&E	LU	Rec	Econ
MATES	0	0	0	0	0	0	0	0	0
BFF	0	0	+	0	0	0	0	0	0
MPRC-H-R	+	0	0	0	0	0	-	0	0

Environmental Impacts due to Operation
of Master Plan Projects as Proposed
(With Mitigation)
Long-Term (>10 Years)

	Noise	LF	Water	Veg	F&W	T&E	LU	Rec	Econ
MATES	0	0	0	0	0	0	0	0	0
BFF	0	0	0	0	0	0	0	0	0
MPRC-H-R	+	0	0	+	0	0	-	0	0

Key:

LF = Land Forms
F&W = Fish & Wildlife
LU = Land Use
Econ = Economic Environment
Veg = Vegetation
T&E = Threatened & Endangered
Rec = Recreation

Threatened and Endangered Plant Species: Threatened and endangered plant species (rough fescue and Hill's thistle) could potentially be affected during the construction phase of the MPRC-H-R if appropriate mitigation procedures are not implemented. The MATES vehicle storage buildings and the BFF have been surveyed, and no T&E plant species have been identified.

Wildlife: No impacts, short-term or long-term, are expected to wildlife as a result of the construction of the MATES vehicle storage buildings and the bulk fuel facility.

Construction of the MPRC-H-R will result in the short-term disturbance of approximately 350 acres, which will displace some wildlife species, resulting in a value of "-". However, this displacement will not be permanent. Therefore, a value of "0" has been assigned to both the short-term and long-term following construction.

Threatened and Endangered Wildlife Species: T&E wildlife species will not be affected by any of the proposed projects. Site surveys have been conducted and no T&E wildlife species were identified.

Land Use: The areas currently used for training are essentially committed to various training uses. The training areas contain impact zones which comprise approximately 11,000 acres of Camp Grayling. Because these zones contain unexploded ordnance, they are committed to this use, or no use.

The implementation of Alternative 1 would not increase training near areas of sensitive use off-post. Therefore, the implementation of the proposed actions will not directly increase impacts to land uses on lands surrounding the post.

The operation of the MPRC-H-R would bring about a small change in the traffic patterns in the current Range 30 area. It is not anticipated that this change will affect frequently used traffic routes or significantly alter road use. Therefore, the impact on transportation is insignificant.

Recreation: The proposed locations for the MATES vehicle storage buildings and the bulk fuel facility will have no affect on recreational opportunities at Camp Grayling. As mentioned in Section 4.3.3, the operation of the MPRC-H-R will mean the occasional closure of the Damon Truck Trail in addition to the Stephans Bridge Road. However, this will not significantly interfere with recreational opportunities but will annoy the people who use the road for travel.

Economic Environment: Under Alternative 1, employment would remain stable at Camp Grayling. The number of troops using the post are not expected to change, and staff and expenses related to training and operations and maintenance will remain stable.

An additional benefit to the regional economy may result from implementation of Alternative 1. Local construction firms and suppliers are expected to participate in and benefit from the building construction projects. In addition, they may take part to a

limited degree in the construction of the MPRC-H-R. However, it is not possible to quantify those impacts at this time.

4.7.2 Alternative 2 - Implement Master Plan Projects at Different Locations

Noise: Siting of the vehicle storage buildings and the bulk fuel facility in a different location will have the same short-term impacts due to construction as Alternative 1. No short or long-term noise impacts following construction are anticipated.

Soils: Siting the BFF at a different location will have increased soil impacts since the alternate location has very little vegetation, has no topsoil, and is closer to a lake. Impact on soils will be slightly reduced from the present since there will be some reduction in present training activities due to training taking place at a MPRC out-of-state.

Vegetation: Building the MATES vehicle storage buildings in a slightly different location will have no impact on vegetation since the site has already been cleared. The vegetation in the alternative location for the bulk fuel facility will be unaffected since the area is open and sandy. The result of moving the MPRC-H-R out-of-state will have little impact on the vegetation. Troops will train as present and off-road maneuvering will continue.

Threatened and Endangered Plant Species: Site surveys have been done and no T&E plant species have been identified at either the MATES vehicle storage buildings or the bulk fuel facility locations. T&E plant species at the Range 30 complex will continue to be protected under the Endangered Species Act whether the projects are built or not. Good populations of rough fescue and Hill's thistle are scattered throughout the Range 30 complex and will be closely monitored to insure protection.

Land Use: The areas currently used for training are essentially committed to various training uses. The training areas contain impact zones which comprise approximately 11,000 acres of Camp Grayling. Because these zones contain unexploded ordnance, they are committed to this use, or no use.

Economic Environment: Under Alternative 2, employment would remain stable at Camp Grayling, the number of troops using the post are not expected to change, and staff and expenses related to training and operations and maintenance will remain stable.

4.7.3 Alternative 3 - Do Not Implement Master Plan Projects

There is no additional noise impact due to no construction. Under this alternative, Camp Grayling's infrastructure and training will not change in any way. Certain training areas currently receive rehabilitation on damaged lands. Typically, these are areas that have the potential to affect water resources and generate off-post fugitive dust. However, rehabilitation is not conducted on sites that are continuously disturbed due to a specific type of training (i.e., Range 30 off-road tank maneuvering), and meet the above criteria. With the full implementation of ITAM, areas needing repair will continue to receive

rehabilitation within a specified time frame. Current training activities include many far reaching mitigation and impact avoidance measures, which will continue in any case.

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Chapter 5
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Chapter 6
GLOSSARY AND ACRONYMS

A. GLOSSARY

A-weighted (noise) - General environmental noise from a continuous source.

AirLand Battle Doctrine - The U.S. Army's basic fighting doctrine suggesting an aggressive offensive position; including the securing and retaining of the initiative, and maneuvering of combined arms teams, tracked vehicles, and aircraft.

air quality attainment area - Areas designated by the EPA as having met national air quality standards.

alluvium - Sand, clay, or similar material gradually deposited by moving water, as along a river or the shore of a lake.

alvar (communities) - Dwarfed vegetation characteristic of certain Scandinavian communities with a limestone base.

Annual Training - Two week yearly training period required for National Guard troops.

aquifer - The water-bearing portion of subsurface earth material that yields or is capable of yielding useful quantities of water.

automated record fire - Computer scored and operated M-16 rifle training range.

BAMBI-buckets - Fire fighting equipment designed to be suspended from a helicopter to retrieve and dump water on a blaze.

battalion - A military unit consisting of a headquarters company and three to five functional (combat arms, combat support or combat service support) companies--approximately 250 to 1,000 persons, depending on the type of unit.

berm - An earthen ridge created to provide concealment or to protect an emplacement from enemy fire.

biodiversity - The variety of genetic combinations, species functions and associations occurring in a area, and the degree representative of the indigenous flora and fauna.

biological opinion - The variety of genetic combinations, species functions and associations occurring in an area, and the degree representative of the indigenous flora and fauna.

bivouac - A temporary encampment made by soldiers in the field; on fixed installations such as Camp Grayling often provided with improved water supply, portable toilets, etc.

brigade - A military unit composed of several battalions, augmented by specialized units (up to approximately 5,000 persons, depending on the type of unit).

Bradley Fighting Vehicle - A modern armored personnel carrier approximately one-third the weight of a tank; mounts weapons lighter than a tank, but it is designed to fight in company with tanks on a crowded battlefield. Also called the Infantry Fighting Vehicle (IFV).

buffer zone - (In the context of this EIS) A strip of untouched vegetation between any maneuver area and a wetland, endangered or threatened species colony, or other sensitive area.

Bulk Fuel Facility - A storage and dispensing facility consisting of large, above ground tanks containing unleaded, diesel and aviation fuel.

burn pan - Shallow welded metal pan in which waste explosives and powder are placed before burning for containment and collection of any potentially hazardous residue.

C-weighted (noise) - Impulse, or blast, noise, not from a continuous source.

calcareous - Of, containing, or resembling calcium carbonate; chalky.

candidate species - A candidate species is one that is being proposed as being listed as either threatened or endangered.

cantonment area - The developed portion (city-like area) of a permanent military installation.

chert - A rock commonly used by Native Americans to form arrowheads and other cutting tools.

company - The next smaller unit of a battalion; the most basic administrative and tactical unit -- approximately 50 to 200 persons, depending on the type of unit.

convoy - A group of vehicles travelling together for mutual protection or convenience.

day-night noise level (DNL) - The 24-hour average-energy sound level expressed in decibels, with a 10-decibel penalty added to sound levels between 10:00 p.m. and 7:00 a.m. to account for increased annoyance due to noise during night hours.

decibel - A unit of measurement on a logarithmic scale which describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference value.

defilade - To arrange troops and fortifications sa that the terrain will protect them from gunfire against either flank.

dud (ammunition) - A bomb, shell or other round that fails to explode when intended.

Economic Impact Forecast System (EIFS) - Export-based, location-quotient economic model developed by USACERL to estimate the regional economic impact of Army actions.

ecosystem - An ecological system that includes all the organisms and their environment within which they occur naturally.

edge - Interface between closed forest and clearings or roadways; favored habitat of many commonly harvested game species.

effluent - The outflow of a sewer, storage tank, or other source.

emergent - A plant rooted in shallow water having most of the vegetative growth above water.

emplacement - A prepared position for guns within a fortification.

endangered species - Any species which is in danger of extinction throughout all or a significant portion of its range.

eutrophication - A process by which pollutants cause a body of water to become overly rich in organic and mineral nutrients, so that algae grow rapidly and deplete the oxygen supply.

firing points - The location at which a vehicle or weapon is positioned for firing at a target.

firing range - The area or group of firing points designed for use by a particular weapon.

floristic (survey) - A survey of the vegetation in terms of the number of different species present in the area.

fugitive dust - Dust which travels off-site from its point of generation.

garrison - A fortified place with troops, guns, etc.; military post or station.

geographic information system (GIS) - A computer system component of ITAM which enables Camp staff to process all natural resources data collected from various surveys and inventories and produces high quality color maps and management documents.

glaciofluvial - Pertaining to meltwater streams flowing from glaciers or to the deposits made by such streams.

geomorphology - A science that deals with the land and submarine relief features of the earth's surface.

graywater - That portion of the wastewater stream, including dish water, bath water, and laundry water, that does not contain human waste.

hardstand - An area with a hard surface (asphalt, concrete) which may be used for parking planes or ground vehicles.

Hanson Land Grant - A large tract of land deeded to the State of Michigan for use as a military training area and wildlife refuge.

hertz - A unit of frequency equal to one cycle per second.

hydrogeological - Of, or pertaining to, subsurface waters and with related geologic aspects of surface waters.

igloos (ammunition) - Buildings specially constructed and fortified to safely store ammunition and other explosive materials to be used in training exercises.

impact area - The area where projectiles fired in gunnery practice are aimed.

Inactive Duty Training - Training normally accomplished during a weekend training period.

infiltration - To pass into or through (a substance) by filtering or permeating.

infiltration gallery - A large, horizontal underground conduit of perforated or porous material with openings on the side for collecting percolating water by infiltration.

Installation Compatible Use Zone (ICUZ) program - A program developed to safeguard the operational capability of Army installations from encroachment by off-post noise sensitive land uses such as housing.

Installation Master Plan - A document, usually consisting of maps, text, and supporting materials, which describes future land uses, goals and policies.

Integrated Training Area Management (ITAM) - A program designed by USACERL to help determine the land's ability to support training with the least impact on natural resources, including wildlife habitats.

kames - A short ridge, hill, or mound of stratified drift deposited by glacial meltwater.

Land Condition Trend Analysis (LCTA) - A component of USACERL's ITAM program which was designed to inventory, monitor, and evaluate the natural resources on Army lands.

Land Rehabilitation and Maintenance (LRAM) - A component of ITAM which provides a means to repair, restore, and maintain land impacted by training activities through the use of erosion control practices and revegetation.

Legacy Program - DOD program designed to encourage and promote research, conservation, and preservation of natural, cultural, and historical resources on military installations.

lentic ecosystems - Relating to standing waters, such as ponds, lakes, and reservoirs.

Leq - The equivalent steady-state sound level which in a stated period of time would contain the acoustical energy as time-varying sound level during the same period.

littoral zone - The shore zone between high and low watermarks.

lotic ecosystems - Relating to running waters, such as rivers and streams.

listed species - Any plant or animal designated as a state or federal threatened, endangered, special concern, or candidate species.

maneuver - The planned and controlled tactical movement of troops, vehicles, and aircraft.

masking - The inability of an animal to hear important environmental signals including noises made by potential mates, predators, or prey.

MATES (Mobilization and Annual Training Equipment Site) - Facility designed to store, maintain, and repair tracked vehicles and other equipment.

mesic - Of or concerning plants and/or areas with a moderate water supply.

mesotrophic state - A body of water having a moderate amount of dissolved nutrients.

MILES (Multiple Integrated Laser Engagement System) - An training system of eye-safe LASERs and micro-electronics used to realistically simulate the firing capabilities of rifles, machine guns, and other direct fire weapons.

moraine - An accumulation of boulders, stones, or other debris carried and deposited be a glacier.

Multi-Purpose Range Complex (MPRC) - A gunnery range designed for use by armored vehicles operating together in teams and also potentially with aircraft.

nap-of-the-earth (NOE) - Pertains to flights which closely follow the contours of the terrain, typically at tree-top level or lower.

National Environmental Policy Act (NEPA) PL 91-190, 1 Jan 1970 - The law requiring Federal governmental agencies to consider the environment when planning and executing major actions.

National Register of Historic Places (NRHP) - The listing of officially recognized historical structures, places, buildings, objects and districts; under the authority of the U.S. Department of the Interior; operated by the National Park Service.

neotropical migrants - Birds that breed in North America but spend their non-breeding periods in Central and South America.

obscurants - Man-made or naturally occurring particles suspended in the air that block or weaken the transmission of a particular part of the electromagnetic spectrum, such as visible light. Fog, mist, dust, and smoke are all examples of obscurants.

organic vehicles - Vehicles belonging to a particular unit.

organic weapon systems - Types of weapons the unit would normally use in combat.

piezometers - An instrument for measuring pressure or compressibility.

platoon - A subdivision of a military company divided into squads or sections and usually commanded by a lieutenant.

plume - An elongated mass of contaminated fluid moving with the flow of the groundwater.

pump-and-treat system - Filtering treatment system designed to remove contaminants.

pyrotechnics - Ammunition containing chemicals that produce smoke or brilliant light in burning; used for signaling or lighting areas.

radiation inversion - A state in which the air temperature increases with increasing altitude, holding surface air down, along with any pollutants.

Record of Decision - The official document which discloses the decision on a major federal action and discusses the alternatives considered and the mitigations associated

with the project.

Resource Conservation and Recovery Act (RCRA) - The act established criteria for the management of hazardous wastes; i.e., handling, disposal and record keeping.

riparian - Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater.

safety fan - The access exclusion zone set around target areas on a firing range.

sensitive species - Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by a) significant current or predicted downward trends in population numbers or density; and b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

scoping - The process by which an agency solicits information and opinions from regulatory agencies and the public about the most important topics to be evaluated in an EIS.

Sharps - Medical equipment or medical waste containing a point or sharp edge, i.e. needles and scalpels.

small arms - Weapons carried and operated by individuals. This group of weapons includes pistols and rifles carried and operated by individuals.

snags - Dead, but standing, trees.

Special Use Permit (SUP) - Any permit issued by a state or federal agency to allow specific use on state or federal lands.

stratigraphy - A geology that deals with the origin, composition, distribution, and succession of strata.

threatened species - Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

topographic - Describing the physical features of a place or region.

up-gradient - Movement or direction against the flow direction of groundwater.

volatile organic compounds (VOCs) - Any precursor organic compound (excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which has a vapor pressure great enough (> 1 atmosphere) to be emitted during use, application or drying of a solvent or surface coating. These include, but are not limited to, chlorofluorocarbons.

watershed - The region draining into a stream, river, or river system.

wetlands - Areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil. This classification includes swamps, marshes, bogs, and similar areas.

xeric - Of or concerning plants and/or areas with low or irregular supplies of water.

B. DICTIONARY OF ACRONYMS AND ABBREVIATIONS

These acronyms and abbreviations are utilized at least once in the document. Some were created for this study; most are standard Department of Defense terminology.

AAFES	Army and Air Force Exchange Service
AASF	Army Aviation Support Facility
ADNL	A-weighted day-night noise level
ADSW	Active Duty Special Work
AEHA	Army Environmental Hygiene Agency
AAFES	Army and Air Force Exchange Service
AFTP	additional flight training period
AGL	above ground level
AGR	Active Guard/Reserve
ANSI	American National Standards Institute
APC	armored personnel carrier
AQD	Air Quality Division
AR	Army Regulation
ARNG	Army National Guard
ARTEP	Army Training and Evaluation Program
ASHU	assault helicopter units
ASP	ammunition supply point
AT	annual training
ATG	Air-to-Ground
ATHU	attack helicopter units
ATV	all terrain vehicle
AVIM	Aviation Intermediate Maintenance Detachment
AVLB	armored vehicle launch bridge
BEA	Bureau of Economic Analysis
BFF	bulk fuel facility
BNOISE	blast noise prediction program
BOQ	bachelor officer quarters
BSB	battalion supply building
Btu	British Thermal Unit
C	celsius
cal.	caliber
CALFEX	Combined Arms Live Fire Exercises
CBP	County Business Patterns
CDNL	C-weighted day-night noise level
CEV	combat engineer vehicle
CFR	Code of Federal Regulations
cfs	cubic feet per second
CFX	command field exercise

CG	Camp Grayling
CGENV	Camp Grayling Environmental
CHABA	Committee on Hearing and Bio-Acoustics
cm	centimeter
COC	Certificate of Coverage
CPX	command post exercises
CRTC	Combat Readiness Training Center
CS	Chlorobenzalmalononitrile
CSWFTQ	crew-served weapons firing/training qualification
CWT	cold weather training
DA	Department of Army
dB	decibel
dBA	decibel, A-weighted
dBC	decibel, C-weighted
DEH	Department of Engineering and Housing
DEIS	Draft Environmental Impact Statement
DERA	Defense Environmental Response Act
DFE	Division of Facility Engineering
DMA	Department of Military Affairs
DNL	day-night level
DNT	dinitrotoluene
DNR	Department of Natural Resources
DOD	Department of Defense
DOT	Department of Transportation
DPH	Department of Public Health
DPTM	Directorate of Plans, Training, and Mobilization
DRMO	Defense Reutilization and Marketing Office
DZ	drop zone
EA	Environmental Assessment
EA	Environmental Awareness (ITAM)
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EOD	explosive ordnance disposal
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPW	enemy prisoner of war
ESE	Environmental Science and Engineering
F	fahrenheit
FA	Field Artillery
FAA	Federal Aviation Administration
FAAD	Forward Area Air Defense
FAC	Forward Air Controller
FARP	forward air rearming point
FARRP	forward air rearming/refueling point
FCX	fire coordination exercise
FEIS	Final Environmental Impact Statement

FISTV	fire integration support team vehicle
ft	foot
F/T	full tracked
FWA	fixed wing aircraft
FTX	field training exercise
FY	fiscal year
g	gram
GAAF	Grayling Army Airfield
GAGR	Grayling Air Gunnery Range
GIS	Geographical Information System
GM	General Motors
gpm	gallons per minute
GRASS	Geographic Resources Analysis Support System
GS	General Schedule
HE	high explosive
HEI	high explosive incendiary
HHC	Headquarters and Headquarters Company
HHD	Headquarters and Headquarters Detached
HMMWV	high mobility multi-purpose wheeled vehicle
HPP	Historic Preservation Plan
HUD	Housing and Urban Development Department
Hz	hertz
ICUZ	Installation Compatible Use Zone
IDT	inactive duty training
IOSC	Installation On-Scene Coordinator
IR	infrared
IRP	Installation Restoration Program
IRT	Installation Response Team
ISCP	Installation Spill Contingency Plan
ITAM	Integrated Training Area Management
ITV	improved TOW vehicle
KD	known distance
kg	kilogram
kVA	kilovolt ampere
KW	Kirtland's warbler
LAW	light anti-tank weapon
l	liter
lb	pound
LCTA	Land Condition Trend Analysis
LFX	live fire exercise
LOS-FH	line of sight - forward heavy
Lp	liquified petroleum
LRAM	Land Rehabilitation and Maintenance
L/T	light tracked
LZ	landing zone
MAPEX	map exercises

MATES	Mobilization and Annual Training Equipment Site
MDNR	Michigan Department of Natural Resources
MEDEVAC	Medical Aerial Evacuation
MGD	million gallons per day
MIARNG	Michigan Army National Guard
MILES	Multiple Integrated Laser Engagement System
MLRS	Multiple Launch Rocket System
m	meter
mm	millimeter
MNFI	Michigan Natural Features Inventory
MP	military police
MPRC	Multi-Purpose Range Complex
MVSP	MATES vehicle storage building
MPRC-H-R	Multi-Purpose Range Complex-Heavy-Reduced
NBC	nuclear biological chemical
NCO	Non-Commissioned Officer
NEMCOG	Northeast Michigan Council of Governors
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NOA	notice of availability
NOE	nap-of-the-earth
NOI	Notice of Intent
NOHD	nominal ocular hazard distance
NOTAM	notice to airmen
NPDES	National Pollution Discharge Elimination System
NVG	night vision goggle
NWI	National Wetlands Inventory
OPFOR	opposing force
ORV	off-road vehicle
OSHA	Occupational Safety and Health Act
PA	public act
PBO	property book officer
PCB	polychlorinated biphenyls
PCE	tetrachloroethylene (tetrachloroethene)
PETN	pentaerythritoltetranitrate
PIPP	Pollution Incident Prevention Plan
PL	public law
POL	Petroleum, oils, lubricants
POW	prisoner of war
PSPL	peak sound pressure level
PUD	planned unit development
PVC	polyvinyl chloride
PX	post exchange
RAOC	rear area operations
R&D	research and development
RCRA	Resource Conservation and Recovery Act

RDX	Royal Dutch Explosive
REDCON	readiness condition
Reg	regulation
ROD	Record of Decision
RS&D	receiving, staging, and deployment
RWA	rotary wing aircraft
RWMP	regulated waste management plan
SABOT	penetrator of tank main gun ammunition
SAM	surface-to-air missile
SC	special concern
SPCCP	Spill Prevention Control and Countermeasure Plan
SFW	sensor fuzed weapon
SHPO	State Historic Preservation Officer
SOP	standard operating procedure
S/P	self-propelled
SPCCP	Spill Prevention, Control and Countermeasure Plan
SPL	sound pressure level
STARC	state area command
STX	situational training exercise
SUP	Special Use Permit
TARWF	training activities requiring weapons firing
TAT	tactical aviation training
TATE	tactical aviation training equipment
T&E	threatened and endangered
TCE	trichloroethylene (trichloroethene)
TE&SC	threatened, endangered, and special concern
TES	threatened and endangered species
TEWT	tactical exercises without troops
TISA	troop issue subsistence activity
TMC	troop medical clinic
TNT	trinitrotoluene
TOW	tube launched, optically tracked, wire-guided (anti-tank missile)
TP	target practice
TRI	Training Requirements Integration
TSCA	toxic substance control act
TSDF	treatment storage disposal facility
TSFO	training site, fire observation
TTS	tank thermal site
ug	microgram
UHU	utility helicopter unit
UMRRC	Upper Manistee River Restoration Committee
UNOCAL	Union Oil of California
USACERL	U.S. Army Construction Engineering Research Laboratories
USAF	U.S. Air Force
USAR	U.S. Army Reserve
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency

USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USPFO	U.S. Property and Fiscal Office
UST	underground storage tank
UTM	Universal Transverse Mercator
UWFTQ	unit weapons firing/training qualification
VEESS	vehicle engine exhaust smoke system
VIP	very important person
VOC	volatile organic compound
WEG	wind erodability group

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APPENDIX A

Information Tables

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Table A-1
Actual Annual Training Strength Report
Fiscal Years 1971 - 1983

Source	1971/2	1973/4	1975/6	1977	1978
Army National Guard				19,675	15,460
United States Army Reserve				393	176
Other				2,043	1,298
Canada				417	548
Totals*	40,501	39,532	46,186	22,528	17,209

Source	1979	1980	1981	1982	1983
Army National Guard	14,185	16,302	16,984	26,145	18,092
United States Army Reserve	486	1,130	2,433	1,154	1,161
Other	2,188	2,957	2,383	2,901	742
Canada	1,111	0	863	1,494	96
Totals*	17,970	20,389	26,663	31,694	19,995

Source: Annual Reports of the Adjutant General, 1971/83. *Note: These totals do not include Fixed Wing usage of the Air-to-Ground Range; these airmen are not included in the official strength reports of the Camp - See Typical AT and IDT Usage Tables for Air-to-Ground Range impacts.

Table A-2
Actual Annual Training Strength Report
Fiscal Years 1984 - 1993

Source	1984	1985	1986	1987	1988
Army National Guard	32,619	24,358	24,559	31,931	24,947
United States Army Reserve	1,770	736	824	1,382	1,845
Active Army	1,854	897	1,777	2,152	1,267
Other Forces	0	55	481	131	280
Visitors	70	51	0	0	0
Totals*	36,313	26,097	27,641	35,596	28,339

Source	1989	1990	1991	1992	1993
Army National Guard	19,899	20,687	17,482	14,201	14,440
United States Army Reserve	4,030	1,812	2,175	669	1,271
Active Army	1,032	1,355	589	802	549
Other Forces	150	29	498	513	153
Visitors	27	170	43	0	0
Totals*	25,138	24,053	20,787	16,185	16,413

Source: Camp Grayling Finance & Budget Office, 1994. *Note: These totals do not include Fixed Wing usage of the Air-to-Ground Range; these airmen are not included in the official strength reports of the Camp - See Typical AT and IDT Usage Tables for Air-to-Ground Range impacts.

Table A-3
Actual Inactive Duty Training Strength Report
Fiscal Years 1984 - 1993

Source	1984	1985	1986	1987	1988
Army National Guard	12,272	18,592	22,012	14,382	21,351
United States Army Reserve	3,005	3,622	2,285	1,701	3,356
Other Forces	1,236	2,814	2,416	2,896	1,607
Civilians	595	703	642	0	316
Totals*	17,108	25,731	27,355	18,979	26,630

Source	1989	1990	1991	1992	1993
Army National Guard	16,726	23,904	20,458	22,483	20,512
United States Army Reserve	4,236	3,890	2,695	691	2,030
Other Forces	576	2,596	121	2,299	2,134
Civilians	1,333	1,395	1,626	1,310	3,045
Totals*	22,871	31,785	24,900	26,783	27,721

Source: Camp Grayling Finance & Budget Office, 1994 *Note: These totals do not include Fixed Wing usage of the Air-to-Ground Range; these airmen are not included in the official strength reports of the Camp - See Typical AT and IDT Usage Tables for Air-to-Ground Range impacts.

Table A-4
Typical Annual Training Troop Usage For Any Fiscal/Training Year
1 October - 30 September

Type of Training Unit	Average # of Soldiers	Average # of Training Mandays	% of Total Soldiers
Infantry (All Types)	4,415	61,810	18.4
Armor (M-60 & M-1 Equipped)	367	5,138	1.5
Cavalry (Ground)	1,412	19,768	5.9
Field Artillery (Towed and Self-Propelled)	1,887	26,418	7.9
Aviation (Rotary Wing - All Types)	842	11,788	3.5
Aviation (Fixed Wing - Air to Ground Range)*	4,012	4,012	16.7
Engineers (All Types + Fire Fighters & EOD)	2,174	30,435	9.0
Military Police	877	12,278	3.6
Medical	881	12,334	3.7
NBC Defense	53	742	0.2
Tactical Smoke Generation	106	1,484	0.4
Quartermaster (Includes Water Purification)	154	2,156	0.6
Supply & Services	2,071	28,994	8.6
Maintenance	1,224	17,136	5.1
Signal	1,019	14,266	4.2
Headquarters (All Types, Regardless of Branch)	1,944	27,216	8.3
Schools	228	3,192	0.9
Transportation (Ground)	367	5,138	1.5
Totals*	24,033	284,306	100

Source: Camp Grayling Files; data is derived from planned and actual troop strength for Fiscal Years 1989 through 1993. Individual manday figures are multiplied by 14 to produce Annual Training Mandays. *Note: Fixed Wing Aviation mandays are not multiplied by any factor; each airman and his/her aircraft is counted as one manday.

Table A-5
Typical Inactive Duty Training Troop Usage For Any Fiscal/Training Year
1 October - 30 September

Type of Training Activity	Avg # of Soldiers	Avg # of Mandays	% of Total Soldiers
Small Arms Range Firing	8,363	16,726	34.4
Tank Gunnery	947	1,894	3.9
Artillery Gunnery	1,409	2,818	5.8
Forward Observer (TSFO)	166	332	0.7
Tactical (Bivouac/Maneuver)	3,127	6,255	12.9
Civil Disturbance	470	940	1.9
Aviation (Rotary Wing)	535	1,071	2.2
Aviation (Fixed Wing)*	675	675	2.8
Facility Support	338	676	1.3
Civilian Activities	1,329	2,659	5.5
Schools	156	313	0.7
Local Unit Inactive Duty Training	6,321	12,642	26.0
Miscellaneous	487	974	2.0
Totals*	24,325	47,975	100

Source: Camp Grayling Files; data is derived from planned and actual troop strength for Fiscal Years 1992 and 1993. Individual manday figures are multiplied by 2 to produce Inactive Duty Training Mandays.
*Note: Fixed Wing Aviation mandays are not multiplied by any factor; each airman and his/her aircraft is counted as one manday.

Table A-6
Typical Army and Air National Guard Units Training at Camp Grayling

Unit	State	Strength
Headquarters, State Area Command, Michigan Army National Guard	MI	437
126 Army Band	MI	41
126 Public Affairs Detachment	MI	15
Detachment 5, State Area Command, Michigan Army National Guard	MI	5
Installation Support Unit, Camp Grayling	MI	201
1071st Maint Co	MI	256
1183rd Ordnance Team, MLRS	MI	19
1184th Ordnance Team, MLRS	MI	2
1438th Engineer Det	MI	56
1439th Engineer Det	MI	22
1440th Engineer Det	MI	22
745th Ordnance Det, EOD	MI	23
HHC, 46th Bde, 38th Infantry Division	MI	90
Det 1, HHC, 38th Infantry Division	MI	8
Det 1, 38th ID Material Mgt Center	MI	4
1st Battalion, 125th Infantry (Standard)	MI	705
3rd Battalion, 126th Infantry (Standard)	MI	705
1st Battalion, 119th Field Artillery (105mm Towed)	MI	469
1st Battalion, 246th Armor (M-60A3TTS)	MI	550
HHC, 177th Military Police Bde	MI	95
1st Battalion, 182nd Field Artillery (MLRS)	MI	424
HHD, 210th Military Police Bn	MI	61
1775th Military Police Co	MI	158
1776th Military Police Co	MI	158
46th Military Police Co	MI	180
144th Military Police Co	MI	158
156th Signal Battalion	MI	517
Det 3, 13th Combat Support Hospital (Hospital Unit, Surgical)	MI	193
HHC, 46th Engineer Gp	MI	73
1434th Quartermaster Tm (Water Purification)	MI	14
107th Engineer Bn (Combat, Corps)	MI	914
HHD, 507th Engineer Bn	MI	36
1432nd Engineer Co	MI	107
1435th Engineer Co	MI	99
1430th Engineer Co	MI	211
1436th Engineer Co	MI	211
1146th Engineer Det	MI	69
Detachment 1, State Area Command (72nd Support Bde)	MI	60
HHD, 107th Supply & Service Bn	MI	63
460th Quartermaster Co	MI	191
464th Quartermaster Co	MI	107
HHD, 225th Quartermaster Bn	MI	58
1171st Quartermaster Co (Petroleum Supply)	MI	169
227th Quartermaster Co	MI	140
HHC, 746th Ordnance Bn	MI	60
1070th Maint Co	MI	208
1072nd Maint Co	MI	236

Table A-6
Typical Army and Air National Guard Units Training at Camp Grayling

Unit	State	Strength
1073rd Maint Co	MI	237
Det 1, Co E, 38th MSB	MI	14
1075th Maint Co	MI	237
Detachment 2, State Area Command	MI	30
1461st Transportation Co	MI	159
Co F, 425th Infantry (Airborne)	MI	202
126th Signal Co	MI	178
2071st Medical Co	MI	120
163rd Personnel Services Co	MI	120
1009th Transportation Det (Movement Control)	MI	7
1st Battalion, 238th Aviation (Attack Helicopter)	MI	375
2nd Battalion (-), 238th Aviation (Assault Helicopter)	MI	267
Detachment 2, HQ, 34th Infantry Division	IL	8
HHC, 66th Bde, 34th Infantry Division	IL	95
Troop E, 106th Cavalry	IL	84
2nd Battalion, 123rd Field Artillery (105mm Towed)	IL	500
126th Supply & Services Co	IL	143
2nd Battalion, 130th Infantry (Standard)	IL	709
3rd Battalion, 130th Infantry (Standard)	IL	709
HHD, 232nd Supply & Services Bn	IL	67
634th Forward Support Bn	IL	302
HHD, 1144th Transportation Bn	IL	50
1544th Transportation Co (Lt-Medium Truck)	IL	136
HHC, 33rd Separate Infantry Bde	IL	320
1st Battalion, 178th Infantry (Standard)	IL	727
2nd Battalion, 129th Infantry (Standard)	IL	727
1st Battalion, 131st Infantry (Standard)	IL	727
2nd Battalion, 122nd Field Artillery (105mm Towed)	IL	527
108th Support Bn	IL	705
233rd Engineer Co (Ribbon Bridge)	IL	237
508th Medical Co (Clearing)	IL	157
708th Medical Co (Ambulance)	IL	89
1744th Transportation Co	IL	44
633rd Signal Plt	IL	51
Co C, 113th Medical Bn	IN	85
Co C, 738th Forward Support Bn	IN	131
HHC, 2nd Bde, 38th Infantry Division	IN	95
Co A, 113th Engineer Bn	IN	165
Co E, 113th Engineer Bn	IN	165
HQ Co, 113th Medical Bn	IN	148
Btry C, 138th Air Defense Bn	IN	148
Co A, 138th Signal Bn	IN	55
3rd Battalion, 139th Field Artillery (105mm Towed)	IN	500
1st Squadron, 238th Cavalry (M-60)	IN	383
Troop D, 1st Sq, 238th Cavalry (Air)	IN	34
1st Battalion, 293rd Infantry (Standard)	IN	709
2nd Battalion, 293rd Infantry (Standard)	IN	709
Co B, 738th Forward Support	IN	96

Table A-6
Typical Army and Air National Guard Units Training at Camp Grayling

Unit	State	Strength
915th Medical Co (Ambulance)	IN	44
Co B, 113th Engineer Co	IN	166
Co A, 113th Medical Bn	IN	85
2nd Battalion, 152nd Infantry (Mechanized)	IN	705
Co D, 738th Forward Support	IN	131
Co D, 238th Aviation Bn	IN	142
38th Adjutant General Co	IN	186
38th Material Mgt Center	IN	30
38th Military Police Co	IN	186
1st Battalion, 151st Infantry (Standard)	IN	727
1st Battalion, 152nd Infantry (Standard)	IN	727
38th Transportation Bn	IN	516
438th Chemical Co (NBC Defense)	IN	102
Co F, 238th Aviation Bn	IN	100
1438th Transportation Co	IN	150
HHD, 112th Transportation Bn	OH	25
1st Battalion, 134th Field Artillery (105mm Towed)	OH	436
1st Battalion, 136th Field Artillery (105mm Towed)	OH	370
135th Military Police Co (Physical Security)	OH	158
HHD, 137th Supply & Services Bn	OH	67
1st Battalion, 147th Infantry (Standard)	OH	709
1st Battalion, 148th Infantry (Standard)	OH	709
196th Public Information Det	OH	6
Troop A, 1st Sq, 237th Cavalry (Separate)	OH	84
237th Forward Support Bn	OH	620
299th Signal Plt (Forward Area)	OH	52
323rd Military Police Co	OH	158
838th Military Police Co	OH	158
324th Military Police Co	OH	158
HHD, 437th Military Police Bn	OH	54
HHC, 371st Support Gp (Corps)	OH	81
637th Field Services Co	OH	196
641st Quartermaster Co (Water Purification)	OH	69
1485th Transportation Co (Lt-Medium Truck)	OH	128
4th Squadron, 107th Armored Cavalry Regiment (Combat Aviation)	OH	552
107th Support Squadron, 107th ACR	OH	831
211th Maintenance Co	OH	207
214th Maintenance Co	OH	314
328th Ordnance Det (TOW/DRAGON Missile Maint)	OH	9
383rd Medical Co (Clearing)	OH	126
385th Medical Co (Ambulance)	OH	88
684th Medical Co (Clearing)	OH	126
837th Engineer Co (Separate Infantry Brigade)	OH	79
1486th Transportation Co (Medium Truck, Container/Cargo)	OH	181
26th Engineer Co	OH	101
HHT, 107th Armored Cavalry Regiment	OH	203
2nd Squadron, 107th Armored Cavalry Regiment	OH	835
3rd Squadron, 107th Armored Cavalry Regiment	OH	835

Table A-6
Typical Army and Air National Guard Units Training at Camp Grayling

Unit	State	Strength
117th Chemical Co (Smoke, Decontamination, Reconnaissance)	OH	73
HHC, 73rd Infantry Bde (Separate)	OH	309
HHC, 112th Medical Bde	OH	97
2nd Battalion, 137th Aviation (Aleutian Islands)	OH	176
1st Battalion, 166th Infantry (Standard)	OH	552
HQ, State Area Command	OH	502
2007th Medical Det (Dental Service)	OH	5
145th Mobile Army Surgical Hospital	OH	239
122nd Army Band	OH	45
186th Military Police Co	IA	158
209th Medical Co (Clearing)	IA	127
1187th Medical Co (Air Ambulance)	IA	82
34th RAOC (Rear Area Operations)	IA	73
HHC, 234th Signal Bn	IA	258
34th Signal Co	IA	140
105th Military Police Co (Physical Security)	NY	75
1st Squadron, 150th Cavalry	WV	235
829th Engineer Det	WI	140
HHD, 426th Engineer Bn	WI	35
127th Tactical Fighter Wing	MI	
191st Fighter Group	MI	
110th Fighter Group	MI	

Table A-7
Typical Army and Air Force Reserve Units Training at Camp Grayling

Unit	Command	Strength
395th Medical Hospital (Combat Support)	123	414
5033rd USARF School	123	178
486th Engineer Co	123	232
221st Ordnance Co (Conventional Ammo, Direct Support)	123	177
4th Battalion, 20th Field Artillery (8" SP)	123	449
4th Battalion, 38th Field Artillery (8" SP)	123	449
4th Battalion, 333rd Field Artillery (155mm Towed)	123	467
446th Medical Det (Dispensary)	123	10
606th Medical Det (Dispensary)	123	10
472nd Medical Det (Dispensary)	123	10
910th Maint Det (FA, Direct Support)	123	18
HHB, 428th Field Artillery Bde	123	151
323rd Hospital (1,000 bed General Hospital)	123	605
148th Medical Det (Central Material Services)	123	3
307th Medical Det (Central Material Services)	123	3
887th Medical Det (Ground Ambulance)	123	13
381st Medical Det (General Dispensary)	123	20
259th Medical Det (Dispensary)	123	10
314th Military Intelligence Bn	123	532
69th Chemical Det (NBC Elem JA)	123	5
224th Chemical Co (Smoke Generator)	123	129
260th Medical Team (Dental Service)	123	5
652nd Medical Det (Dental Service)	123	57
339th Military Police Co	300	106
HHD, 327th Military Police Bn	300	56
HHC, 604th Military Police Bn	300	56
814th Military Police Co	300	176
303rd Military Police Co	300	158
377th Military Police Co	300	158
428th Military Police Co	300	107
342nd Military Intelligence Co	83	79
983rd Engineer Bn (Combat, Heavy)	83	734
192nd Quartermaster Co (Petroleum Supply)	83	64
HHC, 169th Support Gp	83	92
428th Supply & Services Co	83	111
HHD, 307th Medical Gp	83	54
368th Public Affairs Det (Field Service Opns)	83	5
1001st Field Service Co	83	122
369th Medical Det (Dental)	83	10
427th Chemical Det (Team JA, NBC)	83	5
394th Medical Det (Dental)	83	5
360th Medical Det (Dental Service)	83	59
373rd Medical Det (Dental Service)	83	59
324th Engineer Det (Utilities)	83	56
HHC, 364th Engineer Gp	83	86
401st Chemical Det (Tm LA, NBC Recon)	83	4
HHC, 452nd Support Gp	83	83
863rd Engineer Bn (Combat, Heavy)	86	734
389th Engineer Bn (Combat)	88	734

Table A-7
Typical Army and Air Force Reserve Units Training at Camp Grayling

Unit	Command	Strength
872nd Maint Co (Non Div)	103	208
672nd Adjutant General Det (Repro Tm BB)	103	9
816th Maint Det	103	7
844th Maint Det	103	16
868th Maint Det	103	17
138th Military Intelligence Bn	86	546
961st Engineer Bn (Combat, Heavy)	86	735
996th Engineer Co (Panel Bridge)	88	98
378th Chemical Co (Smoke Generator)	86	129
379th Chemical Co (Smoke Generator)	86	127
388th Chemical Co (Smoke Generator)	86	127
121st Chemical Det (Decon)	98	21
Det, 85th Division (Exercise)	85	80
342nd Chemical Co (Decon)	86	109
HHD, 472nd Chemical Bn	86	54

Table A-8
Typical Active Component and Allied Nations Training at Camp Grayling

Unit	Component/Nation	Strength
4th Battalion, 37th Armor	Active Army	500
2nd Battalion, 10th Special Forces	Active Army	297
136th Field Artillery	Active Army	221
1st Battalion, 501st Infantry (Airborne), 101st Air Assault Div	Active Army	500
5th Battalion, 33rd Armor	Active Army	579
2nd Battalion, Irish Regiment of Canada	Canada	200
E&K Scots Regiment	Canada	73
49th Field Artillery Regiment	Canada	130
Northern Ontario Militia District	Canada	29
2nd Battalion, King's Own Border Regiment	Great Britain	130
Queen's Own Yeomanry	Great Britain	130
48th Highlanders	Canada	90

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APPENDIX B

Vascular Plants of Camp Grayling

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VASCULAR PLANTS OF CAMP GRAYLING

Species documented by the Michigan Natural Features Inventory floristic survey conducted in the summer of 1992 are indicated with their abundance. Those species documented during the U.S. Army's Land Condition-Trend Analysis vegetation survey conducted in the summer of 1992 and 1993 are marked with an asterisk (*).

Taxon	Abundance
Aceraceae: (Maple Family)	
Red Maple* (*Acer rubrum*)	Occasional
Silver Maple* (*Acer saccharinum*)	
Sugar Maple* (*Acer saccharum*)	
Alismataceae: (Water-plantain Family)	
Water-plantain (*Alisma plantago-aquatica*)	Common
Arrowhead* (*Sagittaria latifolia*)	Occasional
Amaranthaceae: (Pigweed Family)	
Tumbleweed (*Amaranthus albus*)	
Sandhill's Pigweed* (*Amaranthus arenicola*)	
Powell's Pigweed (*Amaranthus powellii*)	Occasional
Rough Pigweed (*Amaranthus retroflexus*)	
Spiny Pigweed* (*Amaranthus spinosus*)	
Anacardiaceae: (Cashew Family)	
Fragrant Sumac (*Rhus aromatica*)	Infrequent
Smooth Sumac* (*Rhus glabra*)	
Staghorn Sumac* (*Rhus typhina*)	Common
Annonaceae: (Custard Apple Family)	
Pawpaw* (*Asimina triloba*)	
Apiaceae: (Parsley Family)	
Spikenard (*Aralia racemosa*)	
Bulbous Water Hemlock (*Cicuta bulbifera*)	Occasional
Common Water Hemlock (*Cicuta maculata*)	
Poison Hemlock (*Conium maculatum*)	Infrequent
Wild Carrot (*Daucus carota*)	Common
Water-pennywort (*Hydrocotyle americana*)	Occasional
Sweet Cicely* (*Osmorhiza claytoni*)	
Black Snakeroot (*Sanicula marilandica*)	Infrequent
Water-parsnip (*Sium suave*)	Occasional

Apocynaceae: (Dogbane Family)	
Spreading Dogbane* (*Apocynum androsaemifolium*)	Common
Dogbane* (*Apocynum medium*)	
Aquifoliaceae: (Holly Family)	
Winterberry* (*Ilex verticillata*)	
Mountain Holly* (*Nemopanthus mucronatus*)	Occasional
Araceae: (Arum Family)	
Jack-in-the-pulpit (*Arisaema triphyllum*)	Occasional
Wild Calla (*Calla palustris*)	Occasional
Skunk-cabbage* (*Symplocarpus foetidus*)	Common
Araliaceae: (Ginseng Family)	
Bristly Sarsaparilla* (*Aralia hispida*)	Occasional
Wild Sarsaparilla* (*Aralia nudicaulis*)	Common
Asclepiadaceae: (Milkweed Family)	
Milkweed (*Asclepias exaltata*)	Infrequent
Swamp Milkweed (*Asclepias incarnata*)	Occasional
Common Milkweed* (*Asclepias syriaca*)	Occasional
Butterfly Milkweed (*Asclepias tuberosa*)	
Asteraceae: (Aster Family)	
Yarrow* (*Achillea millefolium*)	Infrequent
Common Ragweed (*Ambrosia artemisiifolia*)	Occasional
Western Ragweed (*Ambrosia psilostachya*)	Common
Pearly Everlasting (*Anaphalis margaritacea*)	Occasional
Field Pussy-toes (*Antennaria neglecta*)	Occasional
Common Burdock (*Arctium minus*)	
Western Sagewort (*Artemisia campestris*)	Common
Wormwood* (*Artemisia vulgaris*)	
Slender White Aster (*Aster borealis*)	Common
Wild Aster (*Aster ciliolatus*)	
Smooth Blue Aster (*Aster laevis*)	Occasional
Panicled Aster (*Aster lanceolatus*)	Infrequent
White Woodland Aster* (*Aster lateriflorus*)	Common
Long-leaved Blue Aster (*Aster longifolius*)	Occasional
Large-leaved Aster* (*Aster macrophyllus*)	Common
Wild Aster (*Aster pilosus*)	
Wild Aster (*Aster ptarmicoides*)	Occasional
Swamp Aster (*Aster puniceus*)	Common
Arrow-leaved Aster* (*Aster sagittifolius*)	
Flat-topped White Aster (*Aster umbellatus*)	Common
Arrow-leaved Aster (*Aster urophyllus*)	Occasional
Nodding Beggar-ticks (*Bidens cernua*)	Abundant

Beggar-ticks* (*Bidens frondosa*)	Common
Diffuse Knapweed (*Centaurea diffusa*)	
Spotted Knapweed* (*Centaurea maculosa*)	Common
Ox-eye Daisy (*Chrysanthemum leucanthemum*)	Common
Chicory (*Cichorium intybus*)	Occasional
Canada Thistle (*Cirsium arvense*)	Occasional
Hill's Thistle* (*Cirsium hillii*)	Infrequent
Swamp Thistle (*Cirsium muticum*)	Occasional
Marsh Thistle* (*Cirsium palustre*)	Common
Bull Thistle (*Cirsium vulgare*)	Occasional
Horseweed* (*Conyza canadensis*)	Common
Tickseed (*Coreopsis lanceolata*)	Common
Daisy Fleabane (*Erigeron philadelphicus*)	Common
Daisy Fleabane (*Erigeron strigosus*)	Common
Mist Flower* (*Eupatorium coelestinum*)	
Spotted Joe-pye Weed* (*Eupatorium maculatum*)	Occasional
Boneset (*Eupatorium perfoliatum*)	Common
Grass-leaved Goldenrod (*Euthamia graminifolia*)	Common
Clammy Cudweed (*Gnaphalium macounii*)	Common
Low Cudweed (*Gnaphalium uliginosum*)	Occasional
Curly-top Gumweed (*Grindelia squarrosa*)	Common
Sunflower (*Helianthus divaricatus*)	Infrequent
Sunflower* (*Helianthus occidentalis*)	Occasional
King-devil* (*Hieracium aurantiacum*)	Occasional
Yellow King-devil (*Hieracium caespitosum*)	Occasional
Hawkweed (*Hieracium canadense*)	Infrequent
Hawkweed (*Hieracium florentinum*)	Occasional
Beaked Hawkweed (*Hieracium gronovii*)	Occasional
Hawkweed (*Hieracium scabrum*)	Infrequent
Veiny Hawkweed (*Hieracium venosum*)	Occasional
Spotted Cat's Ear (*Hypochaeris radicata*)	Occasional
Dwarf Dandelion (*Krigia biflora*)	Occasional
Dwarf Dandelion* (*Krigia virginica*)	Occasional
Wild Lettuce (*Lactuca canadensis*)	Occasional
Blazing Star (*Liatris cylindracea*)	Infrequent
Northern Blazing Star (*Liatris scariosa*)	Occasional
Water Marigold (*Megalodonta beckii*)	Common
Sch.-Bip* (*Microseris nutans*)	
Palafoxia* (*Palafoxia sphacelata*)	
Rattlesnake-root (*Prenanthes alba*)	Infrequent
Lion's-foot* (*Prenanthes serpentaria*)	
Black-eyed Susan (*Rudbeckia hirta*)	Occasional
Groundsel (*Senecio aureus*)	Infrequent
Balsam Groundsel (*Senecio pauperculus*)	Common
Prairie Ragwort (*Senecio plattensis*)	Occasional
Late Goldenrod (*Solidago altissima*)	Common

Canada Goldenrod* (*Solidago canadensis*)	Common
Late Goldenrod* (*Solidago gigantea*)	
Hairy Goldenrod* (*Solidago hispida*)	
Houghton's Goldenrod (*Solidago houghtonii*)	Common
Goldenrod* (*Solidago juncea*)	
Gray Goldenrod (*Solidago nemoralis*)	Occasional
Rough-leaved Goldenrod (*Solidago patula*)	Common
Rough-stemmed Goldenrod* (*Solidago rugosa*)	Abundant
Goldenrod (*Solidago spathulata*)	Occasional
Northern Bog Goldenrod* (*Solidago uliginosa*)	Abundant
Common Dandelion* (*Taraxacum officinale*)	Common
Goat's Beard (*Tragopogon dubius*)	Common
Meadow Salsify* (*Tragopogon pratensis*)	
Frostweed* (*Verbesina virginica*)	
Balsaminaceae: (Touch-me-not Family)	
Spotted Touch-me-not (*Impatiens capensis*)	Abundant
Berberidaceae: (Barberry Family)	
Blue Cohosh (*Caulophyllum thalictroides*)	
Betulaceae: (Birch Family)	
Speckled Alder* (*Alnus rugosa*)	Common
Yellow Birch* (*Betula alleghaniensis*)	
Paper Birch* (*Betula papyrifera*)	
Swamp Birch* (*Betula pumila*)	
Beaked Hazelnut* (*Corylus cornuta*)	
Ironwood* (*Ostrya virginiana*)	
Boraginaceae: (Borage Family)	
Puccoon (*Lithospermum carolinense*)	Infrequent
Brassicaceae: (Mustard Family)	
Pale Alyssum (*Alyssum alyssoides*)	Common
Mouse-ear Cress (*Arabidopsis thaliana*)	Common
Rock Cress (*Arabis drummondii*)	Occasional
Tower Mustard (*Arabis glabra*)	
Winter Cress (*Barbarea vulgaris*)	Occasional
Hoary False Alyssum (*Berteroa incana*)	Infrequent
Charlock (*Brassica kaber*)	
Mustard (*Brassica rapa*)	
Shepherd's Purse (*Capsella bursa-pastoris*)	Occasional
Bitter Cress* (*Cardamine impatiens*)	
Bitter Cress (*Cardamine pensylvanica*)	Occasional
Cuckoo-flower (*Cardamine pratensis*)	Infrequent
Wormseed Wallflower (*Erysimum cheiranthoides*)	Occasional

Field Peppergrass (*Lepidium campestre*)	Common
Peppergrass (*Lepidium densiflorum*)	Common
Watercress (*Nasturtium officinale*)	Common
Tumbling Mustard (*Sisymbrium altissimum*)	Occasional
Cabombaceae: (Water Shield Family)	
Fanwort* (*Cabomba caroliniana*)	
Campanulaceae: (Bellflower Family)	
Marsh Bellflower* (*Campanula aparinoides*)	Occasional
Rover Bellflower (*Campanula rapunculoides*)	
Harebell* (*Campanula rotundifolia*)	Occasional
Cardinal Flower (*Lobelia cardinalis*)	Occasional
Indian Tobacco (*Lobelia inflata*)	Infrequent
Kalm's Lobelia (*Lobelia kalmii*)	Occasional
Palespike Lobelia* (*Lobelia spicata*)	Common
Capparaceae: (Caper Family)	
Clammy-weed (*Polanisia dodecandra*)	Common
Caprifoliaceae: (Honeysuckle Family)	
Bush Honeysuckle* (*Diervilla lonicera*)	Common
Twinflower* (*Linnaea borealis*)	Occasional
Honeysuckle (*Lonicera bella*)	Infrequent
Fly Honeysuckle* (*Lonicera canadensis*)	
Wild Honeysuckle* (*Lonicera dioica*)	Infrequent
Swamp-fly Honeysuckle (*Lonicera oblongifolia*)	Occasional
Trumpet Honeysuckle* (*Lonicera sempervirens*)	
Common Elder (*Sambucus canadensis*)	Occasional
Snowberry* (*Symphoricarpos albus*)	Common
Wolfberry (*Symphoricarpos occidentalis*)	Common
Arrow-wood* (*Viburnum acerifolium*)	Occasional
Withe-rod* (*Viburnum cassinoides*)	Occasional
Nannyberry* (*Viburnum lentago*)	
Caryophyllaceae: (Pink Family)	
Corn Cockle (*Agrostemma githago*)	
Thyme-leaved Sandwort (*Arenaria serpyllifolia*)	Common
Mouse-ear Chickweed (*Cerastium fontanum*)	Common
Mouse-ear Chickweed (*Cerastium semidecandrum*)	Common
Pink (*Dianthus sylvystris*)	Occasional
Soapwort (*Saponaria officinalis*)	Occasional
Knawel* (*Scleranthus annuus*)	Common
Sleepy Catchfly (*Silene antirrhina*)	Common
White Cockle (*Silene pratensis*)	Common
Bladder Campion (*Silene vulgaris*)	Occasional

Sand-spurrey (*Spergularia rubra*)	Infrequent
Fleshy Stitchwort (*Stellaria crassifolia*)	
Long-leaved Stitchwort (*Stellaria longifolia*)	Infrequent
Celastraceae: (Staff Tree Family)	
Bittersweet (*Celastrus scandens*)	
Ceratophyllaceae: (Hornwort Family)	
Coontail (*Ceratophyllum demersum*)	Common
Chenopodiaceae: (Goosefoot Family)	
Lamb's Quarters (*Chenopodium album*)	Occasional
Strawberry Blite (*Chenopodium capitatum*)	
Maple-leaved Goosefoot (*Chenopodium hybridum*)	
Hyssopleaf Tickseed (*Corispermum hyssopifolium*)	Infrequent
Winged Pigweed (*Cycloloma atriplicifolium*)	Common
Russian-thistle (*Salsola kali*)	Common
Cistaceae: (Rockrose Family)	
Frostweed* (*Helianthemum canadense*)	Infrequent
Pinweed (*Lechea intermedia*)	Common
Clusiaceae: (St. John's-Wort Family)	
Kalm's St. John's-wort (*Hypericum kalmianum*)	Occasional
Greater St. John's-wort (*Hypericum majus*)	Occasional
Common St. John's-wort* (*Hypericum perforatum*)	Common
Marsh St. John's-wort (*Triadenum fraseri*)	Occasional
Convolvulaceae: (Mourning Glory Family)	
Low Bindweed (*Calystegia spithamea*)	Common
Cornaceae: (Dogwood Family)	
Alternate-leaved Dogwood* (*Cornus alternifolia*)	Infrequent
Bunchberry* (*Cornus canadensis*)	Common
Gray Dogwood* (*Cornus foemina*)	Occasional
Round-leaved Dogwood* (*Cornus rugosa*)	Occasional
Red Osier* (*Cornus stolonifera*)	
Cyperaceae: (Sedge Family)	
Sedge (*Carex adusta*)	Common
Sedge* (*Carex aenea*)	
Sedge (*Carex albursina*)	
Sedge* (*Carex aquatilis*)	Common
Sedge* (*Carex arctata*)	Occasional
Sedge (*Carex argyrantha*)	
Sedge (*Carex atherodes*)	

Sedge (*Carex aurea*)	Occasional
Sedge (*Carex bebbii*)	Infrequent
Sedge* (*Carex blanda*)	
Sedge (*Carex brunnescens*)	Occasional
Sedge (*Carex buxbaumii*)	Occasional
Sedge (*Carex canescens*)	Common
Sedge (*Carex castanea*)	Occasional
Sedge (*Carex chordorhyza*)	
Sedge* (*Carex communis*)	Common
Sedge (*Carex comosa*)	Common
Hybrid Sedge (*Carex comosa hystercina*)	Common
Sedge (*Carex conoidea*)	Occasional
Sedge (*Carex convoluta*)	Occasional
Sedge (*Carex crawei*)	Abundant
Sedge (*Carex crawfordii*)	
Sedge (*Carex crinita*)	Infrequent
Sedge (*Carex cryptolepis*)	Common
Sedge (*Carex cumulata*)	Occasional
Sedge* (*Carex debilis*)	Occasional
Sedge (*Carex deflexa*)	
Sedge* (*Carex deweyana*)	Occasional
Sedge (*Carex diandra*)	Common
Sedge* (*Carex disperma*)	Occasional
Sedge* (*Carex divisa*)	
Sedge* (*Carex echinata*)	Infrequent
Sedge (*Carex emmonsii*)	Common
Sedge (*Carex flava*)	Occasional
Sedge (*Carex foena*)	
Sedge* (*Carex gracillima*)	Occasional
Sedge* (*Carex gracilescens*)	
Sedge (*Carex granularis*)	
Sedge (*Carex gynandra*)	Common
Sedge (*Carex hystericina*)	Common
Sedge* (*Carex interior*)	Occasional
Sedge* (*Carex intumescens*)	Infrequent
Sedge (*Carex lacustris*)	Common
Sedge (*Carex lanuginosa*)	Common
Sedge (*Carex lasiocarpa*)	Common
Sedge* (*Carex leavenworthii*)	
Sedge* (*Carex leptalea*)	Common
Sedge* (*Carex leptonervia*)	Common
Sedge (*Carex limosa*)	Occasional
Sedge (*Carex livida*)	
Sedge (*Carex lucorum*)	Abundant
Sedge (*Carex lupulina*)	
Sedge (*Carex muhlenbergii*)	

Sedge (*Carex oligosperma*)	Abundant
Sedge (*Carex ormostachya*)	
Sedge (*Carex pauciflora*)	Occasional
Sedge (*Carex paupercula*)	Infrequent
Sedge (*Carex peckii*)	
Sedge (*Carex pedunculata*)	Occasional
Sedge* (*Carex pensylvanica*)	Abundant
Sedge (*Carex plantaginea*)	
Sedge* (*Carex podocarpa*)	
Sedge (*Carex prairea*)	Occasional
Sedge* (*Carex projecta*)	
Sedge (*Carex pseudo-cyperus*)	
Sedge* (*Carex retrorsa*)	Infrequent
Sedge (*Carex rostrata*)	Common
Sedge* (*Carex rugosperma*)	Infrequent
Sedge (*Carex scabrata*)	Occasional
Sedge (*Carex scoparia*)	Occasional
Sedge (*Carex stipata*)	Occasional
Sedge* (*Carex stricta*)	Abundant
Sedge (*Carex tenera*)	Infrequent
Sedge (*Carex tenuiflora*)	
Sedge (*Carex trisperma*)	Infrequent
Sedge (*Carex tuckermanii*)	
Sedge (*Carex umbellata*)	
Sedge (*Carex vaginata*)	
Sedge (*Carex vesicaria*)	Occasional
Sedge (*Carex viridula*)	Common
Sedge (*Carex vulpinoidea*)	Occasional
Twig-rush (*Cladium mariscoides*)	Abundant
Nutgrass (*Cyperus schweinitzii*)	Common
Three-way Sedge (*Dulchium arundinaceum*)	Occasional
Spikerush (*Eleocharis acicularis*)	Common
Spikerush (*Eleocharis elliptica*)	Abundant
Spikerush (*Eleocharis erythropoda*)	Occasional
Spikerush (*Eleocharis obtusa*)	Infrequent
Spikerush (*Eleocharis olivacea*)	Common
Spikerush (*Eleocharis smallii*)	Common
Cotton-grass (*Eriophorum angustifolium*)	Common
Hare's Tail Cotton-grass (*Eriophorum spissum*)	Common
Tawny Cotton-grass (*Eriophorum virginicum*)	Common
Cottongrass (*Eriophorum viridicarinatum*)	Common
Beak-rush (*Rhychospora alba*)	Common
Hardstem Bulrush (*Scirpus acutus*)	Abundant
Bulrush (*Scirpus atrovirens*)	Common
Clinton's Bulrush (*Scirpus clintonii*)	Abundant
Wool-grass* (*Scirpus cyperinus*)	Occasional

Bulrush (*Scirpus hudsonianus*)	Infrequent
Softstem Bulrush (*Scirpus validus*)	Common
Droseraceae: (Sundew Family)	
Sundew (*Drosera intermedia*)	Common
Round-leaved Sundew (*Drosera rotundifolia*)	Common
Elaeagnaceae: (Oleaster Family)	
Autumn Olive* (*Elaeagnus umbellata*)	Infrequent
Equisetaceae: (Horsetail Family)	
Field Horsetail* (*Equisetum arvense*)	Abundant
Water Horsetail (*Equisetum fluviatile*)	Abundant
Wood Horsetail* (*Equisetum sylvaticum*)	Abundant
Ericaceae: (Heath Family)	
Bog Rosemary (*Andromeda glaucophylla*)	Occasional
Bearberry* (*Arctostaphylos uva-ursi*)	Common
Leatherleaf* (*Chamaedaphine calyculata*)	Abundant
Trailing Arbutus* (*Epigaea repens*)	Common
Creeping Snowberry* (*Gaultheria hispidula*)	Common
Aromatic Wintergreen* (*Gaultheria procumbens*)	Common
Black Huckleberry* (*Gaylussacia baccata*)	Common
Sheep-laurel* (*Kalmia angustifolia*)	Common
Sheep-laurel* (*Kalmia polifolia*)	Occasional
Labrador Tea* (*Ledum groenlandicum*)	Abundant
Low Sweet-blueberry* (*Vaccinium angustifolium*)	Abundant
Cranberry (*Vaccinium macrocarpon*)	Common
Blueberry* (*Vaccinium myrtilloides*)	Abundant
Small Cranberry (*Vaccinium oxycoccos*)	Common
Eriocaulaceae: (Pipewort Family)	
Pipewort (*Eriocaulon septangulare*)	Occasional
Euphorbiaceae: (Spurge Family)	
Leafy Spurge (*Euphorbia esula*)	Common
Spotted Spurge (*Euphorbia maculata*)	Common
Fabaceae: (Bean Family)	
Everlasting Pea* (*Lathyrus latifolius*)	Occasional
Everlasting Pea (*Lathyrus sylvestris*)	Common
Bird's-foot Trefoil (*Lotus corniculatus*)	Common
Black Medick (*Medicago lupulina*)	Common
Alfalfa (*Medicago sativa*)	Infrequent
White Sweet Clover (*Melilotus alba*)	Common
Yellow Sweet Clover (*Melilotus officinalis*)	Infrequent

Hop Clover (*Trifolium aureum*)	Common
Alsike Clover* (*Trifolium hybridum*)	Common
Red Clover* (*Trifolium pratense*)	Common
White Clover* (*Trifolium repens*)	Common
Hairy Vetch (*Vicia villosa*)	Occasional
Fagaceae: (Beech Family)	
American Beech* (*Fagus grandifolia*)	Common
White Oak* (*Quercus alba*)	
Northern Pin Oak* (*Quercus ellipsoidalis*)	
Northern Red Oak* (*Quercus rubra*)	Abundant
Fumariaceae: (Fumitory Family)	
Rock Harlequin (*Corydalis sempervirens*)	Infrequent
Gentianaceae: (Gentian Family)	
Screw-stem (*Bartonia virginica*)	Common
Closed Gentian (*Gentiana rubricaulis*)	Common
Spurred Gentain (*Halenia deflexa*)	Common
Buckbean (*Menyanthes trifoliata*)	Common
Geraniaceae: (Geranium Family)	
Bicknell's Cranesbill (*Geranium bicknellii*)	Common
Grossulariaceae: (Currant Family)	
Wild Black Currant (*Ribes americanum*)	Infrequent
Dogberry* (*Ribes cynosbati*)	Occasional
Skunk Currant (*Ribes glandulosum*)	Occasional
Swamp Gooseberry (*Ribes hirtellum*)	Infrequent
Swamp Currant* (*Ribes triste*)	Occasional
Haloragaceae: (Water Milfoil Family)	
American Water Milfoil (*Myriophyllum exalbescens*)	Common
Water Milfoil (*Myriophyllum verticillatum*)	Common
Mermaid-weed (*Proserpinaca pectinata*)	
Hamamelidaceae: (Witch Hazel Family)	
Witch-hazel* (*Hamamelis virginiana*)	Occasional
Hydrocharitaceae: (Frog's-bit Family)	
Waterweed* (*Elodea canadensis*)	Common
Eelgrass (*Vallisneria americana*)	Abundant
Hymenophyllaceae: (Filmy Fern Family)	
Filmy Fern* (*Trichomanes boschianum*)	

Iridaceae: (Iris Family)	
Drarf Iris* (*Iris verna*)	
Blue Flag* (*Iris versicolor*)	Occasional
Blue-eyed Grass (*Sisyrinchium montanum*)	Occasional
Blue-eyed Grass (*Sisyrinchium mucronatum*)	Common
Juncaceae: (Rush Family)	
Rush (*Juncus articulatus*)	Common
Baltic Rush (*Juncus balticus*)	Common
Rush (*Juncus brachycephalus*)	Occasional
Rush (*Juncus brevicaudatus*)	Common
Rush (*Juncus canadensis*)	Common
Dudley Rush (*Juncus dudleyi*)	Infrequent
Bog Rush* (*Juncus effusus*)	
Rush (*Juncus greenii*)	Rare
Rush (*Juncus pelocarpus*)	Infrequent
Path Rush* (*Juncus tenuis*)	Common
Vasey's Rush (*Juncus vaseyi*)	
Lamiaceae: (Mint Family)	
American Bugleweed (*Lycopus americanus*)	Occasional
One Flower Horehound* (*Lycopus uniflorus*)	Common
Field Mint (*Mentha arvensis*)	Occasional
Peppermint (*Mentha piperita*)	Common
Wild Bergamot* (*Monarda fistulosa*)	Common
Horse Mint (*Monarda punctata*)	Occasional
Catnip (*Nepeta cataria*)	Occasional
Self-heal (*Prunella vulgaris*)	Common
Mother-of-thyme (*Satureja acinos*)	Occasional
Wild Basil (*Satureja vulgaris*)	Occasional
Marsh Skullcap (*Scutellaria galericulata*)	Occasional
Blue Scullcap* (*Scutellaria lateriflora*)	Infrequent
Lemnaceae: (Duckweed Family)	
Duckweed* (*Lemna minor*)	Common
Greater Duckweed (*Spirodela polyrrhiza*)	Common
Lentibulariaceae: (Bladderwort Family)	
Bladderwort (*Utricularia cornuta*)	Common
Bladderwort (*Utricularia geminiscapa*)	Common
Conespur Bladderwort (*Utricularia gibba*)	Common
Bladderwort (*Utricularia intermedia*)	Occasional
Common Bladderwort (*Utricularia vulgaris*)	Infrequent
Liliaceae: (Lilly Family)	
Wild Leek (*Allium tricoccum*)	

Bluebead-lily* (*Clintonia borealis*)	Common
Wild Lily (*Lilium philadelphicum*)	Occasional
Canada Mayflower* (*Maianthemum canadense*)	Abundant
Indian Cucumber-root (*Medeola virginiana*)	Common
Solomon-seal (*Polygonatum pubescens*)	Common
False Spikenard* (*Smilacina racemosa*)	
False Solomon-seal (*Smilacina trifolia*)	Common
False Asphodel* (*Tofieldia racemosa*)	
Nodding Trillium (*Trillium cernuum*)	Occasional
Yucca Adam's-needle (*Yucca filamentosa*)	Infrequent
White Camas (*Zigadenus glaucus*)	Infrequent
Lycopodiaceae: (Clubmoss Family)	
Stiff Clubmoss (*Lycopodium annotinum*)	Common
Ground Pine* (*Lycopodium clavatum*)	Common
Northern Running Pine* (*Lycopodium tristachyum*)	Common
Hickey's Clubmoss (*Lycopodium hickeyi*)	Occasional
Boc Clubmoss (*Lycopodium inundatum*)	Common
Shining Clubmoss (*Lycopodium lucidulum*)	Common
Tree Clubmoss* (*Lycopodium obscurum*)	Common
Malvaceae: (Mallow Family)	
Musk Mallow (*Malva moschata*)	Rare
Molluginaceae: (Carpetweed Family)	
Carpetweed* (*Mollugo verticillata*)	Common
Monotropaceae: (Indian Pipe Family)	
Pinesap (*Monotropa hypopithys*)	Infrequent
Indian Pipe (*Monotropa uniflora*)	Infrequent
Myricaceae: (Bayberry Family)	
Sweetfern (*Comptonia peregrina*)	Common
Sweet Gale (*Myrica gale*)	Common
Najadaceae: (Naiad Family)	
Naiad (*Najas flexilis*)	Common
Nyctaginaceae: (Four-O'Clock Family)	
Wild Four-o'clock (*Mirabilis nyctaginea*)	Rare
Nymphaeaceae: (Waterlily Family)	
Water Shield (*Brasenia schreberi*)	Common
Pond-lily (*Nuphar variegata*)	Common
Fragrant White Waterlily (*Nymphaea odorata*)	Common

Oleaceae: (Olive Family)	
White Ash* (*Fraxinus americana*)	
Blach Ash* (*Fraxinus nigra*)	
Green Ash* (*Fraxinus pennsylvanica*)	
Onagraceae: (Evening Primrose Family)	
Enchanter's Nightshade (*Circaea alpina*)	Common
Willow-herb (*Epilobium angustifolium*)	Occasional
Willow-herb (*Epilobium ciliatum*)	Occasional
Purple-leaved Willow-herb (*Epilobium coloratum*)	Infrequent
Narrow-leaved Willow-herb (*Epilobium leptophyllum*)	Common
Willow-herb (*Epilobium parviflorum*)	Occasional
Marsh Seedbox* (*Ludwigia palustris*)	Abundant
Common Evening Primrose (*Oenothera biennis*)	Occasional
Sundrops (*Oenothera perennis*)	Common
Ophioglossaceae: (Adder's-tongue Family)	
Prairie Dunewort (*Botrychium campestre*)	Infrequent
Cut-leaved Grape-fern (*Botrychium dissectum*)	Occasional
Western Dunewort (*Botrychium hesperium*)	
Matricary Grape-fern (*Botrychium matricariifolium*)	Infrequent
Grape-fern (*Botrychium minganense*)	Infrequent
Leathery Grape-fern (*Botrychium multifidum*)	Common
Grape-fern (*Botrychium oneidense*)	Infrequent
Rattlesnake Fern (*Botrychium virginianum*)	Infrequent
Little Grape-fern (*Botrychium simplex*)	
Northern Adder's-tongue (*Ophioglossum pusillum*)	Occasional
Orchidaceae: (Orchid Family)	
Arethusa (*Arethusa bulbosa*)	Infrequent
Spotted Coral-root (*Corallorhiza maculata*)	Infrequent
Late Coral-root (*Corallorhiza odontorhiza*)	Rare
Pale Coral-root (*Corallorhiza trifida*)	Infrequent
Pink Lady's-slipper (*Cypripedium acaule*)	Infrequent
Yellow Lady's-slipper (*Cypripedium calceolus*)	Rare
Helleborine (*Epipactis helleborine*)	Common
Rattlesnake-plantain (*Goodyera tesselata*)	Rare
Whorled Pogonia (*Isotria verticillata*)	Infrequent
Heartleaf Twayblade (*Listera cordata*)	Rare
Northern Bog Orchid (*Platanthera hyperborea*)	Infrequent
Ragged Fringed-orchid (*Platanthera lacera*)	Infrequent
Blunt-leaf Orchid (*Platanthera obtusata*)	Infrequent
Rose Pogonia (*Pogonia ophioglossoides*)	Occasional
Yellow Lady's-tresses (*Spiranthes casei*)	Infrequent
Lady's-tresses (*Spiranthes cernua*)	Common
Slender Lady's-tresses (*Spiranthes lacera*)	Rare

Hooded Lady's-tresses (*Spiranthes romanzoffiana*)	Infrequent
Orobanchaceae: (Broomrape Family)	
Squaw-root (*Conopholis americana*)	Occasional
Branched Broom-rape* (*Orobanche ramosa*)	
Osmundaceae: (Royal Fern Family)	
Cinnamon Fern* (*Osmunda cinnamomea*)	Occasional
Interrupted Fern (*Osmunda claytoniana*)	Occasional
Royal Fern* (*Osmunda regalis*)	Infrequent
Oxalidaceae: (Wood Sorrel Family)	
Oxalis (*Oxalis fontana*)	Occasional
Yellow Wood Sorrel (*Oxalis stricta*)	Occasional
Pinaceae: (Pine Family)	
Balsam-Fir* (*Abies balsamae*)	
Tamarack* (*Larix laricina*)	Abundant
White Spruce* (*Picea glauca*)	
Black Spruce* (*Picea mariana*)	Common
Jack Pine* (*Pinus banksiana*)	
Red Pine* (*Pinus resinosa*)	
White Pine* (*Pinus strobus*)	
Arbor Vitae* (*Thuja occidentalis*)	
Eastern Hemlock* (*Tsuga canadensis*)	Occasional
Plantaginaceae: (Plantain Family)	
English Plantain (*Plantago lanceolata*)	Common
Common Plantain (*Plantago major*)	Common
Rugel's Plantain (*Plantago rugelii*)	Common
Poaceae: (Grass Family)	
Wheatgrass (*Agropyron desertorum*)	Infrequent
Quackgrass* (*Agropyron repens*)	Occasional
Slender Wheatgrass* (*Agropyron trachycaulum*)	Common
Redtop* (*Agrostis gigantea*)	Occasional
Ticklegrass* (*Agrostis hyemalis*)	Occasional
Autumn Bent* (*Agrostis perennans*)	Occasional
Rhode Island Bent* (*Agrostis tenuis*)	
Meadow Foxtail (*Alopecurus pratensis*)	
Big Bluestem* (*Andropogon gerardii*)	Common
Little Bluestem* (*Andropogon scoparius*)	Common
Forktip Three-awn (*Aristida basiramea*)	Abundant
Wild Oats (*Avena fatua*)	
Bearded Shorthusk* (*Brachyelytrum erectum*)	Common
Fringed Brome* (*Bromus ciliatus*)	Common

Smooth Brome* (*Bromus inermis*)	Abundant
Japanese Brome (*Bromus japonicus*)	Occasional
Brome Grass* (*Bromus kalmii*)	Occasional
Brome Grass (*Bromus squarrosus*)	Common
Downy Brome (*Bromus tectorum*)	Common
Bluejoint* (*Calamagrostis canadensis*)	Common
Reedgrass* (*Calamagrostis inexpansa*)	Occasional
Sandbur (*Cenchrus longispinus*)	
Drooping Woodreed (*Cinna latifolia*)	Occasional
Orchard Grass (*Dactylis glomerata*)	Common
Poverty Oatgrass* (*Danthonia spicata*)	Common
Tufted Hairgrass (*Deschampsia cespitosa*)	Common
Hair Grass* (*Deschampsia flexuosa*)	Common
Dichanthelium* (*Dichanthelium aciculare*)	
Dichanthelium* (*Dichanthelium depauperatum*)	
Dichanthelium* (*Dichanthelium latifolium*)	
Scribner Dichanthelium* (*Dichanthelium oligosanthes*)	
Dichanthelium* (*Dichanthelium sabulorum*)	
Smooth Crabgrass (*Digitaria ischaemum*)	Common
Hairy Crabgrass (*Digitaria sanguinalis*)	Occasional
Barnyard Grass (*Echinochloa muricata*)	Common
Canada Wild Rye (*Elymus canadensis*)	Common
Virginia Wild Rye (*Elymus virginicus*)	Occasional
Carolina Lovegrass (*Eragrostis pectinacea*)	Occasional
Tall Fescue (*Festuca arundinacea*)	Occasional
Sheep's Fescue* (*Festuca ovina*)	Common
Red Fescue (*Festuca rubra*)	Abundant
Rough Fescue* (*Festuca scabrella*)	Common
Northern Mannagrass (*Glyceria borealis*)	Common
Rattlesnake Grass* (*Glyceria canadensis*)	Occasional
Fowl Mannagrass* (*Glyceria striata*)	Common
Sweetgrass (*Hierochloe odorata*)	Occasional
Foxtail Barley (*Hordeum jubatum*)	Infrequent
Ryegrass (*Lolium perenne*)	Common
Muhly* (*Muhlenbergia glabriflora*)	
Marsh Wild-timothy (*Muhlenbergia glomerata*)	Common
Wirestem Muhly* (*Muhlenbergia mexicana*)	Occasional
Muhly-grass (*Muhlenbergia uniflora*)	Common
Rough-leaved Ricegrass* (*Oryzopsis asperifolia*)	Occasional
Canada Rice-grass (*Oryzopsis canadensis*)	Occasional
Ricegrass* (*Oryzopsis pungens*)	Common
Black-seed Ricegrass* (*Oryzopsis racemosa*)	
Annual Bluegrass (*Panicum annua*)	Common
Panic Grass (*Panicum boreale*)	Common
Bulbous Bluegrass (*Panicum bulbosa*)	Rare
Common Witchgrass (*Panicum capillare*)	Common

Panic Grass (*Panicum columbianum*)	Common
Canada Bluegrass (*Panicum compressa*)	Occasional
Panic Grass (*Panicum depauperatum*)	Common
Panic Grass (*Panicum implicatum*)	Common
Panic Grass (*Panicum latifolium*)	Common
Panic Grass (*Panicum linearifolium*)	Common
Fowl Bluegrass (*Panicum palustris*)	Occasional
Kentucky Bluegrass (*Panicum pratensis*)	Common
Redtop Panicum* (*Panicum rigidulum*)	
Bluegrass (*Panicum saltuensis*)	Occasional
Panic Grass (*Panicum xanthophysum*)	Common
Reed Canary Grass (*Phalaris arundinacea*)	Common
Timothy* (*Phleum pratense*)	Common
Bluegrass* (*Poa alsodes*)	Infrequent
Canada Bluegrass* (*Poa compressa*)	
Fowl Bluegrass* (*Poa palustris*)	
Kentucky Bluegrass* (*Poa pratensis*)	
Bluegrass* (*Poa saltuensis*)	
Grass (*Puccinellia pallida*)	Occasional
False Melic* (*Schizachne purpurascens*)	Infrequent
Grass Rye (*Secale cereale*)	Common
Yellow Foxtail (*Setaria glauca*)	Rare
Indian Grass* (*Sorghastrum nutans*)	
Salt-water Marsh-grass* (*Spartina alterniflora*)	
Sand Dropseed (*Sporobolis cryptandrus*)	Occasional
Prairie Dropseed (*Sporobolis heterolepis*)	
Poverty Grass (*Sporobolis vaginiflorus*)	Abundant
Wild Rice (*Zizania aquatica*)	Common

Polygalaceae: (Milkwort Family)

Fringed Polygala (*Polygala paucifolia*)	Occasional
Fringed Polygala (*Polygala paucifolia alba*)	Occasional
Polygala* (*Polygala polygama*)	Infrequent

Polygonaceae: (Buckwheat Family)

Jointweed (*Polygonella articulata*)	Occasional
Knotweed (*Polygonum achoreum*)	Occasional
Water Smartweed (*Polygonum amphibium*)	Common
Knotweed (*Polygonum aviculare*)	Common
Fringed Bindweed (*Polygonum cilinode*)	Occasional
Wild Buckwheat (*Polygonum convolvulus*)	Occasional
Knotweed (*Polygonum douglasii*)	Common
Pale Smartweed (*Polygonum lapathifolium*)	Occasional
Lady's Thumb (*Polygonum persicaria*)	Occasional
Water Smartweed (*Polygonum punctatum*)	Occasional
Tear Thumb* (*Polygonum sagittatum*)	

Sheep Sorrel* (*Rumex acetosella*)	Common
Curly Dock (*Rumex crispus*)	Occasional
Great Water Dock* (*Rumex orbiculatus*)	Occasional
Polypodiaceae: (True Fern Family)	
Maidenhair Fern (*Adiantum pedatum*)	Infrequent
Lady Fern* (*Athyrium filix-femina*)	Infrequent
Bulblet Bladder Fern (*Cystopteris bulbifera*)	Occasional
Wood Fern* (*Dryopteris cristata*)	
Fancy Fern (*Dryopteris intermedia*)	Rare
Fancy Fern (*Dryopteris xbootii*)	Rare
Oak Fern* (*Gymnocarpium dryopteris*)	Occasional
Ostrich Fern* (*Matteuccia struthiopteris*)	
Sensitive Fern* (*Onoclea sensibilis*)	Common
Bracken* (*Pteridium aquilinum*)	Abundant
New York Fern (*Thelypteris noveboracensis*)	Occasional
Marsh Fern (*Thelypteris palustris*)	Common
Northern Beech Fern* (*Thelypteris phegopteris*)	Common
Marsh Fern* (*Thelypteris thelypteroides*)	
Portulacaceae: (Purslane Family)	
Common Purslane (*Portulaca oleracea*)	Occasional
Potamogetonaceae: (Pondweed Family)	
Pondweed (*Potamogeton alpinus*)	Common
Largeleaf Pondweed (*Potamogeton amplifolius*)	Occasional
Leafy Pondweed (*Potamogeton foliosus*)	Common
Pondweed (*Potamogeton friesii*)	Common
Variable Pondweed (*Potamogeton gramineus*)	Common
Illinois Pondweed (*Potamogeton illinoensis*)	Common
Floatingleaf Pondweed (*Potamogeton natans*)	Common
Longleaf Pondweed (*Potamogeton nodosus*)	Occasional
Sago Pondweed (*Potamogeton pectinatus*)	Abundant
Flatstem Pondweed (*Potamogeton zosteriformis*)	Occasional
Primulaceae: (Primrose Family)	
Tufted Loosestrife (*Lysimachia thyrsiflora*)	Common
Star-flower* (*Trientalis borealis*)	Common
Pyrolaceae: (Wintergreen Family)	
Prince's Pine (*Chimaphila umbellata*)	Rare
Shinleaf (*Orthilia secunda*)	Infrequent
Round-leaved Wintergreen (*Pyrola asarifolia*)	Occasional
Wild Lily-of-the-valley* (*Pyrola elliptica*)	Occasional

Ranunculaceae: (Buttercup Family)	
White Baneberry* (*Actaea pachypoda*)	Infrequent
Red Baneberry (*Actaea rubra*)	Infrequent
Meadow Anemone (*Anemone canadensis*)	
Candle Anemone (*Anemone cylindrica*)	Common
Poir* (*Anemone multifida*)	
Wood Anemone* (*Anemone quinquefolia*)	Occasional
Tall Anemone (*Anemone virginiana*)	
Wild Columbine (*Aquilegia canadensis*)	Common
Marsh Marigold* (*Caltha palustris*)	Common
Goldthread* (*Coptis trifolia*)	Common
Tall Buttercup (*Ranunculus acris*)	Occasional
Small Yellow Buttercup (*Ranunculus gmelinii*)	Occasional
Bristly Buttercup (*Ranunculus hispidus*)	Occasional
Hooked Buttercup (*Ranunculus recurvatus*)	Common
Purple Meadow-rue (*Thalictrum dasycarpum*)	Common
Quicksilver-weed* (*Thalictrum dioicum*)	
Rhamnaceae: (Buckthorn Family)	
New Jersey Tea (*Ceanothus americanus*)	Infrequent
New Jersey Tea (*Ceanothus herbaceus*)	Occasional
Alder-buckthorn* (*Rhamnus alnifolia*)	Common
Rosaceae: (Rose Family)	
Hooked Agrimony (*Agrimonia gryposepala*)	
Service-berry* (*Amelanchier arborea*)	Common
Serviceberry (*Amelanchier sanguinea*)	Occasional
Dwarf Serviceberry (*Amelanchier spicata*)	Rare
Chokeberry* (*Aronia prunifolia*)	Common
Hawthorn (*Crataegus chrysocarpa*)	Occasional
Cockspur Hawthorn (*Crataegus crus-galli*)	Occasional
Wedge-shaped Hawthorn* (*Crataegus spathulata*)	
Woodland Strawberry* (*Fragaria vesca*)	
Wild Strawberry* (*Fragaria virginiana*)	Common
Yellow Avens (*Geum aleppicum*)	Occasional
Purple Avens* (*Geum rivale*)	Occasional
Apple* (*Malus pumila*)	
Ninebark* (*Physocarpus opulifolius*)	
Silverweed (*Potentilla anserina*)	Common
Silvery Cinquefoil (*Potentilla argentea*)	Infrequent
Shrubby Cinquefoil (*Potentilla fruticosa*)	Common
Norwegian Cinquefoil (*Potentilla norvegica*)	Occasional
Marsh Cinquefoil (*Potentilla palustris*)	Common
Sulphur Cinquefoil* (*Potentilla recta*)	Occasional
Old-field Cinquefoil (*Potentilla simplex*)	Common
Three-toothed Cinquefoil (*Potentilla tridentata*)	Common

Alleghany Plum (*Prunus alleghaniensis davisii*)	Rare
Bird Cherry* (*Prunus pensylvanica*)	Occasional
Sand Cherry* (*Prunus pumila*)	Common
Wild Black Cherry* (*Prunus serotina*)	Occasional
Choke Cherry* (*Prunus virginiana*)	Infrequent
Smooth Wild Rose* (*Rosa blanda*)	
Swamp Rose (*Rosa palustris*)	Infrequent
Dwarf Raspberry* (*Rubus acaulis*)	
Common Blackberry* (*Rubus allegheniensis*)	Common
Bristly Blackberry * (*Rubus elegantulus*)	
Northern Dewberry* (*Rubus flagellaris*)	
Swamp Dewberry* (*Rubus hispidus*)	Abundant
Smooth Blackberry* (*Rubus kennedyanus*)	
Black Raspberry* (*Rubus occidentalis*)	
High-bush Blackberry* (*Rubus pensilvanicus*)	Common
Dwarf Blackberry* (*Rubus pubecens*)	Common
Bristly Blackberry* (*Rubus setosus*)	Occasional
Wild Red Raspberry* (*Rubus strigosus*)	Common
Mountain-ash (*Sorbus americana*)	Rare
Meadow-sweet* (*Spiraea alba*)	Common
Rubiaceae: (Madder Family)	
Bedstraw* (*Galium asprellum*)	Common
Bedstraw* (*Galium hispidulum*)	
Labrador Bedstraw (*Galium labradoricum*)	Occasional
Bedstraw* (*Galium lanceolatum*)	Common
Small Bedstraw (*Galium trifidum*)	Occasional
Sweet-scented Bedstraw* (*Galium triflorum*)	Occasional
Long-leaved Bluets (*Houstonia longifolia*)	Infrequent
Partridge Berry (*Mitchella repens*)	Common
Salicaceae: (Willow Family)	
Balsam Poplar* (*Populus balsamifera*)	
Bigtooth Aspen* (*Populus grandidentata*)	
Quaking Aspen* (*Populus tremuloides*)	
Beaked Willow* (*Salix bebbiana*)	Occasional
Hoary Willow (*Salix candida*)	Abundant
Crack Willow (*Salix fragilis*)	Infrequent
Prairie Willow* (*Salix humilis*)	Infrequent
Shining Willow (*Salix lucida*)	Occasional
Bog Willow (*Salix pedicellaris*)	Abundant
Meadow Willow* (*Salix petiolaris*)	Common
Autumn Willow (*Salix serissima*)	Occasional
White X Crack Willow (*Salix xrubens*)	Occasional

Santalaceae: (Sandalwood Family)	
Bastard-toadflax (*Comandra umbellata*)	Occasional
Sarraceniaceae: (Pitcher-plant Family)	
Pitcher-plant (*Sarracenia purpurea*)	Common
Saxifragaceae: (Saxifrage Family)	
Golden Saxifrage (*Chrysosplenium americanum*)	Common
Bishop's Cap (*Mitella diphylla*)	Occasional
Bishop's Cap (*Mitella nuda*)	Common
False Miterwort (*Tiarella cordifolia*)	Infrequent
Scheuchzeriaceae: (Scheuchzeria Family)	
Pod-grass (*Scheuchzeria palustris*)	Common
Schizaeaceae: (Curly-grass Family)	
Curly-grass* (*Schizaea pusilla*)	
Scrophulariaceae: (Figwort Family)	
Smooth Agalinis (*Agalinis purpurea*)	Occasional
Smooth False Foxglove (*Aureolaria flava*)	Common
Indian Paint-brush (*Castilleja coccinea*)	Common
Dwarf Snapdragon (*Chaenorrhinum minus*)	
Turtlehead (*Chelone glabra*)	Occasional
Toadflax* (*Linaria canadensis*)	Abundant
Cowwheat* (*Melampyrum lineare*)	Common
James' Monkey-flower (*Mimulus glabratus jamesii*)	Common
Common Lousewort (*Pedicularis canadensis*)	Abundant
Common Mullein (*Verbascum thapsus*)	Common
Brooklime Speedwell (*Veronica americana*)	Infrequent
Corn Speedwell (*Veronica arvensis*)	Occasional
Speedwell (*Veronica dillenii*)	Rare
Common Speedwell (*Veronica officinalis*)	Occasional
Purslane Speedwell (*Veronica peregrina*)	Common
Marsh Speedwell (*Veronica scutellata*)	Infrequent
Speedwell (*Veronica verna*)	Common
Selaginellaceae: (Spikemoss Family)	
Rock Spikemoss (*Selaginella rupestris*)	Common
Solanaceae: (Nightshade Family)	
Virginia Ground Cherry (*Physalis virginiana*)	Infrequent
Bittersweet* (*Solanum dulcamara*)	Occasional
Sparganiaceae: (Bur-reed Family)	
Bur-reed (*Sparganium americanum*)	Abundant

Tiliaceae: (Linden Family)	
American Basswood* (*Tilia americana*)	
Typhaceae: (Cat-tail Family)	
Narrow-leaved Cat-tail (*Typha angustifolia*)	Common
Broad-leaved Cat-tail* (*Typha latifolia*)	Occasional
Ulmaceae: (Elm Family)	
American Elm* (*Ulmus americana*)	
Slippery Elm* (*Ulmus rubra*)	
Urticaceae: (Nettle Family)	
Clearweed; Richweed (*Pilea fontana*)	Common
Stinging Nettle (*Urtica dioica*)	Occasional
Valerianaceae: (Valerian Family)	
Valerian (*Valeriana uliginosa*)	Infrequent
Verbenaceae: (Vervain Family)	
Prostrate Vervain (*Verbena bracteata*)	Infrequent
Blue Vervain (*Verbena hastata*)	Common
Violaceae: (Violet Family)	
Hook-spurred Violet (*Viola adunca*)	Infrequent
Violet (*Viola affinis*)	Occasional
Dog Violet (*Viola conspersa*)	Occasional
Marsh Violet (*Viola cucullata*)	Occasional
Lance-leaved Violet (*Viola lanceolata*)	Infrequent
Wild White Violet (*Viola macloskeyi*)	Infrequent
Northern Bog Violet (*Viola nephrophylla*)	Common
New England Violet (*Viola novae-angliae*)	Common
Bird's-foot Violet* (*Viola pedata*)	Occasional
Primrose-leaved Violet (*Viola primulifolia*)	Occasional
Smooth Yellow Violet (*Viola pubescens*)	Common
Arrow-leaved Violet (*Viola sagittata*)	Occasional
Northern Violet (*Viola septentrionalis*)	Common
Pansy Violet* (*Viola tricolor*)	

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APPENDIX C

Mammals in the Camp Grayling Area

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MAMMALS LIKELY TO BE FOUND IN THE CAMP GRAYLING AREA

Those species documented during the U.S. Army's Land Condition-Trend Analysis small mammal survey conducted in July/August of 1992 and 1993 are marked with an asterisk (*).

Order: Marsupialia
  Family: Didelphidae
    Virginia Opossum (*Didelphis virginiana*)

Order: Insectivore
  Family: Soricidae
    Northern Short-tailed Shrew* (*Blarina brevicauda*)
    Masked Shrew* (*Sorex cinereus*)
    Pygmy Shrew (*Sorex hoyi*)
    Water Shrew (*Sorex palustris*)

  Family: Talpidae
    Star-nosed Mole (*Condylura cristata*)
    Eastern Mole (*Scalopus aquaticus*)

Order: Chiroptera
  Family: Vespertilionidae
    Big Brown Bat (*Eptesicus fuscus*)
    Silver-haired Bat (*Lasionycteris noctivagans*)
    Red Bat (*Lasiurus borealis*)
    Hoary Bat (*Lasiurus cinereus*)
    Little Brown Bat (*Myotis lucifugus*)
    Northern Myotis (*Myotis septentrionalis*)

Order: Lagomorpha
  Family: Leporidae
    Snowshoe Hare* (*Lepus americanus*)
    Eastern Cottontail* (*Sylvilagus floridanus*)

Order: Rodentia
  Family: Sciuridae
    Woodchuck* (*Marmota monax*)
    Gray Squirrel* (*Sciurus carolinensis*)
    Fox Squirrel* (*Sciurus niger*)
    Thirteen-lined Ground Squirrel* (*Spermophilus tridecemlineatus*)
    Northern Flying Squirrel* (*Glaucomys sabrinus*)
    Southern Flying Squirrel* (*Glaucomys volans*)
    Eastern Chipmunk* (*Tamias striatus*)
    Red Squirrel* (*Tamiasciurus hudsonicus*)

Family: Castoridae
Beaver* (*Castor canadensis*)

Family: Muridae
Southern Red-backed Vole* (*Clethrionomys gapperi*)
Meadow Vole* (*Microtus pennsylvanicus*)
House Mouse (*Mus musculus*)
Muskrat (*Ondatra zibethicus*)
White-footed Mouse* (*Peromyscus leucopus*)
Deer Mouse (*Peromyscus maniculatus*)
Norway Rat (*Rattus norvegicus*)
Southern Bog Lemming* (*Synaptomys cooperi*)

Family: Dipodidae
Woodland Jumping Mouse* (*Napaeozapus insignis*)
Meadow Jumping Mouse* (*Zapus hudsonius*)

Family: Erethizontidae
Porcupine* (*Erethizon dorsatum*)

Order: Carnivora
Family: Canidae
Coyote* (*Canis latrans*)
Gray Fox (*Urocyon cinereoargenteus*)
Red Fox (*Vulpes vulpes*)

Family: Ursidae
Black Bear* (*Ursus americanus*)

Family: Procyonidae
Raccoon* (*Procyon lotor*)

Family: Mustelidae
River Otter (*Lutra canadensis*)
Striped Skunk (*Mephitis mephitis*)
Ermine (*Mustela ermina*)
Long-tailed weasel (*Mustela frenata*)
Least weasel (*Mustela nivalis*)
Mink (*Mustela vison*)
Badger* (*Taxidea taxus*)

Family: Felidae
Bobcat (*Felis rufus*)

Order: Artiodactyla
Family: Cervidae
White-tailed Deer* (*Odocoileus virginianus*)

Sources:

Eugene A. Hickok and Associates. 1989. National Guard Bureau and Michigan Department of Military Affairs Camp Grayling Draft Environmental Impact Statement.

Forest Service U.S. Department of Agriculture. 1983. Manistee River Wild & Scenic River Final Study Report & Environmental Impact Statement.

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APPENDIX D

Birds in the Camp Grayling Area

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BIRDS LIKELY TO BE FOUND IN THE CAMP GRAYLING AREA

Those species observed during the U.S. Army's Land Condition-Trend Analysis bird survey conducted in the Spring of 1992 and 1993 are marked with an asterisk (*). Class A Neotropical migrants are marked with an (A) and Class B Neotropical migrants are marked with a (B). Order names, scientific names, and family classifications are based on Banks et al. (1987).

Order: Gaviiformes
Family: Gaviidae
Common Loon (*Gavia immer*)

Order: Podicipediformes
Family: Podicipedidae
Pied-billed Grebe (*Podilymbus podiceps*)

Order: Pelecaniformes
Family: Phalacrocoracidae
Double-crested Cormorant* (*Phalacrocorax auritus*)

Order: Ciconiiformes
Family: Ardeidae
Great Blue Heron* (*Ardea herodias*)
American Bittern* (*Botaurus lentiginosus*)
Green-backed Heron (*Butorides striatus*)
Least Bittern (*Ixobrychus exilis*)

Order: Anseriformes
Family: Anatidae
Wood Duck (*Aix sponsa*)
Northern Pintail (*Anas acuta*)
Blue-winged Teal (*Anas discors*)
Mallard* (*Anas platyrhynchos*)
American Black Duck (*Anas rubripes*)
Ring-necked Duck (*Aythya collaris*)
Canada Goose* (*Branta canadensis*)
Common Goldeneye (*Bucephala clangula*)
Hooded Merganser (*Lophodytes cucullatus*)
Common Merganser (*Mergus merganser*)

Order: Falconiformes
Family: Cathartidae
Turkey Vulture*B (*Cathartes aura*)

Family: Accipitridae
- Cooper's Hawk**B** (*Accipiter cooperii*)
- Northern Goshawk**B** (*Accipiter gentilis*)
- Sharp-shinned Hawk***B** (*Accipiter striatus*)
- Red-tailed Hawk***B** (*Buteo jamaicensis*)
- Rough-legged Hawk (*Buteo lagopus*)
- Red-shouldered Hawk***B** (*Buteo lineatus*)
- Broad-winged Hawk***A** (*Buteo platypterus*)
- Northern Harrier**B** (*Cirus cyaneus*)
- Bald Eagle* (*Haliaeetus leucocephalus*)

Family: Pandionidae
- Osprey (*Pandion haliaetus*)

Family: Falconidae
- American Kestrel***B** (*Falco sparverius*)

Order: Galliformes
Family: Phasianidae
- Ruffed Grouse* (*Bonasa umbellus*)
- Spruce Grouse (*Dendragapus canadensis*)
- Wild Turkey* (*Meleagris gallopavo*)
- Sharp-tailed Grouse (*Pedioecetes phasianellus*)
- Ring-necked Pheasant (*Phasianus colchicus*)

Order: Gruiformes
Family: Rallidae
- American Coot (*Fulica americana*)
- Common Moorhen (*Gallinula chloropus*)
- Sora (*Porzana carolina*)
- Virginia Rail (*Rallus limicola*)

Order: Charadriiformes
Family: Charadriidae
- Killdeer***B** (*Charadrius vociferus*)

Family: Scolopacidae
- Spotted Sandpiper* (*Actitis macularia*)
- Upland Sandpiper***A** (*Bartramia longicauda*)
- Common Snipe (*Gallinago gallinago*)
- American Woodcock* (*Scolopax minor*)

Family: Laridae
- Black Tern (*Chlidonias niger*)

Order: Columbiformes
Family: Columbidae
Rock Dove (*Columba livia*)
Mourning Dove***B** (*Zenaida macroura*)

Order: Cuculiformes
Family: Cuculidae
Yellow-billed Cuckoo***A** (*Coccyzus americanus*)
Black-billed Cuckoo***A** (*Coccyzus erythropthalmus*)

Order: Strigiformes
Family: Strigidae
Saw-whet Owl (*Aegolius acadicus*)
Boreal Owl (*Aegolius funereus*)
Short-eared Owl**B** (*Asio flammeus*)
Long-eared Owl**B** (*Asio otus*)
Great Horned Owl (*Bubo virginianus*)
Eastern Screech Owl (*Otus asio*)
Barred Owl* (*Strix varia*)

Order: Caprimulgiformes
Family: Caprimulgidae
Whip-poor-will***A** (*Caprimulgus vociferus*)
Common Nighthawk***A** (*Chordeiles minor*)

Order: Apodiformes
Family: Apodidae
Chimney Swift**A** (*Chaetura pelagica*)

Family: Trochilidae
Ruby-throated Hummingbird***A** (*Archilochus colubris*)

Order: Coraciiformes
Family: Alcedinidae
Belted Kingfisher***B** (*Ceryle alcyon*)

Order: Piciformes
Family: Picidae
Northern Flicker (*Colaptes auratus*)
Pileated Woodpecker (*Dryocopus pileatus*)
Red-bellied Woodpecker* (*Melanerpes carolinus*)
Red-headed Woodpecker* (*Melanerpes erythrocephalus*)
Downy Woodpecker* (*Picoides pubescens*)
Hairy Woodpecker* (*Picoides villosus*)
Yellow-bellied Sapsucker***B** (*Sphyrapicur varius*)

Order: Passeriformes

Family: Tyrannidae

- Eastern Wood-pewee*A (*Contopus virens*)
- Alder Flycatcher*A (*Empidonax alnorum*)
- Yellow-bellied Flycatcher*A (*Empidonax flaviventris*)
- Least Flycatcher*A (*Empidonax minimus*)
- Willow FlycatcherA (*Empidonax traillii*)
- Acadian Flycatcher*A (*Empidonax virescens*)
- Great Crested Flycatcher*A (*Myiarchus crinitus*)
- Eastern Phoebe*B (*Sayornis phoebe*)
- Eastern Kingbird*A (*Tyrannus tyrannus*)

Family: Alaudidae

- Horned Lark*B (*Eremophila alpestris*)

Family: Hirundinidae

- Cliff SwallowA (*Hirundo pyrrhonota*)
- Barn Swallow*A (*Hirundo rustica*)
- Purple Martin*A (*Progne subis*)
- Bank SwallowA (*Riparia riparia*)
- Northern Rough-winged Swallow*A (*Stelgidopteryx serripennis*)
- Tree Swallow*B (*Tachycineta bicolor*)

Family: Corvidae

- American Crow* (*Corvus brachyrhynchos*)
- Common Raven* (*Corvus corax*)
- Blue Jay* (*Cyanocitta cristata*)

Family: Paridae

- Black-capped Chickadee* (*Parus atricapillus*)
- Tufted Titmouse (*Parus bicolor*)

Family: Sittidae

- Red-breasted Nuthatch* (*Sitta canadensis*)
- White-breasted Nuthatch* (*Sitta carolinensis*)

Family: Certhiidae

- Brown Creeper*B (*Certhia americana*)

Family: Troglodytidae

- Marsh WrenB (*Cistothorus palustris*)
- House Wren*A (*Troglodytes aedon*)
- Winter Wren* (*Troglodytes troglodytes*)

Family: Mimidae
- Gray Catbird*A (*Dumetella carolinensis*)
- Brown Thrasher* (*Toxostoma rufum*)

Family: Muscicapidae
- Veery*A (*Catharus fuscenscens*)
- Hermit Thrush*B (*Catharus guttatus*)
- Wood Thrush*A (*Hylocichla mustelina*)
- Golden-crowned Kinglet (*Regulus satrapa*)
- Eastern Bluebird*B (*Sialia sialis*)
- American Robin*B (*Turdus migratorius*)

Family: Bombycillidae
- Cedar Waxwing*B (*Bombycilla cedrorum*)

Family: Laniidae
- Northern Shrike (*Lanius excubitor*)
- Loggerhead ShrikeB (*Lanius ludovicianus*)

Family: Sturnidae
- European Starling* (*Sturnus vulgaris*)

Family: Vireonidae
- Yellow-throated Vireo*A (*Vireo flavifrons*)
- Warbling VireoA (*Vireo gilvus*)
- Red-eyed Vireo*A (*Vireo olivaceus*)
- Philadelphia Vireo*A (*Vireo philadelphicus*)

Family: Emberizidae
- Red-winged Blackbird*B (*Agelaius phoeniceus*)
- Henslow's Sparrow (*Ammodramus henslowii*)
- Grasshopper SparrowA (*Ammodramus savannarum*)
- Lapland Longspur (*Calcarius lapponicus*)
- Northern Cardinal (*Cardinalis cardinalis*)
- Lark SparrowA (*Chondestes grammacus*)
- Black-throated Blue Warbler*A (*Dendroica caerulescens*)
- Yellow-rumped Warbler*B (*Dendroica coronata*)
- Prairie WarblerA (*Dendroica discolor*)
- Blackburnian Warbler*A (*Dendroica fusca*)
- Kirtland's Warbler*A (*Dendroica kirtlandii*)
- Magnolia WarblerA (*Dendroica magnolia*)
- Chestnut-sided Warbler*A (*Dendroica pensylvanica*)
- Yellow WarblerA (*Dendroica petechia*)
- Pine Warbler* (*Dendroica pinus*)
- Cape May Warbler*A (*Dendroica tigrina*)
- Black-throated Green Warbler*A (*Dendroica virens*)

Bobolink**A** (*Dolichonyx oryzivorus*)
Brewer's Blackbird***B** (*Euphagus cyanocephalus*)
Common Yellowthroat***A** (*Geothlypis trichas*)
Northern Oriole***A** (*Icterus galbula*)
Dark-eyed Junco***B** (*Junco hyemalis*)
Swamp Sparrow (*Melospiza georgiana*)
Lincoln's Sparrow***A** (*Melospiza lincolnii*)
Song Sparrow***B** (*Melospiza melodia*)
Black-and-white Warbler***A** (*Mniotilta varia*)
Brown-headed Cowbird***B** (*Molothrus ater*)
Mourning Warbler***A** (*Oporornis philadelphia*)
Northern Parula**A** (*Parula americana*)
Savannah Sparrow***B** (*Passerculus sandwichensis*)
Indigo Bunting***A** (*Passerina cyanea*)
Rose-breasted Grosbeak***A** (*Pheucticus ludovicianus*)
Rufous-sided Towhee***B** (*Pipilo erythropthalmus*)
Scarlet Tanager***A** (*Piranga olivacea*)
Snow Bunting (*Plectrophenax nivalis*)
Vesper Sparrow***B** (*Pooecetes gramineus*)
Common Grackle* (*Quiscalus quiscula*)
Ovenbird***A** (*Seiurus aurocapillus*)
Northern Waterthrush**A** (*Seiurus noveboracensis*)
American Redstart***A** (*Setophaga ruticilla*)
American Tree Sparrow (*Spizella arborea*)
Clay-colored Sparrow**A** (*Spizella pallida*)
Chipping Sparrow***A** (*Spizella passerina*)
Field Sparrow* (*Spizella pusilla*)
Eastern Meadowlark**B** (*Sturnella magna*)
Western Meadowlark**B** (*Sturnella neglecta*)
Golden-winged Warbler***A** (*Vermivora chrysoptera*)
Tennessee Warbler***A** (*Vermivora peregrina*)
Nashville Warbler***A** (*Vermivora ruficapilla*)
Canada Warbler***A** (*Wilsonia canadensis*)
White-throated Sparrow***B** (*Zonotrichia albicollis*)

Family: Fringillidae
Common Redpoll (*Carduelis flammea*)
Pine Siskin**B** (*Carduelis pinus*)
American Goldfinch***B** (*Carduelis tristis*)
House Finch (*Carpodacus mexicanus*)
Purple Finch***B** (*Carpodacus purpureus*)
Evening Grosbeak (*Coccothraustes vespertinus*)
Red Crossbill (*Loxia curvirostra*)
White-winged Crossbill (*Loxia leucoptera*)
Pine Grosbeak (*Pinicola enucleator*)

Family: Passeridae
House Sparrow (*Passer domesticus*)

Class "A" species are those that breed in North America but spend their non-breeding period south of the United States, whereas class "B" species breed and winter extensively in North America but some populations may winter south of the United States.

Sources:

Banks, R.C., R.W. McDiarmid, and A.L. Gardner. 1987. Checklist of Vertebrates of the United States, the U.S. Territories, and Canada. U.S. Fish & Wild. Serv., Resour. Publ. 166, 79pp.

Brewer, R., G.A. McPeek, and R.J. Adams Jr. 1991. The Atlas of Breeding Birds of Michigan. East Lansing, MI. Michigan State University Press.

Eugene A. Hickok and Associates. 1989. National Guard Bureau and Michigan Department of Military Affairs Camp Grayling Draft Environmental Impact Statement.

Partners in Flight Annual Report Volume 2 Number 1, Page 30.

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APPENDIX E

Reptiles and Amphibians in the Camp Grayling Area

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REPTILES & AMPHIBIANS LIKELY TO BE FOUND IN THE CAMP GRAYLING AREA

Class: Reptilia
- Order: Testudinata
  - Family: Chelydridae
    - Snapping Turtle (*Chelydra serpentina*)
  - Family: Kinosternidae
    - Stinkpot (*Sternotherus odoratus*)
  - Family: Emydidae
    - Painted Turtle (*Chrysemys picta*)
    - Midland Painted Turtle (*Chrysemps picta marginata*)
    - Spotted Turtle (*Clemmys guttata*)
    - Wood Turtle (*Clemmys insculpta*)
    - Blanding's Turtle (*Emydoidea blandingii*)
  - Family: Trionychidae
    - Spiny Softshell Turtle (*Trionyx spiniferus*)
    - Eastern Spiny Softshell (*Trionyx spiniferus spiniferus*)
- Order: Squamata
  - Suborder: Sauria
    - Family: Scincidae
      - Five-lined Skink (*Eumeces fasciatus*)
  - Suborder: Serpentes
    - Family: Colubridae
      - Blue Racer (*Coluber constrictor*)
      - Ring-necked Snake (*Diadophis punctatus*)
      - Black Rat Snake (*Elaphe obsoleta obsoleta*)
      - Eastern Hog-nosed Snake (*Heterodon platyrhinos*)
      - Milk Snake (*Lampropeltis triangulum*)
      - Queen Snake (*Natrix septemvittata*)
      - Northern Water Snake (*Nerodia sipedon*)
      - Smooth Green Snake (*Opheodrys vernalis*)
      - DeKay's Brown Snake (*Storeria dekayi*)
      - Northern Brown Snake (*Storeria dekayi dekayi*)
      - Midland Brown Snake (*Storeria dekayi wrightorum*)
      - Red-bellied Snake (*Storeria occipitomaculata*)
      - Eastern Ribbon Snake (*Thamnophis sauritus*)
      - Common Garter Snake (*Thamnophis sirtalis*)

Family: Viperidae
Massasauga (*Sistrurus catenatus*)

Class: Amphibia
Order: Caudata
Family: Salamandridae
Eastern Newt (*Notophthalmus viridescens*)

Family: Proteidae
Mudpuppy (*Necturus maculosus*)

Family: Ambystomatidae
Blue-spotted Salamander (*Ambystoma laterale*)
Spotted Salamander (*Ambystoma maculatum*)
Tiger Salamander (*Ambystoma tigrinum*)

Family: Plethodontidae
Four-Toed Salamander (*Hemidactylium scutatum*)
Eastern Red-backed Salamander (*Plethodon cinereus*)

Order: Anura
Family: Bufonidae
American Toad (*Bufo americanus*)

Family: Hylidae
Spring Peeper (*Hyla crucifer*)
Gray Treefrog (*Hyla versicolor*)
Western Chorus Frog (*Pseudacris triseriata triseriata*)

Family: Ranidae
Bullfrog (*Rana catesbeiana*)
Green Frog (*Rana clamitans*)
Pickerel Frog (*Rana palustris*)
Northern Leopard Frog (*Rana pipiens*)
Wood Frog (*Rana sylvatica*)

Sources:

Harding, J.H. and J.A. Holman. 1990. Michigan's Turtles and Lizards. Michigan State University Museum. 92 pp.

Harding, J.H. and J.A. Holman. 1992. Michigan Frogs, Toads, and Salamanders. Michigan State University Museum. 144 pp.

Holman, J.A., J.H. Harding, M.M. Hensley, and G.R. Dudderar. 1993. Michigan Snakes. Michigan State University Extension. 72 pp.

APPENDIX F

Fish in the Camp Grayling Area

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FISH SPECIES LIKELY TO BE PRESENT IN THE CAMP GRAYLING AREA

Family: Petromyzonidae
- Immature Lamprey (Ammocoete) (*Ichthyomyzon castaneus*)

Family: Amiidae
- Bowfin (*Amia calva*)

Family: Lepisosteidae
- Longnose Gar (*Lepisosteus osseus*)

Family: Clupeidae
- Lake Herring
- Alewife (*Alosa pseudoharengus*)
- Gizzard Shad (*Dorosoma cepedianum*)

Family: Salmonidae
- Rainbow Trout (*Oncorhychus mykiss*)
- Brook Trout (*Salvelinus fontinalis*)
- Brown Trout (*Salmo trutta*)

Family: Esocidae
- Grass Pickerel (*Esox americanus vermiculatus*)
- Northern Pike (*Esox lucius*)
- Tiger Muskie (*Esox lucius* x *Esox masquinongy*)
- Muskellunge (*Esox masquinongy*)

Family: Umbridae
- Central Mudminnow (*Umbra limi*)

Family: Cyprinidae
- Common Carp (*Cyprinus carpio*)
- Hornyhead Chub (*Nocomis biguttatus*)
- Emerald Shiner (*Notropis atherinoides*)
- Common Shiner (*Notropis cornutus*)
- Blacknose Shiner (*Notropis heterolepis*)
- Northern Redbelly Dace (*Phoxinus eos*)
- Bluntnose Minnow (*Pimephales notatus*)
- Fathead Minnow (*Pimephales promelas*)
- Bullhead Minnow (*Pimephales vigilax*)
- Blacknose Dace (*Rhinichthys atratulus*)
- Longnose Dace (*Rhinichthys cataractae*)
- Creek Chub (*Semotilus atromaculatus*)
- Pearl Dace (*Semotilus margarita*)

Family: Catostomidae
- Quillback Carpsucker (*Carpiodes cyprinus*)
- White Sucker (*Catostomus commersoni*)
- Chubsucker spp. (*Erimyzon spp.*)
- Largemouth Buffalofish (*Ictiobus cyprinellus*)
- Silver Redhorse (*Moxostoma anisurum*)
- Golden Redhorse (*Moxostoma erythrurum*)

Family: Ictaluridae
- Black Bullhead (*Ictalurus melas*)
- Channel Catfish (*Ictalurus punctatus*)
- Tadpole Madtom (*Noturus gyrinus*)
- Flathead Catfish (*Pylodictis olivaris*)

Family: Aphredoderidae
- Pirate Perch (*Aphredoderus sayanus*)

Family: Gadidae
- Burbot (*Lota lota*)

Family: Gasterosteidae
- Brook Stickleback (*Culaea inconstans*)

Family: Cottidae
- Mottled Sculpin (*Cottus bairdi*)
- Slimy Sculpin (*Cottus cognatus*)

Family: Percichthyidae
- White Perch (*Morone americana*)
- White Bass (*Morone chrysops*)

Family: Centrarchidae
- Northern Rock Bass (*Ambloplites rupestris*)
- Warmouth (*Chaenobryttus gulosus*)
- Green Sunfish (*Lepomis cyanellus*)
- Bluegill (*Lepomis macrochirus*)
- Longear Sunfish (*Lepomis megalotis*)
- Pumpkinseed (*Lepomis gibbosus*)
- Smallmouth Bass (*Micropterus dolomieui*)
- Largemouth Bass (*Micropterus salmoides*)
- White Crappie (*Pomoxis annularis*)
- Black Crappie (*Pomoxis nigromaculatus*)

Family: Percidae
- Rainbow Darter (*Etheostoma caeruleum*)
- Johnny Darter (*Etheostoma nigrum*)

Yellow Perch (*Perca flavescens*)
Logperch (*Percina caprodes*)
Blackside Darter (*Percina maculata*)
Walleye (*Stizostedion vitreum*)

Family: Sciaenidae
Freshwater Drum (*Aplodinotus grunniens*)

Sources:

Michigan Department of Conservation, Fish Division, Stream Fish Collection Reports. 1970.

Michigan Lake Inventory Bulletins No. 20 and 69.

Michigan DNR Lake Fish Collection Age-Growth Summary, 1979.

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APPENDIX G

EIFS Analysis

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United States Army Corps of Engineers
Environmental Technical Information System

ETIS
(Trademark applied for)

ETIS:What program? (Type <cr> to see list): 4

Economic Impact Forecast System - Version 5.0

First county or region (type ? for help): Crawford, MI
Next county or region (type RETURN if done): Kalkaska, MI
Next county or region (type RETURN if done): Otsego, MI

1987 multipliers are being calculated for your list (3 counties)

You have selected 3 counties:

#	FIPS	County	State	1990 Population	Area(sq km)
1	26039	Crawford	MI	12,260	1,459
2	26079	Kalkaska	MI	13,497	1,478
3	26137	Otsego	MI	17,957	1,362
			Total	43,714	4,300

EIFS v5.0 - What Section? (<cr> to see list):

EIFS v5.0 Main Menu

Type: For Section Menu:
- d Demographic Data
- e Economic Data
- m Models
- x Additional profiles

EIFS v5.0 - What Section? (<cr> to see list): m

Models Profiles (m)

Jun 94

Type: For EIFS Models:
1 Forecast Models
2 AIMS (Automated Input-Output Multiplier System)
3 RTV (Rational Threshold Value)
4 Forecast Significance of Impacts

Type: For CEAS Models:
5 AFROI (Air Force Region of Influence) Model

EIFS v5.0 (m) - What profile? (<cr> to see list): 1

Forecast Models - which functional area? (<cr> to see list):

Type: For:
1 Standard EIFS Forecast Model
2 Construction
3 Construction of On-Base Housing
4 Training
5 AR 5-20 Economic Effects Analysis

Forecast Models - which functional area? (<cr> to see list): 1

STANDARD EIFS FORECAST MODEL

Project name: grayling.now

Enter d to enter your own price deflators
RETURN to use the default price deflators (latest year):

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1992)	= 122.8
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1992)	= 114.0
output and incomes (business volume)	(PPI - 1992)	= 114.0

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $11,713,539
Change in expenditures for local services and supplies: $5,452,744.50 (calculated)
Change in civilian employment: 69
Average income of affected civilian personnel: 48,170
Percent expected to relocate (enter <cr> to accept default): (0.0)
Change in military employment: 194
Average income of affected military personnel: 34,584

Percent of military living on-post: .5

STANDARD EIFS MODEL FORECAST FOR grayling.now

Export income multiplier		1.8709	
Change in local			
Sales volume	Direct	$10,316,000	
	Induced	$8,984,000	
	Total	$19,300,000	(2.702%)
Employment	Direct	96	
	Total	443	(2.683%)
Income	Direct	$1,292,000	
	Total (place of work)	$12,451,000	
	Total (place of residence)	$11,773,000	(2.239%)
Local population		483	(1.196%)
Local off-base population		242	
Number of school children		83	
Demand for housing	Rental	62	
	Owner occupied	35	
Government expenditures		$538,000	
Government revenues		$1,161,000	
Net Government revenues		$623,000	
Civilian employees expected to relocate		0	
Military employees expected to relocate		194	

done on Mon Feb 21 13:25:01 1994

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APPENDIX H

Camp Grayling
Environmental Protection Regulation 200-1

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CG REG 200-1

CAMP GRAYLING

ENVIRONMENTAL PROTECTION REGULATION

1 JANUARY 1993

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STATE OF MICHIGAN
DEPARTMENT OF MILITARY AFFAIRS
INSTALLATION SUPPORT UNIT
CAMP GRAYLING, MICHIGAN 49739-0001

CAMP GRAYLING
ENVIRONMENTAL PROTECTION

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CHAPTER 1

ENVIRONMENTAL PROTECTION

1-1. PURPOSE: To establish policy, procedures and guidelines. To insure that environmental concerns and standards are addressed in an efficient and timely manner on the Camp Grayling Military Reservation. Also, to facilitate the identification of offending units/individuals who violate provisions of our environmental regulation. This Regulation will be the principle source of guidance on environmental concerns for all units/agencies/individuals while at Camp Grayling.

1-2. APPLICABILITY:

a. Items and standards set forth in this document apply to all units/individuals utilizing Camp Grayling facilities; without regard to length of use, or controlling headquarters.

b. The unit Environmental Protection Officer (EPO) representing the battalion, separate company, or higher will report to building #12 for an Environmental briefing prior to commencing their training or within 24 hours of arrival at Camp Grayling, whichever occurs first.

1-3. REFERENCES:

a. CG Reg 385-1 (w/change 1), Range Safety, dtd 1 April 1992
b. CG Reg 210-10, Index of Camp Grayling Publications (March 1988 w/change 1 dtd 14 Apr 89 & change 2 dtd 24 Jul 89)
c. TC 8-2, Field Sanitation Team Training (Sep 78)
d. FC 8-6, Unit Field Sanitation Team
e. CG Reg 350-10, Camp Grayling Facility Scheduling and Management, dtd 19 March 1990

1-4. DEFINITIONS: For the purpose of this Regulation, the following definitions are applicable:

a. Post Environmental Protection Officer (EPO): A Commissioned Officer who works directly for the Post Commander, and under the direct supervision of the Post Operations Officer with overall responsibility for the administration and enforcement of Camp Grayling environmental protection (EP) policy as it relates to using units.

b. Post Environmental Protection NCO (EPNCO): A Noncommissioned Officer, appointed by the Post Operations Officer, and is the principle assistant to the EPO.

c. Unit Environmental Protection Officer: An individual appointed at battalion and higher unit levels who has been assigned the additional duty for ensuring that EP standards are enforced within all elements of that command.

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CHAPTER 2

ENVIRONMENTAL STANDARDS

2-1. RESPONSIBILITY: Environmental standards must be enforced, not only by Camp Grayling personnel, but by the using organization chain of command to insure that Camp Grayling's natural resources are protected. Such attention will ensure that the subsequent users will be able to maximize their training based on the best environmental conditions possible.

a. The using unit chain of command, specifically the senior commander who signs the Training Site Agreement (reference CG Reg 350-10), is responsible for coordinating the enforcement of this regulation and for clearing subordinate units from ranges and training areas. (Ref Encl 2, Affidavit)

b. Upon completion of each training event, the using organization chain of command will require a thorough police of the range or training area to ensure that no debris has been left in the area. All weapon spade holes, foxholes, slit trenches, sumps, etc., must have been filled as prescribed in paragraph 2-8.

c. Garbage, trash and rubbish accumulated by units will not be buried, discarded or burned in or outside the training area. It is the unit commanders responsibility to ensure proper disposal of all refuse. Trash compactor or dumpster locations and times of operation will be specified to unit EPO at the initial EP briefing. (See Encl 1). Transportation of refuse is the unit's responsibility.

d. Units are responsible for areas within a 200 meter radius of training/firing point locations.

e. Fill in all holes and excavations; brush and logs will be piled to the side.

f. All barriers and blockades will be removed upon completion of training.

g. All commo and concertina wire will be retrieved.

NOTE: Any unit discovering an area which has not been properly policed will report the incident to the Post EPO at Post Operation prior to occupying such areas. Units failing to make this report accepts responsibility for policing the area.

2-2. POL SPILLS: When POL spills occur, it is imperative that the unit or individuals involved, notify the Post EPO (Bldg. 12) at ext 3828 or Range Control (fm 41.80) immediately and implement the following emergency procedures:

a. Damage control

(1) Stop the source of the spill flow immediately.

(2) Contain spill using whatever means readily available. Earthen fill dams or sandbags are very effective if POL absorbing materials are not available.

b. Reaction procedures

(1) Prevent spill from flowing into drainage ditches, storm and sewer drains and bodies of water.

(2) Attempt to dig out (within safety concerns) contaminated soil with any means at hand (including hand shovels); deposit soil on an impervious surface or in a container (plastic bags or steel drum) which will prevent further contamination.

(3) Limit access to spill area. Do not allow matches, lighters, smoking or sparking mechanisms in the spill area.

(4) Notify your unit EPO

(5) Request additional support through the chain-of-command.

(6) Report location of incident to Post EPO on frequency 41.80 or phone ext 3828.

c. Precautionary measures

(1) Draw contaminated soil drums from the Troop Issue Section, in building 560 prior to going to the field. Having the drums available will save time and prevent spill from soaking further into the soil.

(2) Purchase POL absorbing materials prior to coming to Camp Grayling. (i.e., absorbent blankets, drip pans, pig pans, floor dry, etc.)

(3) Change filters and seals on POL product hauling equipment prior to attending AT and IDT training. (i.e., 5,000 gallon tankers, fuel pods, generators, etc.)

2-3. POL WASTE TURN-IN: It is required that all petroleum waste produced at Camp Grayling be properly disposed of. The units or individuals producing the waste will meet the following criteria to ensure proper turn-in and disposal.

a. Waste Identification: To be properly disposed of, waste must be identified for toxicity to people or the environment.

(1) Examples of waste turn-in material: Solvents, cleaning fluids, degreasers, paints, thinners, metallic compounds, batteries, acids, oils, fuels.

(2) The waste must be evaluated to determine the percent of product and percent of contaminant (e.g., 75% oil 25% water).

(a) Do this by estimating, to the best of your ability, the amount of product and amount of contaminant.

(b) The following information is also helpful in estimating your waste product amounts.

1 Manufacturers product or chemical name.

2 National Stock Number (NSN), Federal Stock Number (FSN), Local Stock Number (LSN).

3 Use the Material Safety Data Sheet (MSDS).

b. Packaging, Labeling and Handling: All labeling, marking, packaging and handling is the responsibility of the unit producing the waste and will be IAW HQ MI Reg 420-4.

(1) Units must coordinate with Troop Issue, located in Bldg. 560, for proper disposal forms, labels and containers needed for turn-in of all POL waste produced at Camp Grayling.

(2) Transferring of wastes from one container into another, as well as any moving that may be required is the responsibility of the producing unit, this may be supported by coordinating with the receiving areas listed below.

(3) Question of proper turn-in procedures, labeling, packaging, storage, etc., will be directed through Troop Issue, Bldg. 560 or phone ext 3288. (i.e., information on services Camp Grayling can provide)

c. Turn-In: Once a unit determines a material as a petroleum waste, notification for proper turn-in must be coordinated through the following:

(1) Units drawing, servicing, or utilizing vehicles/areas through the Camp Grayling Mobilization and Training Equipment Site (MATES) will coordinate all turn-in through the following personnel:

(a) Warehouse Foreman, MATES, 1400 North Down River Rd., Grayling, MI 49738 (517)348-3652.

(b) Support Section, MATES, 1400 North Down River Rd., Grayling, MI 49738 (517)348-3657.

(2) Units utilizing any other area of Camp Grayling including but not limited to the cantonment area, ranges, motorpools, airfield, etc., will coordinate turn-in through the following personnel:

(a) Troop Issue, Federal Warehouse, Bldg. 560, Logistical Support Facility, Camp Grayling, MI 49739-0001 (517)348-7621, ext 3288.

(b) Storage Branch, POL Section, Bldg. 560, Logistical Support Facility, Camp Grayling, MI 49739-0001 (517)348-3773.

2-4. FIRES:

a. Open fires by military personnel are expressly prohibited anywhere on the reservation. Exceptions may be permitted for fire fighting training purposes where permission is obtained in advance from the Camp Commander. Military personnel violating this provision will be reported to the Commander of Troops for appropriate action. Civilians who start open fires and/or are camping on military property will be reported to Range Operations for disposition. Range Operations will contact the Department of Natural Resources, and/or the civilians, to mitigate any conflict with training or land use procedures.

b. Camp Grayling Operations will be notified (FM 41.80 old squelch on) immediately of any fires by grid coordinate. Persons at the scene will attempt to contain the fire.

c. All heat generating items must be operated with care and policed if applicable. Items that must be policed to ensure that they are extinguished are smoke grenade canisters, illumination flairs, Heat tabs, cigarettes, etc.

2-5. SMOKE OPERATIONS: (Ref. CG REG 385-1, appendix P)

a. All smoke operations will be requested through Camp Grayling Operations. Camp Grayling Operations is responsible for necessary notification and/or coordination with the Camp Grayling fire department and the DNR Field Office.

b. Smoke operations submitted to Camp Grayling Operations must have a clear overlay with unit identification, name of OIC, grid location of mission, date/time group and what type of smoke generating device is being used.

c. Smoke generators will not exceed two (2) hours of continuous operation.

d. Smoke operations will be scheduled so that smoke is ceased for a time period greater than or equal to its generating time (i.e., if used for two (2) hours, cease use for two (2) hours).

e. Smoke units participating in external ARTEP Evaluations (EXEVAL) or in support of an EXEVAL will be exempt from para d. above, if the smoke requirement is a part of the ARTEP standards.

f. Smoke units displacing greater than 1,000 meters between operations are also exempt from para d. above. However, notification must still be made with Range Control.

g. All smoke operations will be handled like any other range operation. Prior to beginning the smoke mission the unit will contact Range Control on FM 41.80 to request permission to burn smoke. When the mission is completed the unit will again contact Range Control to shut down the operation.

2-6. KIRTLAND WARBLER NESTING AREA: The Warbler is an endangered song bird species that nests on the Jack Pine plains of northern Lower Michigan. Young Jack Pine stands regenerated by fire provide its ideal habitat. However, it migrates to the Bahama Islands during the winter months.

a. Certain areas have been restricted during the nesting season. During the nesting season all military activity is limited to existing roads and trails. These restricted areas are identified on the current Camp Grayling grey maneuver map, dtd 1 Jan 1992.

b. Helicopters and other aircraft will maintain a minimum 500 feet AGL over active nesting areas during the nesting season.

2-7. BALD EAGLE NESTING AREAS: The American Bald Eagle is another endangered species with nesting sites on military property. The Bald Eagle will build its nest near lakes and streams to allow for easy access to food sources.

a. A certain area has been restricted to keep from disturbing this endangered species. The northern portion of the range 40 complex is restricted from all military activity. This area is identified on the current Camp Grayling grey maneuver map, dtd 1 Jan 1992. This area may change annually due to the nesting habits of the Bald Eagle.

b. Helicopter and other aircraft flights will maintain a minimum 1500 feet AGL at all times over this area.

2-8. VEHICLE RESTRICTIONS: (Ref. CG REG 385-1, appendix O)

a. Track vehicles are prohibited from utilizing and crossing certain areas of Camp Grayling. These areas are shown on the current Camp Grayling grey maneuver map, dtd 1 Jan 1992.

b. Track vehicles will not utilize paved or improved roads on Camp Grayling to include the ditches and shoulders of improved or paved roads. Authorized crossing points are shown on the current grey maneuver map, dtd 1 Jan 1992.

c. All vehicles will refrain from creating new trails. If there is a question concerning the impact of an operation, contact Post Operations for clarification (Building #12).

d. All vehicles are restricted to existing roads and trails when crossing wet land areas.

e. Operation of any vehicle (wheeled or tracked) over large trees (greater than 3" in diameter) is prohibited, damaging any other forms of vegetation is to be minimized in all areas.

f. Vehicle washing is authorized at the wash rack on post and the car wash in town only. Washing vehicles in lakes, streams and other water supply points is prohibited.

g. All vehicles must remain 200 feet away from all waterways except for the AuSable River and it's tributaries. A 400 feet setback must then be maintained. Existing roads and trails that are closer may be used.

h. Track vehicle crossing of County road 612, M72 and US 27 see Camp Grayling Regulation 385-1.

i. Aircraft overflights are prohibited over Hartwick Pines State Park and the Wakeley Lake Nature Area at all times.

2-9. PIPELINE RESTRICTIONS: There is a natural gas pipeline buried along a generally straight line from Coordinates VIC 663305 to VIC 701560. This is identifiable by a cleared area, approximately 50 - 100 meters wide, having the appearance of a trail. Additionally, there are red 12x8 inch signs mounted on 4 1/2 foot red and white posts stating, "Warning High Pressure Gas". There is also, 6 inch yellow signs mounted on 6 foot black and silver posts stating "Warning Do Not Dig".

a. There is to be no drilling, auguring, or any type of excavation along any pipeline.

b. Open fires will not be permitted in, on, or around the pipeline.

c. Military vehicles are prohibited on any pipeline except designated vehicle crossing points.

d. Explosive charges or pyrotechnics are expressly prohibited anywhere within 100 meters of the pipeline.

e. The pipeline is not restricted from use by dismounted troops.

f. Refer to the current Camp Grayling grey maneuver map, dtd 1 Jan 1992, for additional information and locations on the above restrictions. Vehicle crossing points are identified on this map.

g. Any unit or individual discovering damage to or suspecting that damage has occurred to the pipeline should contact Range Control immediately, telephone number 348-3747 or on Frequency 41.80. Remove personnel and equipment from the area and wait for further instructions.

2-10. FIELD SANITATION: Reference TC 8-3, FC 8-6. All field sanitation and mess sites will be placed a minimum of 300 feet from any lake, stream or pond. The most acceptable methods of field disposal are outlined as follows:

a. Kitchen and bath waste disposal.

(1) Soakage pit (figure 1) is used for field shower points.

(a) Locate minimum of 30 meters from mess area.

(b) Size determined by length of stay (see reference).

(2) Grease trap barrel (figure 2) is used for all field mess operations. Barrels, along with burlap and gravel, are to be drawn from Troop Issue, in building 560 prior to movement to the field.

(a) locate minimum of 30 meters from mess area.

(b) Cloth on the top of the barrel is to be changed daily as a minimum or more frequently if needed.

(c) Solid waste (grease) collected on top of barrel will be disposed of at trash collection point.

(3) Soakage trench (figure 3).

(a) Size determined by size of unit and amount of waste water flow (gallons per minute (GPM) - see reference).

(b) Use grease trap barrel as prescribed above.

b. Human waste disposal.

(1) Deep pit latrine (figure 4).

(a) Required for all bivouac sites.

(b) Soakage pit required if urinals are used.

(2) Straddle trench latrine (figure 5).

(a) Use only for short durations, 2 days or less.

(b) Must be covered with a 3 inch layer of dirt after each use.

(3) Cat hole latrine (figure 6).

(a) Will be used only when on a march.

(b) Hole will be minimum of 6 inches deep.

(c) Cover with dirt after use.

(4) Latrine closing.

(a) Latrines will be closed when waste is within one (1) foot from ground surface.

(b) Pack dirt in three (3) inch layers until dirt is mounded one (1) foot above ground.

(c) Post all closed latrine locations with a sign stating "Closed Latrine" with date of closing and unit designation.

2-11. WATER-BORNE AND WATER SUPPLY OPERATIONS: (Ref. CG REG 385-1, appendix J) All units must keep a minimum of 200 feet from all waterways (lakes and streams). This extends to 400 feet on the AuSable River and its tributaries. The only exception to this is the use of roads and trails that are within these limits. These roads and trails may be used for access to ranges and training areas only.

a. Water-borne Operations.

(1) Camp Grayling Operations must receive a written request and give approval prior to any individual (s) or unit (s) conducting water-borne operations.

(2) The following lakes are designated as water-borne operation sites:

(a) Howes Lake

(b) Duck Lake

(c) Sand Lake (special use permit required)

(d) Kyle Lake (special use permit required)

(e) Lake Margrethe

b. Water Supply Operations.

(1) Water purification units, to include laundry and bath units, must obtain written approval for sites prior to the start of any operation.

(2) Requests will be coordinated through Post Operations located in building 12.

(3) Discharges from purification and shower/laundry units must be a minimum of 300 feet from any surface water.

2-12. TREE CUTTING RESTRICTIONS:

a. The cutting of any tree, or its branches is prohibited anywhere on Camp Grayling without prior approval. Requests to cut trees can be submitted to Facility Engineers located in Bldg. 36 or at phone 348-3613 or 3614.

b. Shrubs, small saplings (2" in diameter and smaller) and ferns may be used for camouflage during the conduct of training.

c. If an individual or unit is in doubt of what can be cut, contact the Post Environmental Officer in building 12 for clarification.

2-13. REFUELING SITES: (See enclosure #3)

a. All field refueling sites must be a minimum of 400 feet from all rivers, lakes and wetlands.

b. Due to the cantonment area being located on Lake Margrethe, refueling in and around the cantonment is limited to designated areas only. See enclosure 3 for designated refueling locations.

c. Refueling locations must have spill/leak control and response materials on site. As a minimum, units should have a shovel, absorbent pads, empty drums and a fire extinguisher on hand to respond to spills as soon as possible.

d. Concrete refueling pads have been installed at various locations and should be used as often as possible. The locations of the refueling pads are:

FE 742428 - 2 pads
FE 864618 - 1 pad
FE 865512 - 1 pad
FE 908547 - 1 pad

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CHAPTER 3

CONDUCT OF CLEARANCE

3-1. CONDUCT OF CLEARANCE:

a. The using unit chain of command, specifically the senior commander who signs the use agreement (reference CG Reg 350-10), is responsible for coordinating the enforcement of this regulation and for clearing subordinate units from ranges and training areas. (Ref Encl 2, Affidavit)

b. The Post EPO will dispatch personnel to conduct spot inspections after the senior commander has signed the Affidavit of Compliance.

c. The Post EPO will report deficiencies, if noted, to the senior using unit commander. In accordance with Memorandum of Understanding (MOU) signed by the senior commander, the Post Commander may fix liability for any damages caused by his/her unit and recover costs of repairing that damage.

d. In order to speed up the clearing process, the using unit will provide a guide, if requested, to accompany the Post Environmental team to inspect the training areas to be cleared.

e. Conflicts on inspection criteria between a unit and the Post EPO will be resolved at the lowest level possible. If a satisfactory conclusion or agreement cannot be reached, the problem will be brought to the attention of the Post Operations Officer. Failing to resolve the problem(s) at this level, the Post Commander will be the final authority.

The proponent agency of this regulation is Camp Grayling. Users are invited to send comments to the Commander, Camp Grayling, ATTN: CGCDR, Grayling, MI 48739-0001.

WAYNE C. KOPPA
COL, OD, MI ARNG
Commander

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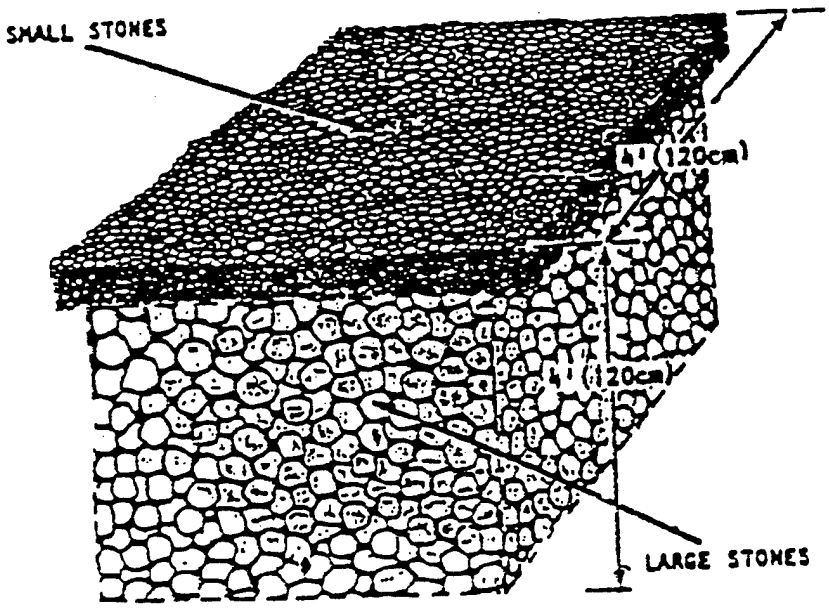

Figure 1 Soakage Pit

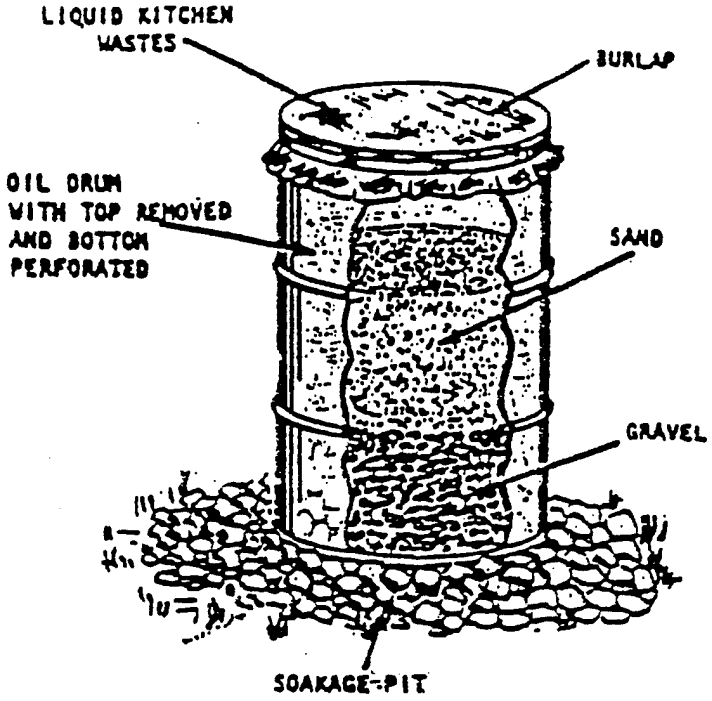

Figure 2 Grease Trap

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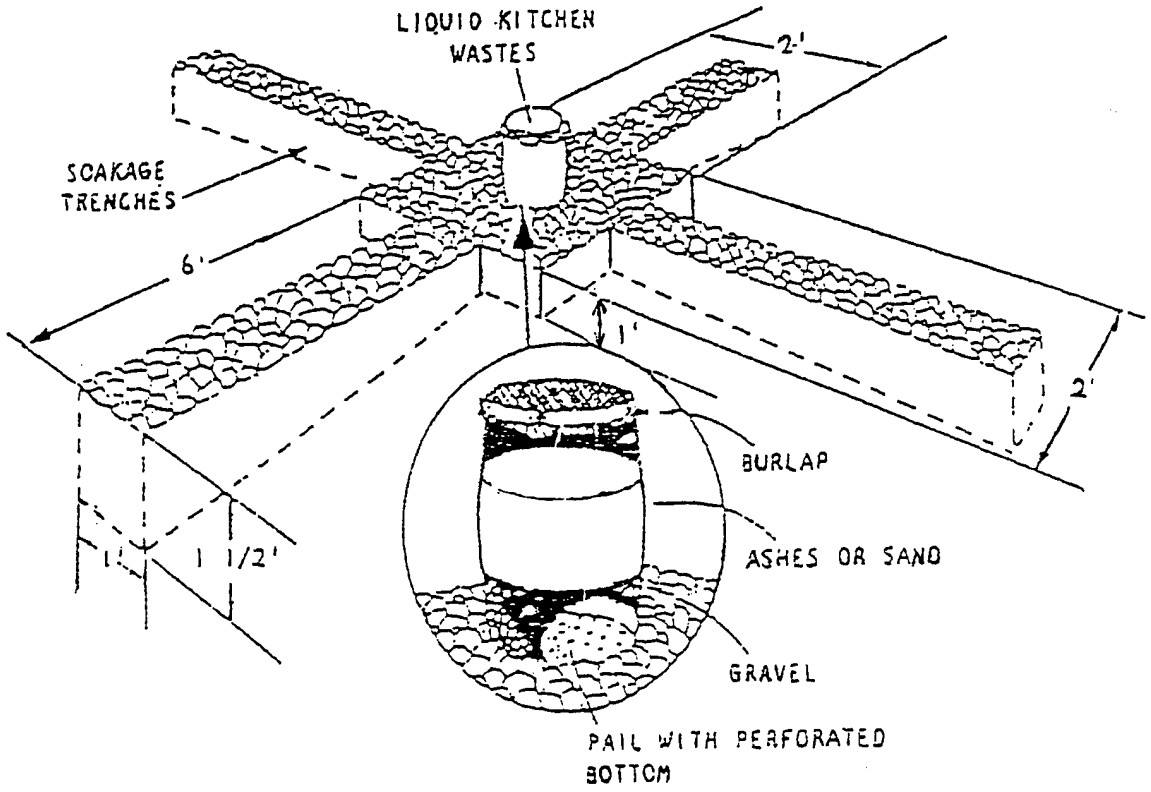

Figure 3 Soakage Trench

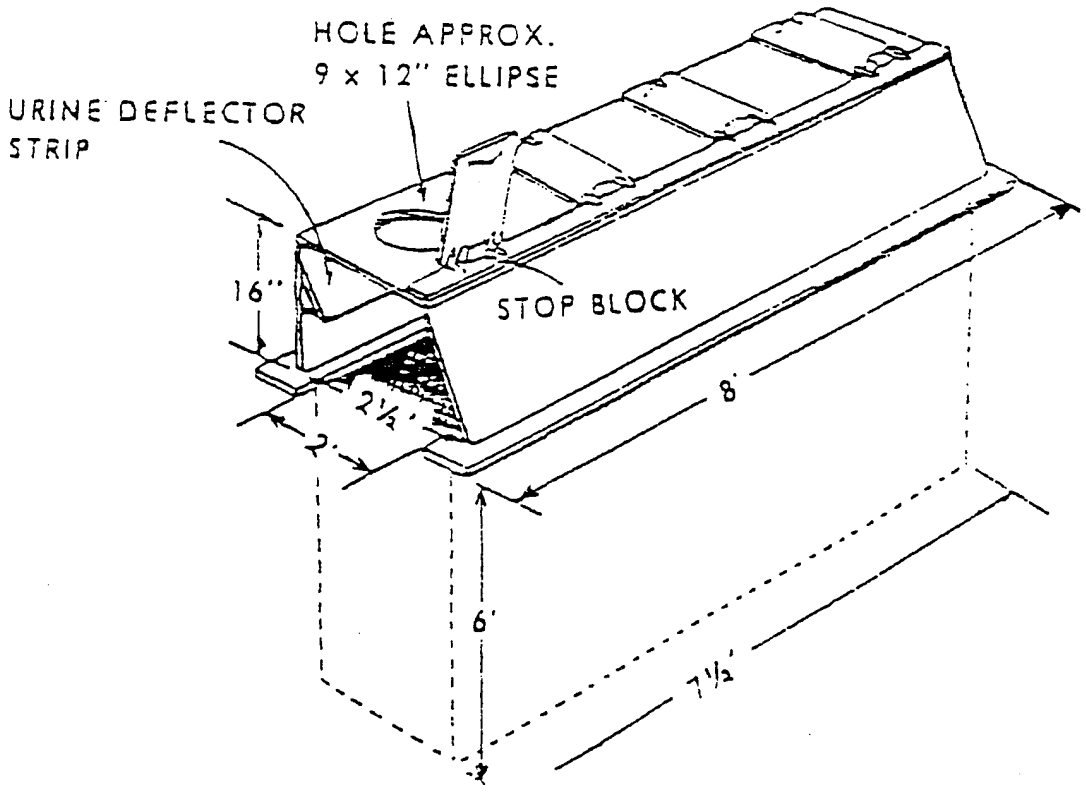

Figure 4 Deep Pit Latrine

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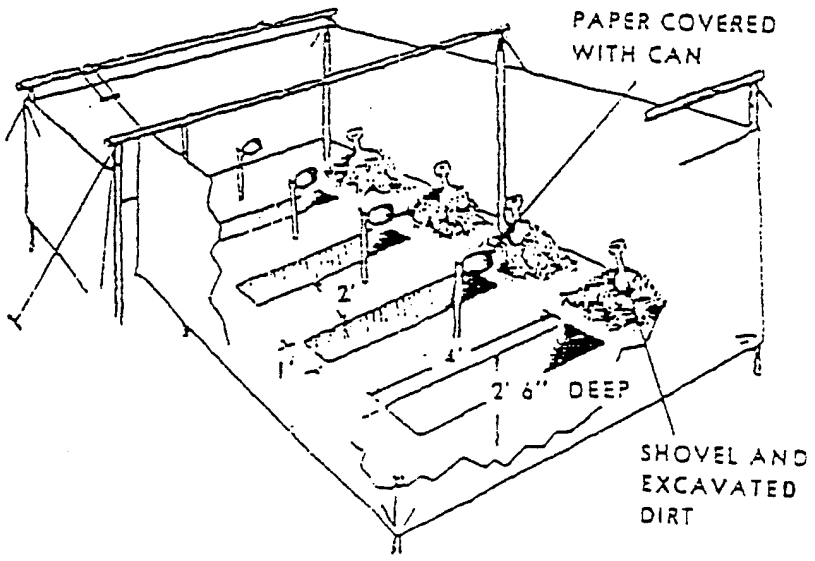

Figure 5' Straddle Trench Latrine

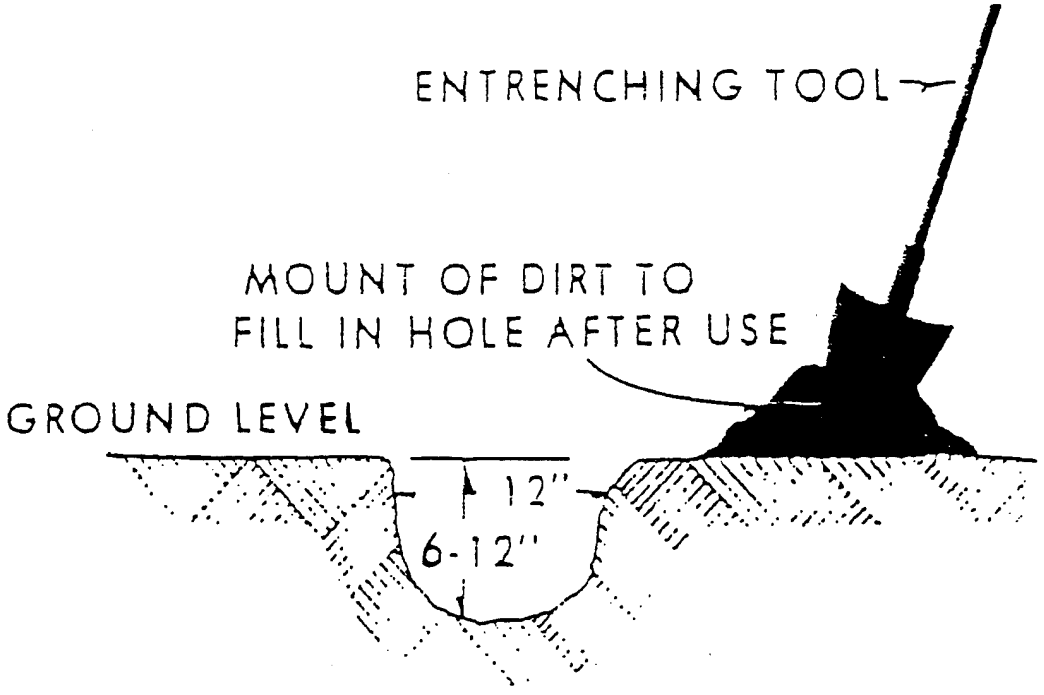

Figure 6 Cat Hole Latrine

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CAMP GRAYLING REG 200-1 1 JANUARY 1993

COMPACTOR, TIMES/LOCATIONS

#1 Beaver Creek Road (Bldg 26).....767440

#2 Howe Road (near gas chamber).....706435

#3 Airfield Parking Area.....808598

#4 Jones Lake Base Camp.....889622

Compactor schedule is subject to change.

0800 - 1100 1300 - 1500

NOTE: Units may request that the schedule of operation be changed to fit their training needs. This can be coordinated through the Facility Engineers, located in building 36, at 517-348-3613. If the compactor is needed after the hours of operation contact the Post Security Guard, located in building 12, for access.

CAMP GRAYLING REG 200-1 1 JANUARY 1993

HEADQUARTERS, INSTALLATION SUPPORT UNIT
CAMP GRAYLING, MICHIGAN 49739-0001

UNIT_____ DATE_____

SUBJECT: Affidavit of Training Area Environmental Compliance

1. As the senior commander, I certify that I have inspected my units training areas and/or areas of occupation. I further certify that I have found all these areas to meet the standards expressed in Camp Grayling Regulation 200-1, Camp Grayling Regulation 385-1, and the Environmental Pamphlet published by the Adjutant General of Michigan.

2. In accordance with the Memorandum of Understanding (Appendix E, Camp Grayling Reg 350-10), the Post Commander may fix liability for any damages caused by my unit(s) that we failed to repair prior to departing Camp Grayling.

_____
Signature

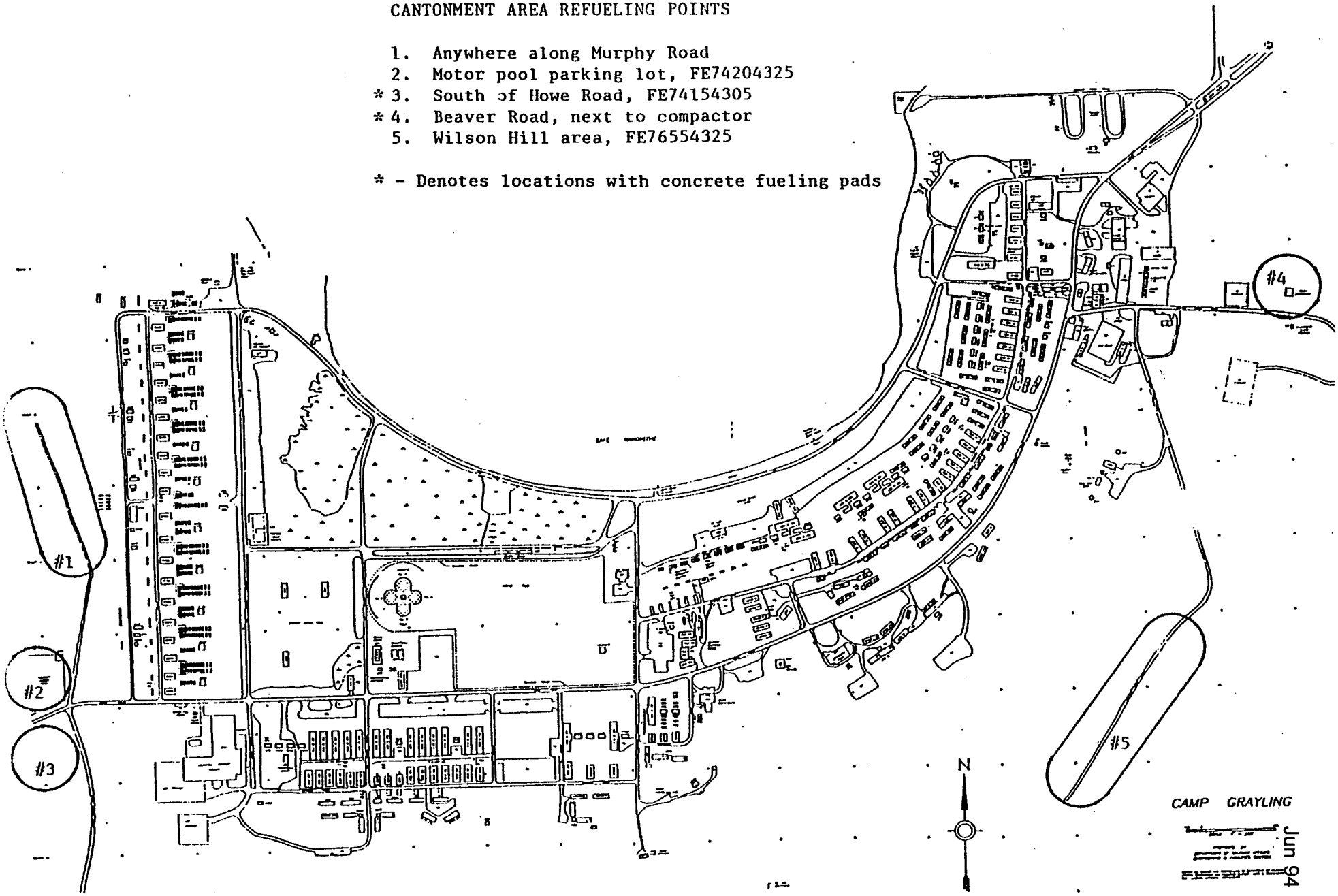
_____
Title

B-2

CANTONMENT AREA REFUELING POINTS

1. Anywhere along Murphy Road
2. Motor pool parking lot, FE74204325
* 3. South of Howe Road, FE74154305
* 4. Beaver Road, next to compactor
5. Wilson Hill area, FE76554325

* - Denotes locations with concrete fueling pads



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APPENDIX I

U.S. Fish & Wildlife Biological Opinion

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United States Department of the Interior
FISH AND WILDLIFE SERVICE
FEDERAL BUILDING, FORT SNELLING
TWIN CITIES, MINNESOTA 55111

TAKE PRIDE IN AMERICA

REPLY TO
FWS/AFWE-SE

JUN 7 1990

Log #: 3-90-F-MI-1-ELFO

Colonel Edgar E. Wilkins, Jr.
Chief, Construction & Facilities Office
Michigan Department of Military Affairs (DMA)
2500 South Washington Avenue
Lansing, Michigan 48913-5101

Dear Colonel Wilkens:

This responds to your letter of January 22, 1990, requesting formal consultation with the U.S. Fish and Wildlife Service (Service), in accordance with the Endangered Species Act of 1973, as amended, on proposed construction and operational activities due to military training at Camp Grayling, Michigan. During informal consultation it was previously determined by our respective staffs that proposed activities may affect endangered resources in the State of Michigan, thus necessitating formal consultation under Section 7 of the Act.

This letter transmits my Biological Opinion on proposed construction and operational activities as described in the Draft Environmental Impact Statement (DEIS) for the Camp Grayling Army National Guard Site, dated March 1989, and the impacts of these activities on the endangered Kirtland's warbler.

This letter provides comment only on the endangered species aspect of the subject under review. Comments on other aspects of the proposed activities were provided previously and were sent under separate cover (see attached letter from Sheila Minor Huff dated July 10, 1989).

This precludes the need for further action on this project as required by the Endangered Species Act. The Department of Military Affairs has a continuing responsibility to review its actions in light of Section 7 and to reinitiate this consultation if new information becomes available which indicates that the proposed project may affect listed species, if critical habitat is designated that may be affected by the project, or if a new species is listed that may be affected by the project.

We appreciate the Department of Military Affairs' cooperation (particularly that of Mr. Huntington) throughout the Section 7 process. Please advise if we can be of further assistance.

Sincerely,

Marvin E. Moriarty
Acting Regional Director

Enclosures

cc (w/enclosures):
Jerry Weinrich
Tom Weise
Wildlife Division
Department of Natural Resources
Box 30028
Stevens T. Mason Building
Lansing, Michigan 48909

Mr. Rex Ennis
Huron-Manistee National Forest
421 South Mitchell Street
Cadillac, Michigan 49601

BIOLOGICAL OPINION FOR CONSTRUCTION AND OPERATION OF MILITARY TRAINING FACILITIES AT CAMP GRAYLING, MICHIGAN

INTRODUCTION

On November 3, 1989, the U.S. Fish and Wildlife Service (Service) was asked to enter into informal consultation on several issues dealing with proposed construction and operational activities due to military training programs at Camp Grayling, Michigan. An informal consultation meeting occurred on December 8, 1989. It was decided at that meeting that the Michigan Department of Military Affairs (DMA) should request formal consultation in regard to the impacts of these activities on the endangered Kirtland's warbler.

The Service has reviewed the project description and biological assessment included with the January 22, 1990, letter from the DMA, as well as additional information, reports, and data acquired through our general coordination activities, the Cooperative Agreement between the Michigan Department of Natural Resources (DNR), and DMA dated May 22, 1986, and the Draft Environmental Impact Statement (DEIS) for the Camp Grayling Army National Guard Site dated March 1989.

BACKGROUND

The following species have been included in this consultation:

Common Name	Scientific Name	Status
Houghton's goldenrod	Solidago houghtonii	Threatened
Bald eagle	Haliaeetus leucocephalus	Threatened
Kirtland's warbler	Dendroica kirtlandii	Endangered

Houghton's Goldenrod
This plant is found at a single site at Howe's Lake. Its location is known to DMA and a snow fence is erected to point out its location to military training units and prevent any incursion onto the site. With this protective action, the proposed project will not affect this species.

Bald Eagle
This species nests at only one location on DMA lands. This current nest is located on the north end of Camp Grayling. This nest, and any future bald eagle nests, will annually be protected by order of the Director of the Michigan Department of Natural Resources. This closure order will prevent all activities, including DMA activities, which have the potential to adversely impact bald eagles. With this protective measure in place, the proposed project will not affect this species.

Kirtland's Warbler
Kirtland's warblers are typically found among young jack pines (Pinus banksiana), in stands 6 to 20 years old and of 80 acres or more in extent. The primary breeding range is in the north central Lower Peninsula of Michigan, but a few males have recently been sighted in Wisconsin. Primary wintering habitat is in the Bahamas. The chief factor limiting the population of the warbler is believed to be a shortage of suitable nesting habitat. In addition, tall lighted towers and low flying aircraft may present a hazard during migration. Last year it was estimated that 212 breeding pairs existed in Michigan, and the breeding population has been less than 245 pairs since 1971. There is no designated critical habitat for the species at this time.

As pointed out in your letter of January 22, 1990, there are five issues remaining from our informal consultation meeting of December 8, 1989. The Service concurs that these are the only activities covered by the DEIS which may affect this species, and therefore require formal consultation. These five activities are:

1) Proposed construction and operation of the Multi-purpose Range Complex (MPRC).
2) Proposed construction and operation of an Assault Landing Strip (ALS).
3) The fate of old growth Jack Pine stands on military-controlled lands that are no longer suitable for Kirtland's warblers but may return to suitability for warblers after a fire or timber cut.
4) The fate of two small parcels (approximately 200 and 100 acres) which are identified as developing Kirtland's warbler habitat and may be occupied by the species in the near future, and
5) Whether ongoing training is likely to jeopardize the species.

IMPACT ANALYSIS

Construction and operation of the Multi-purpose Range Complex (MPRC)

The operation of the MPRC, which would include infantry, armor, and fixed-wing aircraft (FWA) overflights without FWA weapons firing, would occur on lands within older habitat that no longer attracts Kirtland's warblers. Recently-occupied warbler habitat does occur about 2 miles from the site, and FWA and other aircraft do pose a potential disturbance hazard that may affect the warbler. With the minimum altitude restriction of 1000 feet above ground level for all aircraft flying over habitat occupied by Kirtland's warblers (with the single exception noted in the following section), there will be no adverse effects on the warbler.

Construction and operation of an Assault Landing Strip (ALS)

Normal construction and operation of the ALS are not expected to affect the Kirtland's warbler, as the nearest occupied habitat is 1.5 miles west of the strip. Under prevailing wind (north-north-westerly) scenarios the proposed flight paths will avoid flying over occupied habitat. In the unusual circumstance of an east wind, landings would occur in which aircraft will glide onto the strip as low as 200 feet over a small portion of the Sharon Kirtland's Warbler Management Unit west of the strip.

The noise level of aircraft approach under the east wind scenario is expected to be small due to the approaching aircraft being in a glide mode. Significant disturbance to warblers occupying the Sharon Unit is not expected. However, to ensure that disturbance (i.e., incidental take) is insignificant, measures to monitor the extent of disturbance are specified in Attachment 1, Incidental Take Statement.

Developing habitat parcels on military land

If a fire or timber cut provides an opportunity for potential regrowth of sufficiently dense and appropriately aged jack pine stands on military lands, the DMA plans to use land management practices to keep the affected area from revegetating as jack pine stands. The Service agrees that areas in Michigan

DMA land which are not incorporated into designated Kirtland's Warbler Management Units or special use agreement land may be managed by DMA to avoid Jack pine regeneration suitable for Kirtland's warbler nesting habitat. This habitat manipulation will not decrease currently available suitable habitat for the warbler, and will not affect the species.

This management would not be carried out on lands identified for Kirtland's warbler management in the Kirtland's Warbler Recovery Plan, on the Down River Road Kirtland's Warbler Management Unit, or on other lands that currently support warblers. These latter lands will be closed in accordance with the agreement, except for the two areas discussed in the following section.

Developing Kirtland's warbler habitat parcels totaling 300 acres on the Range 30 Complex (tank range) covered by the DMA/DNR Management Plan

The military plans to continue training activities in these two areas (portions of sections 17 and 19, T27N, R2W) in accordance with the DMA/DNR Cooperative Agreement of May 22, 1986. That agreement resulted in over 4000 nearby DMA acres (in the southeast portion of the tank range, all in T27N, R1W and R2W) being formally designated as a new warbler management unit. This new management unit (Down River Road Kirtland's Warbler Management Unit, refer to Attachment 2, which is an excerpt from the May 22, 1986 Cooperative Agreement) currently supports nesting Kirtland's warblers and is expected to continue to do so indefinitely if habitat management is continued by the DNR, as provided for in the agreement.

The Service finds that continued military training use of the two areas totaling 300 acres may affect individual Kirtland's warblers. Kirtland's warblers have not used these two areas in recent years, but it is reasonable to assume that use will occur in the near future. These areas may be used by one or several unmated male warblers, or a small number of nesting pairs may move into these two jack pine stands. Annual Kirtland's warbler surveys will be made whenever it is judged to be possible that the habitat is suitable for warbler occupancy. The surveys will be run by the DNR and the results promptly communicated to the Service and DMA.

Possible adverse effects of the ongoing military activities are lowered pairing, nesting, and fledging success due to frequent disturbance of adult and young warblers. Mortality of adults is not expected, but deaths of nestlings or fledglings could occur as a result of starvation induced by excessive disturbance. Because such disturbance results in incidental take of the species, an Incidental Take Statement addressing this part of the operational plan has been added as Attachment 1.

The continuation of ongoing training at Camp Grayling

Most of the habitat on military lands that formerly supported Kirtland's warblers has matured beyond the age suitable for these birds. The three remaining Kirtland's warbler management units and two small parcels of occupied habitat at Stephans Bridge/North Down River Road and Sections 13 and 14 just west of the Bald Hill Road adjacent to the Down River Road Management Unit, will be closed during the nesting season to protect any Kirtland's warbler there. Through training and distinct marking of training site maps of the Camp Grayling area, military units will be kept abreast of Kirtland's warbler restricted areas. In addition, a 200-foot clear cut of unsuitable warbler habitat has been made around Sections 13 and 14 of the Bald Hill area to clearly delineate the protected areas and minimize accidental incursions by military training units. The continuation of training activities (other than those discussed in the previous section) will not affect the Kirtland's warbler.

CONCLUSION

Based on our review of your biological evaluation; the informal consultation meeting on December 8, 1989; the Draft Environmental Impact Statement of March, 1989; the Cooperative Agreement of May 22, 1986; the Kirtland's Warbler Recovery Plan; and other information provided, it is my biological opinion that the proposed project is not likely to jeopardize the continued existence of Kirtland's warblers or result in the adverse modification of critical habitat.

Two of the five activities discussed above may impact the species by increasing disturbance during the nesting season and may reduce reproduction of Kirtland's warblers nesting in the disturbed areas. Incidental take statements (Attachment 1) are provided for these two activities, as well as terms and conditions which will minimize the affects of the anticipated incidental take.

ATTACHMENT 1
INCIDENTAL TAKE STATEMENT

In the case of non-jeopardy biological opinions, Section 7(b)(4) of the Act requires the Service to specify the amount of incidental take anticipated to occur from the proposed activities. That section also requires that the Service specify reasonable and prudent measures to minimize the impact of the incidental take, and set forth terms and conditions which must be complied with to implement those measures. Compliance with the terms and conditions is mandatory.

Of the five activities covered by this biological opinion, three have been determined to have no adverse effect on Kirtland's warblers. For the remaining two activities, anticipated incidental take levels are specified below, and terms and conditions are prescribed to monitor the actual level of incidental take and to minimize the impact of that take.

Construction and operation of an Assault Landing Strip (ALS)

The operation of the ALS has the possibility of causing a disruption of the normal feeding and reproductive behaviors of individual Kirtland's warblers directly beneath the glide path. However, because the planes will be largely gliding over the warbler management unit, the anticipated disruption is likely to be insignificant. Therefore, the incidental take anticipated and allowed by the operation of the ALS is zero.

In order to ensure that the incidental take is not larger than anticipated, and therefore ensure that the species is not being significantly impacted by ALS operations, the following condition must be carried out whenever the ALS is operated under east wind conditions:

> In every case where an east wind coincides with low level overflights of the Sharon Area management unit (when occupied by Kirtland's warblers) occurs, the Department of Military Affairs or its agent shall employ an appropriate number of qualified monitors (in accordance with the list of volunteer monitors' names to be provided by the Michigan Department of Natural Resources, upon request to Jerry Weinrich, 517/422-5191) to record any disturbance reactions by the Kirtland's warblers present in the overflown areas. If disturbance reactions are observed to occur during this monitoring, the overflights should cease, the Service should immediately be notified, and consultation should be reinitiated. It is recognized that the portion of the Sharon Area management unit affected by these overflights might not be occupied for as long as eight more years due to the age class of current vegetation. If Kirtland's warblers do not occupy the overflown area, monitoring is not necessary.

Developing Kirtland's warbler habitat parcels totaling 300 acres on the Range 30 Complex (tank range) covered by the DMA/DNR Management Plan

Because these areas are small and relatively isolated from jack pine stands currently occupied by the warbler, there is no way to determine the extent of warbler use of these areas in the absence of ongoing military activities. Therefore, it is not possible to anticipate the extent of incidental take in terms of numbers of Kirtland's warblers, reduced reproductive output, diminished longevity, or in any other terms relating to the warbler itself.

Therefore, training activities within these two areas (100 acres and 200 acres) are authorized, and their impacts to the species will be minimized, by the following incidental take statement:

> The Department of Military Affairs is authorized to take (i.e., disturb occupied habitat) up to 300 acres of Kirtland's warbler occupied habitat on the Range 30 Complex (tank range) of Camp Grayling, Michigan. The DMA will be responsible for allowing access to the DNR and the Service, in accordance with the Management Plan of May 22, 1986, for the purpose of censusing singing males in these two parcels and, if male Kirtland's warblers are located, to afford both agencies the opportunity to locate any nests which may also be present. Upon notification of nest site determination, DMA will fence off an area of not less than a 500-foot radius around any identified nest site prior to reinitiating training activities in the vicinity of these areas. The fenced-off nesting areas are to be posted as "no entry" zones for the remainder of the nesting season (through August 15) of the year they are discovered. The Service will also be afforded necessary access to the nest sites to carry out cowbird trapping activities.

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
230 S. DEARBORN, SUITE 3422
CHICAGO, ILLINOIS 60604

ER-89/543

RECEIVED
JUL 19 1989
REGIONAL OFFICE

July 10, 19

Mr. Greg Huntington
Construction and Facilities Office
Michigan Department of Military Affairs
2500 S. Washington Avenue
Lansing, Michigan 48913

Dear Mr. Huntington:

The Department of the Interior (Department) has reviewed the draft environmental impact statement (statement) for the proposed mission expansion and multiple construction, Camp Grayling Army National Guard Training Site in Crawford, Kalkaska, and Otsego Counties, Michigan, and provides the following comments and recommendations.

General Comments

The statement adequately describes the existing fish and wildlife resources and evaluates general project construction impacts. We concur that construction activities should have minimal impacts on fish and wildlife resources. However, we have several concerns related to impacts from operational activities on endangered and threatened species.

Specific Comments

The statement identifies Houghton's goldenrod (Solidago houghtonii) as a state-listed threatened plant species occurring on Camp Grayling (Page 4-5.15). Please note that this species has now been listed as a federally-listed threatened species, as well (Federal Register 27134, July 18, 1988).

The document describes the location of bald eagle (Haliaeetus leucocephalus) nests in and around the post (Page 4-5.44) and describes parts of the Management Guidelines from the Northern States Bald Eagle Recovery Plan. Although construction activities proposed in the statement will not affect the bald eagle, future operations have the potential to affect the species. The final statement should include a commitment from the Department of Military Affairs to follow the Management Guidelines in the event bald eagle foraging or nesting areas may be affected by future military activities.

The statement also describes the historic and present use of Camp Grayling lands by the Kirtland's warbler (Dendroica kirtlandii), the potential impacts to this species, and mitigation (Pages 4-5.41 to 4-5.43 and 4-5.48 to 4-5.49). The statement includes a draft copy of a Memorandum of Agreement between the Michigan Department of Natural Resources and the Michigan Department of

Military Affairs. We concur that the procedures outlined in this agreement will not affect the Kirtland's warbler, given the present species population level and the present distribution on Camp Grayling. However, if population levels and distribution change in the future, the National Guard Bureau should consult with the U.S. Fish and Wildlife Service (Service), in accordance with Section 7 of the Endangered Species Act of 1973 (Act), as amended.

The document is unclear concerning "developing habitat" for the Kirtland's warbler. Two tracts of developing habitat are located in the T2 Multi-Purpose Range Complex. From the discussion in the statement, it appears that this area will not be protected, even if warblers are present, unless the total warbler population falls below 200 pairs. Please be aware that even if this area is not posted, as is currently proposed, all military personnel have legal obligations under the Act. In addition to Section 7 consultation requirements for Federal agencies, Section 9 of the Act prohibits any person (private, State or Federal) from "taking" an endangered or threatened species. The Act defines the term "taking" to include "harassing," which the regulations define as disturbing an animal such that normal behavioral patterns, such as breeding and feeding, are significantly disrupted. Therefore, it is incumbent upon the Department of Military Affairs to avoid all activities that would "take" or "harass" any Kirtland's warblers using these, or other, "developing habitat" areas in the future.

If it is determined that any future activities on the post may affect federally-listed endangered or threatened species, Section 7 consultation with the Service should be initiated. Requests for informal consultation should be directed to the Field Supervisor, U.S. Fish and Wildlife Service, 1405 S. Harrison Road, East Lansing, Michigan 48823. Requests for formal consultation should be directed to the Regional Director, U.S. Fish and Wildlife Service, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

Summary Comments

We do not anticipate adverse impacts from construction activities proposed in the document. However, we request that the statement be revised to clarify commitments to protect threatened and endangered species during operational activities.

The opportunity to provide comments is appreciated.

Sincerely,

Sheila Minor Huff

Sheila Minor Huff
Regional Environmental Officer

cc: U.S. EPA, Environmental Review Branch, Chicago, IL (SME)
bcc: RD, FWS, Twin Cities, MN
RD, NPS, Omaha, NE
Environmental Affairs, USGS, Reston, VA
Acting Director, OEPR, WASO

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APPENDIX J

AEHA Noise Study Analysis

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UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010-5422

ENVIRONMENTAL NOISE ASSESSMENT NO. 52-34-0445-85
NOISE ENVIRONMENT FROM OPERATIONS
CAMP GRAYLING, MICHIGAN
30 JULY - 24 AUGUST 1984

Distribution limited to US Government agencies only; protection of privileged information evaluating another command; Nov 84. Requests for this document must be referred to Chief, National Guard Bureau, ATTN: NGB-ARI-E, Aberdeen Proving Ground, MD 21010-5401.

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

Dr Lewis/dat/AUTOVON 584-1797

REPLY TO ATTENTION OF

26 NOV 1984

HSHB-OB/MP

SUBJECT: Environmental Noise Assessment No. 52-34-0445-85, Noise Environment from Operations, Camp Grayling, Michigan, 30 July - 24 August 1984

Chief
National Guard Bureau
ATTN: NGB-ARI-E
Aberdeen Proving Ground, MD 21010-5401

EXECUTIVE SUMMARY

The purpose, essential findings, and major recommendation of the enclosed report follow:

a. Purpose. Assess the noise environment from operations at Camp Grayling, Michigan.

b. Essential Findings.

(1) The monitoring of the noise environment at Grayling Army Airfield indicates that the normally unacceptable (Zone II) noise zone may extend into Grayling. Noise contours for the airfield are required to determine the extent of this impact.

(2) The monitoring of the continuous noise environment in the Guthrie Lake area showed that this area is normally quiet. During intensive training at the Artillery Range, the day-night sound level in this area increases by 5 to 7 dBA, but is still less than the continuous noise criteria.

(3) The monitoring of the impulsive noise environment in the Guthrie Lake area showed that all monitoring sites were in a clearly unacceptable (Zone III) noise zone. The measured levels indicate that the potential of a high risk of noise complaints and the possibility of damage claims exists. During the monitoring period, noise complaints were received every day from the Guthrie Lake residents.

(4) An Installation Compatible Use Noise Zone (ICUZ) program is needed at Camp Grayling to quantify the existing and future noise environments and to coordinate with planning and zoning agencies to prevent further encroachment of noncompatible land uses which could reduce Camp Grayling's capability to perform its mission.

c. Recommendation. Initiate an ICUZ program as required by AR 200-1.

FOR THE COMMANDER:

Encl

JOEL C. GAYDOS
Colonel, MC
Director, Occupational and Environmental Health

CF:
HQDA(DASG-PSP) (w/encl)
HQDA(MCE-ARS) (w/encl)
Comdt, AMS (HSHA-IPM) (w/encl)
Cdr, HSC (HSCL-F) (w/encl)
TAG, Michigan ARNG (3 cy) (w/encl)
Cdr, MEDDAC, Ft Leonard Wood (PVNTMED Svc) (2 cy) (w/encl)
Cdr, FAMC (PVNTMED Svc) (w/encl)
C, USAEHA-Rgn Div West (w/encl)

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REPLY TO ATTENTION OF

HSHB-OB/MP

ENVIRONMENTAL NOISE ASSESSMENT NO. 52-34-0445-85
NOISE ENVIRONMENT FROM OPERATIONS
CAMP GRAYLING, MICHIGAN
30 JULY - 24 AUGUST 1984

1. AUTHORITY. Letter, National Guard Bureau, NGB-ARI-E, 7 May 1984, subject: USAEHA Mission Services FY 84.

2. REFERENCES. The references used in this report are listed in Appendix A.

3. PURPOSE. Assess the noise environment from operations at Camp Grayling, Michigan.

4. GENERAL.

a. Background.

(1) Camp Grayling is a National Guard installation used for training by Army and Air National Guard units. It is located in north central Michigan, approximately 50 miles east of Traverse City.

(2) Grayling Army Airfield (GAAF) is located adjacent to the town of Grayling. This airfield is used by the National Guard Aviation Units and the community. The Guard flies helicopters, C130 and twin-engine aircraft in and out of the airfield. Business jets and private aircraft also use the airfield.

(3) The artillery range at Camp Grayling is located in the northern section of the installation near Guthrie Lake. The area around this lake has been recently developed. The Guthrie Lake homeowner's organization, the Guthrie Lakes Enchanted Forests Property Owners Association, has been complaining about the noise from the artillery range and has threatened to take legal action to close the range.

(4) The noise contours for large-amplitude impulsive noise at Camp Grayling (reference 2) showed that the clearly unacceptable noise zone extended into the Guthrie Lake area, with the southern half of the lake inside this zone. The results of a previous monitoring study (reference 3) indicated that this predicted noise zone exists.

(5) The current assessment presents the results of extensive monitoring of the impulsive noise environment around Guthrie Lake during an

annual Division Artillery training exercise at the artillery range. The results of continuous noise monitoring at GAAF and Guthrie Lake areas are also presented.

b. Criteria.

(1) For all noise except large-amplitude impulsive noise, the A-weighted day-night sound level (DNL) is used to evaluate the environmental impact of the noise. The C-weighted DNL is used to evaluate the environmental impact of large-amplitude impulsive noise. Large-amplitude impulsive noise is defined as the noise from demolitions, and from 40 millimeter and larger size weapons. The DNL is described in Appendix B and in TM 5-803-2 (reference 4).

(2) AR 200-1 (reference 1) defines three noise zones, referred to as Zone I, Zone II, and Zone III. The C-weighted (dBC) and A-weighted (dBA) limits for these noise zones are listed in Table 1.

TABLE 1. NOISE CRITERIA

Noise Zone	Acceptability for Noise Sensitive Land Uses	Noise Limits: Large Amplitude Impulsive Noise	Noise Limits: All Other Noise Sources
I	Acceptable	Less than 62 dBC	Less that 65 dBA
II	Normally Unacceptable	62-70 dBC	65-75 dBA
III	Clearly Unacceptable	Greater than 70 dBC	Greater than 75 dBA

c. Personnel Contacted. The following personnel were contacted during this assessment.

(1) Col Gwilt, Camp Grayling Commander
(2) MAJ Lawson, Camp Grayling Facilities Engineer
(3) MAJ Roudebush, Indiana Army National Guard (ARNG)
(4) CPT Wells, Camp Grayling Range Control Officer
(5) CPT Dickerson, Indiana ARNG
(6) LT Hanson, Range Control, Camp Grayling
(7) LT Green, Facilities Engineers, Camp Grayling
(8) MAJ Gillespie, Indiana ARNG
(9) Mr. Huntington, Environmental Coordinator, Michigan ARNG

5. PROCEDURES.

a. Automated Monitoring of Continuous Noise Environment.

(1) The Metrosonics model db301/652 noise monitoring system was used to measure the continuous noise environment. This system consisted of

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ENVIRONMENTAL NOISE ASSESSMENT NO. 52-34-0445-85
NOISE ENVIRONMENT FROM OPERATIONS
CAMP GRAYLING, MICHIGAN
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3. PURPOSE. Assess the noise environment from operations at Camp Grayling, Michigan.

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a. Background.

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(2) Grayling Army Airfield (GAAF) is located adjacent to the town of Grayling. This airfield is used by the National Guard Aviation Units and the community. The Guard flies helicopters, C130 and twin-engine aircraft in and out of the airfield. Business jets and private aircraft also use the airfield.

(3) The artillery range at Camp Grayling is located in the northern section of the installation near Guthrie Lake. The area around this lake has been recently developed. The Guthrie Lake homeowner's organization, the Guthrie Lakes Enchanted Forests Property Owners Association, has been complaining about the noise from the artillery range and has threatened to take legal action to close the range.

(4) The noise contours for large-amplitude impulsive noise at Camp Grayling (reference 2) showed that the clearly unacceptable noise zone extended into the Guthrie Lake area, with the southern half of the lake inside this zone. The results of a previous monitoring study (reference 3) indicated that this predicted noise zone exists.

(5) The current assessment presents the results of extensive monitoring of the impulsive noise environment around Guthrie Lake during an

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI, 30 Jul - 24 Aug 84

a Metrologger (model db301) and a Ceramic Microphone (model mk301R). The system was calibrated before each use with an Acoustical Calibrator (model cL302). The stored data, in the form of 10 minute equivalent sound levels (LEQ's), were read from the Metrologger and printed, using the Portable Metroprinter (model db652).

(2) The Metrologger samples the A-weighted sound pressure level at a rate of 4 times per second (4 Hertz). At the beginning of each monitoring period, the Metrologger was switched from "standby" to "operate", at which time the unit computed the LEQ for 10 minute samples of time. The 10 minute LEQ's were stored in the internal memory of the unit. At the end of the monitoring period, the Metrologger was switched from "operate" to "standby". The Portable Metroreader was used to read the LEQ's from the Metrologger's memory and print a permanent record of these levels.

b. Semi-Automated Monitoring of Impulsive Noise.

(1) The Bruel and Kjaer (B&K) Precision Integrating Sound Level Meter (model 2230) and the Computer Engineering Limited (CEL) Precision Impulse Integrating Sound Level Meter (model 193) with the CEL Octave Filter Set (model 178) were used to monitor the impulsive noise environment. The outputs of these sound level meters were recorded with the B&K Level Recorder (model 2306). These meters were calibrated daily with the B&K Acoustic Calibrator (model 4230).

(2) The sound level meters were set up so that the C-weighted slow level of the sound was outputted to the level recorder. The level recorder provided a time history of the sound level, with the impulsive noise showing as 'spikes' above the ambient sound level. The level of each impulsive noise event was manually read from the time history. These levels were summed, as discussed in Appendix B, to compute the DNL of the monitoring period.

c. Manual Monitoring of Impulsive Noise.

(1) The B&K Impulse Precision Sound Level Meter (model 2209) with a B&K Quartz Coated Condenser Microphone (model 4149) was used to manually monitor the impulsive noise environment. The microphone was mounted on a tripod and was connected to the sound level meter with a 3 meter cable. Two setups were used at each site to increase the range of possible meter readings to 40 decibels. The meters were calibrated before and after the measurements using a B&K Pistonphone Calibrator (model 4220).

(2) The sound level meters were set to hold the linear peak level of the event. After each event, the meter reading was recorded by the operator and the meter was reset. The C-weighted slow levels were obtained by subtracting a constant from the measured linear peak levels. Previous work (reference 6) by this Agency was used to determine that this constant was approximately equal to 20 decibels.

6. FINDINGS.

a. GAAF.

(1) Automated monitoring of the continuous noise environment was conducted at the four sites shown in Figure 1, during the period 30 July - 10 August 1984, using the Metrosonics db301/652 system. The daytime (0700-2200 hours) and nighttime LEQ's and the DNL for each site are listed in Table 2. The daily DNL's are summarized in Appendix C.

TABLE 2. SUMMARY OF LEQ's AND DNL AT GAAF

Site	Daytime LEQ(dBA)	Nighttime LEQ(dBA)	DNL(dBA)
1	64.3	54.1	64.2
2	59.5	60.5	66.8
3	59.3	55.0	62.3
4	65.6	61.0	68.4

(2) The daytime and nighttime distributions of the 10 minute LEQ's are summarized in Table 3. The minimum, mean and maximum 10 minute LEQ's for each of the 144 daily 10 minute time periods are shown in Figures D-1 to D-4, Appendix D. These figures show the general trends of the 10-minute LEQ during the 24-hour period.

TABLE 3. SUMMARY OF DISTRIBUTIONS OF 10 MINUTE LEQ's AT GAAF

	Daytime Percent of Time 10 minute LEQ(dBA) Exceeds				Nighttime					
Site	65	70	75	80	55	60	65	70	75	80
1	10.9	6.0	1.6	0.6	4.9	2.9	1.9	1.0	0	0
2	6.6	2.3	0.5	0.2	6.2	4.7	3.7	2.9	1.7	0
3	5.1	1.5	0.7	0	3.7	2.9	1.7	1.3	0.2	0
4	13.1	6.4	2.2	0.6	10.5	7.3	5.1	2.0	1.0	0.5

b. Continuous Noise Environment at Guthrie Lake Area.

(1) Automated monitoring of the continuous noise environment was conducted at sites 1 to 4 shown in Figure 2 during the period 12-23 August 1984, using the Metrosonics db301/652 system. The daytime and nighttime

LEQ's and the DNL for each site are listed in Table 4. The daily DNL's are summarized in Appendix E.

TABLE 4. SUMMARY OF LEQ's AND DNL AT GUTHRIE LAKE

Site	Daytime LEQ(dBA)	Nighttime LEQ(dBA)	DNL(dBA)
1	47.2	45.1	51.9
2	48.8	48.1	54.6
3	49.4	45.5	52.7
4	50.0	48.4	55.1

(2) The daytime and nighttime distributions of the 10 minute LEQ's are summarized in Table 5. The minimum, mean and maximum 10 minute LEQ's for each of the 144 daily 10 minute time periods are shown in Figures F-1 to F-4, Appendix F. These figures show the general trends of the 10 minute LEQ during the 24 hour period.

TABLE 5. SUMMARY OF DISTRIBUTION OF 10 MINUTE LEQ's AT GUTHRIE LAKE

	Daytime Percent of Time 10 minute LEQ(dBA) Exceeded		Nighttime			
Site	60	65	50	55	60	65
1	0.4	0.1	3.5	1.5	0.7	0
2	0.8	0.1	13.2	4.2	1.4	0
3	1.1	0.4	6.7	2.7	2.0	0.2
4	1.9	0.3	10.8	4.2	2.5	0.2

c. Impulsive Noise Environment at Guthrie Lake.

(1) The impulsive noise environment at Guthrie Lake from the artillery range was monitored at sites 1, 2 and 4 (Figure 2) with the semiautomated monitors and at sites 1, 2, 5, 6, and 7 with the manual monitors during the period 20-22 August 1984. The monitoring times at each site are listed in Table 6. The number of events measured at each site are summarized in Table 7.

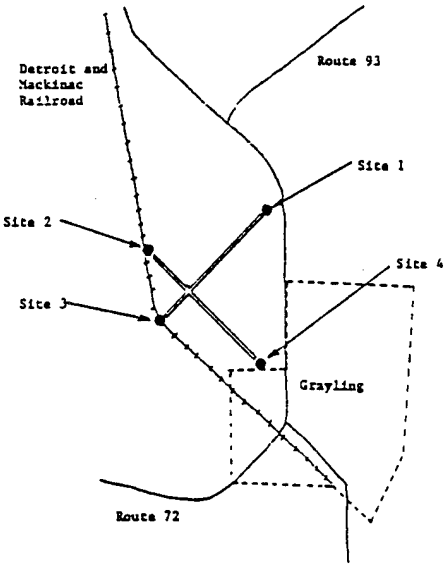

Figure 1. Monitoring sites at GAAF.

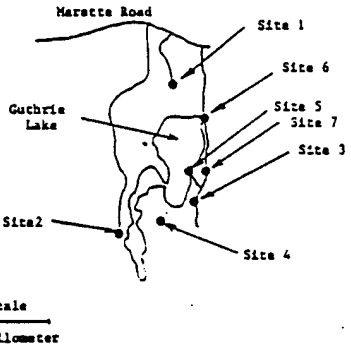

Figure 2, Monitoring sites at Guthrie Lake.

TABLE 6. SUMMARY OF MONITORING TIMES

Site	Monitoring Times (Hours) 20 Aug 84	21 Aug 84	22 Aug 84
1	1338-2315	1037-1922	-
2	1321-0125	1023-2346	0937-1840
4	1355-2312	1106-2209	0922-1430
5	-	2034-2356	-
6	1821-2051	-	-
7	2135-0035	-	-

TABLE 7. SUMMARY OF NUMBER OF EVENTS MEASURED

Site	Number Of Events Measured 20 Aug 84 Daytime	20 Aug 84 Nighttime	21 Aug 84 Daytime	21 Aug 84 Nighttime	22 Aug 84 Daytime
1	158	100	1194	-	-
2	1175	560	1553	332	781
4	256	84	887	-	318
5	-	-	125	438	-
6	201	-	-	-	-
7	29	260	-	-	-

(2) The daily C-weighted DNL's and the DNL for the monitoring period are listed in Table 8. The distribution of the linear peak levels are summarized in Table 9. These distributions are shown in Appendix G. The percent of measured events exceeding 105 linear peak decibels (dBP) for the manual monitoring sites (sites 1, 2, 5, 6 and 7) was lower than the semiautomated monitoring sites because the instrumentation used at the manual sites could measure lower sound levels.

TABLE 8. SUMMARY OF C-WEIGHTED DNL's

Site	DNL, dBC 20 Aug 84	21 Aug 84	22 Aug 84	20-22 Aug 84
1	79.4	77.1	-	78.5
2	92.8	83.3	75.1	88.8
4	81.3	79.2	84.8	81.8
5	-	81.2	-	81.2
6	71.8	-	-	71.8
7	79.3	-	-	79.3

air to ground range or jet aircraft activity during the monitoring period. However, during the Division Artillery training period (20-23 August 1984) at Camp Grayling, the DNL's increased by approximately 5 to 7 dBA. The DNL's during this period are compared with the DNL's for the previous week in Table 10.

TABLE 10. DNL's AT GUTHRIE LAKE BEFORE AND DURING ARTILLERY TRAINING

Site	DNL, dBA Before Training	During Training
1	49.2	54.3
2	50.6	56.6
3	50.3	57.3
4	51.1	58.2

(2) The increase in the DNL during the training period was caused by helicopter overflights of the area and the increased vehicle traffic in the training area. The Metrologgers used to monitor the continuous noise environment were not designed to measure impulsive noise. However, when many impulsive events occur during a short period of time, this impulsive noise does influence the monitor, causing it to read approximately 2 to 5 dBA higher than if this impulsive noise was not present.

c. Impulsive Noise Environment at Guthrie Lake.

(1) The measured C-weighted DNL's (Table 8) indicate that during Division Artillery training, a clearly unacceptable (Zone III) noise zone existed at all six monitoring locations. The monitoring sites were located within 500 feet of residences.

(2) During this 4 day training exercise, approximately 8750 artillery and mortar rounds were fired. Division Artillery training represents periods when the most rounds are fired in the shortest time period, hence, periods of maximum impact on the nearby residents.

(3) The previously generated contours for large-amplitude impulsive noise (reference 2) at Camp Grayling showed that monitoring sites 2, 4, 5, 6 and 7 are located in the clearly unacceptable noise zone. These contours were generated for an annual average condition assuming the training was distributed evenly over each training day. The noise contours generated for the Division Artillery training period show that all six monitoring sites were clearly within noise Zone III.

(4) The results of the 1983 monitoring study (reference 3) also showed that the clearly unacceptable noise zone extended into the Guthrie

TABLE 9. SUMMARY OF DISTRIBUTIONS OF MEASURED LEVELS

Site	Daytime Percent of Measured Events Exceeding, dBP 105	110	115	120	125	130	135
1	77.1	35.5	9.2	2.3	0.1	0	0
2	89.4	54.1	31.7	15.4	3.4	0.2	0
4	100.0	75.4	36.5	10.0	2.6	1.0	0.2
5	40.0	20.0	2.4	0	0	0	0
6	35.8	11.4	3.5	2.0	0	0	0
7	3.4	0	0	0	0	0	0

Site	Nighttime 105	110	115	120	125	130
1	100.0	79.0	37.0	3.0	0	0
2	46.5	28.4	14.9	10.0	5.7	0.6
4	100.0	70.2	55.9	14.3	1.2	0
5	35.3	18.7	3.4	0	0	0
7	34.2	11.9	0.4	0	0	0

7. DISCUSSION.

a. GAAF.

(1) The measured DNL values (Table 2) show that the normally unacceptable (Zone II) noise zone extends beyond the ends of the northwest-southeast runway (sites 2 and 4). This noise zone also extends to approximately the ends of the northeast-southwest runway (sites 1 and 3). The noise zone may extend into Grayling near the southeast end of the runway. Noise contours for GAAF should be generated so that this noise zone can be defined.

(2) The maximum 10 minute LEQ's (Figures D-1 to D-4) during the hours that the airfield is operating are caused by aircraft noise at sites 1 and 4. At sites 2 and 3, these maximum values are caused by aircraft noise and railroad noise from the Detroit and Mackinac Railroad line adjacent to the airfield. During hours when the airfield is not operating, these values are caused by traffic noise on Route 93, railroad noise and bird noise. The minimum 10 minute LEQ's are caused by the existing ambient sound level (when the level is greater than 40 dBA) or the Metrologger baseline level (40 dBA).

b. Continuous Noise Environment at Guthrie Lake.

(1) The measured DNL's from the continuous noise (Table 4) in the Guthrie Lake area indicate that this area is normally quiet. There was no

Lake area. The 1983 West Side site corresponds to site 2 and the East Side site to site 5. The DNL's during the 1983 monitoring periods were 79.8 dBC at site 2 and 80.3 dBC at site 5.

(5) The guidelines established by the Naval Surface Weapons Laboratory, Dahlgren, Virginia (reference 7) can also be used to evaluate the potential of noise complaints and damage claims caused by impulsive noise. These guidelines are listed in Table 11.

TABLE 11. GUIDELINES FOR EVALUATION OF IMPULSIVE NOISE

Linear Peak Level (dBP) Single Events	Rapid Fire	Potential of Complaints and Damage Claims
100-115	90-105	Low risk of noise complaints
115-130	105-120	Moderate risk of noise complaints
130-140	120-140	High risk of noise complaints Possibility of damage claims
>140	>140	Threshold of permanent physiological damage to unprotected ears High risk of physiological and structural damage claims

(6) Table 12 shows the number of measured events in each of the four risk categories for both the 1983 and 1984 studies. Because of the large number of rounds fired, the "rapid fire" category is being used. This Table shows that there is a high risk of noise complaints and the possibility of damage claims exists at all monitoring sites except site 7. During the 1984 Division Artillery training, noise complaints were received by Camp Grayling every day from Guthrie Lake residents.

TABLE 12. NUMBER OF MEASURED EVENTS IN EACH RISK CATEGORY

Study	Site	90-105 dBP	105-120dBP	120-140 dBP	>140 dBP	Number of Events Measured
1984	1	309	1110	33	0	1452
	2	449	3323	629	0	4401
	4	*	1387	158	0	1545
	5	357	206	0	0	563
	6	129	68	4	0	201
	7	200	89	0	0	289
1983	2	268	638	95	0	1001
	5	749	683	113	0	1545

* Did not measure any events in this range because of the monitor baseline level.

d. Installation Compatible Use Noise Zone (ICUZ) Program.

(1) The purpose of the ICUZ program is to safeguard the installation's mission capabilities from off-post encroachment. The Michigan Army National Guard (MIARNG) should begin an ICUZ program as required by AR 200-1. The ICUZ program includes quantification of the existing and future noise environments, coordination with zoning and planning agencies, and exploration of noise mitigation methods to reduce the noise impact. This report quantifies from noise measurements the existing noise environment at GAAF and Guthrie Lake.

(2) To complete the quantification phase of the ICUZ program, noise contours need to be generated for GAAF, aircraft activity at the air to ground range, and small arms ranges. The information required to generate the contours for the airfield and aircraft activities is listed in reference 5. The information required to generate the contours for the small arms ranges is the location of each range, the direction of fire on each range, and the weapons fired on each range.

(3) The noise contours for the large-amplitude impulsive noise were presented in a previous Agency report (reference 2). The information used to generate these contours, listed in the report, should be verified to assure it is current, and if required, these contours should be regenerated using current information.

(4) MIARNG personnel should coordinate with Otsego and Crawford Counties planning and zoning agencies to assure land uses remain compatible with the noise environment. Failure to ensure that these land uses remain compatible with the noise environment could reduce Camp Grayling's capability to perform its mission.

(5) Noise mitigation techniques for the artillery range might include moving firing points further from the developed areas, using smoke or illumination rounds instead of high explosive rounds, and reducing the amount of firing after 2200 hours. When specific noise mitigation has been determined, these changes can be modeled to determine the change in the environmental impact. Upon request, this Agency can do the modeling.

8. CONCLUSIONS.

a. The monitoring of the noise environment at GAAF indicates that the normally unacceptable (Zone II) noise zone may extend into Grayling. Noise contours for the airfield are required to determine the extent of this impact.

b. The monitoring of the continuous noise environment in the Guthrie Lake area showed that the area is normally quiet. During intensive training at the Artillery Range, the DNL in this area increased by 5 to 7 dBA, but is still less than the continuous noise criteria.

c. The monitoring of the impulsive noise environment in the Guthrie Lake area showed that all monitoring sites were in a clearly unacceptable (Zone III) noise zone. The measured levels indicate that the potential of a

high risk of noise complaints and the possibility of damage claims exists. During the monitoring period, noise complaints were received every day from the Guthrie Lake residents.

d. An ICUZ program is needed at Camp Grayling to quantify the existing and future noise environments and to coordinate with planning and zoning agencies to prevent further encroachment of noncompatible land uses which could reduce Camp Grayling's capability to perform its mission.

9. RECOMMENDATION. Initiate an ICUZ program as required by AR 200-1.

NELSON D. LEWIS
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1LT, MS
Environmental Engineer
Bio-Acoustics Division

APPROVED:

for RODNEY M. ATACK
LTC, MS
Chief, Bio-Acoustics Division

APPENDIX A

REFERENCES

1. AR 200-1, 15 June 1982, Environmental Protection and Enhancement.

2. Letter, USAEHA, HSHB-OB/WP, 17 January 1983, subject: Installation Compatible Use Noise Zone Special Study No. 52-34-0479-83, Camp Grayling, Michigan, November 1982.

3. Letter, USAEHA, HSHB,OB/WP, 3 April 1984, subject: Environmental Noise Assessment No. 52-34-0426-84, Blast Noise Measurements at Camp Grayling, Michigan, 4-17 August 1983.

4. TM 5-803-2, 15 June 1978, Environmental Protection: Planning in the Noise Environment.

5. USAEHA Technical Guide No. 122, June 1981, NOISEMAP Airfield Contour Data Collection.

6. Technical Paper, N. D. Lewis and G. A. Luz, "Variables to be Considered when Predicting the L_{dn} of Blast Noise," presented at the 92nd Meeting of the Acoustical Society of America, November 1976.

7. Technical Paper, L. L. Pater, "Noise Abatement Program for Explosive Operations at NSWC/DL," presented at the 17th Explosives Safety Seminar, September 1976.

APPENDIX B

ENVIRONMENTAL NOISE EVALUATORS

1. BACKGROUND.

a. Noise is the variation of the air pressure about a mean (atmosphere) pressure. These changes in the atmospheric pressure [100,000 Pascals (14.7 pounds per square inch) (psi)] vary from approximately 0.0006 Pascal (.08 x 10^{-6} psi) for a whisper at 5 feet to 1,000 Pascals (0.15 psi) for the firing of a M16 rifle at the firer's ear. Because of this large range of sound pressure and the fact that the human ear responds more closely to a logarithmic scale rather than a linear scale, sound pressures are expressed using a logarithmic scale. The sound pressure level (SPL) is defined as:

$$SPL = 10 \log \left(\frac{P}{P_o}\right)^2 \qquad (1)$$

where P = sound pressure, Pascals
P_o = reference sound pressure (0.00002 Pascal).

The SPL is measured in decibels (dB). For example, if the sound pressure doubles, the SPL increases by 6 dB.

b. In environmental noise, the SPL is usually measured using one of the frequency weighting networks of the sound level meter. Since the human ear is more sensitive to sounds of 1,000 hertz and above than to sounds of 125 hertz and below, it is appropriate to apply a weighting function to the noise spectrum which will approximate the response of the human ear. The A-weighting frequency network of the sound level meter de-emphasizes the lower frequency portion of the noise spectrum, as shown in the figure, to approximate the human ear's response to the noise. Thus, the A-weighting of the frequency content of the noise signal has been found to have an excellent correlation with the human subjective judgment of annoyance to the noise. The SPL's measured using the A-weighting network are expressed as dBA.

c. To assess the additional annoyance caused by low frequency vibration of structures, the C-weighting network is used to evaluate the impulsive noise from all weapons whose projectiles are 40 mm and larger. The relative frequency response of the C-weighting network is also shown in the figure. The SPL's measured using the C-weighting network are expressed as dBC.

2. EVALUATORS.

a. A characteristic of environmental noise is that it is not steady, but varies in amplitude from one moment to the next. To account for these variations in the SPL with time, and to assess environmental noise in a consistent and practical manner, a statistical approach has been used to reduce the time-varying SPL to single numbers. The accepted single number evaluators of environmental noise are the equivalent sound level (LEQ) and the day-night sound level (DNL).

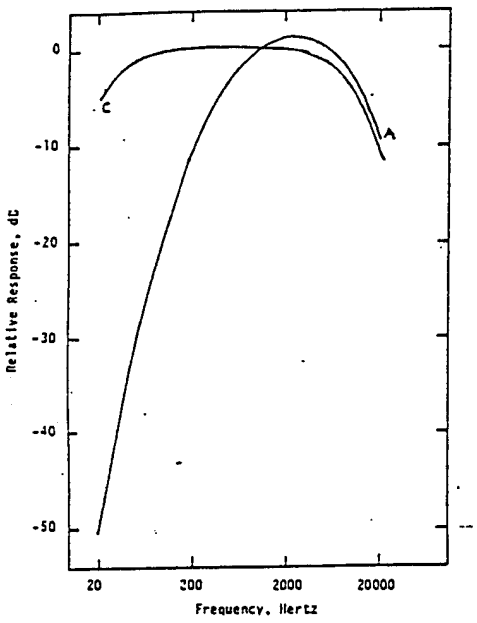

FIGURE. Relative frequency response of the A-weighting and C-weighting networks.

b. An LEQ is defined as the equivalent steady state sound level which in a stated period of time would contain the same acoustic energy as the time-varying sound during the same period. Mathematically, for a sampled noise signal, it is equal to:

$$LEQ = 10 \log \frac{1}{N} \sum_{i=1}^{N} 10^{(SPL_i/10)} \qquad (2)$$

where SPL_i is the with sampled SPL in dB.

N is the total number of samples.

The LEQ is usually computed for a 1 minute, 10 minute, 30 minute, 1 hour, 8 hour or 24 hour segment of environmental noise.

c. As equation (2) indicates, the LEQ is an logarithmic average. The logarithmic average puts more emphasis on the higher SPL's than an arithmetic average. For example, if 10 sampled SPL's consist of 9 values at 60 dBA and 1 value at 80 dBA, the LEQ is equal to 70 dBA. The arithmetic average of these SPL's is 62 dBA.

d. The acoustical energy of an event, such as an aircraft flyover, is equal to the LEQ of the event plus a correction factor for the duration of the event. That is:

$$\text{Acoustical Energy} = LEQ + 10 \text{ Log } \left(\frac{T}{T_o}\right) \qquad (3)$$

where: T is the duration of the event in seconds.

T_o is the reference duration (1 second).

e. To assess the added annoyance of the environmental noise during the nighttime hours (2200-0700), the DNL is used. The DNL is the 24 hour LEQ, with a 10 decibel penalty added to the nighttime levels. Using the hourly LEQ's, the DNL is equal to:

$$DNL = 10 \log \frac{1}{24}\left[\sum_{i=1}^{15} 10^{(LEQ_i/10)} + \sum_{j=1}^{9} 10^{(LEQ_j+10)/10}\right] \qquad (4)$$

where: LEQ_i is the LEQ of the ith daytime hour (0700-2200)

LEQ_j is the LEQ of the jth nighttime hour.

3. NOISE CONTOURS.

a. Noise contours are generated using the DNL evaluator. The contours are computed by averaging over the time period of interest, the acoustical energy from the operations of the set of noise sources of interest. The averaging period is usually a busy day or a year. The contours, representing the boundaries between the noise zones, are constructed by connecting points of equal acoustical energy.

b. For example, the contours for an airfield are computed by averaging at many points the acoustical energy arriving at these points from the aircraft operations. As indicated in equation (4), a 10 dBA penalty is added to all nighttime operations. The contours for the airfield are constructed by connecting all points having an acoustical energy equal to 65 dBA and connecting all points equal to 75 dBA.

APPENDIX C
SUMMARY OF DAILY DNL's AT GAAF

Date: 1984	DNL (dBA) Site 1	2	3	4
30 Jul	61.1	56.7	60.1	70.4
31 Jul	63.7	58.8	59.8	59.6
1 Aug	63.7	56.8	58.9	65.5
2 Aug	57.0	56.5	54.3	59.9
3 Aug	55.3	62.5	54.4	70.8
4 Aug	53.7	55.6	53.7	65.0
5 Aug	64.6	57.2	59.1	65.2
6 Aug	64.0	53.9	55.3	65.9
7 Aug	-	74.9	70.8	70.4
8 Aug	68.7	71.1	50.1	72.0
9 Aug	68.2	66.5	63.4	71.0
10 Aug	55.9	55.4	52.3	70.6

APPENDIX D

MAXIMUM, MEAN, AND MINIMUM 24 HOUR TIME HISTORIES
FOR GAAF

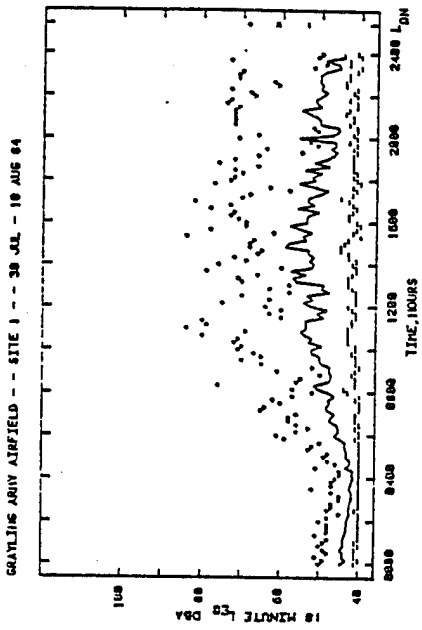

Figure D-1, Maximum, mean, and minimum 24 hour time history for site 1.

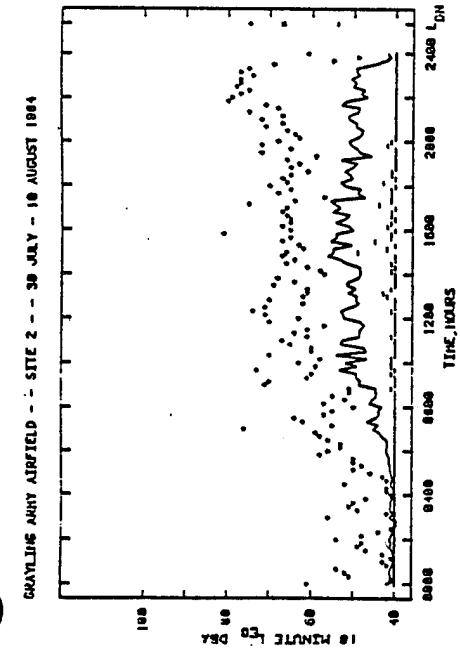

Figure D-2, Maximum, mean, and minimum 24 hour time history for site 2.

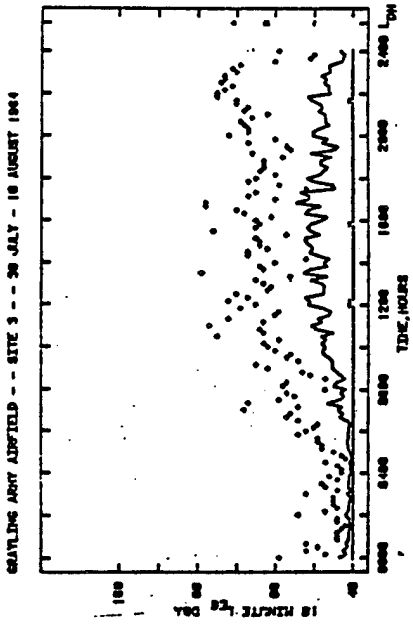

Figure D-3, Maximum, mean, and minimum 24 hour time history for site 3.

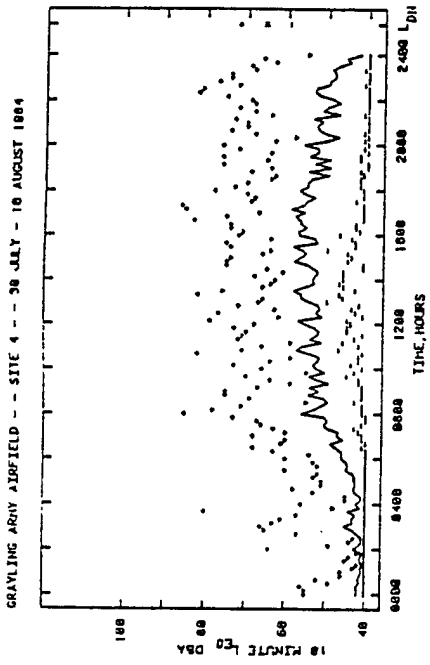

Figure D-4, Maximum, mean, and minimum 24 hour time history for site 4.

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI,
30 Jul - 24 Aug 84

APPENDIX F

MAXIMUM, MEAN AND MINIMUM 24 HOUR TIME HISTORIES FOR GUTHRIE LAKE AREA

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI,
30 Jul - 24 Aug 84

APPENDIX E

SUMMARY OF DAILY ONL's AT GUTHRIE LAKE AREA

Date: August 1984	DNL (dBA) Site 1	2	3	4
12	48.3	50.9	48.2	49.7
13	48.6	48.3	52.5	49.0
14	50.6	50.5	52.0	51.9
15	50.4	50.7	51.5	52.0
16	49.5	53.9	49.8	54.2
17	48.4	43.6	47.9	47.8
18	49.1	-	50.3	52.1
19	48.3	-	47.3	47.4
20	51.7	56.2	56.1	57.0
21	58.8	59.7	61.6	62.4
22	51.0	55.8	53.3	54.3
23	45.5	50.5	48.5	50.6

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI
30 Jul - 24 Aug 84

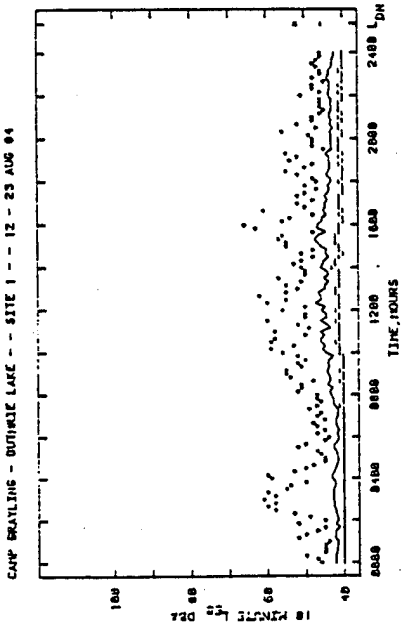

Figure F-1, Maximum, mean, and minimum 24 hour time history for site 1.

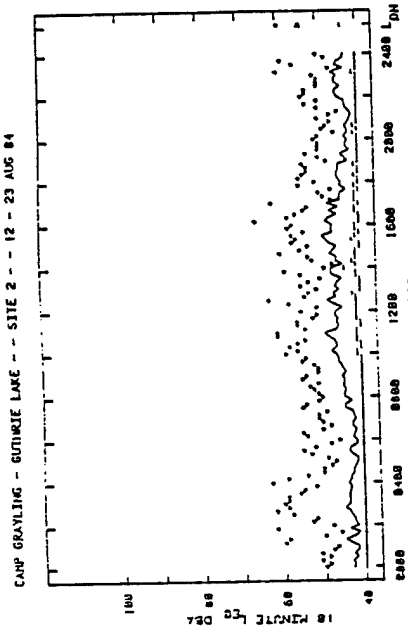

Figure F-2. Maximum, mean, and minimum 24 hour time history for site 2.

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI,
30 Jul - 24 Aug 84

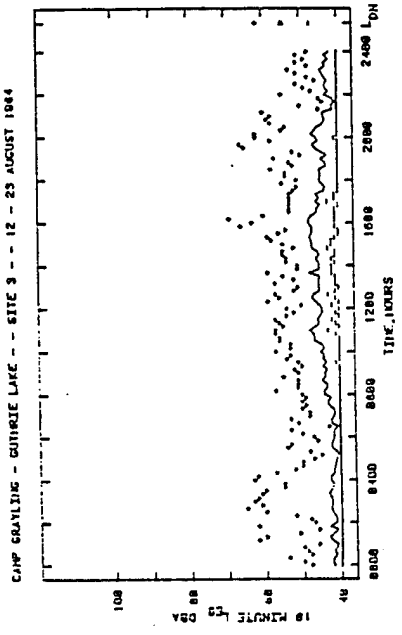

Figure F-3. Maximum, mean, and minimum 24 hour time history for site 3.

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI,
30 Jul - 24 Aug 84

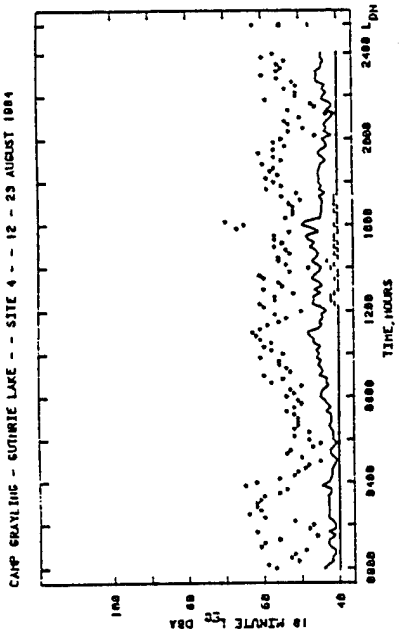

Figure F-4. Maximum, mean, and minimum 24 hour time history for site 4.

APPENDIX G

DISTRIBUTIONS OF IMPULSIVE EVENTS LEVELS AT GUTHRIE LAKE AREA

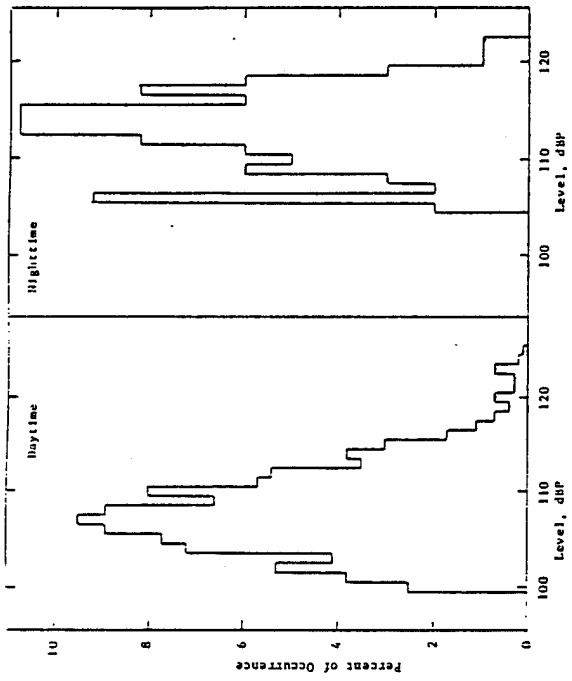

Figure G-1. Distributions of impulsive event levels at site 1.

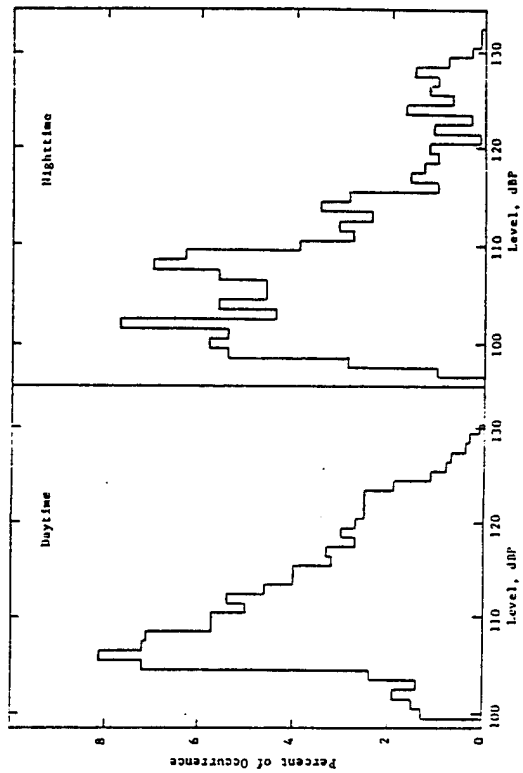

Figure G-2. Distributions of impulsive event levels at site 2.

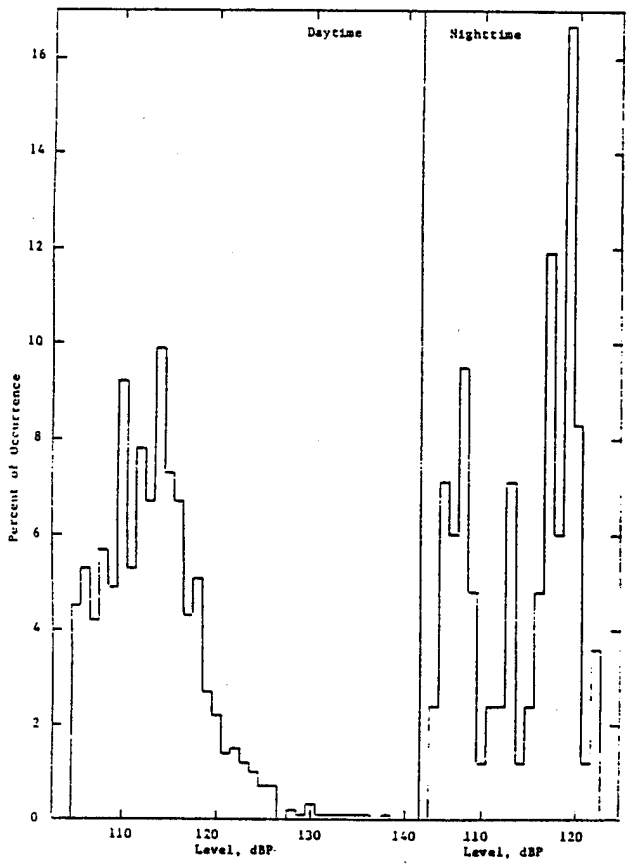

Figure G-3. Distributions of impulsive event levels at site 4.

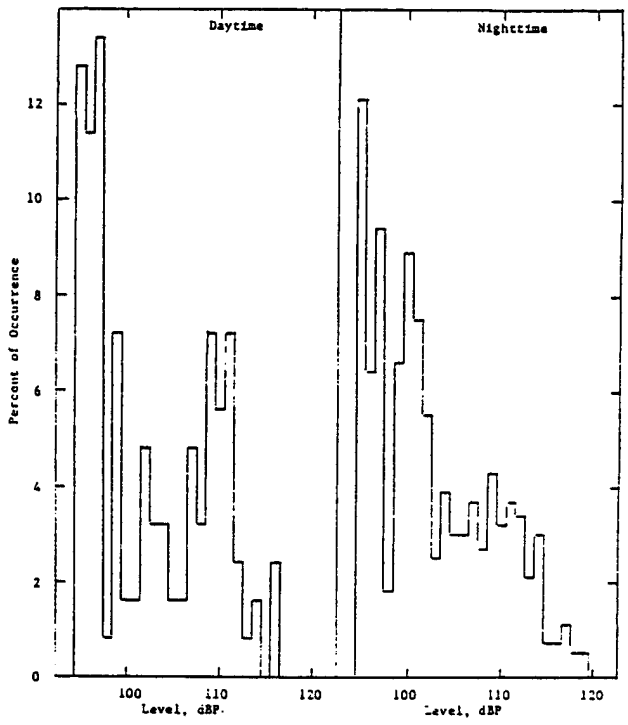

Figure G-4. Distributions of impulsive event levels at site 5.

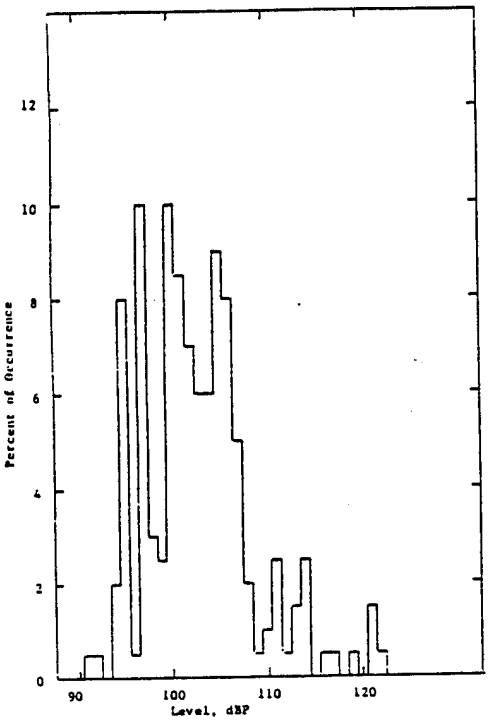

Figure C-5. Daytime distribution of impulsive event levels at site 6.

Environmental Noise Assessment No. 52-34-0445-85, Camp Grayling, MI,
30 Jul - 24 Aug 84

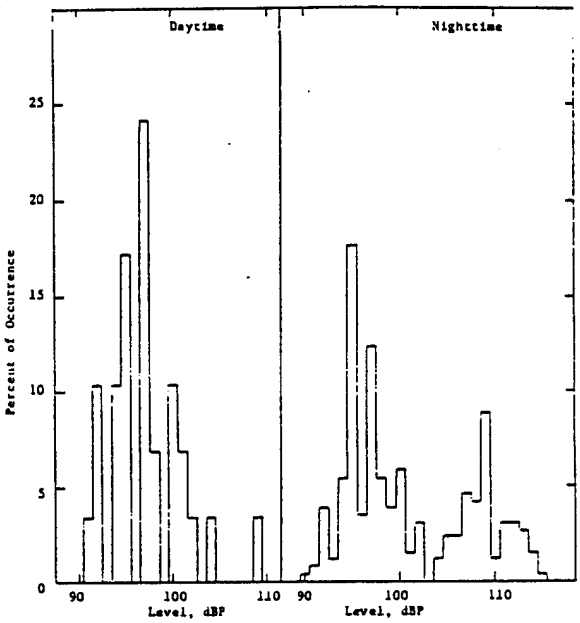

Figure C-6. Distributions of impulsive event levels at site 7.

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APPENDIX K

Training Site Agreement

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FIGURE 3-1

Office of the Commander
Camp Grayling
Grayling, Michigan 49739-0001

TRAINING SITE AGREEMENT

EDITION: 2 June 1990

Between the Adjutant General of Michigan

and

_____

For the period: _____

1. GENERAL. Camp Grayling is owned and operated by the State of Michigan through a cooperative agreement with the Chief, National Guard Bureau. The Camp's facilities are available to assist the training of the Armed Forces of the United States, the National Guard of the various states, and, under certain circumstances, the armed forces of foreign allies of the United States.

2. POLICY. It is the policy of the State of Michigan to assist the units training at Camp Grayling to the maximum extent practicable, and, at the same time, require those units/individuals to strictly adhere to the rules and regulations governing that training. To that effect, this TRAINING SITE AGREEMENT must be executed by the senior commander of any unit desiring to train at Camp Grayling as a part of the scheduling process.

3. RESPONSIBILITY OF THE ADJUTANT GENERAL OF MICHIGAN. The Adjutant General of Michigan will (thru the Commander, Camp Grayling), within the capabilities of the Camp, provide facilities and logistical/administrative support necessary to conduct all approved and coordinated training activities at Camp Grayling.

4. RESPONSIBILITY OF THE USING UNIT COMMANDER. The using unit commander will ensure that all members of his/her command comply with the polices and procedures established in the following post regulations, with emphasis to the special operating requirements outlined in Chap 4, CG Reg 350-10.

a. CG Reg 350-10, Facility Scheduling and Management

b. CG Reg 385-1, Range Regulations

c. CG Reg 55-1, Environmental Protection

5. ACKNOWLEDGMENT OF AUTHORITY OF CAMP COMMANDER. The using unit commander, by affixing his/her signature to this TSA, acknowledges the authority of the Commander, Camp Grayling

a. To suspend any activity which he finds to be in violation of any regulation or standard governing the use of Camp Grayling.

b. To require using unit to repair environmental damage according to procedures established in CG Reg 55-1.

6. CLAIMS. All claims for any damage by the using unit or its members will be processed under the provisions of AR 27-20 and applicable federal statutes, DOD directives and regulations.

FOR THE ADJUTANT GENERAL OF MICHIGAN:

_____ DATE: _____
(Camp Commander Signature)

UNITS/INDIVIDUALS UNDER MY COMMAND WILL COMPLY:

_____ DATE: _____
(Using Unit Commander Signature)

Enclosures: Yes/No (Exceptions to Policy)

FIGURE 3-1

CHAPTER 4
SPECIAL OPERATING REQUIREMENTS

4-1. PURPOSE. To establish and announce special operating requirements to be applied by all users of Camp Grayling.

4-2. OPERATIONAL REQUIREMENTS.

a. Records and Reports.

(1) Journals. It is recommended that units maintain journals and journal files as described in FM 101-5 in order to provide a record of unit events while conducting training and/or operations at Camp Grayling. Such records are invaluable in completing the After Action Report.

(2) After Action Report, CG Fm 2-45R. Each using organization or unit is required to submit an After Action Report as a part of the "out-processing" requirements for either IDT or AT. (Refer to para 3-4 for details.)

b. Vehicle Markings. Bumper markings, or like vehicle identification, will not be covered or otherwise obscured while being operated on Camp Grayling.

c. Road Closings.

(1) Roads, other than those through range safety fans, must not be closed to through traffic unless coordinated with, and approved by, Camp Grayling Operations.

(2) Training which requires the closing of roads must be identified and coordinated well in advance as in some cases notices of closings must be announced to the public.

4-3. ENVIRONMENTAL PROTECTION. There are two (2) key references which prescribe procedures and provide guidance for protection of the Camp Grayling environment. Guidance for military commanders, their staffs, and for civilian agencies is contained in CG Reg 55-1, Environmental Protection. Every individual, military and civilian, must refer to and comply with the provisions of MI ARNG Pam 420-2, "The Soldier and Camp Grayling Resources".

a. Disposal of Trash, Litter and Garbage.

(1) Burial of this material is not authorized. See CG Reg 55-1 for correct procedures.

(2) Units will furnish their troops with suitable containers (for example, small plastic bags) for individual trash, with particular emphasis placed on the proper disposal of MRE residue. Bags are available from the Logistical Support Facility by request or from any section of the Camp's staff on an emergency basis.

FIGURE 3-1

b. Vehicle Washing. Unit vehicles will only be washed at approved wash pads located on the cantonment area. (Refer to para 3-1 for additional details.) Under no circumstances will vehicles be washed in any lake, river, stream, pond or wet lands.

c. Tree Cutting.

(1) Tree branches within 6 feet of the ground and less than 3 inches in diameter may be cut in the conduct of training. Live weeds and grasses may be used for camouflage. Care should be taken to ensure that the trees and the ground are not stripped bare of vegetation.

(2) By permit only, other trees may be cut in designated areas. Priority will go to engineer units undergoing ARTEP missions. These permits will be issued through Post Operations at Bldg 12. Operations will coordinate with the Post Facility Engineer as a part of the approval process, and prior to issuing any permits.

d. Stream/Lake Activity.

(1) Vehicles, other than ribbon bridge carriers, will not enter any stream or lake for any purpose.

(2) With the exception of established roads and trails, vehicle operations and other training not approved for water operations, must maintain a 200 ft. clearance of all waterways. This extends to 400 ft. on the Ausable and its tributaries.

(3) With the exception of designated water-borne training sites, no training activities of any kind are permitted within 200 ft. of any body of water on Camp Grayling. All water-borne training must be approved in advance by Camp Grayling Operations. (See para 3-9, CG Reg 55-1.)

e. POL Spills. When POL spills occur, it is imperative that the unit or individuals involved notify Post Operations, by 6 digit coordinate, immediately and implement the following emergency procedures:

(1) Damage Control.

(a) Stop the source of spill flow immediately.

(b) Contain spill using whatever means readily available. Earthen fill dams or sandbags are very effective.

(2) Reaction procedures.

(a) Prevent spill from flowing into drainage ditches, storm and sewer drains, and bodies of water.

(b) Attempt to dig out (within safety concerns) contaminated soil with any means at hand (including hand shovels); deposit soil on an impervious surface or in a container (plastic bags or steel drum) which will prevent further contamination.

(c) Limit access to spill area. Do not allow matches, lighters, smoking or sparking mechanisms in the spill area.

(d) Request additional support through the chain of command.

(e) Report 6 digit coord or building number location to Camp Grayling Operations on frequency 41.80 or phone 3747.

f. Excavations and Construction as a Part of Barrier Plans.

(1) All digging beyond individual and crew fighting positions (i.e., engineer obstacles such as tank ditches and craters) must have prior approval by Camp Grayling Operations.

(2) Plans for training which involves the construction of barrier plans will be submitted to Camp Grayling Operations as a part of the scheduling process described in Chap 2 of this regulation and must include the unit designation, date(s) and specific location of each operation.

(3) An approved overlay authenticated by Camp Grayling Operations detailing major digging/trenching operations will be in the possession of the unit before work begins.

(4) All road blocks must be approved prior to the start of any mission (see para 4-2c above.)

(5) All barrier materials will be removed by the using unit.

(6) Excavations will be filled to a one foot mound of soil above the ground.

4-4. NOISE ABATEMENT PROCEDURES. In consideration of local residents and recreational users of the Grayling area, the following noise abatement procedures are established for the Range 30 and 40 complexes.

a. Maingun tank and artillery firing, aircraft bombing and the firing of demolitions in excess of 2 pounds will begin no earlier than sunrise and cease no later than three (3) hours after sunset. Only the Camp Commander has the authority to grant extension to the training hours when required to complete METL training, such as EXEVAL. Exceptions must be fully justified and documented on the form provided at Figure 4-1.

b. Official sunrise and sunset times will be published by Range Operations.

operating on a NOE course approved by the MI ARNG State Aviation Officer.

(2) Other than those minimum altitudes indicated on the Skywatch map, there are no set altitude minimums over the reservation.

c. Prohibited Flying Areas.

(1) Overflights of Hartwick Pines State Park is prohibited.

(2) Overflights under 1500 ft MSL of the Eagle's nest located at the north edge of Range 40 are prohibited, including a 5Mum buffer zone.

(3) All safety and/or altitude/overflight violations will be reported immediately to Camp Grayling Airfield Operations.

4-5. SAFETY.

a. Vehicle safety.

(1) Military convoys of units conducting training at Camp Grayling are expected to obey all traffic signals both on and off the reservation.

(2) Military vehicles will not operate on public roads while in a blackout drive configuration.

(3) While operating on public roads, vehicle drivers will be at no higher than a MOPP level 2.

b. Fires.

(1) Open fires are expressly prohibited anywhere on the reservation. Exceptions may be permitted when written permission is obtained in advance from Range Operations, Bldg 12. Military personnel violating this provision will be reported to the Commander of Troops for appropriate action. Civilians who start open fires without first obtaining permission will be advised to put them out. Should they fail to do so, the Camp Commander may have them removed from the reservation.

(2) Camp Grayling Operations will be notified (41.80) immediately of any fires by grid coordinate. Persons at the scene will attempt to contain the fire.

c. Swimming. Individuals using the cantonment area beach should be advised that swimming will be at their own risk. Units should appoint a qualified person to oversee the beach swimming area during free time. All swimmers are to utilize a "buddy system" to supplement safety policy and/or equipment provided by the facility and the chain of command.

c. Holiday Restrictions. The noise reduction procedures outlined in para a. above also apply to Ranges 30 and 40 between 1600 hrs on Friday until sunrise on the following Tuesday for the following holiday periods.

(1) Memorial Day weekend.

(2) Fourth of July weekend.

(3) Labor Day weekend.

d. Trout Season Restrictions. The restrictions established in para a. above also apply on the opening weekend of trout season (last weekend in April) from 3 hrs after sunset Friday to sunrise Monday.

NOTE: All ranges are closed 15-30 November due to firearm deer season.

4-6. ARMY AVIATION ACTIVITIES.

a. Skywatch Program. Camp Grayling Airfield Operations will provide each visiting aviation element with a briefing on the Skywatch program and will provide the SOP and overprinted maps required to operate the system. All pilots training at the Camp will participate in this program when specified by Camp Grayling Airfield Operations.

b. Identification Numbers. (Anti-buzz Numbers)

(1) Helicopters using Camp Grayling at any time will have sequential identification numbers assigned by their command.

(2) Numbers will be displayed on the underside of the aircraft along with the letter designating the state or major command responsible for the aircraft, i.e., "M-12" for a Michigan helicopter, "O-12" for Ohio, "I-12" for Indiana, "AR-12" for Army Reserve units, etc.

(3) Numbers will be no less than ten inches high and their width will be two-thirds of their height.

(4) Each command will provide the Camp Grayling Airfield with a list to cross reference tail numbers and "anti-buzz" numbers.

(5) The Camp Grayling Airfield Commander will provide further guidance in the event of conflicts with the numbering system.

c. Flying Altitudes.

(1) Military aircraft utilizing Camp Grayling facilities to support their training will maintain a minimum altitude of 500' AGL when outside the boundaries of the reservation other than when

4-7. CIVIL AFFAIRS.

a. Citizen Complaints. Expression of dissatisfaction on the part of citizens towards military activities on or around Camp Grayling will be handled as follows:

(1) The senior person present will act as spokesperson for the military. If he/she is unable to resolve the conflict, ask for a name, address, and phone number. State the fact that a military official will contact him/her for a resolution of the complaint. The complainant will also be given the Camp Grayling "Hot Line" phone number of 348-3708 or 1-800-626-5829.

(2) All incidents regardless of resolution or cause will be reported to Camp Grayling Operations as soon as practicable.

b. Civilian Interference. Any activity on the part of civilians which interferes with legitimate military activities will be reported to Camp Grayling Operations immediately. No effort will be made to confront any citizen, other than a simple warning of the problem being caused.

c. Individual Standards of Conduct. Soldiers and airmen assigned to, attached to, visiting, or training at Camp Grayling will conduct themselves in a manner which does not bring discredit upon themselves or the Armed Forces. This standard applies to off-duty conduct as well as on-duty.

d. Weapons in the Civilian Community. Weapons handled or displayed inappropriately in the civilian community can cause fear and/or apprehension needlessly. General guidelines on this issue on or around Camp Grayling include:

(1) With the exception of Military Police performing assigned duties, no soldier will enter any civilian establishment while in possession of a weapon.

(2) Military weapons will not be displayed in the civilian community with the exception of vehicle mounted weapons conducting authorized movements on public roads.

e. Uniform/Clothing Standards. The wear of the Battle Dress Uniform or similar training garment is discouraged for wear in civilian establishments, particularly after 1700 hours. The chain of command must establish and announce policy in this matter. The Camp Commander will assist with enforcement of command policy when requested.

4-8. DISCIPLINE & LAW ENFORCEMENT.

a. Policy. Soldiers assigned to, attached to, visiting in an official capacity, and/or training at Camp Grayling are under military authority 24 hours a day.

b. Civil/Military Discipline & Law Enforcement Cooperation. It is the Adjutant General of Michigan's order that military authorities at every level and in every capacity cooperate fully with the civil law enforcement authorities.

c. Trespassing.

(1) Trespassing on private property is strictly prohibited.

(2) Accidental incursions onto private property, and any associated damage, will be reported to Camp Grayling Operations immediately.

d. Personal Weapons. Military personnel are prohibited from bringing personal weapons (firearms, knives, martial arts devices, etal) to Camp Grayling without obtaining the prior approval of the Camp Commander. Each weapon or article that is approved shall be duly registered, inspected, and identified by the Camp Commander.

4-9. EXCEPTIONS TO POLICY. Exceptions to policy established by this Chapter or referenced regulations will be requested using the format of Figure 4-1, thru Camp Grayling Operations to the Camp Commander.

FIGURE 4-1

MEMORANDUM OF UNDERSTANDING
for
EXCEPTIONS TO POLICY

Between
The Adjutant General of Michigan
and

_____

For the Period: _____

1. POLICY: _____

EXCEPTION: _____

_____

_____

2. POLICY: _____

EXCEPTION: _____

_____

_____

FOR THE ADJUTANT GENERAL OF MICHIGAN:

_____ DATE: _____
(Camp Commanders Signature)

NOTE: Use continuation sheets as needed.

STATE OF MICHIGAN
DEPARTMENT OF MILITARY AFFAIRS
INSTALLATION SUPPORT UNIT
CAMP GRAYLING, MICHIGAN 49739-0001

CAMP GRAYLING
REG 55-1

1 January 1990

CAMP GRAYLING
ENVIRONMENTAL PROTECTION

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CHAPTER 1

ENVIRONMENTAL PROTECTION

1-1. PURPOSE: To establish policy, procedure and guidelines, to insure that environmental concerns and standards are addressed in an efficient and timely manner on the Camp Grayling Military Reservation. Also, to facilitate the identification of offending units/individual(s) who violate provisions of our environmental regulation. This Reg will be the principal source of guidance on environmental concerns for all units/agencies/individuals while at Camp Grayling.

1-2. APPLICABILITY:

a. Items and standards set forth in this document apply to all units/individuals/agencies utilizing Camp Grayling facilities; without regard to length of use, or controlling headquarters.

b. The unit Environmental Protection Officer (EPO) representing the battalion, separate company, or higher will report to Building #12 for an environmental briefing prior to commencing their training or within 24 hours of arrival at Camp Grayling, whichever occurs first.

1-3. REFERENCES:

a. CG Reg 385-1, Range Safety

b. CG Reg 210-10, Index of Camp Grayling Publications (March 1988 w/change 1 dtd 14 Apr 89 & change 2 dtd 24 Jul 89)

c. TC 8-2, Field Sanitation Team Training (Sep 78)

d. FC 8-6, Unit Field Sanitation Team

1-4. DEFINITIONS: For the purpose of this Reg, the following definitions are applicable:

a. Post Environmental Protection Officer (EPO): A commissioned officer who works directly for the Post Commander, and under the direct supervision of the Post Operations Officer with overall responsibility for the administration and enforcement of Camp Grayling environmental protection (EP) policy.

b. Post Environmental Protection NCO (EPNCO): A noncommissioned officer, appointed by the Director of Plans, Training and Security, and is the principle assistant to the EPO.

c. Unit Environmental Protection Officer: An additional duty assignment appointed at battalion and higher unit levels who has the responsibility for insuring that EP standards are enforced within all elements of that command.

CHAPTER 2

ENVIRONMENTAL STANDARDS

2-1. RESPONSIBILITY: Environmental standards must be enforced, not only by Camp Grayling personnel, but by the using organization chain of command to insure that the Post's natural resources are protected. Such attention will ensure that the subsequent user units will be able to maximize their training based on the best environmental conditions possible.

a. The using unit chain of command, specifically, the senior commander who signs the use agreement (reference CG Reg 350-10), is responsible for coordinating the enforcement of this regulation and for clearing subordinate units from ranges and training areas. (Ref Encl 2, Affidavit)

b. Upon completion of training, the using organization chain of command will require a thorough police of the range or training area to ensure that no debris has been left in the area. All weapon spade holes, foxholes, slit trenches, sumps, etc., must have been filled as prescribed in paragraph 2-8 below.

c. Garbage, trash and rubbish accumulated by units WILL NOT be buried, discarded or burned in or outside the training area. Trash compactor or dumpster locations and times of operation will be specified to unit EPO at the initial EPO briefing. (See Encl 1). Transportation of refuse is the unit's responsibility.

d. Units are responsible for areas within a 200 meter radius of training/firing point locations.

e. Fill in all holes and excavations; brush and logs will be piled to the side.

f. All barriers and blockades will be removed upon completion of training.

g. All commo and concertina wire will be retrieved.

NOTE: Any unit discovering an area which has not been properly policed will report the incident to the Post EPO at Post Operations before occupying such areas or as soon as possible (within six hours). Units failing to make this report accepts responsibility for correcting the problem.

2-2. POL SPILLS: When POL spills occur, it is imperative that the unit or individuals involved notify Post Operations immediately and implement the following emergency procedures:

a. Damage control.

(1) Stop the source of spill flow immediately.

(2) Contain spill using whatever means readily available. Earthen fill dams or sandbags are very effective.

b. Reaction procedures.

(1) Prevent spill from flowing into drainage ditches, storm and sewer drains, and bodies of water.

(2) Attempt to dig out (within safety concerns) contaminated soil with any means at hand (including hand shovels); deposit soil on an impervious surface or in a container (plastic bags or steel drum) which will prevent further contamination.

(3) Limit access to spill area. Do not allow matches, lighters, smoking or sparking mechanisms in the spill area.

(4) Request additional support through the chain-of-command.

(5) Report location to Camp Grayling Operations on frequency 41.80 or phone 3747.

2-3. FIRES:

a. Open fires are expressly prohibited anywhere on the reservation. Exceptions may be permitted where written permission is obtained in advance from the Camp Commander. Military personnel violating this provision will be reported to the Commander of Troops for appropriate action. Civilians who start open fires without first obtaining permission will be advised to put them out. Should they fail to do so, the Camp Commander may have them removed from the reservation.

b. Camp Grayling Operations will be notified (41.80) immediately of any fires by grid coordinate. Persons at the scene will attempt to contain the fire.

2-4. SMOKE OPERATIONS:

a. All smoke operations will be approved through Camp Grayling Operations. Camp Grayling Operations is responsible for necessary notification and/or coordination with the DNR Field Office.

b. Smoke generators must not exceed two (2) hours of continuous operation.

c. Smoke operations will be scheduled so that smoke is ceased for a time period greater than or equal to its generating time (i.e., if used for two (2) hours, cease use for two (2) hours).

d. Smoke units participating in external ARTEP Evaluations (EXEVAL) or in support of an EXEVAL will be exempt from para c. above, if the smoke requirement is a part of the ARTEP standard.

e. Smoke units displacing greater than 1,000 meters between operations are also exempt from para c. above.

2-5. KIRTLAND WARBLER MANAGEMENT UNITS: The Warbler is an endangered song bird species that nests on the Jack Pine plains of northern Lower Michigan. Young Jack Pine stands regenerated by fire provide its ideal habitat. However, it migrates to the Bahama Islands during the winter months.

a. Certain areas have been restricted during the nesting season. During the nesting season, all military activity is limited to existing roads and trails. These restricted areas are identified on the current Camp Grayling map.

b. Helicopters and other aircraft flights will maintain a minimum 500 feet over active nesting areas during the nesting season.

2-6. VEHICLE RESTRICTIONS:

a. Track vehicles are prohibited from utilizing and crossing certain areas of Camp Grayling. These areas are shown on the current Camp Grayling map.

b. Track vehicles may not utilize paved roads on Camp Grayling to include the ditches and shoulders of paved roads. Authorized crossing points are shown on the current training map.

c. All vehicles must refrain from creating new trails. If there is a question concerning the impact of an operation, contact the Post Operations for clarification (Building #12).

d. All vehicles are restricted to existing roads or trails when crossing wet lands.

2-7. PIPELINE RESTRICTIONS: There is a natural gas pipeline buried along a generally straight line from Coordinates VIC 663010 to VIC 701560. This is easily identifiable by the cleared area, generally in a straight line, with approximately 50 - 100

meter wide area having the appearance of a trail. Additionally, there are red 12X8 inch signs mounted on 4 1/2 foot red and white posts stating, "Warning High Pressure Gas". Additionally, there is a 6X6 inch yellow sign mounted on a 6 foot black and silver post stating "Warning Do Not Dig".

a. There is to be no drilling, auguring, or any type of excavation along any pipeline.

b. No open fires will be permitted in, on, or around the pipeline within 250 meters.

c. All track vehicles and wheeled vehicles over 2 1/2 ton are strictly prohibited from operating or maneuvering along the pipeline.

d. Explosive charges or pyrotechnics are expressly prohibited anywhere in the vicinity of the pipeline.

e. The pipeline is not restricted from use by dismounted troops.

f. Refer to the current Camp Grayling Training Map for additional information and locations on the above restrictions. Vehicle crossing points are identified on this map.

g. Any unit or individual discovering damage to or suspects that damage has occurred should contact Range Control immediately, telephone number 348-3747 or on frequency 41.80, 41.90 or 42.0. Remove personnel and equipment from the area and wait for further instructions.

2-8. FIELD SANITATION: Reference TC 8-3, FC 8-6. All field sanitation sites will be placed a minimum of 300 feet from any lake, stream or pond. The only acceptable methods of field disposal are outlined as follows:

a. Kitchen and bath waste disposal.

(1) Soakage pit (figure 1).

(a) Locate minimum of 30 meters from mess area.

(b) Size determined by length of stay (see reference).

(c) Use grease trap (figure 2) to prevent clogging of drainage; solid waste (grease) will be collected and disposed of at trash collection point.

(2) The following lakes are designated as water-borne operation sites:

(a) Howes Lake

(b) Duck Lake

(c) Sand Lake

(d) Kyle Lake

(e) Lake Margrethe

(3) With the exception of established roads and trails, vehicle operations and other training not approved for water operations, must maintain a 200 ft. clearance of all waterways. This extends to 400 ft. on the AuSable and its tributaries.

b. Water Supply Operations.

(1) Water purification units, to include laundry and bath units, must obtain written approval for sites prior to the start of any operation.

(2) Requests will be coordinated through Post Operations to the Facility Engineers.

2-10. TREE CUTTING:

a. Tree branches within 6 feet of the ground and less than 3 inches in diameter may be cut in the conduct of training. Live weeds and grasses may be used for camouflage. Care should be taken to ensure that the trees and the ground are not stripped bare of vegetation.

b. By permit only, other trees may be cut in designated areas. Priority will go to engineer units undergoing ARTEP missions. These permits will be issued through Post Operations at Building #12. Operations will coordinate with the Post Facility Engineer as a part of the approval process, and prior to issuing any permits.

(2) Soakage trench (figure 3).

(a) Size determined by size of facility and amount of waste water flow (gallons per minute (GPM) - See reference)

(b) Use grease trap as prescribed above.

(3) Evaporation bed (figure 4).

b. Human waste disposal.

(1) Deep pit latrine (figure 5).

(a) Required for all bivouac sites.

(b) Soakage pit required if urinals are used.

(2) Straddle trench (figure 6).

(a) Use only for short durations, 2 days or less.

(b) Must be covered with a 3 inch layer of dirt after each use.

(3) Cat hole latrine (figure 7).

(a) Will be used only when on a march.

(b) Hole will be minimum of 6 inches deep.

(c) Cover with dirt after use.

(4) Latrine closing.

(a) Latrine will be closed when waste is within one (1) foot from ground surface.

(b) Pack dirt in three (3) inch layers until dirt is mounded one (1) foot above ground.

(c) Post a sign stating "Closed Latrine" with date of closing and unit designation.

2-9. WATER BORNE AND WATER SUPPLY OPERATIONS.

a. Water-borne Operations.

(1) Camp Grayling Operations must receive a written request and give approval prior to any individual(s) or unit(s) conducting water-borne operations.

CHAPTER 3

CONDUCT OF CLEARANCE

3-1. CONDUCT OF CLEARANCE:

a. The using unit chain of command, specifically the senior commander who signs the use agreement (reference CG Reg 350-10), is responsible for coordinating the enforcement of this regulation and for clearing subordinate units from ranges and training areas. (Ref Encl 2, Affidavit)

b. The Post EFD will dispatch personnel to conduct spot inspections after the senior commander has signed the Affidavit of Compliance.

c. The Post EFD will report deficiencies, if noted, to the senior using unit commander. In accordance with Memorandum of Understanding (MOU) signed by the senior commander, the Post Commander may fix liability for any damages caused by his/her unit and recover costs of repairing that damage.

d. Conflicts on inspection criteria between a unit and the Post EFD will be resolved at the lowest level possible. If a satisfactory conclusion or agreement cannot be reached, the problem will be brought to the attention of the Post Operations Officer. Failing to resolve the problem(s) at this level, the Post Commander will be the final authority.

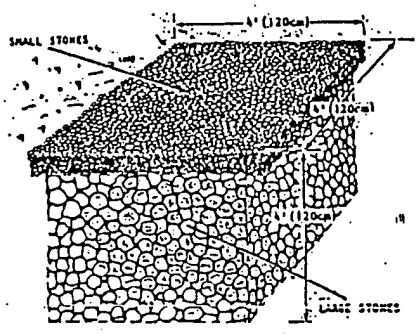
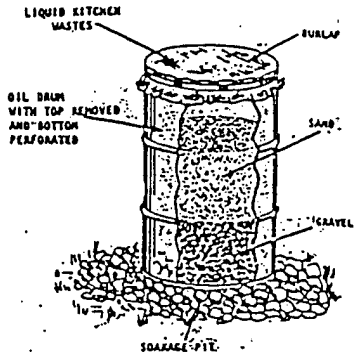
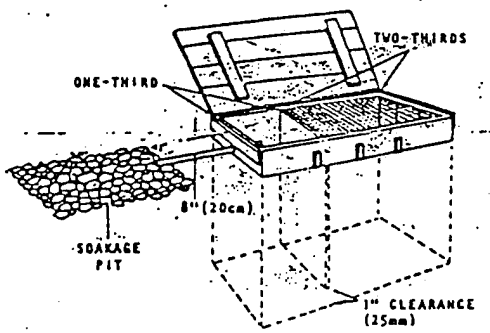


Figure 1 Soakage pit.



Filter grease trap.



Baffle grease trap.

FIGURE 2

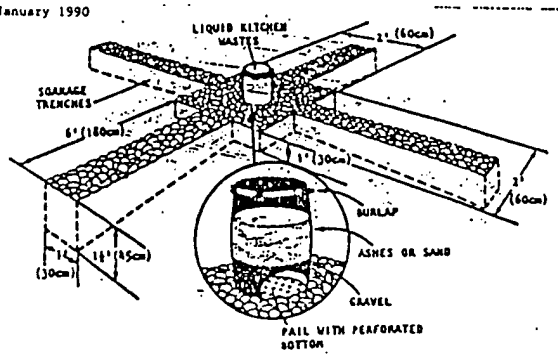


Figure 3 Soakage trenches with pail grease trap.

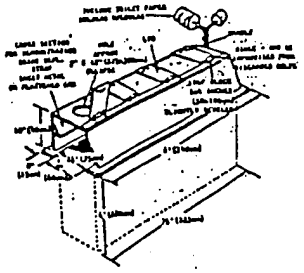


Figure 5 Deep pit latrine.

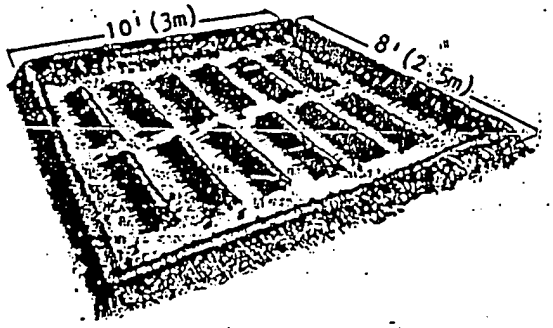


Figure 4 Evaporation bed.

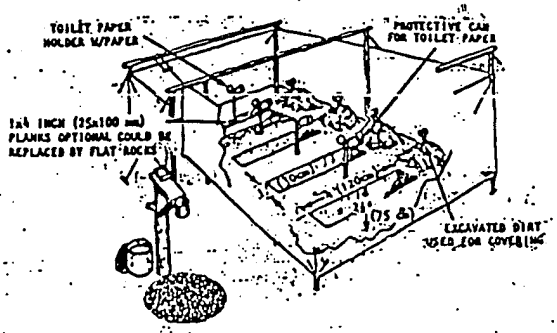


Figure 6 Straddle trench with latrine screen and handwashing device.

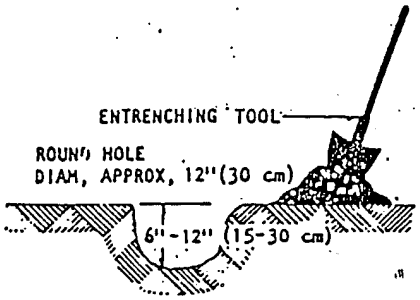


Figure 7 "Cat-hole" latrine.

A-5

HEADQUARTERS INSTALLATION SUPPORT UNIT
CAMP GRAYLING, MICHIGAN 49739-0001

UNIT _____ DATE _____

SUBJECT: Affidavit of Training Area Environmental Compliance

1. As the senior commander, I certify that I have inspected my unit(s) training areas and/or areas of occupation. I further certify that I have found all these areas to meet the standards expressed in Camp Grayling Regulation 55-1, Camp Grayling Regulation 385-1, and the Environmental Pamphlet published by the Adjutant General of Michigan.

2. In accordance with the Memorandum of Understanding (Appendix E, Camp Grayling Reg 350-10), the Post Commander may fix liability for any damages caused by my unit(s) that we failed to repair prior to departing Camp Grayling.

_____
Signature

_____
Title

COMPACTOR, Times/Locations

#1.	Beaver Creek Road (Bldg 26)	767440
#2.	Howe Road (near gas chamber)	706435
#3.	Airfield Parking Area	608598
#4.	Jones Lake Base Camp	339622

Compactor schedule is subject to change.

0800-1100 1300-1500

ENCLOSURE 1

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APPENDIX L

Scoping Correspondence with Government Agencies (USFWS, SHPO, DNR)

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MICHIGAN DEPARTMENT OF STATE

RICHARD H. AUSTIN SECRETARY OF STATE

LANSING

MICHIGAN 48918
Jun 94
BUREAU OF HISTORY

ADMINISTRATION, PUBLICATIONS
ARCHAEOLOGY AND HISTORIC
PRESERVATION
208 N. Capitol Avenue
517—373-0510

STATE ARCHIVES
3405 N. Logan Street
517—373-0512

MICHIGAN HISTORICAL MUSEUM
208 N. Capitol Avenue
517—373-3559

September 2, 1986

LTC Edgar E. Wilkins, Jr.
Engineering and Facilities Division
2500 S. Washington Ave.
Lansing, MI 48913

Re: ER-6225
Camp Grayling Environmental Management Analysis and Plan/Environmental Impact Statement

Dear Colonel Wilkins:

We have reviewed the above cited plan and offer these comments. In our 19 May 1983 letter (copy enclosed) we reported that the Officer's Open Mess is listed on the State Register of Historic Sites and potentially is eligible for the National Register of Historic Places. Since a cultural resource survey is underway (p. 18), we will withhold further comment until the results of that survey are available to us.

Thank you for this opportunity to review this document. Please direct all questions to Dr. Richard Harms, Environmental Review Coordinator, at 517/335-2721.

Sincerely,

Martha M. Bigelow
Director, Bureau of History
and
State Historic Preservation Officer

Martha M. Bigelow

BY: Kathryn B. Eckert
Deputy State Historic Preservation Officer

MMB/KBE/RHH/sl

cc: Boyd Kinzley

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLANNERY
GORDON E. GUYER
KERRY KAMMER
O. STEWART MYERS
DAVID D. OLSON
RAYMOND POUPORE

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

RONALD G. SKOOG, Director
Gordon E. Guyer, Director

October 16, 1986

LTC Edgar E. Wilkins, Jr., P.E.
Engineering and Facilities Division
2500 South Washington Avenue
Lansing, Michigan 48913

Dear LTC Wilkins:

Since sending you comments on the Scoping Documents for the Camp Grayling Environmental Management Analysis and Plan/Environmental Impact Statement about a month ago, I have received one additional set of comments. These came from our Air Quality Division Roscommon District Office.

They concurred that the three major air quality issues to be addressed in the EIS that is to be prepared are: 1) the incinerator, 2) the fuel dispensing facility, and 3) the fugitive dust generated during construction and from trail use.

They said that while the document mentioned the installation of a natural gas distribution system, it did not identify whether or not natural gas boilers will also be installed. If they are to be installed, be aware that the installation of natural gas-fired boilers with a heat input of greater than 10,000,000 Btu/hour requires that an approved permit to install first be obtained from the Air Quality Division.

The document identified the fuel dispensing facility as requiring an air quality permit. Since this 75,000 gallon storage facility will store No. 1 to No. 6 fuel oils and Nos. 2-D and 4-D diesel fuels, a permit will not be needed because these fuels are exempt from the permit system by the Michigan Air Pollution Control Commission (MAPCC), Rule 284(e). Gasoline storage and handling equipment at dispensing facilities are also exempt under the permit system by MAPCC Rule 284(h). However, installation of new gasoline storage tanks of greater than 2,000 gallon capacity at dispensing facilities falls under the requirements of MAPCC Rule 703(1). The Camp Grayling EIS should include information on the size of tanks to be installed and the types of products to be stored in them.

Finally, they noted that a Prevention of Significant Deterioration (PSD) review by Air Quality Division, Permits Section staff, is required for all major sources of air pollution.

In addition to concerns about potential air emissions from fuel storage tanks, I would point out that the EIS should include a discussion of the fact that the Resource Conservation and Recovery Act (RCRA), as amended, requires that designated State agencies be notified of underground storage tanks in use on November 8, 1984, or brought into use after that date. New tanks must be registered within 30 days of the time they are installed. The designated State agency is the Groundwater Quality Division of the Department of Natural Resources. New underground storage tanks to be installed must conform to New Tank Performance Standards that are in the process of being promulgated under RCRA by the U.S. EPA, as well as to State regulations. Until these standards are promulgated, new steel tanks must meet the Interim Prohibition requirements which do not allow buried bare steel tanks, but instead require cathodic protection and proper coatings of such tanks. With regard to State reguations, the EIS should briefly describe how the State Policy Fire Marshall's regulations will be followed.

Sincerely,

Karl Zollner, Jr. P.E.
Community Assistance Division
517/373-8542

cc: Mr. Boyd Kinzley

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
GORDON E. GUYER
KERRY KAMMER
O. STEWART MYERS
DAVID D. OLSON
RAYMOND POUPORE

JUN 94

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

Gordon E. Guyer, Director

September 18, 1986

LTC Edgar E. Wilkins, Jr., P.E.
Engineering and Facilities Division
2500 South Washington Avenue
Lansing, Michigan 48913

Dear LTC Wilkins:

I have circulated the Scoping Document for the Camp Grayling Environment Management Analysis and Plan/Environmental Impact Statement to appropriate staff of the Department of Natural Resources. I specifically asked them to comment on whether or not the document addresses all of the program areas they administer and if there are concerns not mentioned in the scoping document that should be addressed in the full EIS.

I have enclosed the responses I received. If I receive any additional imput, I will forward it to you.

Thank you for providing the opportunity to review this document

Sincerely,

Karl Zollner, Jr.

Karl Zollner, Jr., P.E.
Community Assistance Division
Local Assistance Section
517-373-8542

Enclosures

cc: Mr. Boyd Kinzley

COMMENTS ON THE SCOPING DOCUMENT
FOR THE PROPOSED EXPANSION AND IMPROVEMENTS TO
CAMP GRAYLING

Forest Management Division

An increased level of activity at Camp Grayling and on the surrounding lands used for training will have an impact on recreational uses of these lands. This impact should be addressed in the EIS.

Project C17 - If wood chips are to be used as the main fuel source (RDF supplementary) the EIS should address both the short term and long term availability of a wood supply.

Projects C7, T1, and T3 - In addition to Department of Natural Resources (DNR) timber sale contracts, long term timber production, wildlife habitat, and forest recreational use impacts should be addressed.

Engineering-Water Management Division, Floodplain Control Unit

The majority of the proposed construction projects are located above any expected flooding from a river, lake, or stream.

Projects C13, T1, T2, and T3 present concerns because they may involve stream crossings. Any construction in the floodplain of a river or stream may require a permit under the State's Floodplain Regulatory Authority Act, 1929 P.A. 245, as amended by 1968 P.A. 167.

Geological Survey Division

There are no permits or approvals required from the Geological Survey Division (GSD) for any of the actions proposed.

Project C19 - Their only direct interest would center on the "Fresh Water Treatment Facility" and on the installation of new wells during the future expansion of the camp. When these new wells are drilled, the water well driller will be required to provide the GSD with a copy of the "water well log"

Land Resource Programs Division

Since the scoping document did not include specific information as to the exact location of the 22 proposed activities (county, township, section numbers, town and range numbers), it was very difficult for them to determine any potential involvement of the regulatory statutes administered by their Division. When that information is provided, they have the computer capability to identify concerns related to endangered and threatened species, unique and sensitive natural areas, archaeological and historical sites, formally dedicated wilderness and natural areas, wetland areas, inland lakes and streams, designated natural rivers, and farmland/open space areas enrolled under Act 116, P.A. of 1974, as amended.

They went on to say that the EIS should address the following areas and should include statements of intent to comply with the applicable Federal, State, and local statutues:

Jun 94

1. Any earth change activities within 500 feet of a body of water, or of one acre in size or larger, must have a permit under authority of the Soil Erosion and Sedimentation Control Act, 1972 PA 347, as amended, from the local soil erosion control office of each respective county. Should the project cross county jurisdictions, then a permit would be obtained from the Land Resource Programs Division (LRPD).

2. Any proposed dredging, filling, draining or construction activities in a wetland contiguous to a lake, stream, river, or pond must have an approved permit from LRPD prior to the commencement of the activity. This is required under authority of the Goemaere-Anderson Wetland Protection Act, 1979 PA 203. It is hoped that all project proposals would clearly avoid all wetland areas wherever possible as required by Presidential Executive Order 11990. While the State's regulatory functions only apply to wetlands contiguous to water bodies in the three counties where Camp Grayling is located, other activities in noncontiguous wetland areas may be regulated by the U.S. Environmental Protection Agency under authority of the Federal Clean Water Act of 1977.

3. Any activities which would impact on inland lakes or streams will require a permit from LRPD under authority of the Inland Lakes and Streams Act, 1972 PA 346, as amended. The Department of Natural Resources (DNR) has assumed the 404 program (Clean Water Act of 1977) on all waters of the State. On Federally designated navigable waters, there is a joint application process between this office and the U.S. Army Corps of Engineers. A joint permit application would be submitted to DNR's LRPD for joint processing with the Detroit Office of the Corps.

4. While it is assumed that all proposed activities would occur on lands held by the public, a check should be made to assure that there are no indirect impacts of lands enrolled under Michigan's Farmland and Open Space Preservation Act, 1974 PA 116, as amended.

5. Twenty-three miles of the mainstream of the Au Sable River have been formally designated by Congress under the Federal Wild and Scenic Rivers Act. The State is presently pursuing the formal designation of the mainstream and tributaries of the Au Sable River system. Care must be taken in development proposals to reduce or eliminate any adverse impacts to this State and nationally recognized river system. At a minimum, all development proposals should be set back at least 400 feet from the river and its tributaries.

6. For those projects which involve the rehabilitation or restroration of existing facility, LRPD would not have any concerns. However, any demolition materials should be placed at an approved upland site and not deposited in any wetland area located on public or private land.

They went on to say that they are willing to meet with the appropriate agencies and/or individuals involved in the development of the EIS to discuss any or all of the issues listed above in greater detail. Such discussions should help resolve any potential conflicts.

Wildlife Division

Staff of the Wildlife Division (WD) have discussed the status of wildlife resources on the military lands with your consultant, Mr. Judd Ebersviller, of Eugene A. Hickok, Inc. The details on wildlife populations and habitats that were provied to Mr. Ebersviller included:

1. Location of sensitive and endangered species
   a. Kirtland warbler nesting and management areas
   b. Bald eagle nest locations land status
   c. Sharp-tailed grouse management area
   d. Plant species

2. Deer winter range and yarding areas
   a. Coniferous swamp locations
   b. Jack pine yarding areas
   c. Winter range locations

3. Wetlands - by type and locations

4. Major habitat types
   a. Major wildlife species within each major type
   b. Management goals for each major type for wildlife

5. Population data
   a. Deer population goals and harvest data
   b. Deer hunting pressure and economic importance
   c. Population data on common game species, including bear, bobcat, otter, beaver, coyote, snowshoe hare, ruffed grouse, turkeys, waterfowl, raccoons, fox, and squirrels.
   d. Kirtland warbler census results
   e. Bald eagle and osprey census results

Wildlife Division staff have reviewed a rough draft on the status of wildlife resources that was prepared by the consultant. They found the information in the draft was basically correct and adequately covered all wildlife issues. They will continue to give this project a high priority because so large an area is involved with a potentially significant impact on wildlife.

IN REPLY REFER TO:

United States Department of the Interior

MDO:RM
3110

BUREAU OF LAND MANAGEMENT
MILWAUKEE DISTRICT OFFICE
P.O. BOX 631
MILWAUKEE, WISCONSIN 53201-0631

26 AUG 1986

LTC Edgar E. Wilkins, Jr.
Michigan Army National Guard
2500 South Washington Avenue
Lansing, Michigan 56345

Dear Colonel Wilkins:

This is in reference to the Federal Register Notice of July 22, 1986, Volume 51, Number 140, regarding preparation of an Environmental Impact Statement on the proposed mission expansion/multiple construction at Camp Grayling Army National Guard Training Site, Michigan. We request any additional information available regarding the scoping process and copies of the draft and final Environmental Impact Statements on this proposed activity. This information should be directed to:

ATTN: Becky Metz
Bureau of Land Management
Milwaukee District Office
P.O. Box 631
Milwaukee, Wisconsin 53201-0631

We appreciate your assistance in this matter.

Sincerely,

Wink Hastings
Assistant District Manager
for Energy and Minerals

United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO: Jun 94

East Lansing Field Office (ES)
Room 302, Manly Miles Building
1405 S. Harrison Road
East Lansing, Michigan 48823

August 28, 1986

LTC Edgar E. Wilkins, Jr.
Michigan Army National Guard
2500 South Washington Avenue
Lansing, MI 48913-5101

Dear Lieutenant Colonel Wilkins:

This responds to the Notice of Intent, published in Federal Register dated Tuesday, July 22, 1986, to prepare an Environmental Impact Statement on a proposed mission expansion/multiple construction at Camp Grayling Army National Guard Training Site at Grayling, Crawford County, Michigan.

We have responded to an earlier request by Mr. Judd Ebersviller, Eugene A. Hickok and Associates (see attached). We have no additional information for the scoping process at this time.

We appreciate this early opportunity to participate in this project.

Sincerely yours,

Robert D. Pacific
Field Supervisor

Attachment

3-63-1-MJ-MJC-cL

August 11, 1986

Mr. Judd Ebersviller
Eugene A. Hickok and Associates
545 Indian Mound
Wayzata, MN 55391

Dear Mr. Ebersviller:

This responds to your July 14, 1986 letter requesting information about important wildlife habitat or species within the Camp Grayling Property Boundaries to be included in an Environmental Assessment for future plans in Crawford, Kalkaska and Otsego Counties, Michigan.

These comments provide technical assistance only and do not constitute the report of the Secretary of the Interior on the project within the meaning of Section 2(b) of the Fish and Wildlife Coordination Act, nor do they represent the review comments of the U.S. Department of the Interior on any forthcoming environmental statement.

General Fish and Wildlife Comments

We have conducted a cursory investigation of the project site from U.S. Geological Survey Quadrangles and found that the outlined area encompasses major wetland complexes, lakes, rivers and streams. Wetlands and open water areas are instrumental in the maintenance and production of diversified fish and wildlife populations. Therefore, construction in these environmentally sensitive areas should be avoided if possible, and be minimized and done with extreme caution, in an environmentally sound manner if they cannot be avoided. Accordingly, the following items should be addressed in the Environmental Assessment.

1. The location, number of acres and type (palustrine emergent, scrub shrub, forested, etc.) of wetland systems that will be impacted.

2. A mitigation (avoidance, enhancement, creation) plan to compensate for wetlands lost and/or disturbed during any construction phase.

3. Soil erosion and sedimentation control measures.

4. Permits - contact the Land Resource Programs Division of the Michigan Department of Natural Resources (DNR), Lansing, Michigan.

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. Therefore, we are furnishing you the following list of species which may be present in the concerned area:

Classification	Common Name	Scientific Name	Habitat
Threatened	Bald eagle	Haliaeetus leucocephalus	Forest
Endangered	Kirtland's warbler	Dendroica Kirtlandii	Jack Pine Forest

Section 7(d) of the 1978 Amendment to the Endangered Species Act underscores the requirement that the Federal agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which in effect would deny the formulation or implementation or reasonable alternatives regarding their actions on any Endangered or Threatened species.

There is no designated critical habitat for these species at this time. A current list and location of known nest sites for these species has been provided by the Michigan Natural Features Inventory (MNFI). In addition to the occurrences provided by the MNFI, we note several other areas of important habitat.

An inactive bald eagle nesting territory occurs adjacent to Camp Grayling in T27N, R3W, Section 16. Although this territory has not been active for five years, it is not unlikely that eagles will return to the area in the future. Since you are preparing a long-term plan, this nest site should be considered. We have enclosed a copy of the Management Guidelines from the Northern State's Bald Eagle Recovery Plan.

Additional Kirtland's warbler habitat also occurs on Camp Grayling, including: T27N, R1W, Sections 16, 17, 19, 20, 21, 28, 19; T27N, R2W, Section 13, 14, 19, 20; T26N, R5W, Section 24; T25N, R5W, Section 23, 24.

As you may be aware, a cooperative agreement was recently signed between the Michigan DNR and the Department of Military Affairs concerning a management plan for Kirtland's warblers at the Range 30 Complex (Tank Range). This area generally supports a quarter of the entire State's Kirtland's warbler population; therefore, it is imperative that this management plan be incorporated into the larger plan you are developing.

Other areas on Camp Grayling outside the Range 30 complex also support the warbler, so additional precautions are necessary. Specific consultations should be made with the Michigan DNR endangered species coordinator and the U.S. Fish and Wildlife Service for all activities occurring at those sites identified as supporting Kirtland's warblers.

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APPENDIX M

Documents Received - Mar 89 DEIS Review

Note:
Specific remarks and/or questions within the written comments are acknowledged and identified with a large number in the margin. Each remark and or question identified is responed to in Apprendix O. The original letters (written comments) are available for review at the Michigan Department of Military Affairs.

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TABLE 2-2

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Federal and State Agencies/Officials		
U.S. Environmental Protection Agency (Mr. William D. Franz, Chief, Region 5) (Chicago, IL)	1	M-3
U.S. Dept. of the Interior (Sheila Minor Huff) (Chicago, IL)	2	M-6
Centers for Disease Control (David E. Clapp, Ph.D, P.E., CIH) (Atlanta, GA)	3	M-6
Department of Natural Resources (David F. Hales, Director) (Lansing, MI)	4	M-6
Michigan Loon Registry Program (Arlene A. Westhoven) (Mt. Pleasant, MI)	5	M-7
Local Agencies/Officials		
Excelsior Twp. Supervisor, Kalkaska County (Bethel Larabee) (Kalkaska, MI)	6	M-8
Organizations		
White, Beekman, Przybylowicz, Schneider & Baird, P.C. (Thomas A. Baird) (Okemos, MI)	7	M-9
Trout Unlimited (Robert L. Herbst) (Vienna, VI)	8	M-9

TABLE 2-2 (Continued)

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Organizations (Continued)		
Michigan United Conservation Clubs (Thomas L. Washington) (Lansing, MI)	9	M-15
Sierra Club Mackinaw Chapter (Matthew S. Urdan) (Lansing, MI)	10	M-16
Anglers of the AuSable (Bruce Johnson) (Grayling, MI)	11	M-17
AuSable North Branch Area Association (Walter A. Freyburger, Ph.D.) (Grayling, MI)	12	M-22
Former Servicewomen of America, Mich. Chapt. #1 (Reatha Dubay) (Bay City, MI)	13	M-23
E.F.P.O.A. (Carl W. Lord) (Waters, MI)	14	M-23
The KP Lake Association (Bob Hartwig) (Grayling, MI)	15	M-24
AuSable-Manistee Action Council (AMAC) (Review, Evaluation, and Critique of Mission/Multiple Construction: Camp Grayling Army National Guard Training Site) (Lansing, MI)	16	M-24

TABLE 2-2 (Continued)

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Individuals		
Susan Seifert (Grayling, MI)	17	M-135
Chris B. Polaczyk and Gerald Hemming (Inkster, MI)	18	M-135
Gerald Kimball (Chesaning, MI)	19	M-135
Michelle J. Schwarz (Frederic, MI)	20	M-136
Richard B. McGlinn (Plymouth, MI)	21	M-136
Donald Welser (Grayling, MI)	22	M-136
Richard Davis (Gaylord, MI)	23	M-138
Susan E. Cooper (Bloomfield Hills, MI)	24	M-138
Art Schwarm (Traverse City, MI)	25	M-138
Harvey Burkholder (Mt. Clemens, MI)	26	M-139
Joseph A. Cercone (Rogers City, MI)	27	M-139
Peter L. Gustafson (Grand Rapids, MI)	28	M-140
Leonard S. Gell, M.D. (Grand Rapids, MI)	29	M-140
David F. Oeming, Jr. (Saginaw, MI)	30	M-141
Mr. and Mrs. Karl Leppien (Waters, MI)	31	M-141
Bruce Johnson (Rochester, MI)	32	M-142
Ralph T. Rucinski, D.D.S. (Crown Point, IN)	33	M-142
Edward J. McGlinn (Farmington Hills, MI)	34	M-143

TABLE 2-2 (Continued)

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Individuals (Continued)		
Judith McGlinn (Farmington Hills, MI)	35	M-145
Frank W. Crawford (Kalamazoo, MI)	36	M-145
Anne V. Fuller (Kalamazoo, MI)	37	M-146
Rama L. Stimpson (Grayling, MI)	38	M-146
Dan L. Alstott (Grayling, MI)	39	M-147
William D. Gregory (Bay City, MI)	40	M-149
George A. Bentley (Grayling, MI)	41	M-150
Elaine P. McGlinn (Plymouth, MI)	42	M-150
Joe Stanek Stone (Grayling, MI)	43	M-152

SUMMARY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

27 JUN 1989

Greg Huntington
Construction and Facilities Office
Michigan Department of Military Affairs
2500 South Washington Avenue
Lansing, Michigan 48913

Dear Mr. Huntington:

In accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, we have reviewed the Draft Environmental Impact Statement (Draft EIS) for the Mission/Multiple Construction: Camp Grayling Army National Guard Training Site, Crawford, Kalkaska and Otsego Counties, Michigan. A total of 20 actions are proposed. Fourteen projects are located in the cantonment area, three projects are located in the training area, and three projects are training/operational activities. Projects involve renovation of existing facilities, training range improvements, construction of facilities, and increased efficiency of training site utilization. Some of the projects will permit increased training activities during the wintertime, however, total annual usage of the Camp is expected to remain similar to existing usage.

In general, our concerns relate to the project's potential impacts on air and water quality, wetlands, vegetation, endangered species and noise in the surrounding community. Our comments are highlighted below, and detailed comments are enclosed for your consideration.

Although the Multiple Purpose Range Complex (MPRC) is not expected to cause any significant differences in the noise levels experienced in the surrounding areas than the existing Range 30 area it will replace, the existing noise levels are unacceptable. Therefore, we strongly encourage the Michigan Department of Military Affairs and the National Guard Bureau to work closely with the civilians living in the vicinity of the Camp to formulate and implement an acceptable plan to mitigate for the adverse noise impacts caused by present and future Camp activities. A commitment should be made to provide relief to those persons adversely impacted by noise. Measures to be taken might include installation of soundproofing or relocation of adversely affected residents. Construction of the assault landing strip could involve operations of up to 3,000 aircraft annually. If a significant proportion of the aircraft operations are predicted to occur at night, then we recommend that a single event analysis be undertaken to determine the extent of nighttime wake-ups due to individual aircraft. Abatement/mitigation measures should be provided to those residences adversely impacted by nighttime disturbances.

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With regard to air quality, the proposed development includes renovation and demolition of buildings which may contain asbestos. Federal Regulations (40 CFR Part 61) discuss requirements for notification and removal and disposal of asbestos. A fugitive dust control plan is discussed in the Draft EIS. That plan includes use of calcium chloride mixtures to control dust over unpaved roads. The Final EIS should indicate whether use of this chemical would have any adverse impacts on nearby waterbodies. Other measures should be considered if adverse impacts would result.

The Final EIS should explain why the alternative site cannot be chosen for construction of the fuel dispensing facility. The alternative site appears preferable to the proposed site because it is located further from water resources. We recommend that the alternative site be chosen as the preferred alternative for the fuel dispensing facility. Note that installation of new underground storage tanks and piping and abandonment or removal of existing tanks must be performed in accordance with our Agency's regulations on underground storage tanks (40 CFR Parts 280 and 281).

The Draft EIS discusses the Spill Prevention, Control and Countermeasure Plan (SPCCP) and Installation Spill Contingency Plan (ISCP) in effect at Camp Grayling. However, few details are provided. We recommend that the Final EIS include a discussion of these plans for the assault landing strip, new fuel dispensing facility, MATES, and winter bivouac areas. This information is needed to determine the adequacy of these plans in relation to prevention of potential adverse impacts to the environment in the event of an accidental spill. The Final EIS should indicate whether fire training activities would be undertaken in conjunction with the development of the assault landing strip. Collapsible fuel containers and forward air refueling equipment are used for training by the aviation battalion. This activity may increase in the winter. The Final EIS should stipulate what control measures would be taken in the event of a spill or leak from the refueling equipment or from fire training activities. With the projected increase in winter training, these plans should consider any special measures which should be taken for cleanup of spills during the wintertime, (i.e., spills in snow and under ice).

We do not, at this time, have sufficient information to determine the impacts of the proposed projects on wetlands. We recommend that all areas requiring fill activities be field checked to determine presence of wetlands areas. If wetlands would be filled, then the Final EIS should explain why there are no practicable alternatives to locating the project within wetlands and show how the project has been designed to minimize harm to existing wetlands. Mitigation must be provided for all unavoidable wetlands losses.

The proposal to construct Field Grade Bachelor Officer's Quarters (BOQ) on a hillside (Wilson Hill) with at least ten percent slopes has the potential for causing increased erosion and sedimentation problems. We recommend that the alternative site which would be constructed on flatter slopes be implemented since the erosion potential would be less than with the proposed project. The Final EIS should provide details regarding the implementation of developed lanes for existing training practice and the types of terrain

S - 2

that would be utilized. This information is needed to determine the impacts of these lanes on vegetation, wetlands and other sensitive areas and the effects due to any expected increases in erosion. The Camp Grayling Soil Erosion Control Plan has good features. However, we recommend that the wording of the plan be strengthened to indicate that these measures "will" be taken instead of "should" be taken. A commitment must be made to implement this plan.

The Draft EIS indicates that additional low-level, nap-of-the-earth flights will be conducted at the Camp. A specific plan should be developed and implemented to minimize disturbance of the Kirtland's warbler and bald eagle, which are Federal and State listed species. The Military Department of Military Affairs should also continue to coordinate with the Michigan Department of Natural Resources to formulate and implement an acceptable plan to protect the Kirtland's warbler from proposed development and training activities at Camp Grayling.

Based on our review, we have rated this project as "EC-2". The "EC" indicates that we have environmental concerns regarding this project. The "2" indicates that additional information must be provided. This rating will be published in the Federal Register. Our concerns will be eliminated once the following steps are taken. Additional information is needed regarding the noise modelling. A commitment should also be made to provide adequate measures to mitigate for adverse noise impacts. A commitment should be made to implement adequate fugitive dust and soil erosion control plans. The alternative sites for the fuel dispensing facility and the Field Grade BOQ should be further investigated and considered as the preferred sites for development since these sites appear preferable from an environmental standpoint. Additional details are needed regarding measures to prevent and cleanup accidental spills or leaks of fuels, oils, and other hazardous substances. Additional information is also needed regarding the water quality and vegetation impacts of certain training activities. In addition, the Final EIS should clarify whether development will involve dredge and fill activities within wetlands. Mitigation must be provided for all unavoidable losses. A conceptual mitigation plan should also be prepared for review by the appropriate resource agencies prior to circulation of the Final EIS. A plan to mitigate for adverse impacts to the Kirtland's warbler should be formulated and implemented.

We appreciate this opportunity to provide comments on this project. If you have any questions regarding these comments, please contact Jerri Horst at (312) 886-4244.

Sincerely yours,

William D. Franz

William D. Franz, Chief
Environmental Review Branch
Planning and Management Division

Enclosure

S - 3

DETAILED COMMENTS

U.S. Environmental Protection Agency
Region V Comments
Draft Environmental Impact Statement (Draft EIS)
Mission/Multiple Construction: Camp Grayling
Army National Guard Training Site, Michigan

Project Description

A total of 20 actions are proposed. Fourteen projects are located in the cantonment area, three projects are located in the training area, and three projects are training/operational activities. Projects involve renovation of existing facilities, training range improvements, construction of facilities, and increased efficiency of training site utilization. Some of the projects will permit increased training activities during the wintertime. However, total annual usage of the Camp is expected to remain similar to existing usage.

Noise

Two proposed projects have the potential for causing noise impacts. The two projects include construction of the multi-purpose range complex (MPRC) and the assault landing strip. The intent of the MPRC is to simulate a battlefield including combined arms exercises. The range can accommodate a full company of 12 tanks simultaneously with infantry and helicopters. The MPRC includes approximately 1,000 acres and would be located in the central portion of the existing tank range (Range 30 area). The MPRC is located more than one mile further towards the interior of the post than the tank range and separated from the southern installation boundary by a large hill mass. The MPRC could operate year-round for up to sixteen hours per day. However, the Draft EIS indicates that total annual usage is expected to be comparable to Range 30 with the exception that firing during cold weather would increase while firing during the summertime would decrease.

The noise contours generated by use of the MPRC are not expected to significantly differ from the noise contours generated by the existing Range 30 area. Training at the MPRC would include use of inert ammunition rounds including sub-caliber firing and increased use of laser weapon simulations. Preliminary studies indicate that the movement of the firing points to the northeast could decrease peak sound levels at private lands to the west and south from 3 to 10 decibels. No Zone III (clearly unacceptable) contours exist off-post under existing conditions. However, Zone II (normally incompatible) land uses do occur on private lands near Grayling-Jones Lake Road Truck Trail and North Down River Road. The Draft EIS indicates that possible beneficial impacts could result from use of the MPRC over existing conditions. This is due to the location of the large hill separating the training area from land uses to the south of the post. The Final EIS should estimate the number of residences or population located within the Zone II area with proposed development of the MPRC. 1

Although the proposed MPRC project is not expected to significantly alter the noise impacts over existing conditions, the existing noise levels are unacceptable. Previous measurements by our Agency in 1977 indicated that the private lands approximately one-half mile north of the [illegible] area

of the MPRC likely experienced peak sound levels in excess of 120 decibels peak. In addition, previous studies by the Army Environmental Hygiene Agency correlated the occurrence of noise levels on this range with a moderate to high risk of noise complaints. Therefore, a commitment should be made for noise relief to those persons adversely impacted by this project. Measures to be taken might include installation of soundproofing or relocation of adversely affected residents. 2

Jan 94

Construction of the assault landing strip could involve operations of up to 3,000 aircraft annually. The Draft EIS indicates that no Zone II or Zone III noise contours are located off-post. The contours generated are based on annual A-weighted day-night level (ADNL) contours and do not represent the disturbance caused by individual aircraft operations. The ADNL descriptor provides a good indication of the cumulative sound level which includes an additional ten decibel (db) penalty for each aircraft operation occurring at night. However, the ADNL descriptor calculates the cumulative sound level over a relatively long period of time, and thus it is not a good indicator of single event disturbance. If a significant proportion of the aircraft operations are predicted to occur at night, then we recommend that a single event analysis be undertaken to determine the extent of nighttime wake-ups. Abatement/mitigation measures should be provided to those residences adversely impacted by the construction of the assault landing strip. 3

The Draft EIS discusses the increase of low-level, nap-of-the-earth flights and their potential noise impacts on wildlife. Although the proposal involves an increase of only one to two helicopter flights per week, flights will be restricted over deer wintering areas, and the Kirtland's warbler nesting areas will be observed. The Final EIS should clarify what is meant by "observed" and should include adequate measures to minimize disturbance of both the Kirtland's warbler and bald eagle, Federal and State listed species. 4

Other development projects will have no major adverse impacts on noise levels in the surrounding areas, the existing noise levels due to present activities at the Camp are unacceptable in some areas. For example, at Range 40 it has been estimated that 73 percent of the impulsive noise events created peak sound pressure levels between 105 and 120 db peak; ten percent created levels between 120 and 140 db peak. At these levels, it would be expected that there would be a moderate to high risk of noise complaints and a possibility of damage claims for noise events between 120 and 140 db peak. A total of 190 acres of resort/residential land and 680 acres of State and private forests are located in the Zone III contours, and fifty square miles of mostly State Forest lands are located in the Zone II contours.

The Zone II noise contours for the Grayling Army Airfield Area extended into the Town of Grayling in 1984. The Draft EIS indicated that in 1987, helicopter flight tracks were realigned to avoid populated areas, however, no contours were generated to show how this realignment altered the noise impacts. We recommend the Michigan Department of Military Affairs and the National Guard Bureau work closely with the civilians living in the 5

vicinity of the Camp to formulate and implement an acceptable plan to mitigate for the adverse noise impacts caused by Camp activities. 5

Construction of the various projects at Camp Grayling could have an adverse impact on residents in the surrounding communities and on base personnel. Construction noise is normally short-term in duration. However, we recommend that construction occur during the daytime hours during the weekdays to minimize disturbance of nearby residents. 6

Because one purpose of the proposed development is to increase cold weather training, there will be more mechanized equipment used in the wintertime. If the cold weather training would require machinery to idle for long periods to prevent freezing, then we recommend that measures be taken to minimize noise impacts. For example, the machinery should be allowed to idle only in areas remote from populated areas. 7

Air Quality

Development at the Camp includes renovation and demolition of buildings which may contain asbestos. A survey to determine presence and locations of asbestos should be taken prior to renovation or demolition of any buildings suspected of containing this material. Federal Regulations (40 CFR Part 61) require that the State and our Agency be notified prior to beginning any work in areas containing asbestos. These same regulations also discuss procedures which must be followed in the removal and disposal of asbestos-containing materials. 8

Fugitive dust can be a potential problem during construction. Appendix 4-2 contains a fugitive dust control plan to be followed during construction which includes sprinkling disturbed soils with water and slowing vehicle speeds. Reducing the heights that aggregates fall and minimizing the number of transfers at aggregate loading and handling facilities is another measure discussed. The control plan for operational activities states that various calcium chloride mixtures would be used to control dust over unpaved roads. The Final EIS should indicate whether use of this chemical would have any adverse impacts on nearby waterbodies. If adverse impacts are contemplated, then other measures to control dust should be considered. The Department of Military Affairs should make a commitment to implement the fugitive dust control plan. 9

As previously discussed, increased cold weather training activity would occur at the Camp due to proposed development. If long idling times for machinery are contemplated, then degradation of the air quality could occur. Therefore, we recommend that steps be taken to reduce the amount of time equipment must idle and/or the amount of equipment which must remain idling. 10

Underground Storage Tanks

The Final EIS should explain why the alternative site cannot be chosen for construction of the fuel dispensing facility. The alternative site appears preferable to the proposed site because it is located further from water resources, thus providing an additional safety factor in the event of a leak 11

or spill. We recommend that the alternative site be chosen for development of this facility. 11

Proposed development includes replacement of the existing fuel dispensing/storage facility with a new bulk storage facility of 100,000-150,000 gallon capacity. If development includes installation of underground storage tanks or piping and abandonment or removal of existing underground tanks, then these operations must be performed in accordance with our Agency's regulations on underground storage tanks (40 CFR Parts 280 and 281). Section 280.20 of the Final Rule specifies performance standards for new tanks. The underground tanks must be equipped with devices that prevent spills and overfills and have a leak detection method that provides monitoring for leaks. Tanks containing hazardous substances must also have secondary containment and must have a leak detection system that can indicate the presence of a leak in the confined area between the primary and secondary walls. The State must be notified to certify that proper installation procedures have been followed. To be in conformance with EPA's regulations, the Camp must also notify the State of any underground storage tanks already in existence and must comply with other requirements for existing underground storage tanks. The Federal Register dated November 8, 1985, contains a complete explanation of the notification requirements. If the storage tanks will be constructed above ground, then the Final EIS should indicate the measures that will be taken to prevent releases to the atmosphere to minimize air quality impacts. 12

Hazardous Waste

Camp Grayling has three separate sites which are considered to be small quantity generators. A generator facility is not required to gain "interim status" or obtain a permit for hazardous waste management activity under the Resource Conservation and Recovery Act (RCRA). Such facilities are, however, subject to periodic inspections. The EIS states that expansion of the facility will possibly generate additional hazardous waste. Note that upgrading from small quantity generator to generator would reduce the time limit for storage without a permit from 180 days to 90 days.

Page 4-8.18 states that a Spill Prevention, Control and Countermeasure Plan (SPCCP) and an Installation Spill Contingency Plan (ISCP) have been developed for Camp Grayling. However, the details of these plans have not been included in the Draft EIS. We recommend that details of these plans for the assault landing strip, new fuel dispensing facility, MATES, and winter bivouac areas be included in the Final EIS. Without this information, we cannot determine the adequacy of these plans in relation to prevention of potential adverse impacts to the environment in the event of an accidental spill. With the projected increase in winter training, these plans should consider any special measures which should be taken for cleanup of spills during the wintertime (i.e., spills in snow and under ice). 13 16

The Final EIS should indicate whether any fire training activities would be undertaken in conjunction with the development of the assault landing strip. If such activities are contemplated, then the Final EIS should indicate control measures to be employed to protect the soils and groundwater. Page 17

2-3.11 discusses the mission of the aviation battalion and the use of collapsible fuel containers and forward air refueling equipment. This activity may increase during the winter. The Final EIS should discuss the control measures which would be taken in the event of an accidental spill or leak of this equipment. 18

Page 3-3.21 states that during wintertime training the ground is frozen so excavations may need to be performed by mechanized engineering units or demolition crews. The Final EIS should discuss the impacts that the increased use of explosives may have on the soils. 19

Two lakes are located within the proposed Multi-Purpose Range Complex. The Final EIS should indicate what measures will be taken to prevent contamination of these two water resources due to spent ammunition and explosives. 20

Wetlands

We do not, at this time, have sufficient information to determine the impacts of the proposed projects on wetlands. The Draft EIS states that Michigan Department of Natural Resources (DNR) has not surveyed the wetlands within Camp Grayling. However, it is known that wetlands comprise 1,312 acres of the inventoried forest lands at the Camp and that a large, 4,000 acre wetlands area (Bear Swamp) is located within the Camp's boundaries. In addition, 24 percent of the soils on the post are composed of Group 1 and Group 3 soils which are commonly found in swamps and bogs and in lowlands near lakes and in peat bogs. As you are aware, both the Section 404 (b)(1) Guidelines and Presidential Executive Order 11990, "Protection of Wetlands" mandate that wetlands be avoided unless it can be demonstrated that no practicable alternatives exist. We recommend that all areas requiring fill activities be field checked to determine presence of wetlands areas. The Draft EIS indicates that some of these areas have already been checked by DNR. It is unclear whether all areas have been field-verified. The Final EIS should clarify whether any fill activities would occur within wetlands. If fill activities are contemplated, then we recommend that the Final EIS include a map showing the locations and types of wetlands which would be filled. Wetlands should be mapped according to procedures described in the U.S. Fish and Wildlife Service's "Classification of Wetlands and Deepwater Habitats of the United States". The acreages and types of wetlands destroyed should be inventoried and included in the Final EIS. 21

If wetlands would be filled, then the Final EIS should explain why there are no practicable alternatives to locating the project within wetlands and show how the project has been designed to minimize harm to existing wetlands. Mitigation must be provided for all unavoidable wetlands losses. We recommend a minimum 1.5 acres of replacement or enhancement to each acre lost. This ratio is needed due to the time necessary to re-establish the functions of the original wetlands and because of the uncertainties regarding the success of the mitigation efforts. If fill activities are contemplated, then we recommend that a conceptual mitigation plan be prepared for review by the appropriate resource agencies prior to circulation of the Final EIS.

Page 4-5.22 states that the post will monitor heavily used cold weather training areas for vegetation impacts and that wetland areas will be restricted. We recommend that the word "restricted" be replaced by "off-limits" to prevent any destruction of the wetlands during that time of the year due to training. The Final EIS should also provide details of the vegetation monitoring plan.

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An exhibit in the Draft EIS entitled, "Range/Safety Fans/Impact Areas" shows several such areas just to the south of Bear Swamp. Due to the small scale of the maps in the Draft EIS, it is difficult to determine whether any of these activities would take place within this swamp. The Final EIS should clarify this issue. We would discourage any such activities from occurring within this natural resource.

23

The Draft EIS discusses construction of two wastewater lagoons which will be located within 500 feet of Bear Swamp. Measures must be taken during construction to minimize sedimentation to this swamp. The Final EIS should discuss specific measures to be incorporated into the design of the project to minimize contamination of the swamp from leaching of the wastewater lagoon.

24
25

Water Quality

The proposed project to construct Field Grade Bachelor Officer's Quarters (BOQ) on a hillside (Wilson Hill) with at least ten percent slopes has the potential for causing increased erosion and sedimentation problems. We recommend that the alternative site which would be constructed on flatter slopes be implemented since the erosion potential would be less than with the proposed project.

26

The project includes implementation of developed lanes for existing training practice. However, the Draft EIS does not provide sufficient details of this project to determine the impacts of these lanes on vegetation, wetlands, and other sensitive areas and the effects due to any expected increases in erosion. The Final EIS should discuss the types of terrain that will be utilized within lanes, analyze potential impacts, and indicate how impacts to sensitive areas can be avoided or minimized.

27

The water quality of the Manistee River is excellent and supports a high quality trout fishery. The Au Sable River has been designated a State Natural River and is further regulated in accordance with the adopted Au Sable River National River Plan under State Act 231, The Natural River Act. The Final EIS should indicate if any additional precautions will be taken to prevent degradation of the water quality of these sensitive resources due to erosion and possible contamination due to Camp training activities.

28

The Draft EIS is unclear regarding whether off-road maneuvering is allowed. Page 2-3.7 discusses armor units practicing off-road maneuvers. However, page 2-3.8 appears to say that such off-road maneuvers are against post policy. The Final EIS should clarify this issue and should explain what

29

measures will be taken to minimize erosion and sedimentation due to off-road maneuvering.

Appendix 4-4 includes the Camp Grayling Soil Erosion Control Plan. The plan has some good features. The wording of the plan, however, should be strengthened to indicate that these measures "will" be taken instead of "should" be taken, and a commitment should be made to implement this plan.

30

Portions of the text indicate that hay bales will be used as a measure to control sediment, however, the Soil Erosion Control Plan indicates that straw bales would be used. The Final EIS should clarify what would actually be used. We recommend that straw bales or sediment fences be used since they are more effective than hay bales.

31

The Final EIS should discuss whether deicing chemicals will be used in the wintertime, especially in conjunction with activities at the airfield, assault landing strip and on roads within the Camp. Measures should be taken to prevent contamination of nearby waterbodies by these chemicals.

32

Vegetation

The Draft EIS indicates that cutting of live conifers for camouflage is prohibited according to the Range Regulations, Chapter 2-10. However, with an increase in wintertime training, this may be difficult to enforce since most other trees and brush do not have leaves at this time of the year. In addition, the colder temperatures may increase the number of warming fires used by the troops. The Final EIS should describe measures to be taken to prevent the use of live conifers for these activities. As previously discussed, the Final EIS should also provide details of the vegetation monitoring plan to be implemented to prevent destruction of vegetation during training activities.

33

Endangered Species

According to the Draft EIS, 30 percent of the State's population of the Kirtland's warbler, a Federal and State endangered songbird, is found on the post. The Range 30 complex, which will be the new site of the MPRC, provides critical nesting habitat for this species. In the general discussion of this species, the Draft EIS states that "the military has agreed to set aside less critical military lands for habitat management for the Kirtland's warbler." However, the section of the Draft EIS which discusses mitigation does not mention providing other lands for this habitat to replace that lost due to proposed development. We recommend this section be revised to include a commitment to provide replacement habitat. Appendix A includes a cooperative agreement between the Michigan Department of Military Affairs and the Michigan Department of Natural Resources regarding a management program for the Kirtland's warbler. These two agencies should continue to work together to formulate and implement an acceptable plan to protect the Kirtland's warbler from development and training activities proposed at Camp Grayling.

34

With regard to the bald eagle, two nesting sites are located just to the north of the post near the assault landing strip. One nesting site is located to the west of the MPRC and is partially on-post. The Final EIS should discuss and commit to measures to protect this Federal and State threatened species from training activities at the landing strip and MPRC.

35

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
WASHINGTON, D.C. 20240

TAKE PRIDE IN AMERICA

June 22, 1989

In Reply Refer To:
ER-89/543

Mr. Greg Huntington
Engineering and Facilities Division
Michigan Department of Military Affairs
2500 S. Washington Avenue
Lansing, Michigan 48913-5101

Dear Mr. Huntington:

We received, today, ten copies of your draft environmental statement concerning the Mission/Multiple Construction: Camp Grayling Army National Guard Training Site, Lansing, Michigan.

This is to inform you that the Department will have comments but will be unable to reply within the allotted time as we have just received your submittal of duplicate copies to satisfy our intradepartmental distribution needs. Please consider this letter as a request for an extension of time in which to comment on the statement.

Our comments should be available about July 14, 1989.

Sincerely,

for James M. Martin

John H. Farrell
Acting Director

DOCUMENT 2

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
230 S. DEARBORN, SUITE 3422
CHICAGO, ILLINOIS 60604

ER-89/543 Jun 94

July 10, 1989

Mr. Greg Huntington
Construction and Facilities Office
Michigan Department of Military Affairs
2500 S. Washington Avenue
Lansing, Michigan 48913

Dear Mr. Huntington:

The Department of the Interior (Department) has reviewed the draft environmental impact statement (statement) for the proposed mission expansion and multiple construction, Camp Grayling Army National Guard Training Site in Crawford, Kalkaska, and Otsego Counties, Michigan, and provides the following comments and recommendations.

General Comments

The statement adequately describes the existing fish and wildlife resources and evaluates general project construction impacts. We concur that construction activities should have minimal impacts on fish and wildlife resources. However, we have several concerns related to impacts from operational activities on endangered and threatened species.

Specific Comments

The statement identifies Houghton's goldenrod (Solidago houghtonii) as a state-listed threatened plant species occurring on Camp Grayling (Page 4-5.15). Please note that this species has now been listed as a federally-listed threatened species, as well (Federal Register 27134, July 18, 1988). 1

The document describes the location of bald eagle (Haliaeetus leucocephalus) nests in and around the post (Page 4-5.44) and describes parts of the Management Guidelines from the Northern States Bald Eagle Recovery Plan. Although construction activities proposed in the statement will not affect the bald eagle, future operations have the potential to affect the species. The final statement should include a commitment from the Department of Military Affairs to follow the Management Guidelines in the event bald eagle foraging or nesting areas may be affected by future military activities. 2

The statement also describes the historic and present use of Camp Grayling lands by the Kirtland's warbler (Dendroica kirtlandii), the potential impacts to this species, and mitigation (Pages 4-5.41 to 4-5.43 and 4-5.48 to 4-5.49). The statement includes a draft copy of a Memorandum of Agreement between the Michigan Department of Natural Resources and the Michigan Department of

Military Affairs. We concur that the procedures outlined in this agreement will not affect the Kirtland's warbler, given the present species population level and the present distribution on Camp Grayling. However, if population levels and distribution change in the future, the National Guard Bureau should consult with the U.S. Fish and Wildlife Service (Service), in accordance with Section 7 of the Endangered Species Act of 1973 (Act), as amended.

The document is unclear concerning "developing habitat" for the Kirtland's warbler. Two tracts of developing habitat are located in the T2 Multi-Purpose Range Complex. From the discussion in the statement, it appears that this area will not be protected, even if warblers are present, unless the total warbler population falls below 200 pairs. Please be aware that even if this area is not posted, as is currently proposed, all military personnel have legal obligations under the Act. In addition to Section 7 consultation requirements for Federal agencies, Section 9 of the Act prohibits any person (private, State or Federal) from "taking" an endangered or threatened species. The Act defines the term "taking" to include "harassing," which the regulations define as disturbing an animal such that normal behavioral patterns, such as breeding and feeding, are significantly disrupted. Therefore, it is incumbent upon the Department of Military Affairs to avoid all activities that would "take" or "harass" any Kirtland's warblers using these, or other, "developing habitat" areas in the future. 3

If it is determined that any future activities on the post may affect federally-listed endangered or threatened species, Section 7 consultation with the Service should be initiated. Requests for informal consultation should be directed to the Field Supervisor, U.S. Fish and Wildlife Service, 1405 S. Harrison Road, East Lansing, Michigan 48823. Requests for formal consultation should be directed to the Regional Director, U.S. Fish and Wildlife Service, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

Summary Comments

We do not anticipate adverse impacts from construction activities proposed in the document. However, we request that the statement be revised to clarify commitments to protect threatened and endangered species during operational activities.

The opportunity to provide comments is appreciated.

Sincerely,

Sheila Minor Huff

Sheila Minor Huff
Regional Environmental Officer

cc: U.S. EPA, Environmental Review Branch, Chicago, IL (5ME)

DOCUMENT 3

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

June 30, 1989

Mr. Greg Huntington
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, Michigan 48913

Dear Mr. Huntington:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the Mission/Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan. We are responding on behalf of the U.S. Public Health Service. We found the documentation for this project to be well done with a thorough analysis of potential impacts. We were pleased to find that the proposed action is a part of an approved Master Plan for this facility.

Our review of the DEIS concentrated on potential public safety and health impacts resulting from the proposed project, particularly air quality, and noise. From a public health and safety standpoint, the proposed construction and renovation of facilities should result in a net reduction of potential health and safety risks. The only significant adverse impact on air quality is potential emissions from bulk fuel storage tanks and these emissions appear well controlled with the planned vapor control equipment. Noise, of course, is typically a potential problem with military training operations. We were pleased to find that predicted noise levels under the proposed project would be undifferentiable from that of normal current training operations. 1

Thank you for sending this document for our review. Please insure that we are included on your mailing list for the FEIS for this project as well as future documents with potential public health impacts which are developed under the National Environmental Policy Act (NEPA).

Sincerely yours,

David E. Clapp

David E. Clapp, Ph.D., P.E., CIH
Environmental Health Scientist
Center for Environmental Health
and Injury Control

SUMMARY

DOCUMENT 4

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
GORDON E. GUYER
HENRY HAMMER
G. STEWART MYERS
DAVID O. OLSON
RAYMOND POUPORE

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
P.O. BOX 30028
LANSING MI 48909

DAVID F. HALES, Director

June 13, 1989

Major General Vernon J. Andrews
Department of Military Affairs
2500 S. Washington Avenue
Lansing, Michigan 48913-5101

Dear General Andrews:

I am enclosing the comments from the Department of Natural Resources on the Draft Environmental Impact Statement (EIS) for Camp Grayling. Our technical level review has led us to find that the Draft EIS is deficient and needs a great deal of improvement before being finalized. We are especially concerned that specific details regarding proposed activities, environmental impact analyses of those activities, and determinations of feasible or prudent alternatives are lacking in the Draft EIS.

I hope we can arrange a meeting of key individuals from both of our Departments to go over our concerns and discuss suggestions for improvements. We would be happy to discuss this with you or make arrangements for such a meeting. Please let me know if you wish to pursue this or if you have questions regarding our comments.

Sincerely,

David F. Hales
Director
517-373-2329

Enclosure

cc: Mr. Ronald Steffens, Chairperson
Camp Grayling Management Advisory Committee
Mr. Howard Wetters, Governor's Office
Mr. David Dempsey, Council on Environmental Quality
Deputy Directors, DNR
Mr. Edward Hagan, Executive Assistant to the Director, DNR

Department of Natural Resources Comments on
National Guard Bureau and Michigan Department of Military Affairs
Draft Environmental Impact Statement

Mission/Multiple Construction: Camp Grayling
Army National Guard Training Site, Michigan
March 1989

The National Guard Bureau and the Michigan Department of Military Affairs have released for public comment a draft environmental impact statement as required by the National Environmental Policy Act.

Under the Act, a Federal Agency must prepare an EIS if its activities are having or propose to have a significant impact on the environment.

The National Guard proposes to alter structures and installations, and therefore, has prepared an environmental impact statement.

In reviewing the proposed activities, the Department of Natural Resources (DNR) has determined based on the draft EIS that additional information to address serious environmental concerns is required.

Generally, the EIS lacks specificity with regard to activities proposed, and therefore is deficient. Full and detailed disclosure of all activities, analysis of each activity and its impact on the environment including a determination as to the existence of feasible or prudent alternatives is not contained in the EIS.

The following comments address issue areas of particular concern to the DNR.

Wastewater Treatment System

1 Construction of housing for 900 men and women at the airport which includes an expansion of toilet and shower facilities is not adequately addressed. Previous use was for tenting facilities. Reference to a 12 inch water line from the airport to a treatment center is made, but the treatment center referred to is not identified. Thus, it is not clear how or where additional volumes of waste will be treated.

For example, a currently approved construction plan to address violations of the Camp Grayling National Pollutant Discharge Elimination System (NPDES) permit was not designed to accommodate the proposed permanent airport housing construction.

2 The proposed lagoon construction for the camp's wastewater treatment system will include spray irrigation of water over 40 acres per week, for use during the six warm weather months of the year. Proposed expansion of operations into the winter months precludes this disposal method of effluent. The EIS fails to detail winter sludge management plans.

Assault Landing Strip

The Assault Landing Strip (ALS) as proposed would lie approximately one mile south of the Manistee River in Kalkaska County. The runway would be 3,600 feet long with 300 foot long overruns at each end (4,200), and sixty feet wide with ten foot shoulders on each side (80 feet). This would require the permanent loss of 10-20 acres of wildlife habitat near a major river system. Training missions are one to two weeks with six to eight aircraft flying four missions each day (at least on weekends).

3, 6 Impacts which were not addressed in the EIS include: surface and groundwater impacts from aircraft refueling and deicing activities including impact on the Manistee River; impact on wintering and vulnerable wildlife; loss of wildlife habitat and impact on endangered Kirtland warbler habitat and increase in troop activity and development.

Cold Weather Training

7 No analysis has been done to determine the impact of heavy troop activity during winter months. Analyses should address the impact of year round training on wildlife, vegetation, the human population, and winter recreation activities, especially cross-country skiing and snowmobiling.

Noise

8 Noise reduction or mitigation proposals are needed as well as the impact of year round noise on wildlife, the human population, and tourism.

Railroad Spur

A proposed railroad spur from near Four Mile Road to the cantonment area is proposed. This will traverse approximately five and one-half miles of forest, cross under I-75, and provide for two to three trains per week until after the year 2000 (11 years away), and then the traffic may double. The track right-of-way is 56 feet wide and will require clearing 43 acres of mature oak, aspen and jack pine. Two and one-half miles of the track would be constructed on lands administered by the DNR.

9 None of the environmental impacts of this activity have been addressed including wetlands destruction, wildlife habitat destruction; drainage and surface water effects and public use of the right-of-way. In addition, the contents of the train using the spur were not disclosed raising questions about health and human safety; community right-to-know implications and the likelihood of the transport of toxic or hazardous materials.

Heavy Metals in Soils and Groundwater

10 The DNR continues to have concerns over the impacts of toxics and heavy metals in soils and surface waters. Although a study in the Barnes Lake area which included analysis of soils and surface water has been completed, no results have been released by the Department of Military Affairs. A thorough sampling and investigation is warranted before any expansion or continued use of bombing or artillery range use is undertaken.

Hazardous Waste

11 The EIS must address the method of disposal used for unexploded ordnances and demonstrate compliance with state and federal regulations. Under state and federal law, unexploded ordnances become a regulated hazardous waste when removed from artillery ranges for disposal either on or off site.

Solid Waste

12 The EIS does not address the requirements of the state's solid waste management plan which calls for the inclusion of recycling in all waste management plans.

Wetlands

13 The proposed activities will cross streams with either new crossings or extended crossings. The railroad spur will pass through wetlands.
14 Permits will be required for many of the activities proposed under the Inland Lakes and Streams Act, the Flood Hazardous Regulatory Authority Act and the Wetlands Protection Act.

15 In addition, the Natural Rivers Act prohibits military use within 400 feet of a designated Natural River. The AuSable River is a designated natural river, however, the EIS does not address whether expansion of facilities is proposed within 400 feet of the river.

16 No assessment has been made in the EIS of wetland impacts.

Socioeconomic Impacts

17 The EIS does not adequately address the socioeconomic impact of the proposed activities. Increased traffic, year round noise, potential shipping of toxic or hazardous materials by rail through resort communities, light pollution during nighttime exercises will all have an impact on the quality of life in what is primarily a recreation and retirement based area.

18 Expanded winter training in the state's primary winter recreation area which provides the only year round economic base could have a negative impact. Increased pressure on local infrastructure including roads, hospitals, police and fire personnel also need to be addressed.

19 Equally important, questions of future land use remain unanswered. By virtue of the proposed activities on the base, property values may be substantially altered and the emphasis for future development shifted dramatically. The people of the state of Michigan have much invested in their parks, forests, and waterways and place a high value on them. Only the most detailed and careful examination and analysis is acceptable before evaluating the proposed activities outlined in the EIS.

DOCUMENT 5

THE MICHIGAN LOON REGISTRY PROGRAM

Arlene Westhoven
406 E. Michigan
Mt. Pleasant, MI 48858

General Vernon J. Andrews
Michigan Air National Guard
Michigan Department of Military Affairs
2500 S. Washington Avenue
Lansing, Michigan 48913-5101

Dear General Andrews:

I am writing as the coordinator of the Michigan Loon Registry Program. This project, funded by the Michigan Department of Natural Resources and the Michigan Loon Preservation Association, has among its goals the identification of Common Loon breading lakes and the protection of the nesting efforts of the birds.

In the Camp Grayling activity and proposed expansion area, three lakes have been registered where loon pairs frequent. They are: Shupac, K-P and Wakeley. For the past two years, Wakeley Lake has had a nesting pair, with fledging success in 1988 of two chicks. This year, 1989, the loon pair has again returned to Wakeley Lake. As of 6/19/89, two chicks had hatched. It is our hope that the loons will at some point nest on Shupac and K-P Lakes also.

1 Upon review of the environmental impact statement for the Camp Grayling proposal, I found no mention of the Common Loon. I request that this threatened species be taken into consideration in any plans for range expansion. We also request that loons on these lakes be guaranteed protection from any overhead disturbance such as low, slow-flying planes and hovercraft.

The Michigan Loon Registry opposes any increased military activity in the areas above mentioned until the Common Loon is taken into consideration in the environmental impact statement. If any studies are done involving the effect of noise (artillery fire), overflights or increased daily activity, the Camp Grayling Army National Guard should bear the burden of the cost. Studies should be directed toward effects on the Common Loon species and should be conducted by a qualified loon biologist recommended by the Michigan Loon Preservation Association and The North American Loon Fund.

We thank you for your consideration of this threatened species in Michigan. At present, there are only one-hundred pairs estimated to be breeding in the lower peninsula. This may be below the

critical number for our lower peninsula population. The loss of habitat and stress from increased activity and noise may further the already tenuous status of the Common Loon in Michigan.

Jun 94

Arlene A. Westhoven

Arlene A. Westhoven

Michigan Loon Registry Program

-2-

We are once again asking that the military simply follow its' own regulations and enforce them with all military units using the facilities. Years of assurances seem to be all that happens, and the incidents continue. Would you please once again pass on our concerns to those persons/units responsible for the problems and for the enforcement of flight regulations?

The local contact for our Association, representing many other organizations, also, is: Mr. Doug Munson, U.S. Forest Service, 401 Court St., Mio, Mi 48647. He can be reached at telephone 517/826-3252.

If we can do anything to help the military in control of this problem, we would be more than pleased to do so. We hope we can expect some action, through you, from the responsible commanders.

Sincerely,

Harry Miller

Harry Miller, President,
M.L.P.A.

cc: A. Westhoven
D. Munson
J. Ebersviller, Eugene Hickock & Associates

DOCUMENT 5A

Michigan Loon Preservation Association

An Affiliate of the Michigan Audubon Society and the North American Loon Fund

6011 West St. Joseph Highway, Suite 403, P.O. Box 80527, Lansing, Michigan 48908-0527
Telephone: 517/886-9144

RECEIVED
JUL 17 89
JMM / Minnesota

July 13, 1989

REPLY TO:

Harry Miller
Michigan Loon Preservation Association
2402 Cedarcrest N.E.
Grand Rapids, Michigan 49505
616/363-5348 (home)
616/456-8357 (office)

The Loon — Symbol of the North — Preserve It

General Vernon J. Andrews
Michigan Air National Guard
Michigan Dept. of Military Affairs
2500 S. Washington Ave.
Lansing, Mi 48913-5101

Dear General Andrews:

This letter is submitted to once again make you aware of continuing problems involving aircraft operations in the Camp Grayling area. Arlene Westhoven of the Loon Registry Program (now known as Michigan LoonWatch) also wrote to you recently about the problems. Three lakes in the Camp Grayling area have loon nesting history: Shupac, K-P and Wakeley. Wakeley Lake seems to have the biggest problem.

The common loon is a threatened species in Michigan; only a short step removed from being endangered. There are fewer than 100 pairs of nesting loons in the Northern Lower Peninsula and two or three of those are within the boundaries of Camp Grayling. With virtually no human contact, these loons should flourish. Unfortunately, operation of military aircraft are causing serious harm to this treatened loon population.

Even though the military has written flight rules, posted regulations, and given us and others assurances that the problems will cease, the rules continue to be violated and/or ignored, and enforcement is lax or totally lacking. Recent very low level overflights of Wakeley Lake by flights of 3-4 C-130 transports are only the newest problem. These craft are apparently using Wakely as a reference point for a nearby drop zone, even though there are overflight prohibitions and a 2,000 foot ground level flight ceiling for this area. We are told many of these flights originate in distant states, that the local military has no control over them, that they have no radio contact with them from the local control tower, and that letters and maps with the regulations prohibiting these overflights were either lost or never sent to the units making the flights. We're also told that during the critical April-June nesting period, your local control tower is not staffed, anyway.

1 Although the loon is the focus of our concern, that species is not the only one being harrassed by military flights. Especially in the Wakeley Lake area, we find bald eagles, virginia rails and american bitterns being affected by the flights. Eagles, especially, that soar high above the lake are being threatened. The Air Force harassing eagles is not a pretty picture.

One maybe bright spot: the low level "buzzing" of the lakes by fighters seems to have stopped, but this has happened before, only to be resumed. Only one such incident can destroy not only an entire nesting season's success, but possibly the entire life of loon activity for the area, as loons may simply abandon the area due to the continued threats. This may make the military happy, but not the rest of the folks who also inhabit this world. This year still has had several jet and helicopter violations of your own posted regulations, and the local responsiveness to the timely complaints has been less than acceptable.

(contd., 2nd page)

The Loon — Symbol of the North — Preserve It

DOCUMENT 6

June 17, 1989

From:
Bethel Larabee
Excelsior Township Supervisor
1418 Darke Rd NE
Kalkaska, MI 49646

To:
Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913-5101

Re: The draft Camp Grayling Mission/Multiple Construction Environmental Impact Statement.

Dear Sirs:

A few comments on the draft copy itself:

1. Township and County lines are not well identified on the maps. This makes it hard for the reader to locate areas in question.

2. Some roads have been left off the maps, others are not well identified.

3. One of the most controversial items, the assault landing strip, was left out of the table of contents.

4. The maps are not numbered as indicated, in fact they have no numbers.

The E.I.S. should have been put together in a manner that made it easy for the lay person to understand. This is particularly important in the draft copy, as you need imput by people who live and work in the area. They are the one who will have to live with the changes proposed.

A large fold-out map, with all the roads identified; with County, Township, and section lines identified; and showing proposed sites, as well as alternative sites, would be a big improvement in the E.I.S.

As for the proposed Assault Landing Strip:

a. It is too close to the Manistee River. This is a major recreational river, and the area depends economically on the recreation and tourist trade.

b. Why risk damaging a good river? All plans for environmental protection would fail, if a plane should crash on take-off or landing. A major fuel spill, or for that matter, many little spills, could cause long lasting damage to the river and area.

c. The people who live and own property along that area of the Manistee River should not have an airport move in next to them, even if its only on a part time basis. The value of the property is not only because it is on or near the river, but also because it usually is quiet.

d. There are certainly many areas in the Camp Grayling complex that would be more suitable for the Assault Landing Strip. Have they looked at the area about 4 miles southwest of the south end of Lake Margarethe, on the county line between the restricted access impact areas?

e. The fact that the trees in this area had recently been cut should not have been a major factor in choosing the site.

Sincerely,

Bethel Larabee
Excelsior Township Supervisor
1418 Darke Rd NE
Kalkaska, MI 49646

DOCUMENT 7

WHITE, BEEKMAN, PRZYBYLOWICZ, SCHNEIDER, & BAIRD, P.C.
ATTORNEYS AT LAW
SUITE 200, 2210 UNIVERSITY PARK DRIVE
OKEMOS, MICHIGAN 48864-3967
TELEPHONE (517) 349-7744
FAX (517) 349 8293

Jun 94

JAMES A. WHITE
LENWOOD E. BEEKMAN
ARTHUR R. PRZYBYLOWICZ
BARBARA BUSH SCHNEIDER
THOMAS A. BAIRD
WILLIAM F. YOUNG
SHARON L. LAPOINTE
JAMES J. CHIODINI
KATHRYN A. VAN DAGENS
MICHELE B. EADDY
SUZANNE KRUMHOLZ CLARK

June 28, 1989

Mr. Greg Huntington
Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 South Washington Avenue
Lansing, MI 48913-5101

Re: Draft Environmental Impact Statement Regarding Mission/Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan

Dear Mr. Huntington:

On behalf of the Michigan Council of Trout Unlimited, please find enclosed written comments regarding the above Draft Environmental Impact Statement. I believe you will be receiving separate written comments from the national organization of Trout Unlimited, also. Please file according to the procedures adopted for this purpose.

If you have any questions regarding the enclosed comments, or need further information, please do not hesitate to call. Thank you for your attention to this matter.

Very truly yours,

WHITE, BEEKMAN, PRZYBYLOWICZ, SCHNEIDER & BAIRD, P.C.

Thomas A. Baird

emb
Enclosure
cc w/enc: Al Pienkowski
Gary Marek

DRAFT ENVIRONMENTAL IMPACT STATEMENT

MISSION/MULTIPLE CONSTRUCTION: CAMP GRAYLING ARMY NATIONAL GUARD TRAINING SITE, MICHIGAN

COMMENTS OF MICHIGAN COUNCIL TROUT UNLIMITED, INC.

June 28, 1989

The following constitute the comments of the Michigan Council of Trout Unlimited, Inc., regarding the Draft Environmental Impact Statement (the "DEIS") prepared in connection with expansion proposals relating to construction and operations at Camp Grayling. It is submitted pursuant to 40 CFR § 1503.1. This document is supplemental to the comments made by the undersigned at the public hearings held in connection with this DEIS.

I. SUMMARY

A. Trout Unlimited opposes the expansion of Camp Grayling, and continued operation at current levels, and thus opposes the projects listed in the Camp Grayling Master Plan and discussed in the Draft Environmental Impact Statement. Excepted from this position are those proposals, or portions of proposals, designed to repair, monitor, or mitigate current environmental damage which has been done, and continues to occur, at Camp Grayling. Growth in the Camp to date has outstripped the carrying capacity of the region. Further expansion is out of the question.

B. The Draft Environmental Impact Statement

1. The DEIS is flawed at its inception, because it was designed and prepared to justify the decision to expand Camp Grayling, as described in the Master Plan, and not to constitute a legitimate discussion of the environmental aspects of that proposal. This is a clear violation of the regulations regarding environmental impact statements promulgated by the Council on Environmental Quality (CEQ), 40 CFR §§ 1500.5, 1501.1, 1502.2, 1502.5, and 1505.2.

2. Summary of Technical Deficiencies

The DEIS for Camp Grayling is deficient in the following areas:

a. Description of the environment
b. Identification of reasonable alternatives
c. Failure to use best available information
d. Failure to obtain presently unavailable information
e. Failure to provide a legitimate economic and cost benefit analyses
f. Gross failure to identify the environmental consequences of implementation of the Master Plan, both as a general matter and particularly with respect to the possibility of catastrophic consequences.

C. Need for a Revised DEIS

The March 1989 DEIS for Camp Grayling is so deficient as to preclude meaningful review. It should be totally revised and republished as a draft environmental impact statement, and redistributed for comment pursuant to 40 CFR § 1502.9.

II. ERRONEOUS ASSUMPTIONS UNDERLYING THE DEIS

The DEIS makes several unstated and insupportable assumptions. They affect the entire document. These include the following.

A. The Mission of Camp Grayling

The DEIS makes the erroneous assumption, unsupported by any reference, that the mission of Camp Grayling is the same as the mission of the entire U.S. military establishment as it relates to training, and thus that the mission of Camp Grayling cannot be served unless it is capable of conducting all conceivable land and air based training activities. Camp Grayling is a Michigan facility, owned by the State of Michigan, and essentially leased to the Michigan Department of Military Affairs. It is a multiple use area, and not "dedicated" to military purposes. The needs of the military can be met while taking these other interests into account, and without the requirement that all of

the construction and operational proposals in the Master Plan be located at Camp Grayling, Michigan.

B. The Nature of the Grayling Region

Jun 94

The Grayling region lies within the watershed of two of the great river basins of the midwest, the Manistee and AuSable Rivers. The latter is a premier trout stream, said to be the best east of the Rocky Mountains. The area as a whole is dependent on tourism, recreation, and the resort industry, as well as other industries, not the military, for its sustenance. The DEIS underrates, to an extraordinary degree, the conservation value of this region, which is one of the true jewels in Michigan's treasure chest of natural resources.

C. Ownership

3 The DEIS erroneously assumes that Camp Grayling is "dedicated" to military uses, and that much of the property on which the Camp rests is "owned" by the National Guard. This is incorrect. With some very minor exceptions, the Camp Grayling Military Reservation lies on lands owned by the people of the State of Michigan, under the administration of the Michigan Department of Natural Resources (DNR) and leased to the Michigan Department of Military Affairs (DMA). Foreign units train here by permission only. Some of the leases are short term and will expire. Others do not have a defined term, but state that the DMA is permitted to use the lands "for military purposes in the same manner, and to the same extent, as is now exercised . . . ." These leases are several years old. Since they were executed, both the manner and extent of use of Camp Grayling have increased. In addition, all such lands are to be held open for hunting, though some of them have been closed. They are also subject to a so-called "cooperative agreement" between the DMA and the DNR. Thus, the Master Plan proposes the expenditure of enormous sums of money on lands which the military does not own, over which it does not exercise complete authority or control, and which may soon be lost to it.

D. The Growth of Camp Grayling

Although the DEIS acknowledges that the amount and type of use of Camp Grayling has increased dramatically over the years, it makes the undocumented assumption that there will be no "significant increases" in use, the number of users, traffic, etc. This statement is completely at odds with any reasonable forecast

regarding Camp Grayling should the Master Plan be implemented in full.

1. The history of Camp Grayling shows that use has almost doubled in the last ten years, and has increased fifty-fold since its inception. The current "status quo" is a condition of growth.

2. Many of the projects contemplated by the Master Plan will be "over-built," that is, built to specifications far in excess of what would be needed if growth were not anticipated.

3. The testimony before the Governor's Committee on Camp Grayling, including that of Colonel Green, Ret., indicated that if the Master Plan is implemented in full, and particularly if the assault landing strip (ALS) and multi-purpose range complex (MPRC) are built, the Camp will be an extremely attractive training site for units throughout the country, including active army units. The DEIS itself mentions that Camp Grayling is in "competition" with other training bases for units which need training time. It is well known that Camp Grayling markets itself as a prime training site.

4 4. Statements of military officials, including General Templeton of the National Guard Bureau, have indicated that if the money were available, Camp Grayling could be expanded "a hundredfold."

5. It is ridiculous to assume that the federal government will invest scarce national resources in a facility that goes unused much of the year. If nothing else, use will have to increase to justify these expenditures.

6. Most importantly, when the question was put directly to them, officers of the DMA, including General Andrews and Lieutenant Colonel Downey, refused to state, much less guarantee in any legally binding way, that the Camp will not expand past its present levels.

Unless legally enforceable restrictions are placed on growth and expansion at Camp Grayling, the DEIS must anticipate further substantial increases, and discuss the environmental consequences they will have.

E. The DMA As A "Good Neighbor"

5 It is stated throughout the DEIS that "good practices" and "sound techniques" will be utilized to assure that the environmental consequences of implementation of the Master Plan are minimized. This assumes that such representations can be trusted. They cannot. Witness the following.

1. The prior acts of the DMA and its users do not justify such reliance, for example:

   a. Illegal sewage system at the cantonment area, which for many years violated its NPDES permit (when one was finally obtained), and dumped raw sewage into the ground around Bear Swamp, which feeds Portage Creek and the Manistee River.

   b. Illegal dumping and disposal of waste materials, including hazardous and other dangerous wastes. This includes open burning, on the ground, of waste ordnance, using explosives or fuels for ignition.

   c. Surface burning and detonation of munitions and other hazardous waste in the open.

   d. Numerous documented and undocumented fuel spills and inadequate cleanup measures.

   e. Helicopters landing on the PBB burial site.

   f. Mishandling of hazardous waste, including unlicensed transport of hazardous waste, and improper handling of PCBs.

   g. Unlicensed and illegal landfills.

   h. Numerous stream crossings involving stream bank and stream bed destruction and inadequate bridging of streams, causing substantial erosion, continuing through the time of this writing.

   i. Massive drops of 500 pound bombs.

   j. Uncontrollable wildfires, without adequate fire safety precautions.

   k. The washing of tanks and other machinery in streams throughout the Camp, and in other areas not designed to contain the contaminated runoff.

   l. Accidental or intentional destruction of wildlife habitat through wildfires and reckless driving.

   m. Intentional shelling of surface waters, including Barnes Lake.

   n. Refusal to comply with the recommendation of the Governor's Committee on Camp Grayling, and violations of its agreement to do so. These violations, occurring in 1989, include failure to reach a training agreement with other users of the Camp, failure to mark helicopters with easily identifiable numbers, and firing on the opening day of trout season.

2. Lack of Authority and Control

6 The DMA lacks authority and control sufficient to enforce its own environmental regulations, such as they are. It is admitted by the DMA that due to the niceties of the military command structure, the Michigan Department does not exercise military control over foreign units. Even if the DMA had the time and inclination to monitor their activities, in numerous instances requests to abide by environmental rules are simply ignored. The continuing and ever-present problem of overflights is but one example. The DEIS must assume that these depredations by foreign units will continue.

3. The problems mentioned above are endemic at military basis throughout the United States, not just Camp Grayling. The ultra-hazardous nature of military activities, and the approach which the military takes to environmental matters is well known, documented, and unchanging. This must be assumed for the purposes of the DEIS.

F. The "Marginal Effects" Analysis

7 The DEIS makes the basic assumption that the current environmental, social, and economic status in and around Camp Grayling is acceptable and, thus, the marginal effects of implementation of the Master Plan

7 will not, by comparison, be detrimental. The basic assumption is incorrect. The environmental situation at Camp Grayling is deplorable. The social problems experienced by communities surrounding Camp Grayling are well known and documented. The DEIS ignores the negative economic impacts that Camp Grayling has on the tri-county economic impact area in their entirety. The DMA and Camp Grayling should be required to clean up their current mess before any thought is given to expansion of their activities. The marginal effects analysis should be rejected.

III. THE SCOPING PROCESS AND INTER-AGENCY REVIEW

A. The Scoping Process

Numerous issues were raised during the scoping process, some of which were included in the scoping document itself, which are not addressed in the DEIS. These include the following:

1. The issue of chemical contamination of the soils, ground waters, and surface waters of Camp Grayling has not been addressed.

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2. The "Barnes Lake Study," which would have helped address that deficiency, is completely inadequate. See below.

3. All concerns which surfaced during the entire scoping process, and other pre- and post-DEIS concerns, should be reviewed to assure that they have all been fully addressed in the revised DEIS.

B. Inter-Agency Communication and Expertise

9 The CEQ regulations encourage inter-agency cooperation in assessing the environmental impacts of government proposals, and require any federal or state agency with jurisdiction or special expertise to be notified of promulgation of the DEIS, and encouraged to participate. See, e.g., 40 CFR 1502.19. At a minimum, the following agencies should have been contacted and requested to comment:

1. Fish and Wildlife Service
2. Environmental Protection Agency
3. General Accounting Office
4. OSTHAMA
5. DOD Explosive Safety Board
6. DOD Installation Restoration Program

7. Surgeon General
8. Michigan Department of Public Health

IV. DESCRIPTION OF THE CURRENT ENVIRONMENT

The description of the current environment set forth in the DEIS is grossly inadequate, as indicated by the following examples:

A. Ownership of Camp Grayling

Camp Grayling is owned by the people of the State of Michigan, and is to be used for multiple purposes, including outdoor recreation. See above.

B. Growth

The present status of Camp Grayling is one of a growing operation, and not one which is likely to remain at current levels.

C. Soils and Erosion

The 60-plus year old soil study is completely inadequate. References to minor erosion are laughable. Major portions of the Camp are completely destroyed, and resemble a desert or a moonscape. The DEIS must 10 contain a current and accurate assessment of soil conditions.

D. Hydrogeology

The DEIS is almost silent on the hydrogeology of the Camp. It does not provide adequate characterizations of existing site conditions from which an impact 11 assessment can be made. A complete hydrogeological study is essential to establish existing environmental problems, particularly with respect to soil and ground water contamination, due to the extreme sensitivity of the soils to surface and groundwater contamination. No attempt appears to have been made to establish and include information on groundwater flow patterns other than to indicate that groundwater "is expected to flow from the [glacial] moraines toward the rivers," i.e., that it will flow downhill. No mention is made of the location of the monitoring wells used to determine water quality in the vicinity of the bulk fuel facility, treatment plant, or landfills, nor is any meaningful information included on monitoring well construction, etc. At a minimum, the number, depth, and placement of monitoring wells, and the frequency of monitoring and water quality analysis, should be

presented. Current runoff effects have not been adequately addressed, nor are they addressed in the discussion of environmental consequences. A complete survey needs to be done of the hydrogeology of Camp Grayling before any thought can be given to expansion of activities there.

E. Wetlands

12 There is almost no description of wetlands in the Camp. A complete inventory needs to be done.

F. Plants and Wildlife

13 Again, the description is extremely shallow. At a minimum, endangered plant and animal species should be completely inventoried. Also, key habitat, including that of the Kirtland's Warbler, eagles and other raptors, loons, and deer (especially wintering areas) should be described in detail.

G. Hazardous Waste

Numerous dangerous and hazardous materials are utilized, and related wastes generated, at Camp Grayling. These include artillery propellant, explosive residue, ordnance slated for destruction, hydrocarbons, other liquid wastes, and solid waste. Even now, complaints of illegal waste disposal practices are being investigated relative to Camp 14 Grayling. All hazardous wastes, waste sites, and disposal practices should be inventoried prior to expansion and described in the DEIS.

H. Water

15 The DEIS completely ignores the Barnes Lakes Study. That document, which has now been published and will presumably be referenced in the revised DEIS, is completely inadequate. Sampling took place outside of the impact area. Only shallow wells were used. No meaningful attempt was made to establish or describe overall groundwater flow patterns. Quality assurance and control measures are not described, and may not have been used. Fish tissue sampling was done only on fillets, after the organs and at least some fat had been discarded. Testing for several relevant contaminants was omitted. The study is meaningless, as is basically admitted in the document itself.

I. Rivers

16 Trout Unlimited shares the DNR's concern that the DEIS does not properly address the scenic river designation of the AuSable watershed, nor does it consider the purposes which such a designation is to serve, such as the preservation and enhancement of a wilderness experience.

J. Noise

The DEIS base data, computer modeling, and analysis regarding noise are all deficient. Trout Unlimited adopts by reference the comments of the AuSable 17 Manistee Action Council (AMAC) in this regard. No serious attempt appears to have been made to assess the current health effects of noise at Camp Grayling.

K. Off-Base Environment

Because the air and traffic activities of the Camp sometimes take place off the base, the surrounding environment must be assessed, also. This is especially important with respect to some bird species, such as the Kirtland's Warbler and loons, and surrounding residential and recreational areas, such as the Hartwick Pines.

L. Economic and Social Effects

The economic analysis in the DEIS is perhaps the worst element of a bad lot. It basically considers only the Grayling area, as opposed to the three county economic impact area. It fails to address the negative impact 18 that the Camp has on the area, including property devaluation, burdens on local services, and reduction of the tax base. Most importantly, it fails to measure opportunities in the area of recreation, tourism, and resort industries which have been lost due to the location of Camp Grayling and the activities conducted there.

V. SELECTION OF ALTERNATIVES

The CEQ regulations require, without ambiguity, that a DEIS shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of human environment. 40 CFR 1502.1. The DEIS should rigorously explore and objectively evaluate all reasonable alternatives, and devote substantial treatment to each alternative considered. The alternatives must include reasonable

alternatives not within the jurisdiction of the lead agency, and the alternative of no action. 40 CFR § 1502.14.

A. Alternatives Limited

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The DEIS unreasonably limits alternatives. The only alternatives generally considered in the DEIS are proposed action, no action, "other site," and "relocation." However, the other site and relocation alternatives are defined as involving only Camp Grayling or the Grayling area. This gross limitation of alternatives eviscerates the purposes of NEPA and the CEQ regulations, and makes the entire exercise a sham.

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B. Alternatives Ignored

1. Other locations, for example, other training sites in Michigan, in the region, and throughout the country.

2. Reduced activity. Obviously, reduced activity would enhance the human environment. However, this option is not considered, although it is completely consistent with the few environmentally sound proposals made in the Master Plan, such as repair of the sewage facilities at the cantonment area, and with the requirements of the DMA/DNR leases.

C. Lack of Cost Benefit Analysis

The discussion of alternatives, both accepted and rejected, does not include a cost benefit analysis, although many alternatives, even those defined as alternatives by the DEIS, are rejected as being uneconomical. The DEIS also ignores the cost of cleanup, and other negative economic aspects associated with implementation of the Master Plan alternatives. This is not acceptable.

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D. Summary

The consideration of alternatives is a key to proper consideration of the environmental consequences associated with the Master Plan. It is "the heart of the Environmental Impact Statement." 40 CFR 1502.14. The DEIS is absolutely silent on several alternatives, and rejects others out of hands. This simply cannot be permitted to stand.

VI. ENVIRONMENTAL CONSEQUENCES

The DEIS makes the statement that there will be no adverse environmental consequences which cannot be appropriately mitigated, even if the entire Master Plan is implemented. This extraordinary statement is not supported by the record, inadequate though it is, or by the facts.

A. Failure to Consider Alternatives

Alternatives have not been considered. Contrary to CEQ, regulations, all environmental consequences, including those of reasonable alternatives, should be considered. Due to the unreasonable elimination of various alternatives, this has not been done.

B. Insufficient Description of Proposals

1. The timing of construction and implementation of the operational aspects of the Master Plan is not revealed.

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2. The possibility of expansion is not revealed or discussed.

3. By way of example, consider the following. Significant new housing is proposed for the airfield, but no description of the method of sewage disposal for that facility is mentioned. Regarding the assault landing strip, no discussion is provided regarding the maintenance required for the field itself, the field and airplane operations which will take place (such as de-icing and fuel dumping, which are standard operating procedures), the training activities associated with the C130 landings, or the wetlands impacts, and there is no discussion of the problem of placing a C130 landing strip in such close proximity to a sensitive river and a deer wintering area. Stream crossings are not identified or properly located, and no construction details are given.

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C. The Marginal Effects Approach

It is inappropriate to consider only the marginal effects of projects. Each project must be considered on its own, and the synergistic or combined effect of the entire operation should also be considered. The fact that the current situation is environmentally, socially, and aesthetically unacceptable does not justify additional disturbances.

D. Construction Versus Operational Effects

For the most part, the DEIS treats the Master Plan as a construction project. The numerous, serious, and ongoing environmental consequences of operation of the Camp under the new Master Plan are, for the most part, ignored, and they must be addressed.

E. Environmentally Sound Proposals Should Be Retained

The DEIS indicates that "no action" would negate the positive environmental impacts, such as they are, which will flow from the proposals in the Master Plan. However, the environmental problems at Camp Grayling can be rectified, and they should be, without further expansion.

F. Specific Environmental Attributes

1. Soils and Erosion. Stream banks and crossings, and the environmental effects of the Master Plan, are not discussed. Nor is soil contamination from spills and dumps, propellants and explosives, unexploded ordnance, and other chemicals, including carcinogens, satisfactorily addressed.

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2. Ground Water. The problem of contamination is not discussed, probably because there is insufficient base data to begin with. Sewage disposal at the airfield was mentioned above. The problem of spills, dumping, and accidents associated with the assault landing strip are not addressed in the DEIS. The Master Plan contemplates utilization of a sewage treatment plant at the cantonment area which will be inoperable during the winter. The DEIS completely fails to take into account the problem of spring runoff, particularly in chemically sensitive areas such as the impact areas in the Camp, where residues will build up on frozen ground until spring and, given proper conditions, be washed directly into flowing surface waters, causing a "flash" of contamination. Runoff from paved areas is not discussed. Of particular concern are airplane and vehicle landing, fueling and maintenance areas where runoff and spring melt may cause flushing of hydrocarbons or other hazardous wastes, such as asbestos (from brake linings) into moving surface waters.

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3. Plants and Wildlife. The DEIS gives insufficient consideration to the effect of noise and contamination on eagles and other raptors, loons, the Kirtland's Warbler, and other species. The effects of the proposed construction process and year-round operations on wintering deer is likewise ignored. There is absolutely no consideration of biomagnification of the contaminants in the soil and water through the food chain. Insufficient attention is given to endangered species, which is required by the Endangered Species Act. It does not suffice to say there is a plan or agreement with another agency regarding these species, and thus avoid the requirements of NEPA and the Endangered Species Act. At a minimum, it can be said that there are responsible opposing opinions. The situation of endangered species must be completely reviewed, and a legal opinion regarding the legality of the DMA/DNR Kirtland's Warbler Agreement procured and appended to the DEIS.

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4. Contamination. The problem of contaminants has not been studied or addressed. The Barnes Lake Study, as indicated above, is woefully insufficient, as is admitted in that study itself. An overall assessment of the Camp does not exist.

5. Habitat. Almost no consideration is given to the effects the construction and operations as anticipated by the Master Plan would have on the habitat for wildlife and fish. The problem of wildfires is ignored. Regarding the Kirtland's Warbler, again, the existence of an agreement is not sufficient. Additionally, regarding mitigation of the Kirtland's Warbler habitat destruction process, it appears that the quality of habitat related to seedling plantings has been inadequately addressed.

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6. Air Quality. The problem of gases and blast residue in the air is, for the most part, ignored. No discussion of the effect of peak periods, when gases can be expected to be at their maximum levels, or the health effects of this phenomenon, is included.

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7. Noise. The DEIS brushes off other agencies' studies on the health effects of noise, almost as if they did not exist. This is inappropriate. Those studies, and the adverse health effects of noise, should be described in detail. The sound

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studies contained in the DEIS do not measure the largest weapons utilized at Camp Grayling, nor do they provide any assessment of new weapons which will be utilized in the near future. "Secret" sound studies, already prepared, are not referenced or appended. Trout Unlimited incorporates by reference the submission of AMAC with respect to the noise problem.

8. Soil and Groundwater. The entire problem of soil and ground water contamination has been ignored. This is especially distressing given the extremely sensitive nature of the soils in the Camp Grayling area, and the fact that they are the source of and reason for the high quality of the waters in the AuSable and Manistee Rivers. After a full hydrogeological study, the precise environmental consequences of the proposals in the Master Plan must be considered relative to the problem of ground and surface water contamination.

9. Unquantifiable Impacts. The CEQ regulations require that unquantified environmental impacts, values and amenities must be considered. 40 CFR 1502.23. This simply has not been done. The Grayling area is not just another military camp where unquantifiable environmental attributes, such as the wilderness experience, outdoor recreation, and other similar values can be written off. This is God's country in every sense of the term, a treasure, and this area has been enjoyed by recreationalists, outdoor sports people, resorters, residents, and retirees for many years. The situation has already become intolerable, and the various unquantifiable problems associated with the Camp's current expansion, much less the Master Plan, cannot go ignored.

10. Human Health. Human health hazards from activities at Camp Grayling have essentially been forgotten. These include problems with drinking water, noise (physical effects, including loss of sleep, damage to hearing, and structural damage to buildings), air pollution, poisoning of the food chain, and stress associated with the continuing day and night activity at the Camp. These direct and indirect impacts at the Camp, including those which will be exacerbated by the proposals contained in the Master Plan, should be given the utmost attention.

11. Human Environment. The problem of winter closings of cross-country ski trails, snowmobile trails, and hunting during all open seasons has nowhere been addressed. It does not seem that the general considerations of "liveability" and "aesthetics" in the area have been given any consideration whatsoever.

12. Socioeconomic Considerations. The effect of the Master Plan, if implemented, on the three county economic impact area must be assessed. This includes considerations of the tax base, impositions on local government services, potential loss of population (as indicated in the testimony during the hearings on the DEIS), reductions in tourism, reductions in property values, modifications in land use direction, and lost opportunities to develop the area for purposes other than a battlefield.

G. Catastrophic Consequences

The operation of a military installation is an ultrahazardous activity. The CEQ regulations make it clear that reasonably foreseeable consequences, including catastrophic consequences, even if their probability of occurrence is low, must be addressed. 40 CFR 1502.22. The following possibilities should be considered.

1. A plane crash and/or spill at the assault landing strip, on sensitive soils, less than one mile from the Manistee River.

2. Other fuel spills.

3. Fuel storage tank ruptures. In this regard, we find it astonishing that underground fuel storage tanks are proposed.

4. Accidents in transportation, including wheel and tracked vehicles, air crashes, and train accidents. This consideration should deal both with the immediate destruction that might be caused, and with the types of materials which may be carried on board.

5. Wildfires seem nowhere to be considered, and the testimony has been that the part-time fire safety force at Camp Grayling has been derelict in its duties. Fires should be anticipated and contingency plans disclosed.

6. No mention seems to be made of methods by which the inevitability of unanticipated explosions of ordnance or other materials may occur. The recent death of young Joseph John Anderson is illustrative, and resulted in a finding of wrongful death against the DMA and an award of $1.2 million plus interest to the family of Mr. Anderson against the State. How many children have to die before we recognize the extraordinarily dangerous nature of the Camp Grayling environment?

7. Lack of authority and control, discussed above, exacerbates the situation and makes it much more likely that, even given the best of intentions by the DMA (assumed here only for the sake of argument), enforcement will be impossible because of the lack of a training agreement and of authority to control foreign troups and aircraft.

Under CEQ regulations, these hazards must be recognized, potential catastrophes associated with the planned activities at Camp Grayling anticipated, contingency plans described, and environmental consequences addressed. This has simply not been done in any way.

H. Specific Projects

1. MPRC and Combined Arms Training. The problems of habitat destruction, soil and water contamination, and exacerbation of the noise problem in connection with "combined arms training" at the MPRC have not been addressed, and must be.

2. Assault Landing Strip. The problems of habitat destruction, wetlands destruction, and operational problems associated with the ALS have not been addressed.

3. Airfield Barracks. The question of sewage disposal has been ignored.

4. Winter Activities. The problems of exacerbation of environmental problems due to year round operations, destruction of deer wintering grounds, closure of recreational areas, and potential soil and water quality issues associated with sewage disposal and spring melt and runoff have been ignored.

5. Transportation and Storage of Dangerous Materials and Hazardous Waste. Insufficient detail has been provided in connection with this problem, particularly relative to vehicle maintenance and fueling facilities, the current airfield, the assault landing strip, and the disposal of ordnance. In this regard, it is our understanding that the military has attempted to define its spent, dud, or surplus ordnance as something other than hazardous waste, a true exercise in science fiction.

I. Mitigation and Monitoring

The mitigation and monitoring discussions in the DEIS are so vague as to be incapable of meaningful criticism. Other than references to "best practices," no detail is provided at all. Site specific information must be provided with respect to construction and operations. Important among these is an efficacious groundwater monitoring program, which must be preceded, as indicated above, by a soil and hydrogeological study to determine the parameters of those elements at the Camp. Additionally, accident and evacuation plans should be provided, particularly with respect to the assault landing strip and railway proposals.

J. Cost of Cleanup

The question of who will pay for the environmental damage wreaked upon the Camp Grayling area by the military establishment is nowhere addressed. The DMA is currently scrambling to "clean up its act" now, but it appears to be too little and too late. Ultimately, by termination of the leases, either through expiration or violation, or when the U.S. Army decides that Grayling no longer suits it needs, the Camp Grayling lands will revert to the Department of Natural Resources for further administration. The cost of cleanup of the various spills, landfills, accidents, residues, and other hazardous and dangerous wastes, is nowhere considered in the DEIS. When assessing the relative costs and benefits, and economic aspects, of implementation of the Master Plan, the cost of cleanup cannot be ignored, and will be astronomical. The State of Michigan should be particularly concerned in that regard, now that the Supreme Court has decided that states may be held liable under CERCLA and SARA for cleanup costs. Pennsylvanian v Union Gas Company (US S Ct, June 15, 1989). Before we proceed further with assault landing strips, multi-purpose range complexes, combined weapons training, and the other projects and

activities contemplated by the Master Plan, serious thought should be given to the ultimate costs, both to the community and to the state. The DEIS fails to do so. (In this regard, by the way, we are aware of no agreement by the National Guard Bureau to indemnify Michigan for this liability.)

K. Conflicts Between Users

47 The DEIS fails to adequately take into account the multiple uses to which this region has been put. The tri-county area associated with Camp Grayling is not a desolate, unpopulated, desert region of the arid southwest. It is surrounded by lakes, streams, and forests. There are large population centers in and near the Camp. People go to the area to vacation, engage in outdoor sports, and to live and enjoy their retirement. The DEIS fails to take this into account, much less the direction that future development will take in response to implementation of the Master Plan. Essentially, the DEIS fails to take into account alternative uses and the conservation potential of the area.

VII. INSUFFICIENT INFORMATION

As a general matter the CEQ regulations require the information in the DEIS to be of "high quality," including "accurate scientific analysis, expert agency comments," and the like. 40 CFR 1500.1(b). This has simply not been accomplished in the present DEIS. Where information is incomplete or unavailable, it should be obtained. 40 CFR § 1502.22.

A. Failure to Adequately Review Literature

Other than the sound studies, which are heavily referenced, many of the sources in the DEIS are personal communications. There appear to be few sources cited from the literature, particularly that published by other agencies, which have relevant information available to them. They are listed in Section III(B) above. Several studies have been done regarding the toxic effect of ordnance, some of which are cited in the written comments of the Anglers of the AuSable, which are incorporated herein. Numerous studies on the economic effects of the local military bases, and the effect of base closings (some of which find that the closing of military bases has a positive effect on the local economy) are ignored. The medical literature, particularly with respect to the effect of noise, hazardous wastes, and problems associated with

ground and water contamination and poisonings of the food chain, have been ignored. It is noted that there is no physician or other medical expert on the list of preparers.

B. Inaccurate Data

Much of the data referenced in the DEIS is old, inaccurate, or based on computer modeling as opposed to ground verified data. This includes soil and hydrogeological studies, sound studies, and economic data. This information needs to be updated and substantially improved.

C. Other data reported as incomplete or unavailable.

Under 40 CFR 1502.22, the DMA and National Guard Bureau have an obligation to seek out accurate data relating to the following.

1. Economic data regarding the negative aspects of Camp Grayling, and the other economic attributes of the area.

2. A hazardous waste inventory of the entire area.

3. A wetlands inventory of the entire area, including streams and feeder creeks.

4. A plant and wildlife inventory, including most importantly, all endangered species.

5. Information regarding the effect of noise on wildlife.

6. Inventory of toxic residues and wastes, hazardous and otherwise, in, on, or buried under the Camp.

D. Cost Benefit Analysis

The preparers' attention is directed to 40 CFR 1502.23. Hard economic data and analysis must be provided. The rejected alternatives, or those never considered, must be addressed and analyzed. The problem of commitment of resources to a property not owned by the proponent of these projects must be assessed. Costs of cleanup must be computed and disclosed. The values of this area for recreation, tourism, and residential use, quantifiable and otherwise, should be given the consideration to which they are due. This area is an integral part of the Michigan wilderness. People go there, live there, and spend money there because of it.

Camp Grayling is an intrusion on that, and its net effect in the area, when all factors are taken into account, is negative, not positive. These factors, even if not quantifiable, must be addressed.

VIII. CONCLUSION

The March 1989 DEIS is so inadequate so as to preclude meaningful review. Substantial additional work, in terms of gathering of baseline data, search of the scientific literature, assessment of environmental consequences, and incorporation of nonquantifiable aspects of the situation in the report needs to be undertaken. A revised draft environmental impact statement should be promulgated and distributed for comment.

It is insufficient to say that further experience, as the Master Plan is implemented, "will provide environmental insight." Both the spirit and letter of the national Environmental Policy Act require the environmental attributes of this area to be identified now, and the environmental consequences of the proposals contained in the Master Plan to be addressed at this point in time. Until that is done, no further activity in furtherance of the proposed Master Plan is permissible.

Very truly yours,

MICHIGAN COUNCIL OF TROUT UNLIMITED, INC.

Thomas A. Baird

Thomas A. Baird
Legal Coordinator

/emb

DOCUMENT

TROUT UNLIMITED

ROBERT L. HERBST
Executive Director

June 28, 1989

Mr. Greg Huntington
Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 South Washington Avenue
Lansing, MI 48911-5101

Re: Draft Environmental Impact Statement
Mission/Multiple Construction: Camp Grayling
Army National Guard Training Site, Michigan

Dear Sir:

The following constitute the written comments of Trout Unlimited, a national organization of over 65,000 members, on the above Draft Environmental Impact Statement. To summarize our position, Trout Unlimited is opposed to the projects contained in the Camp Grayling Master Plan, except for those designed to repair environmental damage already done, or being done, at the Camp. Regarding the DEIS, it is deficient in a number of respects.

1 1. It fails to deal with several issues identified in the scoping process, including the problem of contamination from exploded and unexploded ordnance.

2. The DEIS is based on "marginal effect" comparisons to the situation as it stands today, which is unacceptable.

2 3. The proposed timing of construction, and plans for further development, are not disclosed.

3 4. Camp Grayling and the surrounding region are managed for multiple uses, including hunting and fishing, a fact which the DEIS fails to recognize.

Founded in 1959...Over twenty-five years of trout and salmon conservation
Washington, D.C. Headquarters • 501 Church Street, N.E. • Vienna, Virginia 22180 • 703-281-1100

5. The DEIS makes the insupportable assumption that growth in intensity of use and number of users at the Camp will cease. This is contrary to recent history, and testimony by several witnesses presenting testimony to Governor Blanchard's Special Committee on Camp Grayling, including some from the military.

6. The DEIS's description of the current environment at Camp Grayling is inadequate. Among other things, it does not contain an adequate inventory of wetlands, feeder streams, plants, wildlife in general, and endangered species in particular. Nor does it contain an adequate description of current and ongoing environmental problems.

7. The social, economic, and recreational attributes of the Camp Grayling area are, for the most part, ignored. This is particularly true in the economic analysis, which fails to recognize the value of the area for recreation, tourism, and residential uses; undervalues those attributes; and inflates the economic contribution of the National Guard to the area.

8. Human health hazards from the activities conducted at Camp Grayling, and the materials utilized, along with the physical and psychological aspects of the extraordinary noise generated at the Camp, are glossed over or ignored.

9. The discussions of monitoring and mitigation in the DEIS are completely insufficient. Regarding construction, no site specific information is included. No meaningful details regarding ongoing monitoring or mitigation are provided.

10. The DEIS ignores foreseeable consequences of the uses to which the Camp is to be put pursuant to the Master Plan. These include the possibilities of fuel spills and airplane crashes at the assault landing strip, potential spills at stream crossings, the possibility of stream bed and stream bank degradation, and numerous problems associated with the Michigan National Guard's inability to exercise control over its own troops, much less from other states and active units.

11. The cost of cleanup is not mentioned, a glaring omission in view of the fact that Camp Grayling is on state, not federal land.

12. The entire problem of water quality is glossed over. The soil and geological study upon which conclusions are based is over sixty years old. Little or no hydrogeological data is included. This is particularly important given the extremely sensitive nature of the soils surrounding Camp Grayling, which

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are essentially sand and gravel. Existing problems of munitions residues and past spills, and the potential of major spills as indicated above, are exacerbated by these soil conditions. It is these soil conditions which make the AuSable and Manistee Rivers the prime coldwater resources that they are.

13. The socio-economic impacts of implementation of the Master Plan and the resultant potential loss of this area to the alternative uses mentioned above, have been completely ignored.

14. Most egregious, the DEIS is absolutely silent on numerous alternatives to the Master Plan. The definition of "alternatives" itself is limited to construction and operations within current Camp boundaries or contiguous thereto. No consideration has been given to the possibility of reduced activity. Nor has any consideration been given to the utilization of other training bases throughout the state, region, and country to effectuate the goals contained in the Master Plan.

We are extremely disappointed that after several years in preparation, the DEIS for Camp Grayling, Michigan is so extraordinarily deficient in all relevant areas. The lack of detail and references, the inadequate anticipation and description of forseeable environmental impacts, and the lack of consideration of reasonable alternatives is so gross as to preclude meaningful review. We therefore request that the National Guard Bureau and Department of Military Affairs prepare and distribute a revised Draft Environmental Impact Statement for public review and comment.

Very truly yours,

TROUT UNLIMITED, INC.

Robert L. Herbst
Executive Director

RLH/lmp

DOCUMENT 9

MUCC

MICHIGAN UNITED CONSERVATION CLUBS

2101 Wood St. ● P.O. Box 30235 ● Lansing, MI 48909 ● 517/371-1041

June 30, 1989

Department of Military Affairs
ATTN: CNFO (DEIS)
2500 S. Washington Avenue
Lansing, MI 48913

Re: Camp Grayling Proposal - Public Comments

Dear Sir:

This writing is to express the opinion and comments of the Michigan United Conservation Clubs (MUCC) on the Camp Grayling Draft Environmental Impact Statement (DEIS). The MUCC is composed of over 130,000 paid members and over 400 affiliated clubs. It is also the largest state affiliate of the National Wildlife Federation. The NWF has a membership of over 5.7 million members. Historically, the MUCC has advocated the wise management of the state's natural resources since 1937. It has worked tirelessly to protect the public trust in these resources. The MUCC's voice has been heard as a major advocate for the wise use of public lands. We have always advocated a multi-use philosophy.

To this end, the MUCC wishes to inform you that it is opposed to any expansion at Camp Grayling insofar as it would remove public lands from public use, and/or diminish the reasonable use and enjoyment of private property. Additionally, it is most concerned about any impacts from activities at the Camp which would create a likelihood of pollution, impairment or destruction of any of the natural resources of this state. The MUCC has no bones to pick with the Guard per se, as obviously our national defense system is of the utmost importance. Nevertheless, it is entirely possible and reasonable for the activities of the Guard to work well together with the environmental concerns of this state. Therefore, it is our duty to inform you that the Draft Environmental Impact Statement is deficient and unacceptable in its current format. One of the central requirements under the National Environmental Policy Act of 1969, Pub. L. No. 91-180, 83 Stat. 852, 42 U.S.C.P.A. §§4331 et seq is a full analysis of alternatives. Under 40 CFR § 1503.1 the function of the DEIS is to give a full and complete scoping of the proposed project and any alternative to it. It is to be done in a timely fashion such that it is not an after-the-fact document to justify prior made decisions, but rather to afford a fully informed document by which the public can respond to the agency generated proposal. It seems clear to us that this DEIS is not in conformance with those provisions of NEPA. It appears it is a poorly drafted document whose purpose is to justify both the expressed and unexpressed

intent of Camp Grayling officials to expand their facility there both at the present time and into the future.

Additionally, there has been no significant discussion of alternatives available to this project and to sections of this project that are meaningful. The following comments constitute highlights of our objections to the current proposal. The DEIS is deficient in identifying the environmental consequences of implementation of the Master Plan and many different aspects including those of a potentially disastrous nature such as ordinance fire problems, identification of reasonable alternatives, a failure to use the best information and a slanted economic cost benefit analysis. We find the DEIS so deficient that it does not fulfill its legally mandated purpose. It is our opinion that it should be totally revised and republished for public comment pursuant to 40 CFR §1502.9.

Ever since its inception in the early years of this century, Camp Grayling has continued to grow. In the past ten years, its use has almost doubled and it has certainly increased by many times that since its inception. Furthermore, there have been many blatant and more subtle indications that in fact expansion is one of the major goals of the officials in charge of guiding the development of Camp Grayling. Such things as the Assault Landing Strip (ALS) and the Multi-purpose Range Complex (MPRC) are very expensive, hightech capital investment projects, such that it is unreasonable to believe that their use would be confined solely to the present activities at Camp Grayling. It is an acknowledged fact that these facilities will be very attractive and desirable all across the country, and there would be great pressure to utilize them by other units both within the country and without. There is also the stated desire to make Camp Grayling a prime training site. Additionally, when questions were put directly to them, officials of the Camp refused to unequivocally state that the Camp would not expand past its present level. Therefore, it is imperative that the DEIS should have discussed foreseeable future substantial increases in activity and the foreseeable environmental consequences which those activities would entail.

The DMA and its users have had many prior problems such that it would be infeasible for the public to rely on assurances that in the future "good practices" and "sound techniques" would be utilized to minimize and assure the public that there would be no significant environmental consequences of implementation of this Master Plan.

Just a few of the past prior problems have included such things as:

1) Problems in dumping and disposal of waste materials, including hazardous materials.

2) Fuel spills which have been both documented and undocumented.

3) Improper handling of hazardous wastes, including unlicensed transportation of this.

4) Landfills which are not in a legal status.

5) Other activities which have caused degradation of stream crossings and stream beds. Such as, they would impinge upon the superior status of those streams--namely the Manistee and AuSable Rivers.

Additionally, as is obvious, the operation of a military base is an ultra hazardous activity. Therefore, it is imperative that an analysis be made of potential catastrophies which could occur from the nature of the activity involved. Under the mandate of NEPA, a full and complete scoping process must be utilized. Some of the issues raised in the scoping process have not been addressed in the DEIS. We are particularly concerned about the issue 10 of chemical contamination of soils, groundwaters, and surface waters in the Camp Grayling compound.

We are deeply concerned about this project as it is continuing on lands owned by the people of the State of Michigan. Its mandate is to be used for multiple purposes such that the membership of the MUCC would be able to use those lands for outdoor recreation. It bothers us deeply that these lands held in public trust for the enjoyment of the citizenry are being withheld from them. The Camp has been expanding over time and obviously and foreseeably will continue to expand into the future. To state otherwise is to attempt to pull the wool over the eyes of the public. We are dismayed to think and observe that the DMA is acting much as the wolf would, to complete this analogy, by its refusal to completely disclose its intent.

Additionally, we are quite concerned about disposal problems. We believe that much more must be addressed in terms of the disposal of fuel, the storage of fuel, potential for its leaking into the groundwater, for the disposal of other hazardous wastes which would include solvents, lubricants, detergents, paint thinners and other DOC's. Related to this area of concern, of course, is the transportation of those same items and materials throughout the State of Michigan on the ground and also in the air.

We remain convinced that noise is a major problem from this facility, and it is our belief that, given the intent of the DMA to increase its weapons capacity, that noise will continue and escalate as a major problem in the area.

Once again, addressing the issue of alternatives under 40 CFR § 1502.14, the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of human environment, we find this must be gone over thoroughly in regards to this proposal. It is ludicrous that under the DEIS's analysis of alternatives under other site and relocation alternatives, these are defined as involving only the immediate local area. Other locations should 11 and must be considered throughout Michigan, throughout the regional area and within the country. Our defense is not obviously limited to Michigan alone but is a national inquiry. Furthermore, if an alternative is going to be 12 rejected as uneconomical, a more sophisticated and believable cost benefit analysis must be done, and it must include the cost of cleanup from potential 13 contamination caused by the DMA. The DEIS simply fails to mention many other alternatives and, without an adequate basis, rejects others on an arbitrary basis. This is not acceptable.

We have heard over, and over again in many different contexts that there would be no adverse environmental consequences which cannot be mitigated. This is, of course, an incredibly sweeping assertion which is not backed up by any competent data. It is simply disingenuous to fail to discuss the possibility of expansion and its attendant foreseeable consequences on the environment. Such things as the expansion of the nearby airport, new bridges over the Manistee River and waste from an increase in the number of people using this facility simply have to be addressed. As to the alternative proposal for "no action" it is fallacious to leave that analysis with the statement that such inaction would negate positive environmental impacts which would flow from the Master Plan

Regardless of any future activity, the environmental problems at Camp Grayling must be attended to and completely rectified at this point-in-time. If expansion can, in some circumstance, be justified it should not ever be permitted without addressing current environmental problems. It is outrageous to believe that it would be acceptable to simply compound through time these kinds of problems.

Issues of groundwater still abound. Sewage disposal remains a problem. 14 Spills, dumping and accidents associated with the assault landing strip need to be addressed. If you have sewage treatment at the cantonment area which will be inoperable during the winter, that must be addressed in more detail. What are you going to do when you have spring run-off where you have any resi- 15 dues building up until spring and given proper waterfall conditions such residue will be washed directly into surface waters causing the typical "flash" of contamination into those bodies.

All of this activity, of course, will have major impacts on plant and wildlife resulting in the consequent fragmentation and destruction of the eco system which is the territorial range and habitat of much wildlife. In the area of contamination, the Barnes Lake Study is woefully inadequate and needs to be completely redone.

16 It is also a concern of ours that unquantifiable impacts have not been addressed. This was mandated by 40 CFR 1502.23. The area, of course, is not just another run-of-the-mill military camp. It is put right in the middle of exquisitely beautiful lands, where the grandeur of nature can be experienced by all sorts of outdoor recreationists. There is already a major conflict going on in this area over use and these impacts must be further addressed.

The criteria by which consequences are to be addressed is not whether or not the probability of an occurance is low or minimal, but whether or not it is foreseeable. If it is foreseeable at all, then it must be addressed. See 40 CFR 1502.22. A plane crash of personnel or material at the assault landing strip, less then one mile from the Manistee River, could have catas- 17 trophic consequences. If there is an ammunition storage shed there which is struck by lightning, vehicles or an air disaster it could also have catastrophic consequences. Fires are not addressed in this context. There has been a statement that the officials in charge of Camp Grayling have no authority and control over other units which use the Base. This simply makes the situation chaotic and the foreseeability of catastrophic occurrence is much more likely.

18 To continue, wetlands have not been detailed or catalogued. Protection of wetlands is one of the priorities of this organization and causes major concern. There seems to be a total mind slippage on the understanding and comprehension of the importance of wetlands to the maintenance of the entire ecosystem, not only of the local area, but as it figures into state and national habitat, buffer zone and other benefits that wetlands provide.

DOCUMENT 10

Mitigation as it is explained in the DEIS is totally and completely insufficient. Vague and general assurances are unacceptable. It is already stretching the limits of credibility to believe that the probable and forseeable consequences of present activities continued into the future and of expansion on the site are mitigatible in any way. If they are, then such assurances 19 must be provided in detail by such items as groundwater monitoring programs, soil and hydrogeological studies to determine parameters of any potential contamination. There need to be contingency plans for spills, accidents and evacuations. Furthermore, cooperation is essential with the officials who are running section 313 of the Community Right to Know and Emergency Response Act (SARA).

Furthermore, we would also like to know who will pay for the cleanup following in the wake of devastation by Camp Grayling impacts to the area. We certainly don't want the taxpayers of this state to be left with the responsibility for footing the bill to clean up pollution from fuel spills, land fills, accidents, residues, hazardous and ultra-nazardous activities. If the Guard should pick up and leave, it would become the responsibility of the DNR to address these difficulties. Under CERCLA and SARA, states are responsible for these cleanup costs. The MUCC has been working hand-in-glove with other environmental groups and key environmentally aware legislators to make sure that the state has to foot as little as possible for the clean up of contamination caused by private companies. Therefore, it is only reasonable that we are also stating that it is not acceptable that the state be stuck with the bill to clean up bad housekeeping practices and more, committed by the DMA.

More care should be taken in drafting a follow-up DEIS such that the information within it is of "high quality." See 40 CFR 1500.1(b).

Conclusion: The March, 1989 DEIS is unacceptably inadequate in that it precludes any meaningful review as it is not in conformance with the requirements of NEPA. We are extremely concerned about this situation and believe that another draft must be promulgated in good faith, such that it covers all of the requirements under NEPA and can be public-noticed and responded to by the public. Until that is accomplished, it is simply unthinkable and unacceptable that any further change and continued expansion of activity would occur on the Camp Grayling site in furtherance of the proposed Master Plan.

Very truly yours,

Thomas L. Washington
Executive Director

/efn

cc: Rick Jameson
Charlie Guenther

Sierra Club
Mackinac Chapter
115 W. Allegan, Suite 10-B
Lansing, Michigan 48933

June 26, 1989

Michigan Department of Military Affairs
Attention: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, Michigan 48913-5101

Dear Sir/Madam:

Enclosed are our comments on the Draft Camp Grayling Mission/Multiple Construction Environmental Impact Statement. We deeply regret that we did not have the opportunity to present them at the public hearing you held in Kalkaska Tuesday evening, June 13.

I had called your office to receive a schedule of your hearings on the DEIS at the end of April, as I was unable to attend the May 17, 1989 hearing in Grayling. I was informed at that time of the hearing in Kalkaska on Tuesday, June 13, 1989.

After trying for weeks to contact either Major Michael Johnson or Greg Huntington to obtain directions to the location of the Kalkaska hearing, I contacted Major Johnson the day of the hearing while en route to Kalkaska as I was passing through Lansing. Major Johnson informed me that the hearing had been held the previous evening.

Later, the Sierra Club was informed that the hearing had indeed been held on Tuesday evening June 13, as we had been originally informed. This mix-up on Major Jonnson's part prevented us, much to our consternation, from presenting our comments in public.

As is stated in the comment section, we found it was impossible to adequately assess th environmental impacts of your proposed expansion. We reserve the right to comment agai when the DEIS is revised.

Sincerely Yours,

Matthew S. Urdan
Mackinac Chapter, Sierra Club
30430 Rock Creek, Southfield, MI 48076-1054
(313) 540-2099

cc: Anne Woiwode, Mackinac Chapter Executive Director
Brian W. MacKenzie, Chapter Chair
Major Michael H. Johnson
Greg Huntington

Sierra Club
Mackinac Chapter
115 W. Allegan, Suite 10-B
Lansing, Michigan 48933

COMMENTS ON THE CAMP GRAYLING
DRAFT ENVIRONMENTAL IMPACT STUDY

June 13, 1989

The Mackinac Chapter of the Sierra Club has 10,000 members throughout the state of Michigan, and has a great concern for the protection of the natural resources of Michigan. Sierra Club members have closely followed the debate over the proposed expansion of Camp Grayling, putting time into visiting the Camp and taking a tour with representatives of the Department of Military Affairs. We have focussed our attention recently on the sufficiency of the Draft Environmental Impact Statement, and, to the extent possible, the expected impacts of proposed construction and usage.

In summary, the Draft Environmental Impact Statement prepared by the Department of Military Affairs fails in several significant ways to meet the requirements under the law for the preparation of an EIS. The result is that insufficient information has been provided to allow the Sierra Club to adequately examine and weigh the environmental impacts which could be expected to occur at Camp Grayling as a result of the proposed changes. We urge that the Department of Military Affairs go about extensively revising the DEIS in accordance with our concerns prior to proceeding to a Final Environmental Impact Statement for this project. Sierra Club recognizes that the DMA proposal may be environmentally reasonable, and our comments at this time are limited to the deficiencies of DEIS.

At this time, our comments are primarily limited to the deficiencies in the DEIS. We hope to have another opportunity to comment on the potential environmental impacts from these proposed actions prior to finalization of the EIS.

1) A PRESUMPTION IS MADE THAT THE GOAL OF ESTABLISHING A MILITARY FACILITY CAN OVERRIDE CONSIDERATION OF ALTERNATIVES. On page iii, the DMA states that "other alternatives are discussed for each master plan action where they offer reasonable solutions and are feasible in terms of military planning criteria which includes logistics, post mission and cost." This underlying standard for examination of the alternatives for this facility is not in keeping with either the spirit or the content of the Michigan Environmental Protection Act or the National Environmental Protection Act.

The burden on the DMA is the same which exists for any person or entity proposing a potentially harmful activity: to examine a range of alternatives to determine whether "feasible and prudent" alternatives exist to their proposed activities which might have a lesser environmental impact. The DNA DEIS is insufficient because it artificially limits the examination of alternatives using the argument that these alternatives are not in keeping with the mission of the Camp. The limitation of alternatives considered by the DMA has had a very direct impact on the ability of the public to judge the adequacy of the study. 1

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There were only two real choices given on most of the proposed actions: the DMA proposal or a no action alternative. The DMA poses its proposal as somewhat of an all or nothing situation, rejecting lesser levels of change for the facility. On page 3-2.1, for example, in discussion of "Screening of Alternatives", the DNA states with regard to the relocation of the installation command headquarters that this alternative was rejected because "this would leave a part of the post's mission unfulfilled". Likewise, on page 3-2.1, the DEIS states that "alternatives with related logistical effects that would significantly defeat the purpose of the action so that it would no longer be useful are not retained." While such conclusions might well belong in a complete DEIS, the drafters chose not to provide the very information they presumably used to conclude that these alternatives could be rejected. As a result, the interested public is left in the dark insofar as understanding why certain alternatives were eliminated before consideration. 2

Among alternatives which should have warranted consideration, the DMA should have examined the possibility of such a facility being constructed in other states that clearly benefit from the existence of this facility. Were the intention to limit this facility to only Michigan troops, such an argument would be very difficult to make. In reality, however, this is proposed as a regional facility and the possibility of locating the facility at least in Wisconsin or Minnesota (in recognition of the desired climate type) should have been looked at. 3

Another alternative which should have been included, regardless of actions on the remainder of the proposal, would be solely remedial actions to address environmental problems at the Camp. For example, the problems with the wastewater treatment plant should clearly go ahead regardless of any other decisions regarding the facility. This option should be sorted out and considered as a discreet alternative. 4

2) ANALYSIS OF THE IMPACT OF PAST PRACTICES AT THE FACILITY IS VIRTUALLY IGNORED: The DEIS contains very little insight into the condition of the facility as it exists today. The public is unable to adequately assess whether a proposal will actually result in an improvement in environmental quality without such information. Likewise, the impact of existing problems, if there are any, should be fully understood before an expansion of any sort should be undertaken, and appropriate clean-up activities should be identified as needed in the DEIS. Available information that has been collected in previous studies should also be incorporated or at least referenced in the DEIS.

In discussion of spills on page 4-8.18 and 19, the DEIS provides a discussion of a spill of diesel fuel that occurred in the Camp. While actions have been taken to address that spill and to change the possibility that other spills of this sort could occur in the future, there is no attention to whether other spills have occurred, whether remedial actions were taken, or whether groundwater testing in places other than the waste water treatment facility and the fuel oil spill area have been taken.

We are aware, for example, of reports that fuel from planes has been dumped at various times and that there is a potential that heavy metals from ordnance disposal may pose environmental problems. A complete inventory of potential environmental contamination sites on the facility, with any information on results of investigation, would certainly help the public in understanding the current situation at the Camp. 5

3) ANALYSIS OF NATURAL RESOURCES, IN PARTICULAR THREATENED OR ENDANGERED PLANT SPECIES, IS INADEQUATE. There is a surprising lack of information specific to the Camp as to existence or location of specific natural resources. Identification of wetlands and threatened or endangered plant species should have been at the top of the priority list in preparing this report. One map supposedly identifies the types of wetlands found on the site, but in fact makes no differentiations (page 4-5.14 and Water Resources Maps). While the DEIS references occurrences of certain species in nearby areas, this kind of superficial examination is clearly not sufficient (pages 4-5.15 and 5.16). 6 7

4) THE IMPACT OF THE USAGE APPEARS TO BE UNDERSTATED. While it is always difficult to predict impacts from actual use of a facility, there is a clear need in a proposal such as this to ensure that reasonable predictions about such impacts are incorporated. Clearly, the types of environmental problems cited in the past at this facility have focussed in large part on the actions of the troops going through training. This DEIS virtually ignores those problems, giving only a minor role to the examinations of these impacts. Again, a thorough documentation of the kinds of impacts which have occurred in the Camp and environs as a result of past usage practices would significantly help the public understand what kinds of impacts might occur from the expansion.

Because of the unusual nature of this facility, where heavy equipment, artillery and other machinery are used to simulate real life conditions of battle, the impacts of day to day usage must be thoroughly understood. Likewise, the concerns about what kinds of controls will exist over the behavior of the users of the facility, what enforcement capabilities the DMA has in place to react to to violations for the large number of standards of practice that exist in protecting natural resources and the environment, must all be better understood and explained than is currently the case. 1

An area of particular concern to Sierra Club is the potential for accidents involving contamination of the rivers in the Grayling area. The unique and sensitive nature of the Au Sable River and the Manistee River warrant additional attention to the potential for accidents in the course of exercises at the Camp. A complete examination of potential accidents should be included along with dicussions remedial actions to be performed. 8

Thank you for this opportunity to comment on this Draft Environmental Impact Statement and we look forward to an opportunity to submit additional comments after the DEIS is revised.

Appendix M2

DOCUMENT 11

Anglers of the AuSable
2103 AuSable Drive
Grayling, Michigan 49738

June 15, 1989

RECEIVED
JUL 27 1990
JMM / Minnesota

Michigan Department of Military Affairs
Attn: EIS Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913-5101

The Board of Directors of the Anglers of the Au Sable is pleased to submit the following comments on the Camp Grayling Draft Environmental Impact Statement. Our comments are divided into three areas: (1) *General*, (2) *NEPA Process, Procedures and Guidelines*, and (3) *Specific Comments*. We then close our response with our *Conclusions*.

GENERAL

- Since, on May 1, Governor Blanchard rescinded the Michigan Environmental Review Board (MERB) and the State Guidelines on Environmental Impact Statements, the lead agency should be the National Guard Bureau. Our comments, and comments from others, should be directed to that agency. Furthermore, the EIS process must follow the procedures and guidelines of 40 CFR 1500. 1

- These procedures and guidelines have been ignored, violated or bent out of shape since the beginning of the EIS process, more than three years ago.

- The Camp Grayling EIS and the involved process has been, in our judgement, promulgated merely to satisfy a statutory requirement, and to justify decisions already made. This is not in the spirit of NEPA, which is to protect the human environment.

- Since the process has been so corrupted, as detailed below, it isn't surprising to find a flawed document. The document's defects are many and serious. We will list the most important defects in what can only be described as a completely unobjective statement, sycophantic with the military view, at odds with the human environment.

- The document assumes that the amount of training and

2 the intensity of training in this area is somehow frozen in time, ignoring the trend of a continued buildup of training, especially the intensity of training, over the past two decades. It also does not explore even the possibility of increased training. Since with new facilities, especially a state-of-the-art MPRC, it is very likely that the use of Camp Grayling would increase at an even greater rate. Many share this belief, including those who support expansion at Camp Grayling, such as General Temple of the National Guard Bureau. Why was this more likely scenario ignored by the draft EIS? Furthermore, General Andrews has repeatedly stated that the DMA's plans change or could change on a 30 day basis. This makes any statement by the DMA on future plans at Camp Grayling very questionable.

3 • The DEIS assumes that the Michigan National Guard has been a responsible agency and will continue to be so concerning environmental concerns. The document assumes that the past environmental record of the Guard at Camp Grayling is exemplary. The contrary is in fact the truth. Over the last two decades, there have been many laws enacted by the Michigan Legislature and the United States Congress to protect the environment. In spite of all the legal requirements placed on agencies like the DMA, the Guard did not even have an environmental specialist until 1983. While recent initiatives are to be applauded, Camp Grayling has been out of compliance with its original NPDES permit since its inception. It is our understanding that while the MPRC and the ALS are now in the Pentagon's budget, the Wastewater Treatment Facility remains without funds. We believe that this suggests the priorities of the National Guard Bureau and the Department of Military Affairs. Furthermore, the DNR has a record of many Guard environmental violations, including a PCB incident and a serious fuel spill, for example.

4 • The document also assumes that the Michigan Department of Natural Resources has maintained its role as custodian of the environment at Camp Grayling. Though the DNR has an exemplary record across the state on environmental issues, it has been strangely delinquent concerning Camp Grayling. The DNR has many files regarding the environmental transgressions of the military at Camp Grayling. Why it hasn't been more forceful about such issues as forest fires started by the Guard, transgressions into Kirtland's habitat, the stonewalling for years on a management agreement for warbler habitat, the non-compliance of the Camp's NPDES permit, etc., lackadaisical attitudes that have resulted in a major fuel oil spill with serious groundwater contamination and a PCB spill, to name only two examples, all are serious questions that a responsible objective preparer of a DEIS should raise. The disappearance of the DNR at Camp Grayling is a mystery and a disappointment to those who have been its ardent supporters.

5 • The document assumes that the sights and sounds of war, and the training for war, are not intrusive to the human environment nor detrimental to the quality of life in this area including the many recreational attributes, such as hunting, fishing, camping, and just plain relaxing. Cross country skiers do not enjoy the tranquil stillness of winter trails interrupted by cannon, jets and the pressure waves of helicopters. A canoeist rounding the first bend below Wakeley objects to the shock wave from a tank's cannon as it rumbles down the valley floor. The fisherman listening for a rising trout during the Hex hatch is more than annoyed by the cannon and jets. A camper at Keystone, relaxing at night to the crackle of a campfire under a bright starry sky is more than "mildly irritated" by the constant shelling. The naturalist or "birder" listening for the distinctive energetic song of the male Kirtland's wonders how these birds endure in a summer filled with war. These are a few of many invaluable experiences that the EIS should have addressed, but found it convenient to ignore.

• The document assumes that the alternative of "no action" does not require an environmental analysis when the guidelines in 40 CFR 1500 obviously say otherwise. See 40 CFR 1502.16(c) for example.

6 • The document assumes that it has considered all alternatives, where it has ignored many. *For example, it does not include the alternative of using an upgraded MPRC at some other military base outside the state of Michigan.* It does not include the alternative of simulators instead of field training, either as a substitute or a supplement as a mitigation measure. These are only examples. The document should have considered many other alternatives.

7 • The document assumes it has considered all environmental threats by continued military training, when it has not. *For example, the Scoping Document directs the EIS to address the concerns of the threat of toxic residues from exploded and unexploded ordnance in the range areas.* The DEIS ignores these concerns. Also propellant combustion products should be considered as a serious potential pollutant of the Camp's ranges. Some references that the EIS could have used are (1) the research conducted by IIT Research Institute and reported in the J. Environ. Sci. Health of 1985, pp 337-368, (2) the joint USAARL-USAFA Report R-1968, 1970, AD 871485. These two reports restrict their research to propellant discharges. It is likely that similar research has also been done for exploded shells and bombs. With a little diligence the preparers of the EIS should have uncovered many references concerning the pollution effects of ordnance. While we cannot cite such research, we do not believe the DMA, and the National Guard Bureau should rely on private organizations to do their research for them. Furthermore, the preparer of this DEIS should have consulted some major installations such as Picatinny Arsenal and Aberdeen.

• The document should have considered the impact of dispersed but intensive use of military training areas and its effect on water quality. Since we have many military training bases in this country, there should be a whole body of literature on this subject which must be familiar to the Department of Defense.

8 • The document should have considered the result of high intensity aircraft noise and high intensity impulsive cannon and bomb noise on the human environment and on human health, including the effects of the loss of a good night's sleep, the effects on hearing, and the more subtle effects on the psychological welfare of those who must endure the constant pounding of the sounds of training for war. Since, in this country we have had an ever increasing amount of noise from jet aircraft, helicopters, and high explosives, there should be a large accumulation of literature and scientific research in this area. This literature should be very familiar to the Environmental Protection Agency.

9 • The document should have considered the effects of noise on wildlife and other animals. Again, we believe that there has been much research in this area. We could have referred the preparers to a report on this subject by Informatics, Inc., dated July 1980, which is a review of research since 1971. Informatics, Inc. prepared this report for EPA to address the requirements of the Noise Control Act of 1972 as amended by the Quiet Communities Act of 1978. Among other uses, the report was intended to help in developing Environmental Impact Statements on projects affecting animal environments. The preparers of the Camp Grayling EIS should have done a more thorough search of scientific research and would probably find that this report, published in 1980, has been updated.

10 • With additional diligence, the DMA and the National Guard Bureau should have found some significant and relevant research concerning the economic effects on the closing of military bases. Other relevant research of the socioeconomic effects of military bases on contiguous civilian communities should also be available. The DEIS neither describes or alludes to a search of relevant data bases nor the reasons for not searching. We repeat, for emphasis, that the DMA, the National Guard Bureau, and other "cooperating agencies" such as EPA, the DNR, Fish and Wildlife Service should not expect private organizations, such as the Anglers of the Au Sable, to do their searching for them.

NEPA PROCESS, PROCEDURES AND GUIDELINES

11 • *"EPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken."* See 40 CFR Part 1500.1 (b). This is not so with the present EIS and the proposed facilities and activities. For example, the Anglers of the Au Sable and Trout Unlimited had to go to court in a Freedom-of-Information lawsuit in order to acquire certain relevant environmental information. We still have not received all that we requested. Furthermore, decisions about the facilities and activities have already been made, some aspects of the facilities, such as design, and some activities, such as winter training, have already taken place. *The National Guard has vigorously advocated the MPRC, including the entire Camp Grayling Master Plan, for at least three years. General Andrews and others have lobbied in public letters, private letters to elected officials, and in public statements for many years.*

• *"The information must be of high quality."* See 40 CFR Part 1500.1 (b). The information presented in the Camp Grayling EIS is inadequate and, by any measure, must be considered of low quality.

12 • *"Agencies shall reduce delay by (a) integrating the NEPA process into early planning."* See 40 CFR Part 1500.5. This has not been done. For example, the final draft of the Camp Grayling Master Plan is dated December, 1985.

• *"(There must be) ...interagency cooperation before the environmental impact statement is prepared."* See 40 CFR Part 1500.5 and Part 1501.1. We do not believe the preparer of the DEIS has followed this guideline. We are

not aware of any statements or comments from EPA, Department of the Interior, especially the Fish and Wildlife Service, other branches of the Department of Defense, and other Federal agencies, concerning the scoping document for this EIS or the Camp Grayling Master Plan. *If we are mistaken, we would like to see these statements or comments as part of a relevant appendix of the EIS.*

- *It is our understanding that there can be only one lead agency.* See 40 CFR 1501.5. Since the Governor has rescinded Executive Order 1974-4 which eliminates the MERB including the procedures and process for a Michigan EIS, and since the newly created CEQ has not promulgated any new procedures and process, how can the Department of Military Affairs be the lead agency? *It would seem logical that the National Guard Bureau must assume that role, even though the DMA might act on its behalf.*

12 - Since the National Guard Bureau must be the lead agency, it would then seem that it should have requested the EPA, Fish and Wildlife Service, possibly other agencies within the Department of the Interior, and certain other Federal agencies to be cooperating agencies at the "earliest possible time." It isn't clear that the preparer of this DEIS has made any such request. *If we are mistaken, then such requests and the replies of these agencies should be included in the EIS.*

- The Scoping process, as defined in 40 CFR 1501.7 was not followed. As part of this process, the lead agency must invite the participation of all affected Federal, State, and local agencies, and other interested persons. We do not believe that this was done. *If we are mistaken, we would like to see evidence of their participation and their input.*

- Since there should have been other cooperating agencies, allocation of responsibility for preparation of the EIS is suggested by 40 CFR 1501.7. At the minimum, since the Kirtland's is a Federal endangered species, *the Fish and Wildlife Service should have participated in that portion of the EIS.*

13 - *"It (EIS) shall provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."* See 40 CFR 1502.1. This EIS is neither full nor fair in its discussion of environmental impacts, especially concerning *alternatives including the proposed action."* See 40 CFR 1502.9(a). Diverse views are missing from this document, and many major points are ignored. For example, we know that some environmental engineers do not believe that lagoon systems are practicable in northern climates. There is diverse opinion within the Department of Defense and with other military strategists regarding the efficacy of "Total Force" and the assumptions regarding the dependency on reserves. There are serious questions regarding the survival of the Kirtland's in and around Camp Grayling if the training and intensity of training continues at its present state, and especially if it escalates. There are major questions regarding the psychological and physical health of the human community around the camp. These are but a few examples. We could also add that over the last two years the Anglers, Trout Unlimited, and other environmental organizations have expressed diverse views in a variety of ways, especially in communications to both the DNR and the DMA. These views oppose those expressed in the DEIS.

- Concerning supplements as outlined in 40 CFR 1502.9 (c), our position is that both the DMA and the National Guard Bureau have ignored these guidelines.

- *Under the present condition in Michigan we are doubtful that the DMA can be the lead agency.* The name, address, and telephone number of the person at the National Guard Bureau, which probably should be the lead agency, therefore should be included on the cover sheet. It is not.

- *"The summary shall stress the major conclusions, areas of controversy (including issues raised by agencies and the public), and the issues to be resolved (including the choice among alternatives)."* See 40 CFR 1502.12. This summary is inadequate, because the whole report is inadequate as described above.

- Under 40 CFR 1502.14 on alternatives, the DEIS must rigorously explore and objectively evaluate all reasonable alternatives, devote substantial treatment to each alternative considered in detail, include reasonable alternatives not within the jurisdiction of the lead agency, identify the agency's preferred alternative or alternatives and include appropriate mitigation measures. *This DEIS either is very inadequate concerning these guidelines or it ignores them completely.*

- *Under 40 CFR 1502.15 the DEIS must succinctly describe the environment of the area(s) that are affected* the alternatives which would avoid adverse impacts and enhance the quality of the human environment.

14 - *"Environmental impact statements shall be analytic rather than encyclopedic."* See 40 CFR 1502.2. This statement certainly is not analytic and would be a half-hearted attempt at being encyclopedic -- it is full of fluff and boilerplate.

- *"Agencies shall not commit resources prejudicing selection of alternatives before making a final decision."* See 40 CFR 1502.2. Both the DMA and The National Guard Bureau have committed resources which are prejudicial to any final decision.

15 - *"Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made."* See 40 CFR 1502.5, 1500.2(c), 1501.2, and 1502.2. This DEIS is a clumsy attempt to justify decisions already made by both the DMA and the National Guard Bureau.

- *"For projects directly undertaken by Federal agencies the environmental impact statement shall be prepared at the feasibility analysis (go-no go) stage, such as the Camp Grayling Master Plan, and may be supplemented at a later stage if necessary."* See 40 CFR 1502.5(a). This DEIS has been prepared almost five years later than mandated by NEPA.

- *"The draft statement must fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(c) of NEPA. If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."* See 40 CFR 1502.9(a). We believe that many parts of this draft statement are inadequate. For example, diverse views of the effects of noise on wildlife and human health are not explored, the impact of habitat destruction of the Kirtland's is not addressed, nor are other facets affecting the survival of this endangered species, the potential harm of toxic residues from exploded ordnance is ignored, and the likely scenario of ever increasing troop training is not addressed. *We believe that taken as a whole it is a very inadequate document and should be completely redone, not only revised.*

- *"The agency shall make every effort to disclose and discuss at appropriate points in the draft statement all major points of view on the environmental impacts of the* *or created by the alternatives under consideration. We insist that the DEIS does not follow this guideline, especially that of describing the environment which will be created by the alternatives, even including the alternative of no action.*

- Under 40 CFR 1502.16 the DEIS must address the environmental consequences of all alternatives, including that of no action, and must describe the adverse effects which cannot be avoided should any of the alternatives be implemented. This discussion should also describe the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in any alternative. Direct and indirect effects and their significance shall be described. Conflicts between proposed actions and regional, state and local land use plans, policies and controls for the area should be delineated. Environmental effects, conservation potential, natural or depleted resource requirements, urban quality, the design of built environment, and mitigation means must all be addressed according to 40 CFR 1502.16. *Our contention is that this EIS is inadequate concerning all these guidelines and that the scientific and analytic basis that should be provided by this section is almost nonexistent.*

16 - *"... the appendix shall: consist of material prepared in connection with an environmental impact statement ... shall normally consist of material which substantiates any analysis fundamental to the impact statement ... shall normally be analytic and relevant to the decision to be made ... be circulated with the environmental impact statement or be readily available on request."* See 40 CFR 1502.18. The appendices in this DEIS, for the most part, consist of material that was not prepared in conjunction with the DEIS, are not analytic, do not substantiate any analysis fundamental to the impact statement, and for the most part are irrelevant. A good DEIS has several analytic reports, either included as appendices or readily available, prepared by those who prepared the DEIS to serve as additional analytical material to substantiate and enrich the main text of the DEIS. *This DEIS is deficient in this type of analysis. Nor does it refer to any substantial analytic analyses.*

17 - *"... the entire (DEIS) statement shall be furnished to any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved and any appropriate Federal, State, or local*

agency authorized to develop and enforce environmental standards." See 40 CFR 1502.19(a). We believe that the distribution to affected and relevant agencies is inadequate. Apparently many agencies within the EPA and the Department of the Interior will never see this document according to the distribution list. It should have been sent directly to the Fish and Wildlife Service, the Council on Environmental Quality, to specific agencies within the Environmental Protection Agency, to the Michigan Department of Natural Resources, the Michigan Department of Health, the Michigan Attorney General, and to many others. We also believe that it should have much wider distribution within the Department of Defense. Furthermore, all these agencies should be required to give serious consideration and extended comment to this DEIS.

17

- *"... the entire statement shall be furnished to (c) any person, organization, or agency requesting the entire environmental impact statement."* See 40 CFR 1502.19(c). We know of several individuals who have requested the entire statement and have only received the summary.

18

- *"No material may be incorporated by reference (into the DEIS) unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment."* See 40 CFR1502.21. There is no statement about the availability of the referenced material.

19

- *"When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking."* See 40 CFR 1502.22. This requirement is ignored throughout the statement. For example, and only one example, the agency (whether it be the DMA or the National Guard Bureau) does not make it clear that the information regarding the pollution of the range areas from toxic wastes from exploded ordnance is, or is not, available.

- *"If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential" ... "and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the DEIS."* See 40 CFR 1502.22. This DEIS is written as if the information is complete.

- *"If the information relevant to reasonably foreseeable adverse impacts cannot be obtained because the costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include in the DEIS:*

(1) A statement that such information is incomplete or unavailable;

(2) A statement of the relevance of the incomplete or unavailable information ...

(3) A summary of existing credible scientific evidence which is relevant ...

(4) The agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted ..." See 40 CFR 1502.22 (b).

Enough is said. Since the preparers felt they had all the information necessary, they therefore did not believe they had to comply with this guideline.

20

- *"... "reasonably foreseeable" includes impacts which have catastrophic consequences even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason."* See 40 CFR 1502.22 (b). Evidently, the DMA, the National Guard Bureau, and Hickok Associates do not feel there are any impacts that would be reasonably foreseeable. Military towns such as those outside large military establishments, the extinction of the Kirtland's Warbler, the loss of the Au Sable and the Manistee as blue ribbon trout streams, the demise of the area for a first class recreational experience, the loss of the area as a prime retirement area, are not considered to be possible impacts of the expansion of Camp Grayling.

- According to 40 CFR 1502.33 any cost-benefit analysis deemed relevant must be included. Since the DMA included none, there evidently have never been any analyses of military versus recreational conflicts. Furthermore, 40 CFR 1502.23 also requires that the DEIS *"shall, when a cost-benefit analysis is prepared, discuss the relationship between that analysis and any analyses of unquantified environmental impacts, values, and amenities,"* and *"that an EIS should at least indicate those considerations, including factors not related to environmental quality, which are likely to be relevant and important to a decision."* Evidently the preparers of this DEIS do not believe that any cost-benefit analyses are required, nor is any such analysis relevant. We disagree.

21

- The preparers, including the agency involved, shall *"identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions."* See 40 CFR 1502.24. The Department of Military Affairs, the National Guard Bureau, and Hickok Associates are presumably not embarrassed by the sparsity of scientific methodologies, nor were they disposed to make reference by footnote to scientific and other sources.

- 40 CFR 1502.25 requires that draft environmental impact statements be integrated with those required by Fish and Wildlife Coordination Act, the National Historic Preservation Act of 1966, the Endangered Species Act of 1973, and other environmental review laws and executive orders. We do not believe that this has been done.

SPECIFIC COMMENTS

22

- There are no references supporting the value of the National Guard in any national emergency. There are no references that support the thesis that part-time troops can be trained to the level of full-time regulars and therefore insure the "successful and prompt integration of National Guard/reserve and active armed forces in the event of a national emergency." There is much rhetoric regarding the assumptions and potential of "Total Force" but there are no references other than the opinions of the preparers, who are not qualified, and presumably those of the DMA and the National Guard Bureau. However, references to these "expert opinions" are few and, in the main, irrelevant. Surely the idea that part-time troops can be trained to the level of full-time regulars is not a unanimous view of military strategists and analysts, even inside the Pentagon. We do not pretend to be knowledgeable in this area. *We only believe that if the DEIS preparer makes such a dissertation, there should also be references that back up the assumptions.*

- The draft EIS states that *"this document fulfills the purpose of an environmental impact statement by presenting a fair and full discussion of significant environmental impacts."* This, in our judgement, is completely false.

- One of the fundamental assumptions of the DEIS which permeates the entire DEIS is emphasized by the statement that *"the proposed master plan projects are not anticipated to substantially increase the number of troops training at Camp Grayling over recent levels on an annual basis."* This assumption is without validity. According to information provided by the DMA to the Governor's Camp Grayling Management Advisory Committee, the amount of training as measured by annual troop training days over the last five years has increased by 50 percent over the previous five years. Similar increases can be seen by the amount of heavy ordnance used at Camp Grayling and the number of air bombing sorties at Camp Grayling. If the forces remain intact that have caused this increase in training and intensity of training over the last decade, and really over the last two decades, the amount and intensity of training will double over the next decade. Since General Temple has recently speculated that training would increase a hundredfold at Camp Grayling, and Colonel Green has said that armored units from around the country, including Regular Army, will be attracted to Camp Grayling if the MPRC is built, it is more reasonable to assume that the present trend of increased training will continue if not accelerate.

- In the Executive Summary, the definition of "alternatives" is given. They include: no action, alternative site and relocation. *Concerning many of the proposals and projects under review, the DMA or the National Guard Bureau, or Hickok should have considered other alternatives.* There are at least seven other MPRCs throughout the country. The upgrading of at least one of these to accommodate the Fourth Army should have been an alternative. The preparer of this DEIS should have considered other Assault Landing Strips within the state and outside the state. The preparer, whoever, should also have considered the use of other in-state and out-of-state sites for the air-bombing range. The use of simulators for tank crew training and for air crew training to supplement the gunnery and bombing ranges, whether in state or out state, should have been an alternative. These are just a few examples of alternatives or variations thereof which should be considered.

23

- Under the guidelines of NEPA, the DEIS should also give a complete analysis of the environmental impact of the alternative "no action." *The environmental impact of "no action" is ignored in this DEIS.*

- Also, in the Executive Summary, the statement

referring to "State Guidelines" is no longer relevant since the Governor revoked these guidelines on May 1, 1989.

- Table I gives a summary of retained alternatives. The DEIS retains only seven alternatives other than those proposed by the Guard for analysis.

- ***The DEIS states that concerns raised during the scoping process are addressed in this document. This is completely false.*** For example, concerns stated in the Scoping document about the effects of toxic residues from exploded ordnance on ALL the ranges are not even mentioned, much less addressed. Stream crossings are not identified. The whole issue of transportation, storage, security and disposal of ammunition and ordnance is not addressed. Land use description is inadequate. Affected wetlands and forest vegetation are not adequately described. Conflicts of migratory bird routes and the ALS are ignored. These are but a few examples of omission and inadequate treatment by the draft EIS. 24 25 26 27 28

- ***Under Federal guidelines, the DEIS should not just address those issues raised in the Scoping process, but should address all relevant issues.*** To our knowledge, the Federal agencies such as EPA, Department of Interior, FAA and others have been deficient by not commenting on significant issues during the scoping process.

- We find it somewhat ludicrous that there or no state or local regulations, permits, or approvals in the State of Michigan for the regulation of noise. If there are none, there certainly is the common law concept of actionable nuisance. 29

- The document states that the MPRC will have insignificant and possibly minor beneficial noise impacts. ***This is an absolutely unbelievable statement.*** The DEIS does not delineate or substantiate these so-called "minor beneficial noise benefits." The building of this range within a mile of the mainstream will attract increased use by armored units from around the country (according to Colonel Green) and, with the use of helicopter gunships and bombing jets, will offer an even greater noise environment in the Mainstream valley from the mouth of the East Branch down to MacMasters Bridge, or even farther. "Combined arms training," as touted by the DMA and the DEIS, will increase the presence of military training in and near the Mainstream valley even more. 30

- The DEIS never explains why war maneuvers, with increased intensity of training and all the attributes associated with these maneuvers and training, are not detrimental to the human environment of this area and why the the DEIS claims that these recreational attributes remain undiminished. Pete Waldmeir compared this area a war zone when he referred to the Camp Grayling area as the ***"Beirut of the North."*** The Anglers believe that the sounds and sights of the area around the two best trout streams in Michigan are inconsistent with quality recreational experiences, including fishing, camping, hunting, and canoeing. 31

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- The DEIS document states that the Rail Sidings - as proposed will not increase rail shipments or significantly increase locomotive operations. We believe that the stated objective to "train loading/unloading crews" is a carefully camouflaged statement to hide the need to update rail facilities so that more ordnance, more supplies, and MORE troops can be brought into the Camp.

- The DEIS makes the statement that cold weather training noise impacts will be insignificant. The DEIS claims that troops who normally train at Grayling, presumably in the summer, will now train in the winter. The document further states that; ***"Significant numbers of new troops are not anticipated. Troops who come in winter will not come in summer, so annual training time and noise levels are not anticipated to vary significantly."*** There is no documentation to back up this "party line" from the Guard. This is another illustration of the lack of objectivity by the DEIS as it ignores the rapid buildup of training over the last two decades and gives no reason that this trend will not continue. If the DMA constructs these facilities, there is every reason to believe that this trend of increased training and increased intensity of training will continue and even accelerate.

- The construction of the Wastewater Treatment Facility will be located within 500 feet of Bear Swamp, a major wetlands and part of the beginning of Portage Creek, a major tributary of the Manistee River. The document cites no good reason to construct the facility at this location. ***The DNR should not allow the DMA to continue to pollute Bear Swamp which is the wintering ground for one of the largest deer herds in the state.*** What value does the DEIS place on this wildlife resource?

- ***The statement that "the soils of the post have in general sustained the historic training activities with only isolated areas of erosion" would be funny if it weren't so tragic.*** Parts of both the North and South Camps are moonscapes, with serious impact to the soil, vegetation and to whatever forest remains, and, we suspect, to the groundwater. Streambed erosion has been a major problem in several places.

- The north range area, where the MPRC may be built, known as the Tank Range, has been warbler habitat long before 1976. The statement that the habitat quality is declining is questionable, since the warbler population of this area has been stable for at least two decades, holding from 1/4 to 1/3 of the total population. If this has changed, it is because of habitat destruction by the Guard, supported by the DNR, according to the DNR/DMA management agreement on warbler habitat. It is our understanding, for example, that if the warblers do not use a 40 acre section of known habitat, used the previous year, the land reverts to DMA control. Since the warblers are few in numbers, this seems to be an extreme measure. With an endangered species it is not prudent to assume that they will use certain sections each year, regardless of any attempts at habitat creation elsewhere. ***It appears that the DNR, and the Fish and Wildlife Service, has placed the future of the warbler in the hands of a military bureaucracy, which, in our judgement, is very unwise.*** 32

- The North Camp leases which allow the activities for summer training, also mandate that the DNR allows hunting on this range. What types of hunting? The largest turkey population in the state is within a couple of miles of this range. It would seem that a spring and fall three-week season hunt would be practicable. This bird population is steadily moving into Crawford County, and much of the eastern portions of the range hold a significant number of turkeys. Is it legal for the DMA to close this range at anytime after the September 15 opening of the small game hunting season? 33

- ***We are concerned about the expansion of training activities at the airfield.*** With this expansion, it is safe to assume that the sewage system would also receive an increase in use. This system is now tied into the City of Grayling sewage lagoon system, which the DNR has recently required the City to enlarge. Moreover, the City had to recently reject an application for a new motel, across from the Holiday Inn, apparently because of increased sewage requirements. How can the National Guard then plan an increase in housing at the base knowing that the sewage system they are going to use is inadequate? 34

- The DEIS states that ***"the wildlife at Camp Grayling will not be significantly affected by the cumulative impact of the proposed master plan actions."*** The document preparers assume that cannon, tanks, rockets, low level jets and helicopters, and other intrusions of war exercises have no impact on wildlife. There is no basis for this assumption and there are no technical references that back up such an impossible claim. Again, the DMA should not require that the Anglers of the Au Sable and other private organizations do the research for the DEIS. Rather, it should be the responsibility of the lead agency to support this ridiculous claim. 35

- Portions of the DEIS must at the minimum be modified, since the Michigan environmental review regulations are no longer valid, and according to the testimony of General Andrews, the DMA was not the preparer of this EIS. Rather, the lead agency should be the National Guard Bureau, as testified to by General Andrews, and Federal guidelines and procedures must be in force.

- ***The National Guard Bureau should have required other Federal Agencies to submit more detailed comments than those received during the scoping process.*** There apparently was no input from EPA, the Department of the Interior (as a whole), FAA, the Department of Defense, and other Federal Agencies.

- The whole discussion on ***"Purpose,"*** is inadequate, with no references or footnotes. The so-called Total Force Policy should be given more detailed treatment and any relevant references that substantiate the statements made should be listed.

- On page 1-3.2 we see the following statement: ***"In order to alleviate these deficiencies, actions will be taken to rehabilitate and/or EXPAND (our emphasis) existing facilities or construct new facilities."*** Occasionally, throughout the EIS, the true nature of the planned projects and activities escapes the careful censorship of the National Guard. The DMA has maintained that these facilities are solely to replace existing aging facilities, but never to EXPAND. Yet we see the word and the purpose in the Guard's own document.

- The DEIS states that the objective of the Michigan Department of Military Affairs is to manage the post's natural resources in an environmentally sound manner and harmonious with the mission of Camp Grayling. The DEIS also states that the DMA will cooperate with local units of government in comprehensive planning to minimize conflicting land uses. ***We state with great emphasis that***

the past record of the DMA in both of these areas has been just the opposite, and there is no reason to believe that it will be any different in the future.

- The section on training site description is boilerplated and largely unnecessary according to the guidelines of NEPA as promulgated by CEQ. One message that comes through loud and clear is the continued expansion of the camp's boundaries, the facilities, and the increase of training over a long period of time.

CONCLUSIONS

- *The Federal Council on Environmental Quality should reject this statement as inadequate and return it to the National Guard Bureau for a complete rewrite. It should remind the Bureau of statutory guidelines and the complete process should be renewed.*

- *If the CEQ does not want to inflict this task upon the Bureau, it should then find the major components of the expansion of Camp Grayling are environmentally unsound.*

- *The Michigan Department of Natural Resources should reject the present EIS as inadequate and render a negative decision regarding its major projects and activities.*

- *The Governor of the State of Michigan should find this document to be an embarrassment to his environmental record and reject the expansion of Camp Grayling.*

- *Senators Levin and Riegle should present a joint resolution to the U.S. Senate recommending the cessation of the expansion of Camp Grayling and that further military intrusion into this area is neither warranted nor desirable.*

- *The Attorney General of the State of Michigan should investigate the whole history of this environmental sojourn of the past 3-5 years to ensure the people of Michigan that its laws, the spirit of its laws, and the types of leases with the DMA have been followed.*

- *The Adjutant General of the State of Michigan should explain to the people of Michigan why he has insisted that Hickok & Associates and the National Guard Bureau were the preparers of the EIS and that his department had little to do with it except to provide information and respond to questions.* This is in direct conflict with the title sheet of the draft EIS which has his department as the Preparer, and the name of Hickok does not appear. Furthermore, on page 1-1.1 of the Draft EIS, it is stated that "... *the Department of Military Affairs has prepared an Environmental Impact Statement (EIS) ...*"

- *The Adjutant General should also explain why the this environmental process took place after the decision to expand the facilities and activities at Camp Grayling when under both Federal and, at that time, State Guidelines, the environmental review should precede such decisions.*

- *The Department of Natural Resources and the Natural Resources Commission should explain where they have been in this whole mess. They are the custodians of our lands and the statutory caretaker of our environment. Where have they been? And why have they been so delinquent?*

- *In conclusion, though NEPA has been ignored so far in this process, and since NEPA does not require an Environmental Impact Statement, those who want to run roughshod over some of the most precious real estate in our state, land which contains two of the finest trout streams east of the Rockies, should not have the delusion that these laws are without force and are harmless artifacts of lost environmental causes. They are not.*

Sincerely,

Bruce Johnson

Bruce Johnson
Secretary
Anglers of the Au Sable

for

The Board of Directors
Anglers of the Au Sable

DOCUMENT 12

The Au Sable North Branch Area Association

June 13, 1989

Michigan Dept. of Military Affairs
2500 S. Washington Ave
Lansing, Michigan 48913

Attn: Mr. Greg Huntington
Environmental Coordinator
Construction and Facilities Office

Subject: Draft Environmental Impact Statement

Dear Sirs:

In section 4.10.27 (Affected environment and environmental and socioeconomic consequences) you state, "No significant adverse effects upon psychological, physiological or community needs and lifestyles of residents in the area are perceived as the result of full implementation of these actions." This is a bald-faced lie! At the hearing in Grayling on May 17, 1989, speaker after speaker countered this canard. The ambiance of North Branch area residents, many of whom have been property owners for 15-25 years or more, has been profoundly affected in the past five years by the noise and concussion from your artillery rounds, bombs, jets and helicopters. When children, visiting on the North Branch, scream in terror all night, is this not a significant psychologic and possibly physiologic event ? When frustrated property owners even think of picking up a rifle and firing at screaming jets and low flying helicopters, this is a major psychologic event. In May, 1989, helicopters in groups of 6-8 passed from east to west and back just north of twin bridges. At no time, when visible, were they ever over guard-leased land. My wife described the noise as "deafening". In the past month, jets have regularly left the bombing range area and shrieked south, just east of the North Branch and directly over Lovells, so low that I could clearly see the pilot. When people in the area consider selling their properties because their prized ambiance has been shattered by military-generated noise and concussion, how can you state there have been "no significant adverse effects ... on community needs and life styles of residents in the area"? Major concussion effects from artillery rounds and bombs, with pictures falling from the walls of the shaking houses, serve to amplify concerns cited above.

We have become much concerned about toxic chemicals generated by exploding or dumped ordinance - including those which might be air borne, water borne or animal borne. Since the prevailing winds blow from west to east, and since the upper North Branch appears to be in close enough proximity to the impact zone to potentially pick up toxins percolating into this drainage, this subject is of special interest to us.

The Au Sable North Branch Area Association

1 You state (p19 of the Scoping Document) "Concerns expressed over water pollution from explosive's residue and ammunition dumped in waters within the Camp will be investigated." When? How? We heard that a report on toxic residues in the Barnes Lake area and the East Branch would issue last fall. Where is it? What methods were employed? How were they validated? What chemicals were studied? What were the results ? As a scientist and a member of The American Society for Pharmacology and Experimental Therapeutics and of The Federation of American Societies For Experimental Biology, I have served as a reviewer of manuscripts presented for publication in the journals of these societies. In addition to a statement-of-purpose and a summary of results and conclusions, which you present, the meat of a manuscript is to be found in the methods employed, the justification of the methods, and the detailed presentation and discussion of the results obtained. Absent the information cited in the previous sentence, the reader or reviewer is unable to judge the merits of the study. I submit that such detailed information is crucial to an Environmental Impact Statement on the toxins question. Have or will studies be (or been) made on the five or more heavy

2 metals (mercury, lead, zinc, cadmium, chromium and their soluble forms)? What about possible carcinogenic or otherwise toxic nitrogenous chemicals, such as nitrosamines? These need be studied in plants and animals as well as in water. What about other toxic organic chemicals? We want convincing data on such substances which may affect our North Branch populace through the air we breathe, the water we drink, the fish we eat and the game (deer, turkeys, grouse, rabbits, squirrels, etc.) which we hunt and eat.

3 We are also concerned for the future of the only bird, the Kirtland's Warbler, which nests exclusively in Michigan. Your records (Cooperative Agreement section p.4) indicate that nearly one third of the world's population has been nesting on the Tank Range. I will not address the Cooperative Agreement except to say that it is one more item to which the Department of Natural Resources should not have agreed. However we call your attention to the recently developed potential nesting area north of Lovells. Jets cross this site (going toward the bombing range) at very low altitude since the taller trees have been removed. Since your military activities have caused bald

4 eagles to repeatedly abandon young in at least one nest, is it not likely that these low altitude jet assaults would also be a negative force on Kirtland's nesting at this site.

Sincerely yours,

Walter A. Freyburger

Walter A. Freyburger, Ph
Director

DOCUMENT 13

June 13, 1989

Dept. of Military Affairs
Attn: E.I.S. Response
Const. and Facilities Office
2500 S. Washington Ave.
Lansing, MI 48913-5101

Gentlemen:

We read with interest the Executive Summary of the Draft E.I.S., concerning Camp Grayling.

Although we understand the concern of the people of Grayling, in regards to their property and safety, we understand the importance of this training camp for our National security and safety.

Therefore, we endorse the changes you are making.

Former Servicewomen of America
Michigan Chapter # 1
Reatha Dubay
Reatha Dubay, Adjutant

DOCUMENT 14

June 16, 1989

Michigan Department of
Military Affairs
ATTN: Mr. Greg Huntington
2500 S. Washington Avenue
Lansing, Michigan 48913

Jun 94

Dear Sir:

I am writing this letter on behalf of the Enchanted Forest Property Owner's Association which is more commonly called Guthrie Lakes.

Remarks that follow relate to concerns that acutely impact Guthrie Lakes. This does not deny our general concerns and reservations about expansion of facilities and what we perceive to be calculated increases in training activities which will adversely impact on the area's environment. Numbers that appear in parentheses will key the reader to specific pages found in the Environmental Impact Statement (EIS) prepared by Eugene A. Hickok and Associates which is dated March 1989.

The EIS prepared for the Michigan Department of Military Affairs (MDMA) is an impressive document. The EIS catalogues data intended to prove that Master Plan projects are not threatening to the stability of the area's environment.

1 The statement is made, "this document fulfills the purpose of an environmental impact statement by presenting a full and fair discussion of significant environmental impacts of purposed acts. (i: In our judgment, the study is flawed and is far from an impartial presentation of data. It is truly a charade intended to comply with regulations while the sponsoring agency (MDMA) considers their plans a matter of accomplished fact. We question the degree to which the MDMA complies with legislative intent regarding environmental studies

We find it difficult to argue that mere construction of facilities constitutes danger. Inherently, buildings and facilities pose little or no threat to the area's environment. However, the anticipated utilization of facilities would appear to be the real issue. As an example, one might ask:

2 A. Does the size of the water treatment facility suggest increased activities?

3 B. Does the barracks/BOQ complex, at the airfield, capable of housing 900 individuals suggest increased activities?

4 C. Does the construction of two MATES buildings suggest increased activities?

-2-

5 The EIS is ambiguous regarding the relationship between projects and their subsequent use. On the one hand, MDMA states that it does not anticipate substantial increases in the number of people who will train at Camp Grayling. (iii) Indeed, at recent hearings conducted by the Governor's Blue Ribbon Committee, the MDMA denied any increase in training intensity at Camp Grayling. However, the MDMA admits in the EIS that over the period FY 80 to FY 86 that the average yearly increase in troop strength at Camp Grayling was 3500. (2-3.1)

6 The EIS makes reference to a public scoping meeting conducted in September of 1986. (1-2.1) Guthrie Lakes concerns were enumerated and include vibrations so intense as to cause damage to structures, military trespass on private property and overflights across Guthrie Lake by low flying aircraft. These conditions still exist, especiall noise pollution which is the direct cause of damage to structures located in and around Guthrie Lakes.

For the folks residing at Guthrie Lakes, noise pollution is an ongoin problem. The EIS defines noise as sound unwanted, objectionable or misplaced. (4-3.1) It is said to annoy people but the statement fail to comment on damage to man made structures such as the 173 homes located at Guthrie Lakes. The EIS indicates that there are 39 homes which is an example of the errors found in the EIS. (4-3.12)

The MDMA continues to ignore noise studies made by Department of Army (DA) agencies such as the Construction Engineer Research Laboratory. (4-3.5) They fail to honor the Installation Compatibility Use Zone devised by DA agencies. The use zones are divided into three noise areas with the major portion of the Guthrie Lakes development falling into Zone III. Zone III classification by definition indicates that an area is clearly unacceptable for use if noise levels exceed 75 decibels in a residential area. (4-3.6)

7 Citizens residing at Guthrie Lakes feel that there is a clear and present danger regarding noise levels which are far in excess of 75 deci[illegible] The area was recently subjected to several days of bomb rela[illegible]se which measured approximately 130 decibels. By the Depa[illegible]ment [illegible]itary Affairs own admission 500 pound bomb drops in 1985 registe[illegible] 125 decibels when measured on the west side of Guthrie Lake. In 1985, one hundred 500 pound bombs were used in the range 40 area which is adjacent to Guthrie Lakes. (4-3.14)

How is this obvious violation of citizen health and rights justified? Where data would deny an activity, the MDMA uses a procedure called mitigation to justify an action. Examples follow:

A. Winter training will alleviate noise levels by spreading the noise over the entire year. (4-3.29)

B. Neither the State of Michigan or the City of Grayling have enacted specific noise regulations therefore there is no technical violation if training results in excessive noise levels. (4

C. Federal agencies recognize 55 decibels as a goal for [illegible] noise in and around residential areas. However, this does not requir conformity because it is a goal and is not regulatory. (4-3.5)

-3-

D. One must consider "busy day" conditions within the context of a 365-day period. Thus average noise appears to be the criteria used by the MDMA when measuring and reporting noise levels. (4-3.5)

7 E. Energy averaging the twenty-four one-hour values in a day should be considered. Thus two-hours of 130 decibel readings when energy averaged proves to be less than 12 decibels, well within safe and accepted limits. (4-3.3)

In summary, one might address the following questions:

8 A. Can natural resources be managed in a sound environmental manner and yet be harmonious with the mission of Camp Grayling as discussed in the EIS? We think the answer is no! Current training intensity is already damaging to the area's natural resources.

B. Is the EIS so prepared as to skew the results in favor of the sponsoring organization? NEPA demands a fair and total presentation of facts bearing on the subject so that a responsible decision will evolve.

C. Had the MDMA pre-determined its position in advance of the completed EIS? They rejected categorically the option of relocation.

D. Does the Master Plan suggest increased training intensity?

E. Is there an ethical obligation on the part of leadership, both at Camp Grayling and within the MDMA, to protect the health and property of citizens from the harmful affects of noise pollution?

F. Is the credibility of the MDMA and Camp Grayling leadership suspect considering past performances and practices?

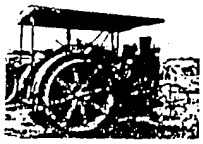
At Guthrie Lakes, we would respond to questions B-F with a firm YES!

We hope you'll share your views with us and at the same time relay our concerns to the proper individuals. We know that informed people will respond in a rational and responsible manner.

Regards,
Carl W. Lord
Carl W. Lord
Treasurer, E.P.P.O.A.
P.O. Box 38
Waters, Michigan 49797

DOCUMENT 15

Robert J. Hartwig



ROUTE 3 - BOX 3722
GRAYLING, MICHIGAN 49738
PHONE: (517) 348-9458

Jun 94

23 June 89

Department of Military Affairs
Construction and Facilities Office
2500 S. Washington Ave.
Lansing, Mich. 48913

Gentlemen:

I have read or scanned most of the Statement and have not seen sufficient reference to the impact on KP Lake. We have, around KP Lake, about 70 homes. Family ownership of some of them dates back to the 1920's.

Our main concern here is the expansion of the military in this area. We realize that a certain amount of expansion would,no doubt,mean purchasing our property and moving us out.Maps do show us to be inside the Guard perimeter. I know of no one who would be happy to move.

As far as the Environmental Impact factor goes- I would mention noise and concussion. The Impact Statement, page 4-3.14, states
1 "Flight paths are carefully designed"----We can't help but wonder why they are so designed that planes and helicopters so often fly tree-top height over the lake. Or is this intentional? It does often shake us up a bit.

Understand, we do believe that the Michigan National Guard should train. But that is all. We knew about that years ago.

2 We have questioned many folks and can not yet find the need for HE ammo.Neither the plane that drops bombs or the artillery that fires a shell sees the target hit or missed. So- why not practice ammo or spotting charges?

3 I don't believe wells have been sunk in the impact area to determine the effects of ground water underneath.

4 This area- this land among the Au Sables and the Manistee and a number of small lakes is and has been recreation area.It was planned that way a long time ago.There are hundreds of homes that would be adversely affected by the expanding use of the Military.

An environmental impact statement needs to address these items.

Bob Hartwig
President of The KP Lake Association

PRELIMINARY ERRATA SHEET
CAMP GRAYLING RE&C

Page	Line	
Beginning throughout the RE&C	3	Change "Renewal" to "Continuation" and "APROL" to APCOL"
1-9	4	change Civil to Civilian
2-8	22	should read: "HPRC-H) addresses neither need...
2-17	23	replace "or" with "of"
2-20	23	close parentheses after "...contamination)"
2-21	7	change eageness to eagerness
3-1	17	change "?" to "."
4-1.1	15	change "aircoclimate" to "microclimate"
4-1.2	12	change "mvoements" to "movements"
4-2.3	16	change "valid a" to "a valid"
4-3.1	1	change experienced to expressed
4-4.2	16	change thought to though
4-4.3	19	begin quote marks before "Bivouac
4-4.4	9	should read "...destruction that is occurring in Camp Grayling."
4-5.3	21	should read characterized as
4-5.12	12	should read "above (See Appendix IV)."

DOCUMENT 16

REVIEW, EVALUATION AND CRITIQUE

of the
National Guard Bureau
And
Michigan Department of Military Affairs

Draft Environmental Impact Statement

MISSION/MULTIPLE CONSTRUCTION: CAMP GRAYLING ARMY NATIONAL GUARD TRAINING SITE, MICHIGAN

March 1989

Prepared for the

AuSable - Manistee Action Council (AMAC)

as part of their Public Comment

VITAL RESOURCES CONSULTING
P.O. BOX 22116
LANSING, MICHIGAN 48909

June 1989

AuSable Manistee Action Council

A NON-PROFIT CORPORATION
Organized to initiate and manage appropriate action required to protect the environment, natural resources and quality of life in the Upper AuSable and Manistee River Basins of Michigan.
ROUTE 3, BOX 3510A, GRAYLING, MICHIGAN 49738

June 30, 1989

Department of Military Affairs
Attn: C & FO (DEIS)
2500 S. Washington Ave.
Lansing, MI 48913-5101

Sirs:

Pursuant to the NOTICE OF PUBLIC MEETINGS on the Camp Grayling Draft Environmental Impact Statement, we transmit herewith the written comments of the AuSable Manistee Action Council.

This is in the form of the attached Review, Evaluation and Critique document as prepared for AMAC by Vital Resources Consulting of Mason, MI.

Please give this document the full attention of your staff in further processing the DEIS. If you need additional copies, please advise.

Sincerely,

AuSable Manistee Action Council

Dan L. Alstott

Dan L. Alstott
Executive Director

AFFILIATED ORGANIZATIONS:
Anglers of the AuSable, AuSable North Branch Assoc., AuSable River System Assoc.,

VITAL RESOURCES CONSULTING
P.O. BOX 22116
LANSING, MI 48909

June 28, 1989

Mr. Dan Alstott, Executive Director
AuSable-Manistee Action Council
Route #3, P. O. Box 3510A
Grayling, MI 49738

Mr. Alstott:

In fulfillment of our contract with the AuSable-Manistee Action Council (AMAC) please find enclosed 125 copies of the Vital Resources Consulting (VRC) team's review, evaluation and critique (RE&C) of the Draft Environmental Impact Statement (DEIS) for the Mission/Multiple Construction Camp Grayling Army National Guard Training Site, Michigan which was released March, 1989 by the Michigan Department of Military Affairs (MDMA), Engineering and Facilities Division, Lansing, Michigan as prepared by Eugene A. Hickock and Associates Division of James M. Montgomery, Consulting Engineers, Inc. (Wayzata, Minnesota).

As per the agreement between AMAC and VRC, we have conducted the RE&C of both the DEIS content and process in an objective manner, based on information provided and available to our team and according to the highest existing standards in our respective fields. In the DEIS we have avoided commenting on qualifications of the preparers of the DEIS. Suffice it to say that the limitations of the expertise of the consulting company hired by MDMA are obvious both in the overall approach taken to the development of the DEIS, and in the lack of balance and depth of assessment in various subject areas. We strongly urge a re-draft of the DEIS, including public comment, before going ahead in preparation of a final EIS. Additional expertise in field biology and ecology is particularly recommended.

We trust that what you will find in the report submitted herewith is in keeping with the above-stated standards, intents, and agreement.

Major contributors to the RE&C include the following:

F. Glenn Goff, PhD
Certified Senior Ecologist
Vital Resources Consulting
201 Ash Ridge
Mason, Michigan 48854

Phyllis J. Higman
Ecologist (RE&C Production Manager)
Vital Resources Consulting
1393 Maynard Road
Sanford, Michigan 48756

William E. Cooper, PhD
Consulting Ecologist
Public Sector Consultants
300 S. Washington Square
Suite 401
Lansing, Michigan 48933

Bert E. Ebbers, M.S.
Consulting Biologist
Ecological Research Services, Inc.
Academy Center
512 N. Lincoln
Bay City, Michigan 48708

Daniel R. Talhelm, PhD
Resource Econometrics
Resource Economics
531 Gainsborough Drive
East Lansing, Michigan 48823

George W. Kamperman, P.E.
Kamperman Associates, Inc.
Acoustical Consultants
26100 Woodland Trail
Kansasville, Wisconsin 53139

Donald B. Richards, M.A.
Richards Consulting: Education &
Educational Technologies
4642 N. Seeger Street
Cass City, Michigan 48726

Jun 94

Sincerely,

F. Glenn Goff

F. Glenn Goff, PhD

Encl: 125 copies of RE&C

REVIEW, EVALUATION AND CRITIQUE

of the

National Guard Bureau

And

Michigan Department of Military Affairs

Draft Environmental Impact Statement

MISSION/MULTIPLE CONSTRUCTION:
CAMP GRAYLING ARMY NATIONAL GUARD
TRAINING SITE, MICHIGAN

March 1989

Prepared for the

AuSable - Manistee Action Council
(AMAC)
as part of their Public Comment

VITAL RESOURCES CONSULTING
P.O. BOX 22116
LANSING, MICHIGAN 48909

June 1989

CAMP GRAYLING DEIS REVIEW, EVALUATION AND CRITIQUE

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C. Letter Read at DEIS Public Hearing, Kalkaska, MI

III. Conflict and Reason: A Personal Perspective on the Conflict Surrounding the Camp Grayling Environmental Impact Statement; Donald P. Richards

IV. A Vegetation Sampling Procedure for siting Studies, Baseline Characterization and Monitoring - Integrated Plot Sampling

1-0 INTRODUCTION

CAMP GRAYLING DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

REVIEW, EVALUATION AND CRITIQUE (RE&C)

By

Vital Resources Consulting
Lansing, Michigan

1-0. INTRODUCTION

1-1. VRC Team and Purpose

VRC engaged professionally competent and highly regarded experts in fields related to the various aspects of the DEIS to provide the RE&C. Those selected were:

Dr. F. Glenn Goff
Vital Resources Consulting
Lansing, Michigan
(Terrestrial, regional impacts, lease, scope, overall assessment and general project coordination)

Dr. William E. Cooper
Public Sector Consultants
Lansing, Michigan
(Aquatic environments, animal ecology, water quality, toxics in the environment, DNR permitting, public trust and overall assessment)

Dr. Daniel R. Talhelm
Resource Econometrics
East Lansing, Michigan
(Socio-economic aspects)

Mr. George Kamperman, P.E.
Kamperman Associates, Inc.
Kansasville, Wisconsin
(Noise Impacts)

Mr. Bert Ebbers (MS)
Ecological Research Services, Inc.
Bay City, Michigan
(Impacts to animal and bird populations, and to winter vegetation)

Phyllis J. Higman (MS)
Vital Resources Consulting
Lansing, Michigan
(Project Report Production Manager, Natural Resources, including wetlands and endangered species, and Energy Resources aspects)

Jun 94

Mr. Donald B. Richards (MA)
Richards Consulting:
Education and Educational Technologies
Cass City, Michigan
(Project Manager, Conflict Management and Future Assessment Recommendations)

Melinda S. Goff (College Student)
Vital Resources Consulting
Lansing, Michigan
(Project Report Coordinator, Office Staff)

The efforts of the above experts, presented in the "Technical Reviews" section of the RE&C and total final RE&C report, as well as the staff, stand on their own merits. We have been honored to have been associated with this caliber of professional and staff effort, and present this documentation as the best response possible, given the time and other constraints under which we worked.

The purpose of the above team effort was to fulfill the requirements of the AuSable - Manistee Action Council (AMAC), who contracted with VRC to review, evaluate and critique the Camp Grayling DEIS "in a timely and professionally competent manner." The contract between AMAC and VRC states that VRC:

> Shall conduct the review, evaluation and critique in a scientifically objective manner, making use primarily of extant data, and shall be expected to release any and all pertinent findings to the public. AMAC shall not attempt to control or bias the findings of the RE&C in any manner, except that members and staff of AMAC may provide information to VRC. The method of procedure to be used in conducting the RE&C shall be determined by VRC and may include public informational or educational meetings, solicitation of public comment, and other information gathering , research and evaluative procedures. The purpose of the RE&C shall be to evaluate the adequacy of the DEIS, to recommend modifications if inadequacies are apparent upon review and evaluation, and to professionally substantiate such recommendations."

1-2. Process of Review, Evaluation, and Critique

The process of conducting the RE&C, as indicated in the contract with AMAC, was to do so "in a scientifically objective manner, making use primarily of extant data," and could "include public informational or educational meetings, solicitation of public comment, and other information gathering, research and evaluative procedures."

Jun 94

The team of experts were contracted by VRC, as soon after their contract with AMAC as possible, to respond to the DEIS when released. When the DEIS was released, copies were sent to all expert team members for their RE&C as assigned (see 1.0 Introduction, 1-1 "VRC Team and Purpose" for specific assignments). Subsequent documentation, related to their assignment, was provided to team members with a suggested date for return of their RE&C report component. Meetings and other communications between the VRC team were held as needed and possible; contacts with other resource experts, agencies and organizations were made for information and corroboration of information. At the Grayling hearing on May 17, 1989 on-site testimony about the DEIS was provided by available members of the team, with a audio cassette recording of the entire hearing provided to all team experts. Later the transcript of this hearing (See Appendix II-B) was obtained and provided to some of the team members.

As RE&C results were received by VRC they were made available to other team experts and other appropriate agencies and

individuals for both formal and informal review prior to extrapolation of salient points for the final overall evaluation of and recommendations regarding the DEIS.

By "scientifically objective manner", we mean following the requirements of truth in our respective fields - requirements acknowledged by us to be independent of ourselves" (M.S. Polanyi. 1958. Personal Knowledge -- Towards a Post-Critical Philosophy - page 300). We do not mean to imply a mechanical process with no judgement involved - indeed, a critique is a judgement, supported by facts and in-depth reason. Ultimately knowledge is personal and we take personal responsibility for our attempts to bring the most universal dimensions of our fields of knowledge to bear on the issue. In order to be as helpful as possible in our review, evaluation, and critique of the DEIS, we have made numerous recommendations. These should be considered as suggestions only - - their respective merit will probably have to be worked out in terms of bureaucratic powers, public relations, the press, political expediency, and perhaps eventually the courts. Although we have made suggestions we believe have merit, we leave it to those more skilled than ourselves for evaluation and implementation. The contributions of the individual team members reflect their different orientations and backgrounds. These differ in format as well as in content.

George Kamperman's contribution not only provides skilled review and evaluation of the noise situation in the Camp Grayling vicinity but also levels deserved criticism at the approach taken in the evaluation of impacts. Noise is already so bad that asking

if these specific projects will be a significant addition begs the issue and obscures the real impact. (We address the flaw in this approach later). He also makes potentially very helpful suggestions for use of an on-line monitoring and simulation system considering weather conditions in order to regulate noise production and thereby limit its impact. His approach offers hope for immediate reduction of one of the most troublesome problems in the area.

Bill Cooper's approach is more general. Dr. Cooper reviews the ecological content of the report and focuses on several deficiencies. He also makes very helpful suggestions from his years of experience as chairman of the Michigan Environmental Review Board.

Phyllis Higman conducted the analysis of several specific sections of the DEIS. Much of the writing in section 4 is the result of her work. She also took major responsibility for pulling together information from the Technical Reviews of our team of experts, and from other sources, helping to produce a more readable and comprehensive RE&C.

Dan Talhelm focused in-depth skills from the field of resource economics on the Camp Grayling issue. His analysis of the cost of lost opportunities and other economic factors not only points to major deficiencies in the present DEIS but also provides a framework for a more comprehensive, realistic, and much needed assessment of the economic aspects of what is happening because of escalation of guard activities. Things are not as they seem economically.

Bert Ebbers reviewed and analyzed primarily biological aspects of the DEIS. He is an excellent young scientist and has been involved in research on several of the species considered. His critique points to the need for more thorough and ecologically grounded assessment of impacts.

Jun 94

Dr. Glenn Goff guided the effort and provided focus for not only the overall evaluation, but also some of the more general aspects of the critique: lease restrictions, approach taken in using the DEIS process in escalation of military activity, as well as several other more specific aspects.

An unusual, but highly cogent, aspect of the RE&C is included, at the request of VRC, to go beyond the technicalities of the RE&C per se. Recognizing the ethical, moral and spiritual aspects of conflict developments, as a result of public reactions to the total DEIS, another form of RE&C developed by Don Richards from his years of experience, great skill, and understanding is included as Appendix III. This report, entitled "Conflict & Reason: A Personal Perspective on the Conflict Surrounding the Camp Grayling DEIS," objectively reviews the developed circumstances, regarding the situation, and from this provides professional observations and relevant resource references regarding how this type of situation can and does occur and how existing conflict can best be resolved and prevented, through professionally proven conflict management and reconciliation methods and futuring processes. This will be especially helpful information to those who are actually involved in leadership in this crisis situation. While this is not the final word, if

considered seriously, it will open a dimension of this issue worthy of response.

1-3. Organization of Document

This document was prepared in a manner that is intended to facilitate ease of use. Following the introductory material is our statement of overall evaluation and review which highlights several of what we believe to be major points that we have addressed. It includes a critique of the use of the EIS process as it is applied to the Camp Grayling situation, an overview of issues that have been included in other sections of the document, issues that do not fit neatly into any other section, and issues that have not been addressed at all in the DEIS.

The following sections three and four match those of the DEIS for easy cross-referencing. Section three addresses the question of alternatives, while section four addresses areas of affected environment and environmental and socio-economic consequences. Included in section four are stated impacts from the DEIS or summary statements of the DEIS contents, our evaluation of these stated impacts, and our recommendations derived from these evaluations. All quotes and summary statements of DEIS content are referenced by page number. Admittedly the RE&C covers the range from minor points needing corrections to criticism of major issues which, if not responsibly addressed, threaten the quality of life and environment in north central Michigan for generations to come.

We have included in section five a more detailed discussion of those issues that were either omitted from the DEIS or may have been addressed in the DEIS, but we believe are of such importance that they need to be elaborated upon beyond our comments in earlier sections. Section six consists of a compilation of technical reports which comprise expert opinions of several members of our group regarding either specific and/or overall issues raised in the DEIS. References to these reviews are made frequently throughout the document and in some cases the review is referenced in its entirety due to its more comprehensive study of the issue(s).

Section seven, the Appendices, contains pieces of information which we believe clarify some of the points we have raised. Also included in this section is a special report entitled "Conflict & Reason: A Personal Perspective on the Conflict Surrounding the Camp Grayling EIS." The purpose and content of this report is described in the previous section (1-2) of this document.

There is some overlap of issues in various sections of this report, however that is indicative of the complexity and interdependency of the issues at stake regarding the implementation of the proposed projects. It also serves to reinforce these points as they are raised again and again. In all cases an attempt to cross reference information has been made. Due to the repeated use of some titles, i.e., departments, documents etc. we have shortened them to their commonly used

acronyms. A list of these follows.

AMAC: AuSable Manistee Action Council
APPOL: Agreement Pursuant to Renewal of Lease
CGCOC: Camp Grayling Civil Oversight Committee
CGMAC: Camp Grayling Management Advisory Committee
DEIS: Draft Environment Impact Statement
EMAP: Environmental Management Analysis and Plan
MDMA: Michigan Department of Military Affairs
MDNR: Michigan Department of Natural Resources
RE&C: Review, Evaluation and Critique
VRC: Vital Resources Consulting

2-0 OVERALL EVALUATION AND GENERAL CRITIQUE

2-1 No Assessment of Cumulative Impacts

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The most glaring single deficiency in the DEIS is, "The impacts are examined in comparison to the existing condition of the attribute's features." Ref: (3-4.1 paragraph 2) 1

In other words, there is no assessment of cumulative impacts. The approach taken in this DEIS is to evaluate only the incremental change produced by the actions proposed. No attention is given to the fact that in many instances, escalation of Guard activities in recent years has already created unacceptable environmental conditions.

The military's strategy of escalation based on "unexamined incrementalism" if allowed to continue will result in yet more conflict as well as needless waste of vital resources. By adopting current conditions as the "no action" alternative, the DEIS ignores the fact that significant deterioration of environmental quality has already occurred. According to the DEIS (Section 2-3, page 2-3.1): "Yearly training levels ranged from approximately 34,000 troops in FY80 to 55,000 in FY86 (See Figure 2-3.1). The average increase in training was 3,350 troops per year." There has also been an increase in cold weather training during this period.

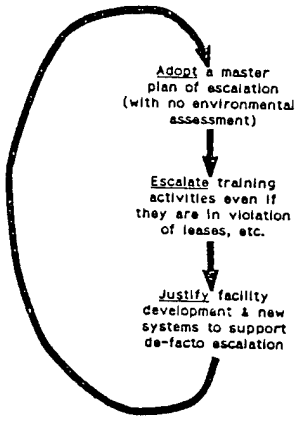
This increase occurred despite restrictions on leases, e.g. exceeding the restrictions of the 1978 lease on approximately 50,000 acres of "restricted use" leased lands (See Section 4.6),

creating numerous nuisance conflicts, and seemingly creating a justification for new facilities, increased capacity, and new types of training. But, the baseline for evaluation of these proposed activities should not be present conditions but the former, pre-expansion conditions which more truly reflect the assumptions of the land lease and permits granted by the MDNR. A more reasonable baseline would be 1978 troop levels and training tecnnologies (See Section 3.2), and at the very least, cumulative impacts from this baseline should be included in the DEIS.

The situation is analogous to requesting a local electrical permit for wiring an addition to an old house in which wiring has already been added repeatedly with no regard for a permit. Under such circumstances, the new permit application must take into account not only the new addition but also the wiring in the existing structure which may be overloaded, deficient, and already in violation. Requesting a permit for the new construction opens the issue of adequacy of the pre-existing situation. Before a permit is granted for new wiring it is normally necessary to upgrade the existing system to alleviate existing overloads plus accommodate the new load or to cut back to levels that do not represent an overload. A permit for wiring in the new addition may or may not be granted, depending on whether the already existing situation can be remedied. Similarly, in the proposed Camo Grayling expansion, the fact that an overload has developed does not constitute justification for further expansion. Present conditions, which are marked by significant environmental quality

deterioration since 1978, do not constitute a reasonable baseline. The strategy underlining the DEIS appears to have been:

CYCLE OF ESCALATION



Breaking this cycle will require a great deal of diligence on the part of the regulatory agency (MDNR), especially when the "cycle of escalation" is supported by large amounts of money and military strategic planning. This cycle is obviously being aggressively pursued at present with the DEIS principally a justification document.

Recommendation(s) -

Since the proposed actions, if taken, would sustain present environmentally damaging situations, the assessment should evaluate the final resulting quality of environment associated with each action rather than the incremental addition that it makes to an already unacceptable situation. The DEIS should address cumulative impacts. The DEIS and the assessment tnat produced it should be redone using a different, more realistic basic assumptions.

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2-2 Neither Master Plan nor Master Planning Process Included in the Scope of the DEIS

The DEIS states the goal of its "Master Plan" as follows:

"The Michigan Department of Military Affairs has prepared a master plan for the continuation and development of the Camp Grayling Army National Guard Bureau. The goal of this master plan is to ensure effective use of the site and economical use of funding for development in an environmentally sound manner. The approved plan will identify development within the next five years and proposed facilities thereafter."

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Neither the master plan nor the master planning process is included in the DEIS. Obviously the National Guard has already defined the future mission of the Camp without considering

environmental effects on total public welfare, and is complying with EIS requirements only for individual small steps in carrying out this larger mission.

By dividing the planned mission/multiple construction program into 20 components and considering each separately without addressing the overall issues of expansion and use of new military technologies (as well as that of the problems caused in recent years by unassessed escalation), the DEIS ends up addressing several minor issues while completely ignoring the major ones.

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This is admitted by the DEIS (Section 3-1):

> "In most cases, the proposed actions are at least through the Army National Guard preliminary planning phase. This planning process begins with the development of master plans that identify necessary projects and schedule these actions."

According to this, the assessment of meaningful alternatives by the DEIS has already been precluded by the military planning process.

The master plan, setting forth training needs, projections and alternatives, as well as assessing tne potential use of other training facilities, must be included in the EIS and subject to public scrutiny. This DEIS is inadequate not only in specific content but even more so in its scope, frame of reference, and illegitimate prior assumptions. The most significant decisions - those that the public should have the most voice in - have

apparently already been made by the military and are presumed to lie in the domain of military master planning, outside the scrutiny of the EIS process. The DEIS should be re-drafted including the master plan, its assumptions, and its alternatives, in the assessment. It should examine the master planning process to assure that public interests and values (See Section 5.5) are taken into account. Part of this master planning is the so called "scoping process" conducted by the military. Tne fact that public hearings were held on the "scoping document" prior to the development of the EMAP and DEIS, is largely irrelevant, because without more detailed information about what was planned it was impossible for the public or other agencies to make informed comments, pro or con.

The DEIS does not consider alternative sites outside the Grayling area because the military "master plans" have already limited the frame of reference to this area only. However, this limitation and the limited scope that it imposes on the alternatives considered, invalidates the EIS process. (See Section 3-1 for a discussion of this issue)

2-3. Mistaken Assumption Regarding Land Availability

Numerous categories of land, under various types and degrees of control by the MDMA, comprise the training area and camp. In developing the EMAP and DEIS a mistaken assumption was made that the lands on which the proposed projects are sited were available for development and escalation of training activities. This is

not the case for the Multi-Purpose Range Complex - Heavy, All Weather Training, and other projects located on the "North Range." In fact, blatant lease violations have apparently occurred in recent years on these restricted use lease lands, shown in Figure 4.6A, thereby exceeding the multi-use carrying capacity and introducing the need to assess a "rollback" alternative in the DEIS re-draft. No further violation of the terms of lease L-1479 should te allowed. The lease issue is treated more comprehensively in Section 4.6 but it must be alluded to here, for it negates the possibility of what the military plans.

2-4. Is There an "Urgent and Unique Need" or Competition Among Guard Camps for Expansion? (How Can There be Both?)

The DEIS admits (on page 3-4.1) that:

> "Taking no action...the facility would eventually become less competitive in relation to other National Guard camps. Thus, over time the post would lose many of the troops who currently train there..."

raises a "master planning" issue of major pubic concern. On one hand the case is made that there is an urgent and unique need for these proposed actions (so urgent and unique, in fact, that no meaningful off-site alternative can even be considered). The EMAP and the DEIS assume and attempt to justify the assumption that such training must be done as proposed and that it can be done at Camp Grayling. Yet, the DEIS argues that if the actions are not

taken other National Guard camps will out-compete Camp Grayling for such training. If there is in fact such competition for guard clientele, then the need to expand and deploy new military training technologies at Camp Grayling cannot be as urgent or as unique as suggested.

Are the leaders involved here really in the service of guard training or are they in the competitive business of specialized commercial camping -- that is, of selling the north central part of Michigan competitively for the Guard encampments of other states. The motives behind this do not appear to be to train the Michigan guard and simultaneously preserve the quality of life and environment in the area (as the mission statement says!). Otherwise, why not reciprocity with other states and Camps for parts of the training mission? To resolve this issue a quantitative assessment of all off-site alternatives is recommended.

Competition among National Guard camps for troops and training activities is dealt with inconsistently and superficially in the DEIS. The DEIS uses need plus "uniqueness" to justify not considering other sites. The alternatives posed for facility expansion and for new military training technologies (e.g. the MPRC-H) address need nor site "uniqueness" (except to say that north central Michigan looks like Russia in the wintertime). This need for evaluation of off-site alternatives applies particularly to T1, T2, T3, as well as cold-weather training and assignment of new aviation units.

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2-5 The DEIS is Careless and Presumptions Regarding Private Land Ownership and State Lands Under Lease in Its Definition of "Military Lands" Jun 94

The DEIS states: "The military lands within the Camp Grayling Military Reservation boundary occupy approximately 140,000 of the 173,000 total reservation acreage. The remaining acreage (slightly more than 33,000 acres) is private and local, State or Federal land. The post can be considered as four geographical areas: the Cantonment Area, the Grayling Army Airfield, south post (training areas west of I-75), and north post (training areas east of I-75). This discussion focuses on the north and south post training areas and the ranges they contain.

The north and south post training areas include firing ranges and approximately 90,000 acres of non-fire maneuvering area, enough land to accommodate a combined arms division. The post utilizes approximately 140,000 acres. Forty-three thousand acres are owned by the Department of Military Affairs and 56,000 acres are leased."

By what authority are the 33,000 acres of private and local, State or Federal land, which are not owned by or under lease to MDMA, included within the "Camp Grayling Military Reservation" boundary? By being so identified (as part of the Military reservation) their value is probably diminished. In all representations, these private, State, and Federal non-military lands should be clearly mapped and identified as either exclusions

from the military reservation, or included under restricted conditions.

2-6 Inadequate and Superficial Assessment of Impacts

In many places throughout the document the DEIS concludes:

"...there will be no significant adverse impacts of the proposed activity, etc."

Potential impacts are either not assessed or are assessed superficially. The erroneous conclusion of "no significant impact" is apparently based, at least in part, on the assumption that the additional impacts resulting from the 20 proposed projects and activities covered in the DEIS are insignificant compared to the negative impacts already being experienced. This might even be so for some of the projects, given the unacceptable impacts already resulting from elevated activity levels (and depending on how "significant" is defined). Again, we encounter the failure to assess cumulative impacts.

2-7 Insufficient Specification of Mitigation

The DEIS states over and over:

"the impacts of _____ are anticipated to be insignificant after mitigation".

Again, potential impacts are either not assessed or are only assessed superficially! By indicating that they are anticipated to be insignificant after mitigation, the DEIS implies that the foreseen but unexamined impacts are quite apt to be significant without a mitigation plan? If so, why are they not assessed? No new data are collected. The information cited often is not directly relevant to the issue at hand or its relevance is oblique -- certainly not sufficient to support the planning and decision-making. Far from advancing the state-of-the-art, the information used is often not up-to-date.

The assumption that a mitigation plan acceptable to regulatory authorities can be developed in the face of such superficiality is blatant. Since a meaningful mitigation plan is not specified (or at best underspecified), its reasonableness cannot be evaluated. To make the assumption that the MDNR field staff and administration, or that of other regulatory agencies, will accept such a mitigation plan, is not only presumptuous, but borders on being an insult to the integrity of that staff and administration. Does MDMA really think that they can make such assumptions without a careful assessment of the nature and distribution of the environmental systems and subsystems involved, fuller specification of the actions proposed, quantitative assessment of likely impacts, and realistic appraisal of alternatives? This is what is implied. It appears that specific

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mitigation plans are not offered because the assessment has not been sufficient to allow specification of mitigation. Whether acceptable mitigation is feasible remains to be seen. As with the frequent use of "no significant impact" assumption, the presumption that impacts will be acceptable after mitigation may also be based, at least in part, on the misleading premise running through the entire DEIS that the additional impacts resulting from the any of the 20 projects and activities proposed are insignificant compared to the negative impacts already being experienced. However, an escalation strategy of incrementalism (in both manner and extent of use!), in apparent violation of the terms of land leases governing military use of state lands, plus avoidance of responsible assessment of all impacts (incremental and cumulative) to the natural and human resources of the Upper AuSable/Manistee, cannot be allowed to work. If not checked such superficiality will produce needless waste of vital resources. Specific mitigation plans must be given in detail.

2-8 Operational Phase Impacts Are Not Addressed

Only impacts during the construction phase are addressed, impacts of the operational phase are largely or completely ignored.

The unstated assumption is that once the State permits an action, there will be no deleterious activities. This is blatantly false. Most of the environmental cases that involve

litigation or negotiated settlements in Michigan involve permitted operations.

Because of the operational interdependency of impacts of the proposed projects, no single permit application should be considered complete until the environmental assessment of the mission/multiple construction environmental assessment process is complete.

MDMA should develop an Appendix to the re-draft DEIS containing all of the draft permits needed.

In the process of developing draft permit applications additional information needed to evaluate impacts of both construction and operation would be required and therefore relevant new information would be gathered. This enhanced data base would enable effective assessment of impacts, which is not possible without further investigation. Specific parameters of each permit, including procedures for assuring compliance during operation, need to be specified.

5

2-9 Potential Impacts Resulting From Accidents and/or Violations Are Not Adequately Assessed.

The DEIS does not consider accidental, worst case, or abnormal events. This is a particularly serious deficiency in view of the multiplicity of such events reported in recent years. In evaluating impacts the DEIS assumes "normal" operations, and no violation of operating rules. If rules are violated either accidentally or otherwise, the DEIS simply states what action will

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be taken to remedy the situation. It does not describe or evaluate the adverse impacts created by such violations, and/or accidents.

An evaluation should be made of the adverse impacts of accidents and violations, taking into account use density, and proximity to resources and population. A "worst case" scenario should be posed for each proposed action, as well as probable rates of accidents of various types potentially associated with each of the proposed activities during both the construction and operational phases. A preliminary list of the types of accidents and violations anticipated should be compiled from records of such events during the past several years. But other possible accidental events should also be evaluated.

From an "accident/unusual-event" point of view, the proposed escalation of activities is especially poorly sited in terms of impact to prime trout streams and the recreational activities associated with them. Accidental incidents such as the 10,000 gallon diesel fuel spill described in Section 4-8.18 of the DEIS are not considered in terms of assessment of either their likelihood or their associated impacts, in the DEIS.

2-10 The Decision-Making Process is Underspecified

The DEIS states:

"It [the DEIS] is to be used by decision makers in conjunction with other relevant material to plan actions and make decisions. Ref: (pg. 1-1.1)

Neither the other relevant material nor the regulatory authority involved in such decisions is specified. The roles of MDMA and MDNR need to be clarified. The proper roles of MDNR as a) owner/lessor, and b) regulator, need to be more clearly defined. Likewise, the role of MDMA as a) lessee or a') owner, and b) developer/permit applicant, need to be more clearly identified. MDMA is a "developer" in this instance, competitively promoting National Guard Camp training in Michigan. They should be required to meet the same standards as any other developer. Sorting out these roles, and thereby freeing MDNR field staff members to perform their proper regulatory functions, is an extremely urgent need.

According to Dr. Cooper (See Technical Review I): "The only regulatory control over Camp Grayling activities lies in the MDNR permits. Regulations usually are minimal standards - the result of compromises negotiated during the rule-making process. Camp Grayling is located at the headwaters of the AuSable and Manistee rivers, adjacent to the Hartwick Pines State Park, and contains a significant portion of the breeding habitat for the Kirtland's Warbler, a federally designated endangered species. This area deserves more than the minimal standards of environmental protection. Rigorous standards can be promulgated and enforced through a consent agreement signed by all parties."

A consent agreement is one alternative. Another potent mechanism is available because of violations of lease L-1479. As an alternative to a consent agreement, specific actions, as well

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as the requirement for any authorized new actions, should be detailed in an "Agreement Pursuant to Renewal of Lease" (APROL) document. Review of the terms of the APROL document, with the possibility of changes to accommodate new projects not sufficiently large to require an EIS, as well as review of compliance with the specifications of the APROL should be scheduled on a regular basis. These reviews should be open to public input. If new actions need to be taken during the interim between reviews of the lease terms, these should be authorized by a detailed, written "modification" of the APROL document signed by both MDNR and MDMA. If such modifications are of potential interest and significance to the public, appropriate public hearings should be provided. Compliance evaluation criteria should be specified and a compliance review scheduled on at least an annual basis with renewal of the lease contingent on compliance. There is no such thing as a "perpatual lease" having terms and conditions. If the terms and conditions are violated this voids the lease (See Section 4.6). Regardless which mechanism (Consent Agreement or Agreement Pursuant to Renewal of Lease) is used, it should be an agreement in writing, providing clear, agreed-upon directives to staff of both departments (MDNR & MDMA).

Recommendation(s) -

7 As part of the EIS process, the MDNR should work with MDMA and the Governors "Camp Grayling Civilian Oversight Committee" (CGCOC) to draft a Consent Agreement that augments the regulatory permits, or an Agreement Pursuant to Renewal of Lease (APROL) to

7 assure appropriate and adequate protection of this ecologically unique area.

Although the only regulatory power in the traditional sense Jun-94 that is vested in the State for healthy control of the military may be in the form of permits, this is not so on restricted use leased lands. On these the additional responsibility is placed on the MDNR to assure that the terms, conditions, and intent of the lease are adhered to, thus protecting the public interest.

8 2-10 The On-Going Decision-Making Process is Insufficiently Regulated.

The DEIS states:

"This plan will.....be reviewed annually and revised as needed with the approval of the Chief, National Guard Bureau." Ref: (1-1.1)

Assuming that deficiencies in the DEIS are eventually corrected and an adequate final EIS is issued, future changes in the plan or the Agreement Pursuant to Renewal of Lease (APROL) [or consent agreement] covered by this EIS should not be allowed without public comment. Any departures from the plan considered by MDMA, MDNR, or CGCOC to be significant to civilians should receive public review. Major projects should require environmental impact analysis (not just the "approval of the Chief or the National Guard Bureau").

The public's interest and values should be protected on an ongoing basis by:

a) MDNR's recognition and vigorous insistence upon compliance of the restrictions of Lease L-1479 and other leases.

b) MDNR's exercise of authority to terminate or refuse to renew permits due to non-compliance with permit provisions.

c) MDNR's insistence upon compliance with terms of a consent agreement drafted specifically to provide terms for regulatory control.

a) MDMA's cooperation in the institution and strengthening of needed checks and balances in the decision-making system.

b) MDMA's full participation in drafting and seeking consensus in a consent agreement or an Agreement Pursuant to Renewal of Lease.

The expected outcome of these recommendations is an appropriate "checks and balances" regulatory system protecting the natural resources, environment and life quality in the Upper AuSable/Manistee area. This will mean recognition, clarification, and more vigorous implementation of MDNR's regulatory role as well as assurance that public interest and values will be treated as significant and given due consideration in future planning and decision making. The Governor's Camp Grayling Civilian Oversight Committee and that committee's ombudsman, as suggested by the CGMAC report, may be of great assistance both in achieving the

consensus needed and in preventing future problems. It is imperative that this committee be formed soon so that they can have input to the suggested agreement as well as to the re-draft of the DEIS.

2-12 Need to Address MEPA

The DEIS attempts to follow federal (NEPA) guidelines and format. It does not responsibly address several issues required by the Michigan Environmental Protection Act (MEPA) and executive orders and guidelines pursuant thereto. Some obvious omissions are (1) public interests at risk and (2) assessment of aesthetic factors other than noise (this is addressed in Section 5.3). MDMA's proposal is for a major action of statewide significance which will have irreversible adverse impacts to the environment. It is proposed on state owned land. Obviously an EIS based on MEPA is needed.

2-13 Need For Assessment of Public Interests/Public Values at Risk

The DEIS states the purpose of the proposed action but does not provide an assessment of public interests and public values at stake in the proposed escalation, as required by MEPA. Only the military's "Master Plan" perspective is provided and this permeates all aspects of the DEIS.

Probably the most useful approach to analysis of public interests/public values at risk is a hierarchical or multi-level procedure. (See F.G.Goff, S.P. Voice, J.R. Wells and J.A. Lively. 1986. Environmental Study of the Hamlin Lake/Nordhouse Dunes Area--Mason County, Michigan. Report on file with the Michigan Department of Natural Resources, Geological Survey Division in fulfillment of Contract Number 3193. pp.144-156.)

Various interest/value eschelons (abstract levels) are identified. One possible approach is a three level hierarchy amplifying the following:

PUBLIC INTEREST/PUBLIC VALUE ANALYSIS (MULTI-LEVEL)

Global/National

--Protection of the habitat of the Kirtland's warbler, perhaps America's best known, Federally protected endangered song bird species

--Protection of one of America's (if not the world's) finest trout stream, the AuSable Sable River headwater area.

--Protection of the Nation's "Water/Winter Wonderland" recreation heartland. Hazard of loss to Great Lakes in event of war (more continental location would pose less threat to the Great Lakes in case of attack and major e.g., nuclear, region-wide contamination.

State/Region

--Increasing traffic on interstate confluence corridor; inconvenience of pass through to other Michigan recreation, resort residential opportunities. Possibly temporary closure.

--Foreclosed opportunity for other longer term healthier development options. In economic desperation or eageness, there may be a tendency to seize the first opportunity, (military training escalation) at any cost (i.e., to lower the value placed on life quality and the environment), rather than to stay by deeper values and keep the long view, trusting the outcome. Other opportunities constituting statewide/regional public interest and values might include opportunities for:

- prime resort/residential
- decreased vulnerability to attack of region during times of war
- wood products industry
- hydrocarbon development
- one of the large pine barrens environments of the Great Lakes Region
- Down River hills
- Lake Margarethe
- Major ground water recharge area

- Fishing (esp. trout) (fly fishing as an art form)
- hunting
- camping
- Recreation Trails (several types)
- Hazardous/Toxic waste capacity and transport (safety)
- Air space in critical central zone
- Bear swamp
- See also public interest values expressed by other groups

Local/Site

-- most of what is addressed in the MDMA DEIS and our REIC

--numerous values reflected in letters, local newspapers, and public testimony

--There has been a perception of general deterioration of the environment by some civilians in the Camp Grayling area. This perception has been reported to us but we have no verification in terms of cause and effect. Some area residents cite loss of Osprey and Loons, decline in songbirds, fewer large fish in the rivers, and possible decline even in human health, attributing these to military training activities. All of these trends seem to these local residents to be

correlated with increased escalation of training activity. Some possible sources of this perception include a) it may be a misperception due to high irritation level or fear, b) there may have been general deterioration of the biotic community due to (1) noise impacts, (2) undetected slow releases of toxic substances, or (3) impacts of activity *per se* on the biotic community (behavioral responses). Even if the suggestion of an insidious, general, destructive side effect of military training is merely a local perception with no basis in fact, it is still important to take note of this since at a minimum such a perception reduces the quality of life for those who hold it.

--attitudes toward Guard Leadership. Upon enquiring about the causes of hostility expressed toward some Guard leadership, we were told:

-the Guard leadership has lost respect, they are generally insincere and patronizing.

-routinely they ignore legitimate complaints and concerns

-all night cannon firing and low flying jets over residences are major irritations.

--We were told,

-"A basic urge of an aviator is to 'let people know we're up there' to draw attention to himself."

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--Many other similar comments are found in Appendices IIB and IIC.

A public value at Region/State and Local/Site levels is respect for the Guard, this perception should be remedied by constructive action.

9 Public attitudes were not addressed in the DEIS. We suggest summarizing and presenting public attitudes and responses in the re-draft DEIS rather than waiting to put this information in the final EIS.

2.14. Carrying Capacity Exceeded

So long as military training was at a relatively low level it was compatible with the recreation/resort-residential use of the area. However, all indications are that the carrying capacity for military and non-military combination of activities has already been exceeded - and that further expansion of military training use of these lands would result in continued and mounting conflicts. A systematic, quantitative assessment should be made of the carrying capacity of these lands for the multiple uses 10 which they are being asked to support as part of the DEIS re-draft.

2-15 Ecological Awareness Program

There is a need to incorporate ecological and environmental awareness training into the training program of the National

information about their training environment, will be better able to appreciate the values of Camp Grayling and the area. Such appreciation will increase sensitivity to the environment and encourage troops to take pride in the ecological values of their training area. In turn they can be expected to protect and preserve these values. Any threat to the ecological integrity of Camp Grayling will be a personal matter with them. While all troops will not be equally aware of, or sensitive to such values, it is very important to infuse this opportunity (and requirement) into the troop training activities especially during the introductory phases. A significant number of the troops can be expected to gain a depth of concern, awareness, and conscience to make a positive difference -- appreciating, enjoying, and protecting the ecology of their natural heritage and environmental resources. While this type of education/training may seem inconsistent with the normally destructive practices of simulated warfare, caring and a resources stewardship is a perspective implied in the master plan - "in an environmentally sound manner" - and should be vigorously pursued as a Michigan emphasis in the training program of all troops training here.

Recommendation(s) -

1. Develop and implement a more substantial training program for creating environmental awareness among individuals training at Camp Grayling.

Guard, Reserve, and regular Army units that make use of Camp Grayling.

Although the mission of the Camp Grayling Training Site does not include sensitivity to the environment (See EMAP 1-3.1, DEIS 1-3.1), the Michigan Department of Military Affairs master plan does:

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". . .The purpose of the master plan is to ensure effective training and economical use of the funding for development in an environmentally sound manner" (Executive Summary ii, paragraph 1).

The pamphlet, "The Soldier and Camp Grayling Resources" published by the Engineering and Facilities Division - Environmental Section of MDMA and made available to all troops, details rules and regulations regarding environmental concerns. Although a good effort, it is not sufficient to create the kind of awareness necessary to preserve the environmental integrity of the post and surrounding lands.

An ecological awareness program, involving both cognitive course work and development through creative interactive processes, is a constructive means of developing and maintaining a more enduring sensitivity that will assist in the protection of the ecological values of the Camp Grayling site. It is one means of building and heightening ecological conscience during training programs. Informed troops, provided with attractive and accurate

3-0 ALTERNATIVES CONSIDERED

3-0 ALTERNATIVES CONSIDERED

3-1 Include Off-Site Alternative

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According to the DEIS (Executive Summary page iii) the only alternatives considered were those which were "feasible in terms of military planning criteria," including, logistics, post mission, and cost. The description and examples of this screening process provided in Section 3.2 are insufficient. The DEIS approaches the screening process in terms of minor criteria but ignores the major ones. Apparently only military criteria are applied. No clear definition or analysis is given in support of the guiding military criteria. For example, although the "post mission" is supposed to include protection of the environment, there is no evaluation of whether the mission includes training levels and technologies compatible with the primary recreation/resort-residential land use in the area. Environmental, recreation, and quality of life costs are not included under cost criteria?

If the overall mission of the Guard had been subject to DEIS evaluation, it may have been obvious that an alternative site was more cost effective from the greater public's point of view. The increased logistical costs of transporting National Guard troops to a training site located further from home may be a small price to pay to gain the availability and enjoyment of a high quality environment for present and future generations in the heart of Michigan's prime recreation area. Since battle-readiness would

certainly include the ability to mobilize at a point a considerable distance from home, the inconvenience and added cost of moving the troops may even be offset by a more realistic mobilization training situation. Reciprocity among states in hosting parts of the training mission at two or more Guard Camps may be advantageous.

The logistical criteria, the post mission, and the related cost are not sufficiently defined or evaluated in relation to other, non-military criteria, missions (options) and related costs, (See Section 2.13 regarding analysis of Public Interests/Public Values at Risk), making it impossible to determine whether the real alternatives included are sufficient.

For example, according to the DEIS (Executive Summary page iii):

> "The 'alternative site' alternative means moving an activity or facility to a different on-post site. The 'relocation' alternative means relocating actions or activities proposed for the post to an off-post location."

This seems to promise that serious consideration will be given to other locations - perhaps even other out-of-state bases or training facilities.

However, in Section 3 (Page 3-1.1) one is made aware that the only off-post alternatives considered by the DEIS were "...relocation off-post (in the vicinity of Camp Grayling)...":

and again in Section 3 (Page 3-1.2): "The 'relocation' alternative requires that the actions be performed at a site off-post in the Grayling vicinity." This "requirement" is supported by the assumption that overall and cumulative impacts need not be considered. Each individual action is evaluated independently, so the alternative of moving part or all of the planned training mission to some other site not in the Grayling vicinity is not even addressed. While the detailed assessment of individual proposed actions (even more detailed and comprehensive than that presented) is needed, there is a more general level of assessment at which more broadly scoped alternatives must be analyzed and evaluated.

The fact that other National Guard units, from other states, presently utilize Camp Grayling (apparently cost effectively), and are expected to do so in the future, suggests that an out-of-state option (e.g. at an abandoned military base) should at least be systematically evaluated for the Michigan National Guard. If other states can come to Michigan cost effectively, why can't we go to other locations for at least part of the training mission? We suspect that there is factionalism within the military establishment (as in any other organization) that prevents a full and fair assessment of the relative merits and public risks of the Camp Grayling site vis-a-vis other "competing" sites.

The DEIS states: "The Michigan DMA has no off-post lands suitable for an MPRC facility." Ref: (Page 3-2.5). This is apparently true both in general and for the proposed MPRC site. [This site M-40 controlled land under restricted use lease to

Appendix M

MDMA. The terms of the present lease do not permit development of the MPRC. (See Section 4.6 Land Use Development for further discussion of this issue)] The DEIS further states: "The logistical effects of constructing and maintaining another facility as well as moving the large numbers of troops and their equipment to and from another facility located away from the post, would prevent the necessary utilization of the MPRC since training is constrained by time and budgets." (3-2.5) This statement would be true only if one assumed that the troops had to remain based at Camp Grayling at times when they were using an MPRC located elsewhere. This assumption is unnecessary if the troops could be moved to other sites. As indicated, the DEIS even states that other Guard units find it cost effective to come to Camp Grayling for such training.

Is the purpose of the proposed actions:

a) "...to correct deficiencies and correct problems at Camp Grayling." [Given the assumption of further expansion and deployment of new hi-tech training technologies as well as the fact that expansion during recent years--for which there has been no public evaluation, contrary to the spirit of NEPA-- has created the deficiencies and problems alluded to.] - or,

b) to accomplish effective training [perhaps only part of the total National Guard training

needed with reciprocity, etc.] while maintaining the quality of environment and life in the upper AuSable - Manistee basin.

If it is "b", then consideration of off-site (even considerably removed) alternatives beyond those included in the DEIS is called for. If it is "a", then the prior question must be posed, "What is the role of Camp Grayling vis-a-vis other facilities (e.g. "competing Guard camps) in military training?"

12 In either case the alternative of conducting National Guard training at another site outside of the Grayling area has not been adequately evaluated. The "Camp Grayling and environs only" assumption underlying the DEIS is not legitimate. According to the DEIS (Executive Summary - page ii): "In response to reduction in manpower and equipment of active military forces, the Secretary of Defense has increased the strength (total force) of the National Guard." The reduction of the active military forces which is presently underway has in turn made available the regular military base lands. These belong to the federal government. They are presently and have historically been dedicated to military training uses. Many are surrounded by federally owned buffer lands which separate populated areas and special recreational/resort-residential areas from military activities. Because these lands have historically been used for military training the effects of toxins and other adverse impacts to the environment would be only marginal - no new lands would need to be exposed to such insults. In some cases (e.g. Jefferson proving ground) cleanup of these lands, which are now contaminated with

explosives to several feet depth in the soil, has been determined to be unattainable (surface cleanup at the Jefferson proving ground is estimated to cost more that $550 million). Moreover, the local economics in the vicinity of several of these closing regular military bases is geared to the military presence and would be adversely impacted, at least temporarily, by discontinuation of military use of base lands.

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The lack of evaluation of an off-site alternative is a sufficiently major problem with the DEIS that it reinforces obvious need for a re-draft of the DEIS addressing this issue before a final EIS is developed. Are there other lands better suited - and perhaps already dedicated - to use as military training grounds? A comprehensive assessment should be made of "off-site" alternatives with particular attention directed to existing military bases, especially those now selected for closure.

The following procedure is suggested to evaluate alternative sites:

1. Inventory all potential training sites:
   - -Existing Military Bases
   - -Other National Guard/Reserve training areas
   - -Other Federal Reserve lands.
2. Assess all potential training sites, considering alternative uses.

3. Screen sites to eliminate all but the top three preferred.
4. Conduct an in-depth comparative analysis of these three sites, considering public values/interests as well as military training needs at multiple levels.
5. Select preferred site - support selection with rational, data-supported, analysis.

NEPA requires at least that the consequences of this kind of decision be evaluated before the decision is finalized. If there is enough pressure from the military, and if it continues long enough, civilian users of this land may give up and go elsewhere. But then we must ask ourselves, "Is exclusive military training the highest and best use of these lands?"

3-2 Suggested Alternatives

More realistic alternatives for an initial matrix analysis of alternatives would be:

1. FURTHER ESCALATION -- Continue escalation of activities with associated construction and changes of troop training components reflecting simulation of "modern all-out warfare" as proposed in the military's master plan. This would probably necessitate clearing the area of civilians and curtailing recreational use.

2. STABILIZATION -- Stabilization of activities at present levels with existing facilities, and training components. Deploy available technology for significant noise reduction, monitor toxic and hazardous waste, and aggressively seek out and implement other measures to correct present abuses. Some upgrading of facilities in the cantonment area, possibly upgrading of roads on the ranges, and other projects protective of the environment and quality of life might be permitted.
3. ROLLBACK -- Reduction of activities and changes in troop training components to levels compatible with environmental protection and quality of life in the area (approximately 1978 levels).
4. ALTERNATIVE SITE -- Move parts of the training mission to other sites outside the Grayling area (and perhaps outside Michigan) under a reciprocity agreement with Guard units of other states. Continue to conduct some parts of the training mission at Camp Grayling with improvement of existing facilities and some construction to facilitate these.
5. MICHIGAN GUARD ONLY -- Develop Camp Grayling as needed (with proper environmental impact assessment and regulation) but for use only by the Michigan National Guard. Evaluation of this alternative would take into account the issue of optimum size and placement of Guard camps nationally as well as co-training vs. independent training costs/benefits, reciprocity among states, etc.

6. CLOSURE -- Gradually move the training of Michigan National Guard troops to other training facilities in recognition of the unique value of the lands presently utilized by the Guard for recreation and resort/residential use. The DEIS (3-4.1) points out that unless the proposed (escalation) actions are taken "the facility would eventually become less competitive in relation to other National Guard Camps. Thus, over time it would lose many of the troops who currently train there..." If competition for Guard training is so vigorous among the various national guard camps, the people of Michigan might be wise to seriously question if this is the highest and best use for Michigan's recreation, resort/residential heartland.

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These six alternatives may have been evaluated by the military establishment, but apparently only in terms of troop training goals with no explicit consideration of environment or life quality in the area. If such an analysis occurred, the behind the scenes work was not made public. The first level of assessment should comprehensively and fairly address these alternatives, selecting one or two for more in-depth analysis. Assessment and selection should employ a multi-level public interests/public values assessment including both environmental and local life quality criteria as well as goals of the military training mission. The DEIS should document this process, showing impacts and trade-offs of each alternative, and justifying the

selection of a "preferred" alternative (as well as possibly a "contingent preferred alternative").

Once the preferred alternative is selected, each specific component of the proposed action should be analyzed in relation to each identified component of the environment. Much more detailed assessment of potential impacts, based on state-of-the-art extant data, and on new data, should be conducted. At this level an impact matrix should be developed for each of the 20 proposed actions. Mitigation plans and options should be specified in detail (preferably in the form of permit applications considered by the military to be complete, appended to the DEIS). Because of the portent and complexity of the issues involved we suggest a carefully structured hierarchical approach to the assessment and the resulting DEIS re-draft.

Environmental variables in the analysis should comply with the Michigan Environmental Protection Act as well as executive orders and administrative rules pursuant thereto. However, a "NO ACTION" alternative is not an acceptable option in this case (unless "NO ACTION" equates to "ROLLBACK") because present violations of lease terms and other infractions, as well as insufferable violations of private rights, mandate remediation.

4-0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES

4-1 CLIMATE

Stated Impact -

The DEIS states that the "climate of Camp Grayling is a major concern for units training at the installation and for design and maintenance of the training support facilities (4-1.1). It then describes the climatic conditions at Camp Grayling in terms of temperature, percipitation, sky cover and stability. Their conclusions regarding impacts follow:

"While the climate attribute contains background information vital to the evaluation of other attributes it has no direct bearing on the project. Since climate will not be impacted by proposed activities no impacts nor mitigation measures are discussed." Ref: (4-1.4)

Evaluation -

The DEIS addresses macroclimate only. Some of the proposed activities will have an effect on mircroclimate, potentially causing changes in vegetation, animal habitat, soils, etc. Effects of tree removal, year around activity, and other proposed activities that will effect microclimate should be considered.

While macroclimate will not be significantly impacted by the proposed activities, the need to more accurately measure local weather conditions will (or should!) be. Accoustics engineer George Kamperman has pointed out the potential for employing climatic data from a local weather monitoring station to regulate

firing and thus control noise effects. (Technical Report III) This will require much better weather information and will necessitate the construction of a weather station at Camp Grayling that will provide appropriate data.

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Recommendation(s) -

13 1. Assess the impact of proposed activities on microclimate and the consequential effects on vegetation, animals, soils, etc.

14 2. Develop specifications for weather monitoring needed in order to implement on-line determination of noise propagation contours on a continuous basis (Kamperman, Technical Review III) and control of mvoements during

15 thaw conditions (DEIS proposed mitigation 4-5.22).

4-2 AIR QUALITY

Stated Impact -

Air quality standards and the pollutants for which they are set for the State of Michigan are described, and nearest monitoring stations are located. Factors that affect air quality and the sources of air emissions at Camp Grayling are listed and appropriate compliance with regulations is described. The existing air quality at Camp Grayling is stated to be "very good" and in compliance with current air quality standards (4-2.3). Impacts of proposed projects are determined to be insignificant after mitigation in all areas.

Evaluation -

Although one is left with the impression that air quality is, and will not be a problem at Camp Grayling, there are several areas of concern that need to be addressed:

No data is presented regarding emissions of various pollutants at Camp Grayling, nor is it stated where the monitoring was done. The closest monitoring station is, however, noted to be 30 miles away and it tests for only particulates and carbon monoxide. Tests for other pollutants, one assumes, must be conducted at sites further from Camp Grayling than this. Furthermore, the only data connected with air quality assessment cited, was that of Van Dale in 1986 (4-2.3). This is not current enough information and monitoring is not done close enough to Camp Grayling to be of significance, especally for detection of local problems or the early development of a potential problems?

There is also no clear explanation as to why Camp Grayling "cannot be classified for ozone". (4-2.1)

Pollution is admitted in the following statements, but impacts are not analyzed:

> "The units in training may use smoke/obscurants to obscure or screen the movement of its troops and vehicles during exercises. Particultes and hydrocarbons are the principal pollutants discharged." (4-2.5)
>
> "...bivouac areas may be exposed to a tear gas fog from tear gas grenades..." (4-2.5)
>
> "The lanes training may use smoke/obscurants to screen troop movements but this activity is presently being used and does not significantly impact air quality." (4-2.10)

The "does not significantly impact air quality" conclusion is reached because the DEIS addresses incremental rather than cumulative impacts, a feature which we consider invalid. Because an activity is presently ongoing does not imply there is no impact, nor does it insure that there will be no future impact.

Does this deliberate release of pollutants to the air conform to state and federal air quality control regulation? Are such releases allowed because a state agency is doing it? Could a private citizen use smoke bombs, tear gas grenades, etc., without regulation?

In addition, air pollutants are produced by explosives and other Camp activities. Close to the points of firing, vaporization of explosive rounds, and sites of open detonation and open burning, concentrations of many toxic materials must exceed standards. Yet, "...these emissions including particulates, nitrogen dioxide, sulfur dioxide, hydrocarbons, and carbon monoxide are at acceptable levels." (4-2.10) Where were the samples taken to provide data in support of the above conclusion? Michigan ambient air standards are cited (tabulated), but no air quality testing is presented.

Recommendation(s) -

16

1. Include research documentation that demonstrates monitoring of emissions is valid if done 30 miles from the source. If it is not, determine valid a method of monitoring air quality at emission sources of Camp Grayling.
2. Obtain accurate, up-to-date emission data to determine present day air quality at Camp Grayling.
3. Provide an acceptable explanation regarding the omission of ozone data, or provide a measure of ozone levels at Camp Grayling.
4. A "rollback" alternative considering alternatives to training activities that deliberately introduce pollutants in the air should be considered. At the very least, the ecological impact of such activities should be considered.
5. Stop open detonation and open burning of waste explosives.
6. Develop a comprehensive toxic and hazardous waste monitoring program, including baseline characterization of concentration levels in soils, vegetation, animal tissue, etc., and also modeling vectors of movement of these materials. Include air transport as one of the movement pathways in the simulation model. To provide realism, test air chemistry at firing points or use extant data (see P. Ase, W. Eisenberg, S. Gordon, K. Taylor and A. Snelson. 1985. Propellant Combustion Product Analyses on an M16 Rifle and a 105 Caliber Gun. (J. Environ. Sci. Health A20(3):337-368) on all munitions fired at Camp Grayling.

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4-3 NOISE

Considering the importance of this issue, as experienced by public complaint (See Appendix II Public Hearing Comments), we believe that the noise issue has been side-stepped in the DEIS.

A review, evaluation, and critique of this section of the DEIS appears as a Technical Review in Section 6-III of this document. In addition to the recommendations, of the Kamperman report and cited appendix material, we suggest that an assessment of the psychological and health impacts of noise (See Lowell Ponte. 1989. "How Noise Can Harm You". Readers Digest, March 1989 pp. 121-125.), should be included, as should a more comprehensive and detailed assessment of the effects of noise on animal behavior and populations (see Ebbers Technical Review IV).

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4-4 PHYSICAL SETTING

Stated Impact -

The DEIS section on physical setting addresses geology, landforms, topography and soils. A brief description with a corresponding map of landforms is included regarding the first three items, and a detailed description of soil formation and types is provided for the last item. It is noted that a modern soil survey of the Camp Grayling area does not exist, therefore information included in the DEIS was derived via correlation of 1927 soil surveys for Kalkaska and Crawford Counties as well as "recent" Reports from Kalkaska, Otsego and Crawford Counties.

Much of this section of the DEIS involves references to the obtaining of permits or to the following of "good soil conservation and construction practices" as outlined in Appendix 4.4, in order to implement various projects of the master plan:

"each lagoon will involve excavation of approximately two acres...good soil conservation and construction practises will be followed as outlined..." (4-4.11)

"a soil erosion and sediment control will be obtained" (4-4.11)

" The project will have a soil erosion and sediment control permit" (4-4.13)

"...good soil and conservation and construction practises will be used as outlined... Since land within 500 feet of Lake Margrethe will be affected, a soil erosion and sediment control permit will be aquired." (4-4.14)

"All three of the training area projects can impact the soils through increased erosion..." [therefore:] (4-4.16)

"Any rennovations that are within 500 feet of a water body will receive a permit under Act 347." (4-4.17)

"Any construction within 500 feet of Kyle Lake will have a permit to undertake Earth Change/Soil Erosion and Sediment Control Permit." (4-4.18)

The phrase "Impacts are anticipated to be insignificant after mitigation appears at least ten times in this section, usually following statements such as those above, leading to the final conclusion that "None of the proposed training/operational activities will impact the soils" (4-4.21).

Evaluation -

The above are used as thought obtaining a permit or developing mitigation replaces the need to conduct a thorough and on-going assessment. Although some assessment of existing problems is contained in Appendix 4-4, and negative impacts are admitted, the steps to be taken are filled with uncertainties such as "should be", "may be necessary", "may want to consider", "could

be" etc. The specific action to be taken is not rigorously outlined.

Even if we can assume that in fact the assessment and "good soil conservation and construction practises" are sufficient to control existing and potential soil erosion and conservation problems at Camp Grayling, there is no method for on-going assessment of the actual condition present year after year of use of this land.

This is especially critical since the erosional problems existing to date have not been minor:

"In 1979, the post had significant problems with sheet and gully erosion in the cantonment area." (4-4.10)

"Tank traffic has degraded the road shoulders near the culverts allowing sand to run directly down to the creek." (Appendix 4-4)

"Activities among the trees on the hillsides east and west of the valley are causing eroded slopes and partially denuded hillsides." (Appendix 4-4)

Bivouac points and assembly areas that are constantly used by troops are denuded of grass cover and are increasingly defoliated as bushes and trees are damaged...their usefulness will diminish as the area is denuded so it will be difficult to revegetate these sites." (Appendix 4-4)

measures to protect the environment should be made the topic of detailed plans to be developed in the consent agreement.

3. Present detailed reclamation plans for use of plant species native to the area in stabilizing areas subject to erosion. Reclamation should be immediate! Forget the use (as implied by attachment 1 of Appendix 4.4) of beachgrass (Ammophila breviligulata) here. It is not botanically suited to this inland area.

20

We are not talking about small issues here; impacts have been significant and the potential irreversible impact to the environment of some military activities is admitted.

Of concern also, is this statement in Appendix 4-4:

"To minimize public concern over the areas within public view, it is possible to plant trees or shrubs that hide the site from the road."

The public should be concerned! This visual impact creates awareness of the is destruction occurring in Camp Grayling. Not only does any irreversible destruction occurring here take land away from the public, it also takes potential uses of this land away from the military itself.

Recommendation(s) -

19

1. All required permit application packages needed, with supporting data and mitigation plans, should be provided by MDMA in their redraft of the DEIS. They should include plans to monitor the effectiveness of soil conservation and construction methods utilized and require specific action if they are ineffective.
2. Because of the sensitive nature of wetland ecosystems surrounding the proposed construction sites, and their statewide significance, more than the minimums required by permits should be required by MDMA. Specific

4-5 NATURAL RESOUCES

A. MINERALS/ECONOMIC GEOLOGY

Stated Impact -

According to the DEIS, the following describes the extent of mineral/economic (natural gas, oil, coal, geothermal energy, peat, metallic ores, and construction materials such as stone, sand, and gravel) resources on Camp Grayling land: (4-5.1 - 4-5.2)

a. no known coal or geothermal energy resources
b. no known metallic minerals
c. approximately five acres Loxley series peat deposits which are not mined because they are small and scattered
d. an oil field located 4.5 miles SW of the cantonment area which produces 1,500-1,600 barrels of oil per day and a 'small' amount of natural gas which is used to run machinery
e. no stone or gravel in enough quantity for military use
f. sand which is extracted from two pits on the edge of the cantonment area, the amount of which varies from 0 to 10,000 yards per year

The DEIS states that there are "no impacts on the mineral or economic geologic resources from implementation of the master plan or the alternative actions."

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Evaluation -

The statement is to the point and conclusive, but it is too concise in its brevity, and apparently inaccurate. It does not describe how conclusions regarding the availability and recovery of these resources was determined. It is possible that other mineral resources not considered in the statement could be found on military lands if they were open for exploration. Is there any reason to believe that coal, geothermal, or more oil resources could not be found if looked for? If so, should they be retrieved? How was it determined that extraction and use of gravel is not profitable? Data and references are needed. There is no analysis to support the conclusions. Again, the impact may be in the form of lost opportunity (See Section 4-10). 21

The issue of ownership and profit is also not specifically addressed. Who has rights to these resources, where are the products now being extracted going and for what purpose, and who benefits from the product or revenue?

Perhaps more importantly for the immediate future are unanswered questions regarding present day impacts which the DEIS does not bring up. Are the retrieval of oil, gas and sand being conducted in an environmentally sound way? Are any reclamations necessary? How rapidly are the known resources being depleted and will implementation of the master plan speed this process?

Recommendations -

More detailed information regarding the above questions is necessary to accurately determine impacts. In their re-draft of the DEIS, MDMA should provide an up-to-date data base and analysis including lease terms with MDNR regarding mineral and economic geological resources.

B. VEGETATION

Stated Impact -

The vegetation of Camp Grayling is characterized generally according to broad categories of forest cover type from upland forest communities and open land to aquatic wetland, stream, and lake vegetation. The primary use of the land is stated to be for the training of military troops, with the MDNR having management authority over natural resources in areas where MDNR management practices do not conflict "unreasonably" with this use (4-5.4). Specific areas for management have been defined by the MDMA and indicated on a map, and MDNR management practices specifically relating to forest management are discussed.

Of the total acreage, 150,955 acres of land within the Camp Grayling boundary has been inventoried, all of it being land designated as MDNR managed land. These lands are categorized a forest and brush lands, open grasslands and wetlands. Forest and brush lands are further categorized into forest types and corresponding acreages compared to proposed acreages planned by

management activities. Both forest and brush land and open/grassland areas are described as they are found within Camp Grayling. It is stated that wetlands have not been surveyed by the MDNR although they indicate 1,312 acres within inventoried forest land and include glacial lakes and large swamps. Major wetland types 2-8 (as defined by U.S. Dept. of the Interior, 1956) are described but not related to the extent and location of wetlands existing within Camp Grayling. In addition, according to the DEIS approximately 23,000 acres of land within the boundaries have not been inventoried at all.

One threatened plant species, Solidago houghtonii has been found within military boundaries, however the possibility of there being others is acknowledged with five likely candidates specifically identified since they are found in surrounding counties. The habitats of all six species are described.

In all cases (except cold weather training) where previously undisturbed land will be impacted by implementation of the master plan, the possibility of the occurrence of threatened or endangered plant species is acknowledged and in all cases this problem is resolved by stating that either the occurrence of endangered or threatened species is "highly unlikely" (4-5.17) or that a survey will be conducted prior to construction and necessary permits obtained. The conclusion reached in the DEIS is that implementation of the master plan projects will have an insignificant impact on threatened and endangered plant species.

Other impacts on previously undisturbed land are also concluded to be insignificant either as proposed or after

mitigation. To implement projects C12 (ASP/LSF Railroad), T1 (Road and tank trails), T2 (MPRC-H), and T3 (Assault Landing Strip) some clearing of land is necessary as follows:

C12: [illegible] acres of "primary oak pole timber" (4-5.18)

T1: "isolated areas of minimal acreage" (4-5.19)

T2: "minimal clearing for firing lanes within 350 acres of woodland" (4-5.20)

T3: "scattered trees and portions of adjacent lands" or "35 acres of relatively low quality Jack Pine Forest" (4-5.21)

In the case of T1 (Road building and tank trail construction and improvement), this clearing is considered so minimal that it would not significantly impact vegetation. The DEIS justifies this claim by explaining than any disturbance by the implementation of T1 would not be greater that the no action option in which poor stretches of roads and trails are often circumvented by driving vehicles around them onto surrounding vegetation.

In the case of C12 and T3, this clearing is not considered an "irreversible loss" or "irreversible commitment" of forest resources (4-5.18, 4-5.21) and hence is considered to have an insignificant impact on these resources. In the case of C12 and T2, the DEIS further justifies the conclusion of insignificant impact by noting that there are "vast acres" of similar habitats existing within Camp Grayling boundaries, specifically 30,000 acres of pole-sized oak for C12 and 20,000 acres of woodland,

primarily jack pine like that to be cleared for the firing lands of T2. It is further justified for T2, by the DEIS statement that the land in question "has never been actively managed forest." The possible impact on wetlands is addressed for all projects in the cantonment area except C1 and C2 with the statement that "no construction will take place within wetlands." (4-5.17) Wetlands are also addressed with regard to T3, in that there is acknowledgement of a wetland designation on the 1950 USGS map of a portion of the proposed site. This problem is resolved by the DEIS by the explanation that MDNR inspection of the site confirmed that "the project will not impact a wetland area." (4-5.21)

An alternative site presented for implementation of C12, which would require the acquisition of or obtaining of an easement to pass through a 20 acre piece of private land and the addition of 1000 feet of track. The DEIS considered this to have the same impact as the proposed site (insignificant).

The impact of cold weather training as has occurred to date is described as being "non-existant" because mobility is reduced, "soil is frozen" and "vegetation is dormant." (4-5.21) As proposed, implementation of this portion of the master plan would increase the maximum number of simultaneous troops by 3,000 men although the actual average over five years as stated by Col. LaChance "should" be 1,500. (4-5.22) Potential impacts on vegetation in the winter due to increased bivouacking, decreased recovery time for land with heavy summer use, vulnerability of vegetation during thaw conditions, and cutting of live conifers for camouflage, are addressed in the DEIS by mitigation.

As described, mitigation will involve monitoring of heavily used winter training areas, wetland restriction, treatment and recovery time for severely disturbed areas, and selective scheduling of troops during spring thaw. It was also noted that extensive field training is "rarely" scheduled for the spring except for weekend training which "normally has its activities confined to range firing." (4-5.23)

Evaluation -

An issue that is addressed at great length in section 4-6 of this document is that of to what extent, if at all, does the military have primary use of the lands within Camp Grayling. The DEIS assumes that the MDMA has primary use of the land not only in terms of designating management lands for the MDNR, but one is led to believe that it can control use of private lands within the post's outer boundaries as well. Consider the unclarified statement regarding the alternative site for C12: "although the private land would likely need to be acquired or an easement obtained." (4-5.19) What happens if the owners refuse? Just exactly what rights the MDMA has needs to be clarified.

Given the use of the land, the DEIS does acknowledge many potential impacts that might result from implementation of the master plan, however, in many cases their resolution of the problem is inadequate or unclear. In part this results from the consideration of vegetation primarily as forest timber land or isolated endangered or threatened species, independent from other potential areas of impact, e.g. wildlife habitats, erosion control, etc., and in part it results from an incomplete

assessment and characterization of existing vegetation and present impacts due to military use of the land.

To address this first issue, it is evident that this section of the DEIS considers vegetation resources primarily in terms of forest resources, i.e. timber. This is evidenced initially by noting that the characterization of forest lands within military boundaries by forest cover with no mention of understory, and little emphasis other strata. The timber emphasis is further evidenced by the DEIS' resolution of the impact of clearing land that is required to implement C12 and T3 projects. In the first instance, it states "the timber affected is primarily oak pole timber...roughly 800 cords would be cut for this project..."(4-5.18). What else may be present besides oak? Is that all oak forests are good for? Are there not other other positive or even necessary functions of this forest land? In the second instance, it states that development "would remove 35 acres of relatively low quality Jack pine forest land from production" (4-5.21). Presumably this may be low quality for timber production, but what about for Kirtland's warbler habitat? They also claim in both cases that this represents "a reversible commitment of resources." This assumes that use of these cleared areas as intended by the master plan does not involve changes that would preclude regeneration of these lands to forest. The DEIS does not address this possibility. In addition, because there are "vast acres" of similar habitat (there was once vast acres of white pine in Michigan), or because the land has never been actively managed, is not sufficient justification to destroy it without a more

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realistic assessment of the ecological impacts of such actions.

The preparers should be given credit for noting that the clearing of land involved in project T2 should be considered not just from the point of view of timber production, but also from the point of view of warbler habitat. It is not discussed further in this section however, but the reader is referred instead to the wildlife section.

This lack of considering the "whole" picture is evidenced again in the treatment of threatened or endangered species. The potential impact is commendably acknowledged, however, the DEIS' resolution of the issue reflects a lack of understanding regarding the ecology of individual species. In most cases of new construction, their solution is that "a search will be conducted." They even acknowledged that there are habitats that are likely to contain these species. This is good. However, their underlying assumption must be that these species will not be found, for at present they have no knowledge of where these species might be, since searches have not yet been undertaken. Certainly they aren't expecting to alter many of their construction plans significantly. To avoid individual plants that might be found may at first seem adequate but a growing body of research indicates that we need to consider fragmentation of habitat seriously when considering the survival of species. Constructing a building such that it avoids the square foot that several Calypso bulbosa plants grow on so as to not destroy those individual specimens, does not do much to assure the survival of that particular population let alone the species as a whole. This is especially true when one

considers that the other 500 square feet that the building is constructed on is likely to be another 500 square feet of destroyed Calypso habitat. Furthermore, the two specimens that may have been found would probably have been "detected" because they were in flower; some species do not flower faithfully every year. Those that are in a vegetative state or resting as dormant seeds or rootstocks are often extremely difficult to find.

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The other option, that they will be required to move them, also reflects a lack of understanding. Certainly they must realize that moving plants is one thing ensuring their survival is another. These species are considered threatened or endangered in many cases because their habitat is being destroyed. Where will they be moved to? Furthermore, according to Bill Cooper, the "Endangered Species Act does not even permit this option" (See Technical Review, Section 6-I).

The emphasis on vegetation as forests is also evidenced by the comparative lack of emphasis in open/grassland areas and wetlands. In the former, there is little mention of the negative effects of an impact on grassland areas other than to state that "many of these grasslands coincide with training areas as they are a result of military training activities." (4-5.13) Training certainly has impacted these areas - it made them! One assumes that these open areas are being referred to in the brief discussion of the impact of non-winter training activities: "Because the ground activities associated with the assignment of the new aviation units involve minimal, isolated portions of the training areas and the new lanes training is undifferentiable from

historic training... activities, no significant impacts will be associated with these activities." (4-5.21) We are left to wonder what exactly occurs and how this occurs without impacting vegetation.

Wetlands are also underemphasized as a valuable vegetation and hydrologic resource. In the DEIS, the statement is clear: "The Michigan DNR has not surveyed the wetlands within Camp Grayling" (4-5.13) The following statement that "wetlands comprise 1,312 acres of the inventoried forest lands" (4-5.13) is confusing given the first statement. How was this acreage determined? Evidently this was done by a source other than the MDNR. One suspects it comes from the USGS maps after reading that "Although a 1950 USGS quad shows a portion of the proposed site [of the Assault Landing strip] as a wetland, a recent MDNR inspection of the site confirmed that the project will not impact a wetland area" (4-5.21). It is evident that an accurate description of the extent and location of wetlands contained within camp Grayling is not available. Given this fact one must criticize the statement regarding construction in the cantonment area: "No construction will take place within wetlands (4-5.17). If the location and extent of wetlands is not known, how can this be assured? Nowhere in the DEIS document does it state that a wetlands determination will be conducted. On top of this, there is no mention of wetland restrictions during implementation of the other projects of the master plan, other than for the assault strip mentioned above.

Wetlands are simply handled inadequately. This is especially poignant considering the following statement by Bill Cooper: "The director of the MDNR has publicly announced his goal of enhancing and developing 10,000 acres of wetlands in Michigan." (See Technical Review, Section 6-I) The importance of these wetland areas is never specifically stated in the DEIS document, however it is indirectly supported by the inclusion of the list of definitions of Type 2-8 wetlands. That these are never related to their functional, ecological or other importance, nor to the extent and location of wetlands existing within Camp Grayling is a grand omission.

This separation of vegetation as forest cover, from other areas of impact, is a logical decision considering the complexity of the task involved, however a stronger tying together of vegetation with other aspects is necessary. Vegetation does not stand alone, nor does it have value only as a timber resource. Habitat is discussed in the wildlife section, but where are the other values such as non-game species, species diversity, aesthetics, scientific and education addressed in this statement? It is appropriate to note that the Michigan Natural Features Inventory, which compiles information regarding endangered, threatened or other wise significant plant and animal species, natural plant communities and other natural features, has included two vegetation areas existing within or near Camp Grayling boundaries. These include, Dry Northern Forest and Dry-Mesic Northern Forest. (Listings available from MNFI)

The second issue, incomplete assessment and characterization of existing vegetation and present impacts, is evidenced in several places as follows:

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"The effects of the existing cantonment area upon the vegetation are few since the bulk of the area has already been developed and the remaining wooded areas are not actively managed resources." (4-5.17)

"Since these areas (cantonment) are already developed, the occurrence of threatened or endangered plants is highly unlikely." (4-5.17)

"This land has long been committed to range use, has never been actively managed forest..." (4-5.24)

"Since the existing roadways (T1) have been continually disturbed, the occurrence of threatened or endangered plants is not likely. Therefore, the impacts associated with this project are anticipated to be insignificant." (4-5.20)

No action - C3 "Training activities will continue to be conducted here as in the past. This action has no known impacts." (4-5.21)

"to date no vegetation impacts associated with cold weather training have been identified" (4-5.21)

The logic in these statements is faulty. To assume that because an area was used this way in the past does not imply that there are no impacts or that there will be no impacts if the use

is continued or increased. If one could use this logic consistently then one would have to assume that since the Kirtland's warbler habitat has been used in the past, it will be in the future and hence construction in Range 30 should be prohibited.

This logic is also wrong because an assessment has not been made of existing impacts. Have endangered or threatened species searches been conducted along roads or in the cantonment area? How have impact training areas been assessed - are there before-and-after baseline studies? Has anyone done a quantitative study of numbers of conifers destroyed by cutting for camouflage? Has anyone looked at the effect of digging foxholes or other implacements on vegetation? Note the following statement regarding foxholes: "The ground is also frozen so excavating may have to be prepared by mechanized engineering units or demolition crews." (3-3.21) Some major earth moving activities are planned here. Do they have no impact?

This logic also does not consider carrying capacity of the environment. If use of an area is increased by construction e.g., the cantonment area, or by increased numbers of troops, e.g., training areas, the carrying capacity, (i.e. the total number of organisms that can be supported) in these areas may be surpassed. Carrying capacity is not addressed in the DEIS. Furthermore, present impacts have not been addressed in those areas where lands have not been inventoried. Because this is not managed land does this mean it cannot be impacted upon? Obviously, time constraints

come into play here, however the issue has not be addressed and should be.

22 An impact of particular concern is that of exposure to toxins. There is no mention in the DEIS of the possible direct affects of toxic materials or toxic material uptake by plants. This is of concern considering the possible toxins involved in the various types of ammunition utilized by troops training at Camp Grayling. (See Section 4-7) Any toxins incorporated into plant tissue can then move through the food chain potentially affecting primary, secondary and tertiary consumers. It is important to note that the tendency for certain landscape situations to concentrate these toxins due to hydrologic patterns. (See the suggestion to look for toxic contamination "hot spots" in ombrotrophic landscape units, in section 4-7). Additionally, certain plant species and tissue systems, e.g. pollen, fruits, etc., tend to take up toxins, especially toxic metals, through their rooting systems to further concentrate these substances. When these are fed upon by animals or, in some cases, collected and consumed by human beings (wild berries, nuts etc.), they may present a health hazard. This should be indicated.

The assault landing strip is claimed to have no impact because most of the area involves recently cut jack pine. Why was this cut, and did that not impact warbler habitat? (See also Technical Report 6-I, pg. 7, point #13) It is also described as a habitat "not characteristic of any of the six threatened plant species therefore their occurrence is not likely." (4-5.24) If the master plan is implemented there is no search required. Is it

possible that other endangered or threatened plant species may be found? Furthermore, the discussion regarding a once present, but no longer present wetland in this area is vague. What happened to it?

Aside from these issues discussed above, cold weather training is an issue which requires particular attention. There will be an increase in land use for winter training whether it comes as greater numbers of troops, more training days or both. There are other concerns aside from the potential impact of foxhole and gun placement excavation, mentioned above. How will wetlands be restricted as the DEIS states, when they have not been located? How will severely disturbed vegetation be treated and allowed to recover? And how will sensitive scheduling to thaw conditions be accomplished as conditions during winter time are not always predictable? The assurances of "almost always", "rarely", and "normally" do not preclude exceptions. Furthermore, as suggested by the following statement by Bert Ebbers, there is room for concern even on the "frozen" days of winter: (See Technical Report, Section 6-IV)

"Relatively heavy snow cover in almost all cases precludes frozen ground. Snow effectively insulates the earth, trapping warmth at the snow interface. Available moisture in this unfrozen soil allows some evergreen conifers to actively photosynthesize on mild winter days; in such cases, the vegetation is not "dormant" nor is it protected from disturbances by military activities. Potential damages include general habitat

destruction as well as mortality of small mammals (shrews, voles, mice) active at the soil surface."

One other issue that has tremendous potential impact, yet has not been addressed in the DEIS, is that of fire. Fire is of concern whether due to use in training exercises or as accidental occurances. Not only has it resulted in the creation of Kirtland's warbler habitat, a conflict of land use for the military, but it has also resulted in public concern for safety. We have addressed this issue more fully in section 5-1.

Recommendation(s) -

1. An accurate survey with the help of aerial photos and field work should be conducted and a detailed map of the wetlands within Camp Grayling should be provided. All projects should be analyzed to reassess the impacts on wetlands before approval is granted and all drafts of all necessary permits should be included in an Appendix to the DEIS. See also recommendation from Cooper regarding wetlands (Section 6-I, page 4). 23
2. See Ebber's recommendation regarding re-evaluation of impacts of cold weather training on vegetation. (Section 6-IV)
3. Immediate threatened or endangered species searches should be conducted for all proposed construction and training areas. Mitigation plans should outline steps to be taken for any problem areas and drafts of these plans should be included in the EIS. These plans should 24

use up-to-date information regarding habitat size requirements for insurance of survival.

4. In order to address the issues of present and future impact assessment as discussed in the evaluation above, it is recommended that a comprehensive assessment and monitoring plan be developed and implemented. This should include the following: 24 Jun 94
   a. Development of criteria for a classification system which characterizes military lands according to increasing levels of sensitivity. Criteria include such things as species richness, economic values recreational values, presence of threatened and endangered species etc. This would allow for prioritizing of assessment areas in the face of size and time constraints.
   b. Classification and mapping of these classifications of military lands according to the above criteria. This would include incorporation of the wetlands survey recommended in 1 above. It would also include mapping of open/grassland areas.
   c. Development of an evaluation system. This would involve firstly determining impacts that need to be assessed, i.e., effect of vehicles, noise, blowing up areas, digging fox holes, stampeding, etc. - in essence all possible

activities of troops training need to be considered for impacts. Secondly it would involve determining method of assessment of these activities, i.e. changes in vegetation characteristics, population structure, boundaries of habitats, concentrations of toxins, etc.

   d. Baseline characterization of priority areas as determined from letter b above.
   e. Specifying a schedule to monitor in an scientifically objective manner impacts as evaluated according to letter c above.
   f. Development of an impact reduction plan which ensures prompt, responsible responses to negative impacts.

C. WILDLIFE

Stated Impact -

Management of designated lands by the MDNR for wildlife habitat is described, indicating species of primary emphasis. The designation of Camp Grayling lands for MDNR management is stated to be determined by the MDMA "with the understanding that the primary use of the land is for military training..." (4-5.26) General wildlife uses in uplands, open areas and wetlands are described, followed by a general description of fisheries including a listing of fish species found in the major water

bodies of the Camp Grayling area.

Threatened and endangered species are discussed, with two threatened species identified as being present on Camp Grayling lands. Maps indicating locations of nesting and management areas for these two species, the Kirtland's warbler, and the bald eagle, are included in the Appendix. Three other threatened or endangered species are specified as likely candidates to be found on military lands because they have been found in nearby counties. These are the loggerhead shrike, osprey, and deep water pond snail. History of the ecology and protection efforts of the Kirtland's warbler and bald eagle on military lands is described in considerable detail, and brief descriptions of the habitat requirements for the other three species are noted.

Evaluation -

Once again the issue of rights to land use is assumed to belong to the military. This issue needs to be clarified. (See section 4-6 for an exhaustive discussion of this issue)

The habitat descriptions are good. They point to the critical use of these areas by wildlife for a multiplicity of reasons, including nesting, and feeding. This picks up some of the loose ends with regard to the vegetation section, however, again there is no referencing to mapping of either open grassland areas or wetlands. This seems urgent considering the included statement: "More than 40 percent of all bird species breed in riparian or associated wetland areas" (4-5.31)

Furthermore, the stated importance of these areas for the variety of species mentioned is negated by the inadequate assessment of impact on all of these species. The only species that quantitative data are presented for are the Kirtland's warbler, bald eagle and deer. These species, too, were probably overlooked historically until they became threatened, or of significant economic interest. How many other species do we overlook until critical numbers are reached? Furthermore, how can an assessment of impact be accompliished with no baseline data to draw from? Access to some areas was denied to those conduction surveys for the Michigan Breeding Bird Atlas. It is appropriate, in fact necessary, to obtain quantitative as well as qualitative data on as many species as possible in order to accurately assess impact.

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The following statements indicate a lack of understanding with regard to carrying capacity: "None of the cantonment area projects will impact wildlife. Disturbance form construction activities will not affect wildlife since the animals that do occur are well adapted to this type of habitat." (4-5.26)

First of all there is no mention of the present status of these animals populations so impact cannot legitimately be determined. Secondly, construction will (fact) utilize some of the existing habitat of these "adapted" species. That means some will either move elsewhere, or be eliminated. Individuals may be well adapted to developed habitats, but at some point total numbers in the population will surpass carrying capacity of the habitat, so that some (or all) individuals will not survive.

The effect of cantonment area projects on water quality and hence impact on fish and other water-dwelling organisms is also glossed over with the statement: "studies of lake water quality though have indicated that over the years, the post has not had adverse impacts on this resource..." Not only is there inadequate data presented to support this claim, but it is faulty logic to assume that because it was OK last year it will always be OK. Are they not proposing to significantly increase troop capacity in this area? What is planned in the way of monitoring? The issue of water quality is addressed in greater detail in Section 4-7 and 4-8. The no action option for project C1 indicates that the water is "slightly" enriched from waste water effluent. "Slightly" is not a very scientific term and has no business in such a critical document. The above concerns discharge into Bear Swamp, a 4,000 acre wetland. This may have impact on white cedar which is critical winter habitat for deer (See Technical Review, Section 6-I, page 6)

Consideration of the no action option for C12 indicates that "wildlife will not be further disturbed. No impacts on wildlife are anticipated." (4-5.47) One is left to wonder what are present disturbances and what will happen if the stated anticipation is incorrect.

The "as proposed" and "alternative site" option for C12 involve clearing of land and addition of noise from train activity. Disturbance of wildlife is said to be insignificant because the area cleared does not contain "critical wildlife habitat" and "disturbance from train activity should be minimal so

that wildlife will be left relatively undisturbed the majority of the time." (4-5.47) A definition of "critical wildlife habitat" is omitted as well as an explanation as to how it was determined in this area. That wildlife will be undisturbed the majority of the time is not very reassuring in that indication of when the remainder of the time will be nor what type or extent of the actual disturbance will be. If it occurs during breeding, the effect may be drastic and even if not, as pointed out by both Kamperman and Ebbers, noise during any point in the life cycle of a given organism may have a greater impact than is recognized. See Section Technical Reviews III and IV for a further discussion of noise impacts.

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The impact of the MPRC-H and the Assault Landing Strip is stated primarily in terms of Kirtland's Warbler habitat. Since this is an area of such concern, a special review of the issue follows below.

Conflict between land use of the Federally protected Kirtland's Warbler and the MDMA is unavoidable in the Camp Grayling area due to the existence of what has traditionally been high quality habitat for the Kirtland's Warbler. The Kirtland's Warbler nests in Jack Pine of 8 to 18 years old, some of which, ironically, has been produced by military burn activities. By law, these lands must be protected and maintained (See Cooper and Ebbers, Technical Reviews Section 6-I & IV). Although this conflict exists throughout Camp Grayling, the Range 30 lands are of particular concern due to its being a critical area for military use and in fact is the proposed site for the MPRC-H. The DEIS provides an interim plan which addresses this area only and is an attempt by the MDMA and MDNR to mitigate a difficult situation. It basically shifts the emphasis of Kirtland's Warbler habitat management by the MDNR away from Range 30 to the east where new developing habitat exists. The development of this plan was spurred by the recognition that Jack Pines in Range 30 are reaching an age such that they will no longer provide suitable habitat for the Kirtland's Warbler. All parties have agreed to this interim plan based on the assumption that the warblers will naturally and successfully relocate to new areas.

Furthermore, the plan allows the MDNR to preempt any further development or management of specific habitat areas in Range 30, once it is determined that breeding birds are no longer there. This determination is made by annual field surveys. If no nesting warblers are found, "there mitigation measures will not be necessary." (4-5.49) Once this determination has been established, the MDMA can destroy the habitat and prevent its development from ever reaching the stage that Kirtland's Warblers require. Any warblers found to be nesting in Range 30 will be protected by restricting military activity until the above determination has been made. In addition, any lands that are developing Kirtland's Warbler habitat are also to be protected by the current methods i.e. restrictions of military activity.

In the strict letter of the law, this plan is illegal since Kirtland's warbler habitat is not being maintained. The fact, that a trade-off is occurring whereby the new Kirtland's Warbler habitat can be more effectively managed because it is located in

less critical use military lands and has definite easy to recognize boundaries, is recognized and accepted by most individuals involved. It is a reasonable mitigation plan, assuming military activities must continue essentially "making the best out of a bad situation." Even if one accepts this mitigation, there are areas of concern that are not adequately addressed.

1. In the absence of definitive data to show that a shift will occur, we have no assurance that it will be done successfully. At present, there are no warblers (nesting) in the new area. (However, there are pairs nesting in other regenerated Jack Pine habitat areas off military land.) If for some reason, a shift does not occur, we have no assurances that the Range 30 land will not be irreversibly destroyed as Kirtland's warbler habitat.

26 2. There have been incidents in the past of infractions of restrictions regarding use of Kirtland's warbler habitat. This could occur again, to these areas still containing breeding pairs within range 30, or in those areas that may inadvertently be reconverted to warbler habitat if failure to stop regeneration by the military occurs.

3. The warblers now present within the safety net of Range 30 activities are stated to not be impacted by Range 30 activities. The MPRC safety net will encompass

additional Kirtland's Warbler habitat. The impact of this is stated to be insignificant because it is insignificant presently. Once again, no true assessment was done and because it is insignificant now [illegible] it be later, is not good logic considering Range 30 activities would change. This assumption cannot be taken so lightly.

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4. The construction of the MPRC firing lane will take up part of "developing habitat" lands in Range 30. Impacts have been determined to be insignificant after mitigation. This habitat is not protected unless the total Kirtland's Warbler population drops below 200. To mitigate, annual surveys will be conducted to locate

26 Kirtland's Warbler nesting sites, which if found will be restricted. If not, no mitigation will occur. Lack of nesting for one year is not an appropriate measure of quality of habitat. As stated by Cooper "there is considerable year to year variability in density and location of breeding birds." (Technical Report 6-I) To destroy an area that may still be high quality nesting habitat goes against the spirit and intent of the Law. In addition, the criteria for determining Kirtland's warbler areas by breeding pairs only may be inadequate. Are there other uses for this habitat by Kirtland's Warblers other than breeding, e.g. feeding?

5. With regard to the Assault Landing Strip, the DEIS states that "noise or activity from C130's

training...should not disturb Kirtland's warblers. The nearest warbler nesting area is located over one mile to the west. As mentioned earlier, the effect of noise on wildlife has not been adequately examined. Furthermore, assuming no disturbance because the nearest nesting area is over one mile away, overlooks the fact that there may be potential nesting areas closer.

5. The new aviation units are said to have an insignificant impact since "there will only be one to two additional helicopters in the air per week." (4-5.50) Where is the assessment of current impacts, and who says one or two more flights will not be significant especially when

26 these will be NOE flights within 50 feet of the ground? Beyond that, the capacity to have significantly more than one or two more flights per week would be there. What assurances do we have that this additional capacity will not be made use of?

7. The new lanes training although having no "known" impact, will continue to have no "known" impact even though the boundary type will change. (4-5.50) What does this mean? Not only does the DEIS incompletely explain what the nature of these activities will be, but it assumes impacts to be insignificant because they are now. Where is a true assessment of present impacts? Again, we emphasize the need for an assessment of cummulative impacts.

8. Regarding existing or potential Kirtland's warbler habitat in other areas of Camp Grayling, the DEIS states that "Plans have been developed for the remaining warbler areas with the post and are under review." (4-5.27) There must be assurances that a long range comprehensive plan will be adopted, agreeable to all parties.

9. See also comments regarding the Kirtland's warbler in Camp Grayling, by Cooper and Ebbers. (Technical Reviews 6-I, 6-IV)

The heavy emphasis on the Kirtland's warbler has overshadowed the fact that other species as well may be affected by training activities. There is no reference to any other wildlife in their

26 impact statement regarding T2 and T3. Wildlife as concerns these two projects is the Kirtland's warbler. Other wildlife is addressed as described in the impact stated section above, however with the exception of the bald eagle and general references to other wildlife, impacts are not specifically identified. The loon, a threatened species in Michigan has been seen on three lakes within the boundaries of Camp Grayling, and is known to have nested on Wakely lake, which is near the post and has been reported to be used as a turn-around point for air flights. Complaints have been received by the Michigan Loon Registry Association regarding the impact of this on the loon. (Arlene Westhoven, Loon Registry Coordinator, pers. comm.) The loon is not mentioned in the DEIS.

Ebbers makes comments regarding not only most of the above species but also, the red shouldered hawk, the osprey, wild turkey, pine martin, and selected other species. (See Technical Review 6-IV.) Cooper also makes comments regarding selected other species. (See Technical Review 6-I.) There is also a Great Blue Heron rookery included in the Michigan Natural Features Inventory.

It is noteworthy that access to some areas of Camp Grayling could not be obtained by those conducting field surveys of breeding bird populations of the Michigan atlas:

> "Several of the blocks were not surveyed because volunteers (primarily Russ Emmons) could not get access to them. A good number of the blocks show Kirtland's Warblers, Bald Eagles, Ospreys, Red-shouldered Hawks, and other species of concern." (Letter to Dr. Cooper from Gail McPeek, dated 5-18-89)

How can significant environmental problems be detected if no one is allowed to look? Those who wrote the DEIS failed to use even up-to-date extant data (to say nothing of collecting some new data) on the impacts of the proposed activities on bird populations. In the case of rare, threatened and/or endangered species, this is a very serious omission. Moreover, preventing access to the areas of greatest likely impact may not only hide some significant negative trends in bird populations. Unless remedied, this also means that there will be a large gap in the statewide data on Michigan's breeding bird populations, rendering

long term monitoring of population changes in the impacted areas impossible.

Specific recommendations regarding wildlife are included in Ebbers Technical Review (Section 6-IV). We support these recommendations as well as Cooper's recommendation regarding the Kirtland's warbler (Section 6-I).

In addition to these recommendations we recommend the following:

Recommendations -

1. The redrafted DEIS should make use of data on Michigan's breeding bird populations in the impacted area. Use should be made of extant data to estimate what species are most likely to be found in the impacted zones.
2. Access should be allowed for breeding bird population surveys in the proposed impacted areas. This is particularly important in order to provide a baseline for monitoring population changes in relation to proposed activities, if permitted. Since volunteers were prevented from conducting a survey on these lands in a timely manner, if necessary:
   a. Funds should be provided by MDMA for a special project to survey these populations prior to implementing any of the proposed activities that are likely to impact them.
   b. One or more qualified guides should be provided by the military to provide access and

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avoid any potentially hazardous locations and times when firing might occur.

c. If necessary (because of the publication schedule Michigan Breeding Bird Atlas) a special supplement to the atlas should be provided, at MDMA expense, to assure coverage of lands used by the military. Trends on these lands may be especially important in the future and without a baseline it is impossible to establish a trend.

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We also recommend on-going monitoring of water quality and its effect on aquatic organisms. See section 4-7 for a detailed plan.

4-6 LAND USE DEVELOPMENT

4-6.1. Restricted Use Lease (L-1479)

Stated Impact -

"Approximately 50,000 acres of land were leased in perpetuity from the Department of Conservation (now the Department of Natural Resources) by the Military Board under authority of Act 154, P. A. 1941 and executed May 3, 1948. The "in perpetuity" lease allows the land to be used for military purposes by the Military Board, but the MDNR retains control for hunting, fishing, timber, and mineral extraction purposes. The MDNR must first obtain permission of the Military Board before developing any conservation, recreational, or other project in order to assure that there will be no interference with military activities." Ref: (4-6.4)

The DEIS distorts the intent of this lease. It makes no mention of the actual primary lease restrictions.

Much of the Camp Grayling Environmental Management Analysis and Plan ("EMAP" or "Plan") and accompanying Mission/Multiple Construction Draft Environmental Impact Statement (DEIS) are based on the assumption that the lands upon which the proposed expansion would occur are under the complete control of the MDMA.

Evaluation -

Paragraph 2 of Page 4-6.4 of the DEIS indicates a fundamental distortion in the perception of jurisdictional control over more

than 50,000 acres of land on the part of the MDMA. Apparently it was mistakenly assumed by the MDMA (and the NGB) in developing the Environmental Management Analysis and Plan, as well as in writing the DEIS that this entire 50,000-plus acre area was available for year around training activities, for deployment of new high-tech weaponry training, for doubling and redoubling of activity levels, etc. In fact, these are different manners and extents of use than were exercised on the Hanson Reservation in 1978, and the military therefore has not been authorized to use these leased lands in the manner or to the extent proposed. The 1948 lease, renewed in 1978, is a very restrictive covenant, extending only extremely limited rights for low activity levels, summer training usage, prescribed (i.e. 1978 conventional) weaponry and training technology, and no permanent buildings or improvements to be erected..

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In a large portion of the area proposed for escalation of training and for the implementation of new technologies in training, the assumption of complete control is not valid. According to the DEIS, twenty-nine percent (29%) of the land within the post boundaries is in this lease category, which the MDMA terms "Under leases in perpetuity" and which we term (more accurately) "Restricted Use Lease" land (See Figure 4.6A). Careful reading of the lease agreement between the MDNR and the MDMA reveals that only limited rights were transferred to the MDMA with respect to this extensive area. The DEIS correctly acknowledges (Page 4-6.4) that approximately 50,000 acres of land were leased for an indefinite period from the Department of

Conservation (now the Department of Natural Resources) by the Military Board on May 3, 1948. However, the DEIS fails to mention that this lease was renewed by a supplemental agreement in 1978, a fact that becomes significant in terms of the restrictions stated by the lease. Significantly, the DEIS also wrongly states the terms of this lease, completely ignoring the primary restrictions of the lease agreement.

The 1948 lease conveyed:

> ". . . authority to use said lands for military purposes in the same manner, and to the same extent, as is now exercised on and over the Hanson State Military Reservation. . ."

There is an accompanying document entitled "Map Index Background Information -- Department of Natural Resources and Department of Military Affairs Ownerships and Agreements: Crawford, Ostego, and Kalkaska Counties. This document, dated May 3, 1948 coinciding with the date of lease L-1479, provides clear evidence of the intent (or perhaps even one of the terms) of L-1479. It states:

> "This long term lease provides for usage by the military during their encampment, with no permanent buildings or improvements erected."

The clear intention of the lease was multiple use balanced between military training and other public uses. Recent conflict

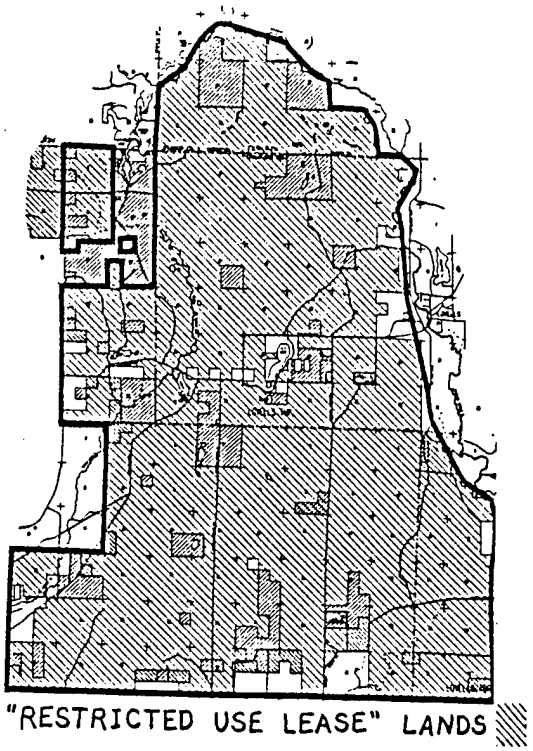

Figure 4.6A. Extent of "restricted use lease" lands (L-1479) in the north range area.

arising because of escalation of training activities (resulting in closing of much of this land to the public and other offenses), are calling into question the compatibility of these uses.

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These restrictions cover essentially the areas of ranges 30 and 40. Not only does the EMAP propose the building of new permanent structures, and improvements, e.g. MPRC, MATES, air-to-ground structures, etc. but existing structures on this land are also in violation of this lease restriction. Neither the Plan nor the DEIS makes mention of this primary lease restriction on the manner and extent of allowed use. The Plan and the DEIS do make reference to reservations of authority by the MDNR in terms of game, fish, forestry, and other interests. But this is a secondary restriction. The primary restriction is the restriction against use of these lands in a manner or to an extent different from that use which was exercised on the Hanson State Military Reservation at the time of the original lease (1948) or when the lease was renewed (1978). The secondary restriction, assuring access for, and management for game, fish, forestry, etc., is to be exercised within that manner and extent of use established by the primary lease restriction. The DEIS mistakenly emphasizes the secondary restrictions which circumscribe the role of the MDNR and completely overlooks the primary restrictions of the lease under which the MDNR retains complete control over any use that is not of the same manner and extent as at the time of the lease (1948) or the supplemental agreement (1978). This would include most of the multipurpose range complex and year-around training activities proposed by the MDMA.

Neither the Plan nor the DEIS makes clear the important jurisdictional division of responsibility that is at issue here, nor what specific action is called for and by whom. Under the terms of the lease, the MDMA does not presently have authority to implement their Plan within the 50,000-plus acres of land having restricted rights on manner and extent of use. With respect to these 50,000-plus "restricted use lease" acres, the MDMA Plan, together with its accompanying draft EIS, should be viewed by the MDNR and the public as a proposal for significant jurisdictional as well as geographic expansion by the MDMA -- i.e., for the taking of substantially new and greatly increased jurisdictional authority by the MDMA, with corresponding proscription of the MDNR's regulatory and land management prerogatives and responsibilities (See Section 4-6.3).

Lands owned by the military or under unrestricted lease should be treated by the MDNR as any other private lands in terms of the MDNR regulatory role [with the possible exception of consideration of the residual liability to be incurred by the MDNR when such leases expire]. This is the division of roles and responsibilities assumed in the Plan and the DEIS. However, on the 50,000-plus acres of restricted use lease lands, the authority to utilize these lands for the expanded and intensified types and levels of training projected in the EMAP, and implicitly acknowledged in the DEIS to be of a different manner and extent from those permitted by the lease, has never been extended to either the National Guard Bureau or to the MDMA by the MDNR.

The entire MDMA planning process, including the development of the accompanying DEIS, has proceeded as though the MDMA had authority to do what it is proposing to do on these lands. The lease agreement implies that the MDNR must first authorize any expansion of use and any changes in the types of use before the proposed actions are permissible. Before such authorization is provided (if it ever is!) a thorough assessment of the resource values and trade-offs implied by such a major action should be undertaken. Earlier (Sections 2.10 and 2.11) a suggestion was developed to enter into an Agreement Pursuant to Renewal of Lease (APROL).

The lease restrictions can be illustrated by use of a diagram. Figure 4.6B shows graphically the restricted manner and extent of use granted by lease L-1479 in 1948 (lower left, white area). Only those uses commensurate with those on the Hanson Reserve in 1948 were allowed for by the lease covenant. Likewise, the expanded manner and extent of use provided for in the 1978 Supplemental Agreement is graphically portrayed (cross-hatched area). Finally, the proposed expansion in manner and extent of use is shown (diagonally lined area). Outside this would hypothetically lie an even more expanded extent (e.g. higher training density levels) and manner (e.g. missiles, field nuclear or other high-tech devices) of use than those currently proposed by MDMA. In addition, the secondary lease restrictions providing for use as game, fish, forestry, and mineral production areas would lie in the province of the MDNR.

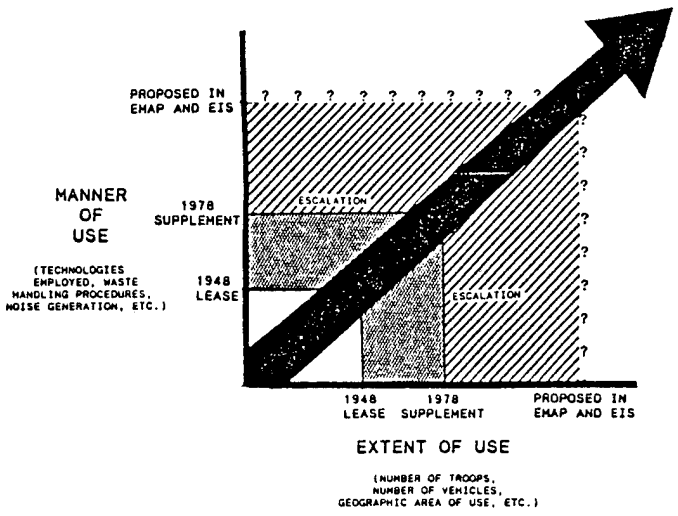

Figure 4.6B. The 1948 lease (L-1479), renewed in 1978, conveyed to the military only very limited rights of usage on over 50,000 acres of "RESTRICTED USE LEASE" lands. This area includes all of firing ranges 30 and 40, as well as the proposed "multi-purpose range complex". These lands were to be used only in the same manner and only to the same extent as were the lands of the Hanson State Military Reservation at the time of the lease. Land use agreements appended to the 1948 lease specifically forbid construction of permanent structures. Other secondary restrictions are also stated. The land is to be open for fishing, forestry, game hunting, mineral extraction, and other natural resource uses. Only within the bounds of these stated primary and secondary restrictions does the military have the right to use this land for military training purposes. A functional, compatible, multiple-use concept of resource management (then popular, and still sound resource management theory and practice) was clearly intended by the parties signing this lease. As one component of of the multiple-use policy, the military was given "full and free" right to use the land for military purposes within the bounds of the restrictions imposed by the lease. Recent escalation of military activities has exceeded the carrying capacity of this land for the multiple-use intended, and the proposed projects would constitute further excess.

The scales for manner and extent of use have not been quantified, for to do so would clearly require careful definition of technologies, activity levels, etc., beyond the scope of this review. However, such definition and scaling are technically feasible. To some extent (due to the lack of definitions and scaling), we must speculate on what the framers of the original lease had in mind when they restricted this lease to activities of the manner and extent then (1948, 1978) exercised on the Hanson State Military Reserve. The definition and scaling required to administer these restrictions will probably entail much hard work and substantial negotiations between the MDNR and MDMA, with public input. However, some points are clear:

1. The major restriction on manner and extent of use would not have been put into the terms of the lease unless the framers intended to hold down activity levels and new military technologies in the area covered by the lease. The complete omission of consideration of such restrictions in both the EMAP and the DEIS represent major deficiencies in these documents and a fundamental flaw in the assumptions underlying their development in terms of the division of jurisdictional authority between the MDMA and the MDNR. If the secondary restriction (game, fish, forestry, etc.) was all that was intended to be reserved to the MDNR, the primary restriction to make military use of these lands only in ways and to levels commensurate with the then (1948,

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1978) current manner and extent of use would not have been incorporated into the lease (nor the supplemental agreement).

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2. It seems highly likely that the principal reasons for such restrictions were: (a) an intent of multiple-use based on the assumption of compatibility, (b) recognition of the limited carrying capacity of such lands for combined recreation/residential and military training uses [giving rise to exactly the kinds of conflicts that are presently being experienced as the military seeks to extend its rights beyond the confines of the terms of lease], and (c) the possibility of new or expanded military technologies (e.g. MPRC, attack helicopters, field nuclear devices, year-around training, etc.) that would jeopardize the primary intended use of these lands.
3. Although no agreed-upon definitions or scales of what constitutes a significant change in manner and/or extent of use have yet been developed, the fact that the NGB/MDMA has produced both a formal plan and an accompanying DEIS is tantamount to admission that a significant change in manner and/or extent of use is presently underway and intended in the near future. There should be no argument with the assertion that more than doubling of troop levels, construction of the MPRC, proposed year-around training, incorporation into the training program of substantial new technologies, etc.,

do in fact constitute both a manner and an extent of use different from that in 1978, and therefore not allowed under the present terms of lease.

4. Unless the restriction in the manner and extent of use was recognized as valid, thereby necessitating an "update" modification of restrictions to the then more current manner and extent of use, there would have been no need for the 1978 supplemental agreement. While the review process was apparently deficient for this 1978 update, the fact that it was deemed necessary, and actually implemented, provides evidence of the recognition of the need for such periodic updates, and suggests that a further update would be the proper precursor to any further expansion or change of manner and extent of use in the restricted-use area covered by L-1479.
5. Legislative authority exists to remove the restrictions presently on the "restricted use" leased acreage (50,000 plus acres). However, to do so would require significant action on the part of both the MDNR and the MDMA. In order to permit the use of these lands in the manner proposed by the EMA Plan, the MDNR would be required to take some action to remove present manner and extent of use restrictions (possibly another supplemental agreement to L-1479, or an entirely new lease). Action beyond the authorization of the various permits mentioned in the DEIS would be required. To

allow new and expanded uses such as those proposed, without significant action, would not only be a violation of the lease agreement, but would be a dereliction of the public land and resource duties and responsibilities vested in the MDNR. Therefore, Table 2 (Pages xxv and xxvi) of the DEIS has a major deficiency with respect to proposed activities T1 and T2.

Recommendations -

In order to establish more precisely what the restrictions on manner and extent of use are under the 1978 lease agreement, the following course of action is suggested:

1. MDMA and MDNR should jointly establish a classification of manners of use. Every significant differentiation in manner of use should be recognized. Variations that constitute a distinctively different manner of use (e.g. a new technology) should be differentiated from those acceptable as within-class variations in manner of use (e.g. schedule variations during annual training or changes in ARTEP standards).
2. MDMA and MDNR should jointly establish one or more scales of extent of use. More than one scale may be required to account for the various factors that constitute extent of use -- for example year-around training is an increase in extent in terms of duration or periodicity, whereas an increase in number of troops

or of vehicles is an increase of density. Scaling techniques such as factor analysis can be used to establish how many scales are needed and to develop one or more extent-of-use scales.

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3. MDMA and MDNR should jointly chart the manner and extent of use in 1978 within the classification and ordination framework provided by steps 1 and 2. This would establish a baseline characterization of extent and manner of use. Plotting several years prior to 1978 would provide a basis for determining what manner and extent of use was considered normal at the time of the lease supplemental agreement (1978) and how much change would be necessary before a significantly different manner or extent of use had occurred (given significance levels agreed upon jointly by MDMA and MDNR).

4. Unless and until a new supplemental agreement or other appropriate administrative procedure is implemented, only those manners and extents of use commensurate with these baseline conditions should be allowed on the 50,000-plus acre "restricted use" leased lands.

These steps should be subject to public review, as should any administrative action extending the allowable manner and extent of use beyond the 1978 norm. In the absence of such an extension of authority, all new, intensified, or expanded uses should be strictly forbidden.

4-6.2. Traffic Impacts Associated With Land Use

Stated Impact -

After briefly describing traffic expected if training activities continue on a year around basis ("Cold Weather Training Mission"), the DEIS simply dismisses all consideration of traffic impacts with the statement:

"Impacts [of traffic] on land use are anticipated to be insignificant. Ref: (4-6.14)

Evaluation -

Traffic impacts associated with moving large numbers of vehicles and personnel are highly significant. Apparently the DEIS does not address this issue because the traffic impacts of the escalated activities already taking place are sufficiently great that the DEIS drafters considered the additional impacts of the activities presented in the EMAP to be "insignificant". (Again, demonstrating the need for assessment of cumulative impacts)

Recommendations(s) -

There are numerous recorded accidents in Crawford County which document the adverse impacts of increased military traffic. Every reasonable effort should be made to eliminate conflicts (e.g. by moving out-of-state Guard units at night).

1. Include an assessment of off-site and on-site impacts of traffic in the re-draft of the DEIS.
2. Evaluate impacts of:
   a. movement of troops creating congestion;
   b. construction of railroad spur possibly necessitating closure of I-75 for several months;
   c. damage to local roads by overuse and use by heavy equipment;
   d. increased loss of "life and limb" expected because of military traffic
   e. adverse impacts to residents along the traffic routes (loss of tranquility, increased noise, dust, fumes, etc.). Evaluate quantitatively with "distance/density traffic assessment model" or other state-of-the-art engineering model of traffic impacts.
3. Evaluate in terms of total (cumulative) traffic impacts rather than just those added by the proposed EMAP actions, since these actions will have the effect of continuing and sustaining present levels of impacts.
4. See Section 5-2 in this document.

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4-6.3. De-Facto Closing

Stated Impact (not effectively considered in the DEIS)-

De-facto closing of much of the range area is accomplished during training periods by notices in the Crawford County Avalanche. One such typical notice follows:

Evaluation -

These vary from week-to-week, (typical in summer is 7 days). Their net effect is to render much of the lease area "CLOSED" for many weeks during the year. Moreover, since the Guard is often in the area on weekends and during other prime recreation times, this impact is amplified beyond that suggested by a measure such as number of days per year.

"From an economic standpoint, reducing the value of use, (i.e., the net benefits received) to zero is indistinguishable from exclusion of use. In both cases, the use does not occur and the users do not receive the benefits of the resource." (Talhelm, Technical Review II)

Year round training would further limit access to the restricted use lease area and would thereby constitute another

round of the "cycle of escalation" and further takeover of these supposedly multiple-use lands.

The presence of hazardous (explosive) waste and the security fence accomplish further closure. The following articles indicate the trend:

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16 Crawford Co. Avalanche Thurs., June 22, 1989

Camp Grayling Range Firing

The Small Arms ranges located west of Lake Margrethe, north of Howe Road, east of the gas pipeline and south of Portage Creek. Firing will begin on June 21 and cease on June 28.

The Small Arms ranges located west of Lake Margrethe, north of Howe Road, east of the gas pipeline and south of Portage Creek. Firing will begin on June 21 and cease on June 28.

The Small Arm ranges located at Arrowhead Road in Kalkaska County. Firing will begin on June 21 and cease on June 28.

Range 18, Mortar Range located south of the main post, bounded on the west by Cadillac Rd. and on the east by Carrier Rd. Firing will begin on June 21 and cease on June 28.

Range 20 and 21, Demolition Ranges located south of Howe Road, west of the Crawford County Line, north of Daniels Road and east of the gas pipeline. Firing will begin on June 21 and cease on June 28.

Range 30 Complex located north of North Down River Road, east of Jones Lake Rd., south of County Rd. 612, and west of Damon Truck Trail. Firing will begin on June 21 and cease on June 28. Howitzer and tank main guns will cease firing three (3) hours after sunset.

The Range 40 Complex located North of County Rd. 612, East of Guthrie Lake, South of Old State Rd. 618, and West of County Rd. F97 (Twin Bridge Rd.). Firing will begin on June 21 and cease on June 28. Howitzer and tank main guns will cease firing three (3) hours after sunset.

Unexploded ordnances will be exploded on the Range 40 Complex on the dates and times indicated below:

8:00 a.m. - 8:00 p.m., June 22.
8:00 a.m. - 8:00 p.m., June 23.

500 LB live Bomb Drops will be conducted on the Range 40 Complex located north of County Rd. 612, east of Guthrie Lake, south of Old State Rd. 618, and west of County Rd. F97 (Twin Bridge Rd.). Live drops will be between the hours of:

9:30 - 10:00 p.m., June 22
10:30 - 10:48 p.m., June 26
11:00 - 11:18 p.m., June 26.

The Ranges will be closed to the public during these periods and all persons are warned to keep out of the areas identified.

4-6.17

34-Mile Range Fencing Project Nearly Completed

By Irene Pettyjohn

Thirty-four miles of welded wire fences are the Michigan National Guard's latest attempt to secure their artillery, surface-ground, mortar, and tank impact ranges.

Camp Grayling's Public Affairs Officer Maj. Frank explained that construction of the three fences became necessary when old other attempts to keep the public out of the unstable impact ranges failed. Despite gates, signs, guards, barbed wheels, and public announcements the incidences of trespassing, accidental and deliberate, continued to be a serious problem.

The Range Complex 13 fence is 3.2 miles long and encloses the mortar impact area located west of Military Road, and south of the Camp Grayling headquarters. The Range Complex 40 fence is 10.2 miles long, and secures the artillery and air-to-ground impact area north of County Road 612. The Range Complex 30 fence is 12.6 miles and encloses the tank range located north of North Down River Road, and south of County Road 612. All three fences are 8 ft. high.

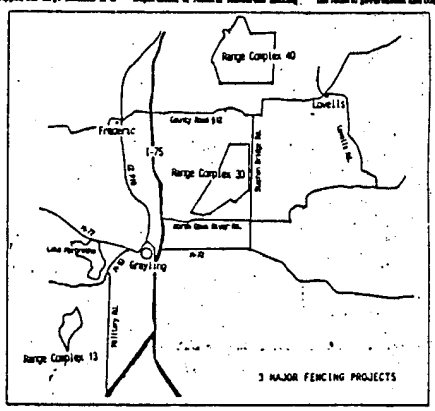
The contractor, Snowden, Inc., of Escanaba, completed installation of the Range Complex 13 and 40 fences in 1987, and according to Col. Edgar Wilcken, Facilities Management Officer from Lansing, is scheduled to complete the complex 30 fence by June 1. The price tag for this project is $600,000, and Michigan taxpayers will pay the bill.

Facilities Engineer Lt. Col. Lee Lawson stated that the new fences should effectively eliminate all accidental entries into the impact areas, but deliberate trespassing is another matter.

Lawson explained that Range Complex 40 is considered the most dangerous impact area. Military personnel, experts in recognizing unexploded artillery and rocket shells, two years since the area, travel only on the hard packed dirt roads where disturbed surfaces can be easily detected. He further stated that fires started in Range Complex 40 are allowed to burn themselves out. Fighting these fires is considered too dangerous, yet the fence constructed to secure this area has been breached in numerous places. Trespassers, in the form of duck hunters, four-wheelers, mushrooms, and scavengers have used wire cutters, and in some cases, bowled over the fence with chains and ripped-out large sections in order to gain entrance to the area. Lt. Col. Lawson said, "It is amazing to me that due to the number of people breaching the Range Complex 40 fence, that there accidents have not occurred."

To assist in securing these fenced areas a closure directive has been issued by the Department of Natural Resources making all public use of these areas illegal. Trespassers will be fined.

The new security fence surrounding the Grayling Army Air Field is 6.1 miles long, and was constructed by Durabo Inc. of Sterling Heights. The project was funded by the federal government and cost $184,000.



Crawford Co. Avalanche Thurs., May 19, 1988

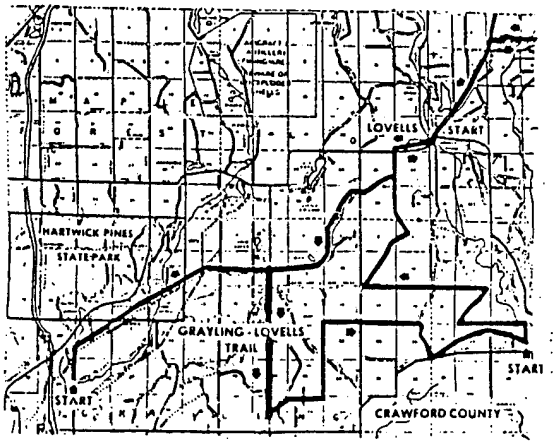
4-6.18

6 Crawford Co. Avalanche Thurs., Jan. 14, 1988

2½ Mile Portion of Lovells Snowmobile Tra Closed By Military

Camp Grayling Commander Colonel Richard K. Schmidt has announced the temporary closing of a portion of the Lovells Snowmobile Trail. The closed portion, approximately 2½ miles of the 60 mile trail, lies in the southwest corner of the Range 30 Tank Training Complex. The south leg of the trail, from the Lewiston Grade Road to the south end of the Stephan's Bridge Road, will be closed from January 25th to March 15.

Schmidt said the closing was necessary to protect the public due to a military training activity in the area and to assist in the enhancement of the existing Lovells Snowmobile Trail network.



4-6.19

While it is true that the MDNR agreed with the erection of these fences, we might ask, "what choice did they have?" The areas had already been contaminated with hazardous waste. In the public interest nearly everyone involved had to agree that absolute closure to the public was the only feasible and prudent alternative (short of a massive cleanup and a rollback of military activity on the ranges). The damage to the environment had already been done by the time the MDNR entered the picture. Like the Kirtland's warbler management plan, this was apparently the MDNR's way of trying to make the best of a bad situation after the fact.

There has been much frustration on the part of MDNR staff in knowing what their regulatory roles and responsibilities are relative to these leased lands. The military has tended to act and then ask. The most recent example, not even mentioned in the DEIS, is the missile laser guidance system site at Hardgrove Lake.

Recommendation(s) ?

We make the following recommendations relative to closing the area to the public:

1. Quantify the amount of annual closing by:
   a Tabulating days closed
   b. Multiply by recreation user density in the area to arrive at a recreation conflict index. Present graphically by month.
   c. Set up closing limits compatible with multiple use objectives.
   d. Evaluate potential for cleanup of portions of fenced range impact areas under rollback alternative in rewrite of the DEIS.
2. Negotiate realistic multiple use schedules as part of the consent agreement or Agreement Pursuant to Renewal of Lease (APROL). Adhere to these.
3. Negotiate adjustment of fence location. Negotiations between MDNR and MDMA resulting in the construction of security fences around ranges 30 and 40 were not subject to public scrutiny. A review of the location of these fences should be incorporated as part of the environment assessment for the re-draft of the DEIS. Particular attention should be given to the advantages of a rollback alternative in the spirit of the multiple use intent of lease L-1479. No further lands should be placed under fence on any further lands within the area covered by lease L-1479 (and the conditions that make such an extreme exclusion of the public necessary should not be allowed).

4. If year around training would result in an increase of closure to the public it should not be allowed.

4-6.4. Suggested Deadline for Restricted Use Lease (L-1479) Termination Due to Violation of Terms

A deadline should be established for the official termination of lease L-1479, unless violations currently occurring are corrected. A detailed memorandum of understanding pursuant to lease renewal (or supplement) should be drafted. A restraining order should be issued immediately to prevent any further escalation of the terms of lease L-1479.

4-7 WASTE DISPOSAL

4-7.1 Overview

Stated Impact -

Six types of waste are described in section 4-7 of the DEIS in terms of their handling, generation and disposal. Impacts in all but two cases are considered to be insignificant primarily because of the claim that the increased waste is insignificant or that the capacity to handle the increased waste exists already. The two exceptions are considered to have beneficial impacts. These include the Fuel Dispensing Facility and the Wastewater Treatment Facility because they are upgraded facilities. In addition, it is stated that the Installation Maintenance Facility may also be slightly beneficial.

Evaluation -

The existing conditions regarding Camp Grayling waste disposal are inadequately assessed. The old wastewater treatment facility lost 96 percent of the effluent before it reached Bear Swamp (4-8.13). According to Cooper's calculations, considering that these losses will be remediated, that volume will be increased by increased activities at Camp Grayling, and that winter conditions limit waste handling capability, the value of effluent released to Bear Swamp will increase 48 times. (Technical Review I). This is a different interpretation than presented in the DEIS. The situation needs to be reassessed.

The MDMA has described what in ordinary terms is an acceptable waste disposal method; landfilling. However, the

number one priority for solid waste management in Michigan is waste reduction. The DEIS does not consider any alternative technologies aside from noting that spent oil is not considered a hazardous waste if it is recycled or reclaimed, and then it doesn't even specify that it must be: "Used engine oil is transported off-site for disposal OR reclamation." (4-7.3) Furthermore the storage of this waste oil before off-site transfer may be an area of concern itself as a large underground storage tank is uses for storage. The potential for leakage from this tank is not addressed or assessed. Should not the MDMA provide a leadership role in these areas? (See also Technical Report I, page 2 for a discussion of these issues.)

The issue of toxic and hazardous waste, although addressed, also is not adequately assessed and resolved. Since we believe this to be an area of critical concern, we have included an in-depth discussion regarding this issue as a potential serious hazard, and in addition have included a detailed set of recommendations which we believe should be included in a re-draft of the DEIS.

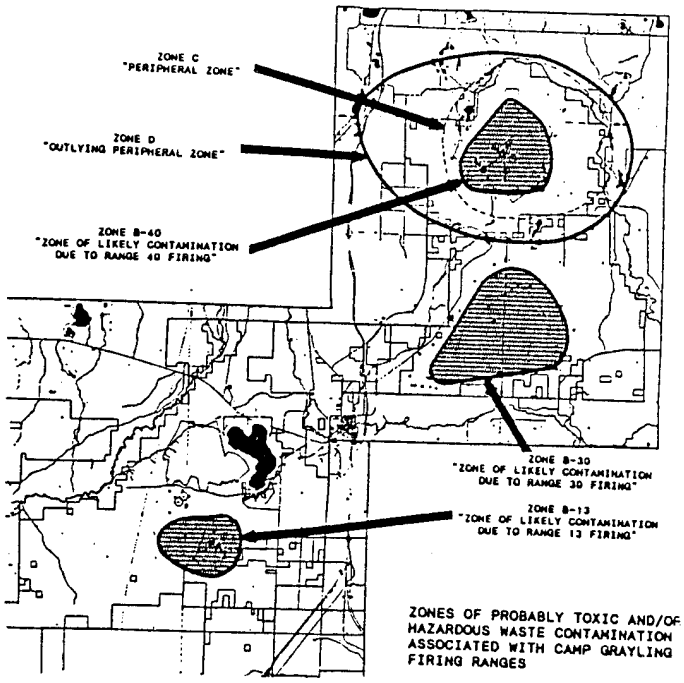
4-7.2 Toxic and Hazardous Waste in the North Camp Area

A preliminary assessment of water quality recently conducted by the Army Hygiene Agency in the area surrounding Range 40 suggests that large amounts of toxic materials are not migrating from the site to surrounding lands and waters. We refer to this study as "A Preliminary Monitoring Baseline Study of Chemical Contamination in Peripheral Areas Surrounding Range 40" (See Appendix II). The Army refers to it non-specifically as "Water Quality Study No. 32-24-0881-89 Effects of Firing Range 40 on Water Quality Camp Grayling, Michigan 23-27 May and 23-31 August, 1988." This appears to provide credible background data and is probably a reasonable starting point for development of a comprehensive monitoring program (including baseline characterization). However, beginning with the non-specificity of the title, the study promises more than it delivers and concludes more than it has a right to based on its temporal and geographical scope. Frankly, it is disappointing to see such irresponsibility in the use of data from this supposedly professional branch of the Army. One can only wonder whether they might have had help in some of the interpretations and conclusions of the report. They do state an important caveat (Background point #8):

> "This study represents a preliminary assessment of environmental impact on water quality around the Firing Range 40 area [underline is VRC]. A more detailed analysis would involve significantly more data collection, and individual drainage basins would have to be analyzed separately. Therefore, the conclusions drawn in this study are for broad overview purposes and should not be interpreted as a detailed and comprehensive environmental assessment." (See Appendix I for the body of this study report and two of their appendices, including a map.)

No samples were taken within the actual impact area most likely to be contaminated -- an area of about sixteen square miles (some 10,000 acres). In Figure 4.7-A we show in schematic form the concept of zones of likelihood of contamination using the MDMA's range safety fan map as a base. The zone of highest probability of contamination is probably a relatively small area northeast of Barnes, Bull Frog, and Timber Lakes and the interconnecting wetland areas. This upland area drains to the wetland to the southwest. Which is a highly significant wetland/aquatic complex because it is the uppermost headwater area of the East Branch of the AuSable. Comparison with Figure 4.7-B, for the Army's study, shows that no sampling was done in this area. This is a major deficiency of the DEIS and of this study done to augment the DEIS.

Even within this area, further geographical specificity is advisable in order to focus in on prospective "hot spots" of contamination (e.g. small, relatively hydrologically isolated topographically low or wetland areas that might tend to concentrate toxic contaminants). Such targets for baseline characterization and monitoring can be identified with reasonable accuracy from topographic information and by field examination by an ecological expert. Areas most likely to show significant contamination would probably be relatively ombrotrophic portions of the wetland/aquatic complex or other topographically lower portions of the landscape that are not strongly hydrologically connected to groundwater, since groundwater flow in these high



ZONES OF PROBABLY TOXIC AND/OR HAZARDOUS WASTE CONTAMINATION ASSOCIATED WITH CAMP GRAYLING FIRING RANGES

Figure 4.7-A. Hypothesized zones of likelihood of toxic contamination due to ecosystem projectile loading. Samples for the "Preliminary Monitoring Baseline Study of Chemical Contamination in Peripheral Areas Surrounding Range 40" were taken from Zones C and D. Areas labelled as "B Zones" (Zone B-30, B-40, and B-13) are areas in which toxic and/or hazardous waste contamination is likely to occur in various forms (e.g. temporary ecosystem capture and concentration of heavy metals from vaporization of explosive rounds, slow release from penetrators and other contaminating projectiles, hazardous unexploded rounds ("duds"), intentional burial of toxic or hazardous unexploded munitions and other waste, ecologically unsound "convenience" disposal of waste explosives by open detonation or open burning, etc.). Zone "A" refers to potential "Hot Spots" within the B-Zones. No samples were taken from Zone A, B-40, B-13, or B-30. Not surprisingly, samples taken in spring and late summer from peripheral Zones C and D by the Army Hygiene Agency showed no detected significant migration of hazardous or toxic chemical substances from the likely contaminated areas into these peripheral zones. Their study was of a general and preliminary nature and was not designed as an assessment of toxic and/or hazardous materials contamination.

Appendix M

SAMPLE LOCATIONS IN ARMY HYGIENE AGENCY'S
PERIPHERAL AREAS CHEMICAL CONTAMINATION STUDY

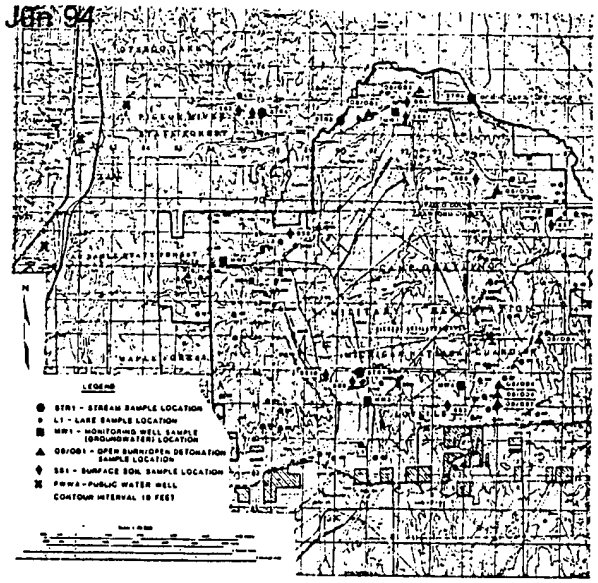


Figure 4.7-B. Location of samples taken for Army Hygiene Agency Water Quality Study No. 32-24-0881-89 Effects of Firing Range 40 on Water Quality Camp Grayling, Michigan 23-27 May and 23-31 August, 1988, which we term (more descriptively) "A PRELIMINARY MONITORING BASELINE STUDY OF CHEMICAL CONTAMINATION IN PERIPHERAL AREAS SURROUNDING RANGE 40". This study sampled only in the peripheral areas (Zones C and D -- See foregoing Figure 4.7-A). No samples were taken within the fenced areas of any of the ranges. The more likely zones of environmental contamination due to toxic substances and/or hazardous materials (Zones B-13, B-30, and B-40, as well as areas marked Zone A "Hot Spots of Likely Ecological Contamination") were not sampled in this army agency study. (Map is a reproduction of Figure B-2 from the peripheral areas contamination study report (Water Quality Study No. 32-24-0881-89)).

porous substrate materials is rapid and would tend to quickly flush contaminants through the system and into downgradient waters. Where such ombrotrophic areas occur in proximity to sites of maximum firing activity and/or projectile (including unexploded ordinance) concentration a pollution "hot spot" can be expected.

Detailed ecological data (aquatic/wetlands vs. uplands, hydrology, soils, vegetation) should be compared with geographic records of firing and projectile impact on ranges 30, 40, and 13 to establish sampling priorities. In monitoring, the frequency of sampling should also be increased in comparison to study 32-24-0881-89 (2 per year is less intense than nearly any waste facility in the state!). If winter firing is ever permitted, it will be particularly important to monitor the snow pack and spring meltwater, when a large flush of toxicity might be expected from the watersheds where contamination accumulates. The absence of apparent contaminants in the data set generated by the Army Hygiene Agency from samples taken at only two times during the year, from stations up to several miles from these sites of likely contamination is not surprising.

The specific boundaries of the zones shown on Figure 4.7-A are a hypothesis only at this point. We are unable within the time constraints of this review, evaluation, and critique to gather the sort of original data that would be required to design the needed baseline characterization and monitoring program. However, they do show one perception of the most likely areas of contamination, and that such areas particularly those resulting from projectiles, were not sampled. The caveat quoted above is

correct in stating the need for "significantly more data collection" and study of "individual drainage basins". It is hard to believe that the same author emphasizes that "the conclusions drawn in this study are for broad overview purposes and should not be interpreted as a detailed and comprehensive environmental assessment" and also reaches the conclusion (which we consider unwarranted and completely disagree with) that, "Although this study represents a preliminary assessment, the data indicates that a follow-up study of a more comprehensive and detailed nature is not warranted." In light of the fact that no samples were even taken from areas most likely to be contaminated, this conclusion begs for rational justification.

As a result of this study "it was found that current munitions burning practices on the ground surface may create highly localized elevated concentrations of metals such as lead and zinc." The conclusion continues, "In order to attenuate possible future environmental problems and concerns, OB/OD [open burning and open detonation] of munitions compounds should not be conducted on the ground surface." In complete disregard for air pollution (which was not included in any way in this study) it continues, "All munitions compounds should be placed in burn pans prior to burning. The containers should be designed to trap the residue and prevent it from getting onto the soil surface. After the munitions have been burned, the containers should be removed from the site and the residue disposed of in an environmentally acceptable manner."

From an ecological point of view, waste explosives should not be "open burned" or "open detonated". Not only have there been releases of toxic materials to the soils and waters from the uncontained ash (which burning pans and ash disposal may remedy), but the explosive waste material itself is probably both toxic and hazardous and should not be "open burned" or "open detonated" as a means of disposal. No private citizen could get away with such a practice. Why should the MDMA? Waste handling procedures should comply in every detail with state and federal law. The proposed OB/OD procedures apparently are not in compliance and are ecologically unacceptable means of toxic/hazardous waste disposal. Variances should neither be assumed nor permitted for training convenience. Proper regard for the environment, through implementation of detailed procedures for handling and disposing of even small quantities of toxic/hazardous waste, in compliance with state and federal law, should be a requirement of Guard training.

4-7.3 Calculation of Contaminant Load

Some records do exist as to the type and amount of ammunition expended annually in designated firing ranges and courses. Table 4.7-A reproduced from the Environmental Management Analysis and Plan document (for some reason this was not provided in the DEIS) gives this data for 1984. By knowing both the propellent and projectile chemical compositions associated with each of these munitions, and provided with a model stating experimentally based assumptions about the amount and fate of the toxic materials

produced as a consequence of firing each type, a total load of toxic materials introduced to the environment annually could be calculated. Moreover, where materials are volatilized, immobilized in chelates or other soil materials, incorporated into organic matter, or carried from the system by various transport mechanisms, the cross modality transfer rates from one ecological medium to another can also be calculated. Much of the basic simulation modeling required for tracing the fate of the toxic substances found in these ranges already exists. Gathering the necessary data to initialize these models and carrying out realistic simulations to provide meaningful estimates of future toxic contaminant loads is a reasonable requirement for environmental impact assessment in the kind of sensitive, multi-use system occurring in this "headwater area".

4-7.4 Other Hazardous Waste Considerations

Hazardous and toxic waste have reportedly been buried in munitions residue burial sites inside the west fence and at the "Air-To-Ground" (ATG) range. Drums marked "Contaminated JP-4" (Jet Fuel) have reportedly been buried at these locations. The site inside the west fence is marked by signs. The other site is east of the ATG target area. There are reports that "thousands of bombs" have been buried in these areas. These may be exaggerated but it is impossible to tell since no assessment of hazardous waste is provided. Use of nuclear penetrators at Range 30 is also

suspected. Are these used? If so, what of the uranium (highly toxic metal) released upon decay?

The Environmental Management Analysis Jun 94 also states that:

> "Some of the post lands such as ranges 13 and 40 have irreversible land commitments due to [unexploded ordinance ("dud")] contamination. While these areas still provide wildlife habitat and forestry resources, the areas cannot be managed as an environmental resource."

The extent of this problem is not known, nor are the costs of a cleanup if one is eventually required, nor who would bear the cost of such a cleanup.

The Crawford County Avalanche (May 19, 1988) on the occasion of the completion of the security fences provided the following information in regard to hazardous waste contamination on these ranges:

> "Facilities Engineer Lt. Col. Lee Lawson stated that the new fences should effectively eliminate all accidental entries into the impact areas, but deliberate trespassing is another matter.
>
> Lawson explained that Range Complex 40 is considered the most dangerous impact area. Military personnel, expert in recognizing unexploded artillery and rocket shells, who must enter this area, travel only on the hard packed dirt roads

> where disturbed surfaces can be easily detected. He further stated that fires started in Range Complex 40 are allowed to burn themselves out. Fighting these fires is considered too dangerous, yet the fence constructed to secure this area has been breached in numerous places. Trespassers, in the form of dirt-bikers, four-wheelers, wood-cutters and scavengers have used wire cutters, and in some cases, hooked into the fence with chains and ripped-out large sections in order to gain entrance to this area. Lt. Col. Lawson said, 'It is amazing to me that due to the number of people breeching the Range Complex 40 fence, that more accidents have not occurred.'"

To have this type of contamination known widely to the public and not to include a thorough assessment of hazardous waste in the DEIS is a glaring deficiency. The cleanup costs associated with restoring this land to useable status by the public could well exceed the 550 million dollars for surface cleanup at the Jefferson Proving Grounds (a site of similar extent). Who knows? Why has an assessment not been done, since the liability is borne by the citizens of Michigan? This is especially cogent in view of the fact that contamination of yet additional lands is being proposed.

A study recently conducted by the Indiana Department of Environmental Management (based largely on the findings of the consulting firm CH2M HILL) on a seemingly similar problem on the Jefferson Proving Ground in Madison, Indiana -- an area of similar

size to the "north range" at Camp Grayling (See Appendix II-B), among other disconcerting findings, presented the following:

-- The cost to clean up ordinance (explosive munitions and radioactive penetrators) is estimated to exceed $550 million. [The cost of a 12-acre landfill onsite will probably exceed $5 million. Removal and offsite disposal could cost as much as $100 million.]

-- This is for a surface cleanup (to a depth of 3 feet). It is considered technically unfeasible to completely clean up the site.

Comparing table 4.7-A to the data tables in the Indiana report, it is apparent that many of the same types of munitions are used in these two areas. Public reports of the use of radioactive penetrators, as well as admitted use of "white phosphorous" munitions raise the specter of similar type of cleanup eventually being required on these Upper AuSable-Manistee lands. Intuitively it seems that since Camp Grayling has a training rather than a weapons testing mission (as at the Jefferson Proving Ground), there may be less contamination at the Michigan site. Yet Camp Grayling has been operating longer, and the annual ammunition loads fired here are indeed massive (examine Table 4.7-A). Within the time and cost constraints of this RE&C it is impossible to conduct this type of analysis of the amount of hazardous waste existing on the impact areas at Camp Grayling (both "duds" and waste burial sites). But we can and hereby do point out the need for such an assessment, and call for its incorporation into the re-draft of the DEIS.

From the data collected on two dates in 1988, as yet there does not appear to have been significant chemical movement into the area surrounding fenced portions of Range 40. However, in order to deal responsibly with the hazardous waste question, as well as to assure that both toxic and hazardous contamination introduced by the proposed plan is differentiated from that already in the system (as a guide to the decision and regulatory process) we recommend the following:

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Recommendation(s) -

1. A "toxics and hazardous materials contamination assessment design task force" should be appointed by the MDNR to specify the scope, design, schedule, and parameters to be included in a baseline and monitoring program dealing with contamination in the areas likely to be polluted at present, as well as any future contamination resulting from proposed activities.

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2. No permit for proposed new activities or construction should be granted without a monitoring program plan agreed upon by MDNR, MDMA and local representatives. A "consent agreement" or "agreement pursuant to renewal of lease" are suggested elsewhere in this RE&C as promising approach to such consensus. The recommended monitoring program plan should be one part of such a consent agreement.
3. No permit for proposed new activities should be granted without comprehensive baseline characterization of

present levels of contamination by both toxic and hazardous waste. Satisfaction that sufficiently thorough assessment has been conducted on both firing and impact areas, as well as outlying zones, should be attested to by the MDNR Waste Management Division.

4. In view of the Army Hygiene Agency's apparently irrational conclusion regarding the need for such monitoring, an unbiased firm acceptable to the MDNR as qualified to analyze and monitor both toxic and hazardous waste materials, should be retained by MDMA to conduct this work.
5. MDMA should be required to comply with state and federal regulations in all handling of toxic and hazardous waste materials. No more open burning or open detonation should be allowed to occur as a waste disposal technique. No more burial of hazardous waste should be allowed. The advisability of classifying all areas containing such waste (including unexploded waste explosives) as hazardous waste storage areas under RCRA should be thoroughly and expeditiously investigated by the MDNR as well as EPA and other appropriate federal agencies. We recommend such a classification in order to bring to bear more stringent surveillance (including manifesting), appropriate handling, proper disposal, etc.

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6. If, upon investigation as suggested above, significant contamination is found in areas that have already been

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used for firing or as target impact areas -- either in the form of toxics or hazardous waste (e.,g. unexploded ordinance), no further expansion of such activities (modification in either firing or projectile target areas) should be permitted on leased lands. Moving contaminating activities to the proposed MPRC-H may be especially damaging to the environment in terms of toxic and/or hazardous waste contamination. If baseline studies show that this is so, such movement of activities should not be allowed.

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4-8 WATER RESOURCES

Stated Impact -

This section provides a description of both surface and ground water resources within Camp Grayling boundaries, indicating that they are protected by State regulations. Drinking water standards and other protective rules are discussed and drinking water usage is described. All water bodies for which data have been presented are stated to be within acceptable limits. Wastewater collection and treatment systems are described, indicating that the upgrading of the existing waste water treatment plant is one of the proposed projects. The details of a leakage incident and its subsequent handling is described and a plan for dealing with potential future spill incidents is outlined.

Potential impacts are listed as 1) increased sedimentation, 2) increased storm runoff, and 3) possible spills and leaks of hazardous/toxic substances (4-8.20). All proposed projects are concluded to have either no significant impact or a beneficial impact either as proposed or after mitigation.

Evaluation -

Considering that Camp Grayling contains "5 rivers, 2 major streams, numerous creeks, 23 named lakes and numerous wetlands" (4-8.20), that the Au Sable river has been designated as a State Natural River, and that a 23 mile section of the Au Sable has been given scenic river designation, it is without a doubt one of the most important inland water resources in the state of Michigan. The impact assessment on these resources should be of the highest

quality possible. A thorough environmental analysis of the watersheds of the Au Sable and Manistee river systems has not been presented in the DEIS. Jun 94

The fresh clean high quality rivers provide some of the best trout fishing nationally and account for that being the prime river use in the area. There has been extensive comment in the media and by groups concerned with the preservation and use of this high priority resource e.g., Anglers of the AuSable, Trout Unlimited, etc., regarding the DEIS and potential impacts due to implementation of the master plan. It is our belief that their concerns should not be dismissed as those of "special interest groups" but taken into account as concerns that are valid in their own right when considering the integrity of these aquatic resources.

Historically erosion and sedimentation have been a problem at Camp Grayling. These issues have been addressed significantly in Section 4-4, however most of the resolutions require permitting with mitigation of potential impacts. Quantified specifics as to impacts are not provided nor is a system for on-going monitoring of soil conservation practices. We have discussed this issue in greater detail in section 4-4 of this document.

Data from only selected bodies of water were provided and the data presented for these is inadequate (see Section 4-7). Some lakes were dismissed as "small and less significant" (4-8.4) and data on other water bodies was either not discussed or unavailable. Sedimentation has been a problem for some of these "minor" systems, in addition to the larger systems, due to various

training activities (DEIS Appendix 4-4), and although a 200 foot buffer zone has been included, there is no specification of how limited access to this is to be enforced. In addition two lakes are used for amphibious training, Howes and Duck Lakes (Appendix 4-4). How does bridge and barge training impact these two lakes?

The described response to the diesel spill is encouraging in that it has been used as an experience to learn from, however in general the problem of toxic contamination potential has not been examined thoroughly, especially since the pollution potential of the groundwater is considered to be relatively high due to the high water table and high soil permeability (4-8.10). We have commented elsewhere in this document on the need to conduct a comprehensive baseline characterization and monitoring study on the potential of toxic contamination in, and potentially emanating from, high impact zones (see Section 4-7). This needs to be extended to include surface water resources and non-toxic chemicals that could change the nutrient and chemical balance in these surface water systems, e.g., potential for eutrophication, erosion or sediment loading, turbidity, or water temperature.

According to the comments of Bill Cooper in Technical Review I, page 3:

"Continued discharges to Bear Swamp are discounted because the C-1 project will upgrade sewage treatment and improve water quality. The old facility lost 96 percent of the effluent before it reached Bear Swamp. The new facility will remediate these losses and

increase the volume 24 times. Effluent generated in the winter must be stored and spray irrigated only when the ground is not frozen and not already saturated with water. These conditions exist for only six months each year. This will increase the loadings to 48 times the existing levels. The analysis in the EIS is totally flawed."

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Recommendation(s) -

1. Address the concerns raised by the Anglers of the AuSable, Trout Unlimited, etc.
2. Refer to Section 4-4, recommendations regarding soil erosion and sedimentation issues.
3. Refer to Section 4-7, recommendations regarding toxic contamination.
4. Expand baseline characterization and monitoring to include surface waters and other pollutant types.
5. .The Surface Water Division of MDNR should check discharge to Bear Swamp. If the discharge is too much to be compatible with present wetland composition, a redesign of the treatment plant should be required.
6. Assess the impact of bridge and barge training.
7. Provide an assessment of the potential deleterious effects of accidental impacts to water resources.
8. Obtain and present a more comprehensive picture of ground and surface water hydrology and use this in a spatial assessment of potential impacts.

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4-9 CULTURAL RESOURCES

4-9

4-9 Cultural Resources

Stated Impact -

The DEIS states that in May 1987 a cultural resource assessment for the development of a historic preservation plan was conducted and notes that the Officers Open Mess and three other buildings in the cantonment area are either of historic significance or are being so considered.

Recent work on a site for a laser guidance system for a surface to air missile site is underway at the "Ghost Town" of Hardgrove in Section 25-T28N-R3W (Just north of Co. Rd. 612, about 5 miles east of I-75). This development is being conducted by the regular army in cooperation with the MDMA to provide a control point for testing of the air to ground guidance system. It will include road construction activities, laying power and communications cables, and other "improvements" costing several hundred thousand dollars, yet it is not even addressed in the DEIS. While the MDMA has stated that no test firing is intended "at this time", there is a perception and deep concern on the part of local residents that this may be the beginnings of deployment of "yet another weapon system for simulating modern warfare in [their] backyard".

Under "Impacts and Mitigations" further mention is made of:

1. Future archaeological surveys are recommended for Camp Grayling lands adjacent to streams or lakes, areas adjacent to old railroad grades, and areas where extinct

4-9.1

communities are known to have been located. It further states "All impact areas and ranges, firepoints, the cantonment area, the airport, the oil field, tank maneuver areas, and the interior sand areas away from any water source will be deleted from future surveys due to the disturbance of the cultural resources at these sites or the unlikeliness of past habitation..."

2. C12 ASP/LSF Railroad - AS PROPOSED - "...possible disturbance of old logging camps..." and in ".3 Training Area" that "...all three projects (T1, ...; T2, ...; and T3), ...will be constructed primarily on previously disturbed land; however, they could affect cultural resources due to the large acreages affected. All impacts are anticipated to be insignificant after mitigation... the post will prepare a historic preservation plan and will coordinate planning/construction activities with the State Historic Preservation Office in accordance with Army Regulation 420-40, Historic Preservation."

Evaluation -

1. No mention is made of the Hartwick Pines State Park in the DEIS, nor of possible impacts of existing increased military activity on that area or agency.
2. Out-of-state/country persons, whether military or civilian, cannot be expected to place the same value on cultural resources as those who have closer allegience

4-9.2

to their preservation, because of their cultural heritage. Expansion of military activity to include non-state persons, especially when no state authority has disciplinary power over these guests, can present unrecoverable damage or destruction to these resources.

Recommendation(s) -

1. In view of the large area involved (T1-3), known cultural resources in existence in those areas, and the high priority placed by the Army on Historic Preservation (Regulation 420-40), as indicated by the DEIS, it seems inconsistent to delete any area from the recommended "Future archaeological surveys", especially the interior sand areas away from any water source because of "disturbance of the cultural resources at these sites or the unlikeliness of past habitation". It is recommended that:
   A. The surveys be moved into the immediate future to prevent possible disturbance of the cultural resources, and, that they be conducted under the auspices of the State Historic Preservation Office.
   B. That any construction be predicated on the results of the survey and approval of the State Historic Preservation Office.
   C. An assessment of possible impacts on Hartwick Pines State Park and any other Grayling area

4-9.3

community cultural resources should be made prior to completion of the DEIS.

D. Should Camp Grayling activity be increased, maintained at present levels, reverse incremented back to levels of the 1948 or 1978 leases, or should it be closed in the future - what impacts on the known cultural resources, both inside and neighboring the Camp, would each of these have? These need to be assessed by the DEIS.

2. The development of a missile guidance system component in the Hardgrove Lake logging ghosttown needs to be addressed in the DEIS redraft. Civilians need to understand exactly what this is (and what it is not!).

42 Because of the high level of distrust of the MDMA, bonified assurances must be provided that such developments as this are not in fact just a way for the military to "get their foot through the door" of lease agreements, etc.

3. The DEIS promises that a Camp Grayling Historic Preservation Plan and Memorandum of Agreement for Camp Grayling will be drafted but doesn't provide it. How

43 can we or anyone else evaluate its adequacy unless it is included in the DEIS? It should be presented as an Appendix to the re-draft.

4-10 Socioeconomic Resources

A review, evaluation and critique of this section of the DEIS appears as a Technical Review in Section 6-II of this document.

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4-10 SOCIOECONOMIC RESOURCES

4-11 ENERGY RESOURCES

Stated Impact -

Types of energy, their uses and sources are described in the DEIS. Tables showing 1985 heating fuel and electricity consumption are presented, and 1985 unleaded gas as well as 1986 diesel and aviation fuel consumptions are stated. Impacts are considered from the standpoint of increasing energy use at Camp Grayling and are discussed for all proposed projects.

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It is stated that fuel use for the heating of buildings is "estimated to increase to a maximum of 25%...but since this will occur over a five year period it "should not significantly tax existing resources." (4-11.6) The fuel disposal facility is described as producing a beneficial impact because it "will provide a safer more secure and convenient fuel storage." (4-11.6) The training projects "could require increased fuel use..." (4-11.7). This possible increase is explained as being due to possible increased use of aircraft with the implementation of T3. It is acknowledged that cold weather training will increase fuel use, primarily due to the increased need to heat buildings and water, but is considered to have an insignificant impact due to the new natural gas line available to transport it. It is also acknowledged that new aviation units will increase fuel use, however this too will be insignificant as only "minimal" numbers of additional maintenance flights are planned.

Evaluation -

Considering the global situation regarding energy resources, the DEIS evaluation of impact on energy resources is irresponsible. Not only does it consider merely impacts on Camp Grayling's ability to supply addition energy resources for their activities, it does not rigorously and quantitatively assess potential increases in use of energy resources.

So what if Camp Grayling can get the resources to where they need them? The DEIS almost denies any increased use of energy resources by considering the impact to be insignificant. How many insignificant pieces of pie does it take before the whole pie is gone? It is fact; the world as we know it has finite amounts of the energy resources that are used by Camp Grayling. If every person or organization documents their increase in energy consumption as insignificant, at what point does the whole picture become significant? So what that Camp Grayling can convert a "growing number of buildings" to the use of natural gas for heating? Known reserves of natural gas are predicted to last 50 years at present usage rates - shouldn't a government agency such as the military, who itself is trying to upgrade to the most "modern" training techniques, also at least consider the most up-to-date energy alternatives? There is no mention of alternatives in the DEIS.

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The need to document energy consumption comparatively is evident. It is good that actual data are presented for energy consumption in 1985 and 1986. Now, three to four years later we have baseline data which can be used to accurately assess present (1989) and predict future consumption with or without expansion. What do the phrases "possible increased use", "could require increased fuel use", or "minimal increase" mean? New aviation

4-11.2

4-11.1

units will be available if the master plan is implemented. Will they fly or won't they and how often? If only two additional flights per week are expected to fly next year, how many will be expected 10 years from now? Someone will surely say, "the capacity is there, why not use it."

Recommendation(s) -

1. The MDMA should take a more global perspective leadership approach when looking at energy impacts, and consider energy use as a depletion of finite resources. A study of the use of alternative energy resources should be included in the re-draft of the DEIS and alternative resources should be utilized where feasible.

5-0 ADDITIONAL ASSESSMENTS OMITTED FROM DEIS

5-0

5-1 Fire

Stated Impact -

The issue of forest fire has not been adequately addressed in the DEIS.

Evaluation -

That this is serious concern is evidenced by public comments of Mr. Schwarz during the Grayling DEIS hearing:

> "Range fires, I've been subjected to the last couple of weeks just about every day...When I came home from work, my area was enshrouded in wood smoke...I called Camp Grayling...The phone rang 15 times..." (See Appendix IIB)

after finally getting a response, he was told:

> "Oh dear. We fought that today, but it was time to go home. We figured we'd come back in the morning."

Whether this story is exaggerated or not, the potential for fire is definitely understated by its omission in the DEIS. According to Facilities Engineer Lt. Col. Lee Lawson, "Fires started in range complex 40 are allowed to burn themselves out. Fighting these is considered too dangerous" (see Section 4-7.12). While this may be true in this hazardous waste contaminated area, the attitude cannot be allowed to become a general one.

Much of the Kirtland's warbler habitat in range 30 is the result of the regeneration of Jack Pine due to fires; "the Michigan National Guard, having produced this ideal nesting habitat incidental to field training exercises..." (4-5.41). Particular attention needs to be given to those types of training that are creating the extensive wild forest fires that threaten life and destroy resources in this area.

Jun 94

Recommendation(s) -

1. Investigate and document the relationship between forest fires and training activities on Camp Grayling lands. Based on these findings a rollback alternative should be included in the re-draft of the DEIS.

2. The issue should be comprehensively re-assessed, the latest state-of-the-art fire prevention and suppression techniques should be utilized in all cases, under authority of lease L-1479, the MDNR should insist on adjustment of firing protocols on the basis of weather and fire hazard in order to protect the natural resources and humans of the area. The same weather monitoring facilities installed for control of noise impacts will provide information needed to regulate firing and troop movements so as to reduce the threat of wildfires.

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3. A comprehensive cause-and-remediation assessment system should be put in place to evaluate every wildfire, determine its cause, and take remedial action wherever possible to prevent the cause from re-occurring. Suppression activities should be similarly evaluated.

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5-2 Traffic

Stated Impact -

There is no assessment of traffic or of impact on County or State roads, Interstate Highways, etc.

Evaluation -

Citizens, both in the Grayling area and throughout Michigan, encounter significant traffic problems resulting from National Guard movements. The perception of local citizens is that military traffic on local roads has resulted in significant deterioration of the quality of these roads. Typical of this perception is the following comment by Mr. Thomas Pallarito a full-time resident of Waters: "The paved road is in sad condition. Marlette Road is terrible. They (military vehicles) will pull off on the shoulder of the road -- tear the shoulder of the road up, because that is where it is weakest -- and wait for the rest of the convoy to come up." Although both traffic movement and impacts of military traffic on local roads are complex issues involving several impact perpetrators (e.g. oil

trucking) in addition to the military, impact of military traffic is significant and will continue to be so (e.g. if elements of the EMAP are implemented).

The DEIS does not even mention impacts of military traffic other than to briefly describe traffic expected if training activities continue on a year round basis ("Cold Weather Training Mission"). The DEIS simply dismisses all consideration of traffic impacts with the statement:

> "Impacts [of traffic] on land use are anticipated to be insignificant." (4-6.14)

Traffic impacts associated with moving large numbers of vehicles and personnel are highly significant. There are several types of impact: citizen vs. military road use, increased potential for accidents, impacts to residences near routes of travel or the deterioration of County roads through overuse. This omission may be based on the assumption that the additional impacts resulting from the proposed projects/activities in the DEIS relating to traffic are insignificant compared to the negative impacts already being experienced. This may be so, given the unacceptable impacts already resulting from elevated activity levels. Since an environmental impact statement has never been developed for Camp Grayling, and since the proposed new activities would result in increased and redistributed traffic impacts, omission of the impacts of training activities on traffic, and of military traffic on local citizens and roads of the area

represents a significant deficiency in the DEIS. Several of the proposed projects would sustain or even increase traffic impacts. Therefore the cumulative impacts of traffic needs to be included in the DEIS.

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Aviation traffic is significantly affected in lower Michigan by the "off-limits" status of this airspace to private aircraft. This needs to be assessed on a cumulative basis in the DEIS.

Recommendations(s) -

1. Include an assessment of off-site and on-site impacts of cumulative traffic in the redraft of the DEIS.
2. Evaluate impacts of:
   a. movement of troops creating congestion
   b. construction of railroad spur possibly necessitating closure of I-75 for several months.
   c. damage to local roads by overuse and use by heavy equipment
   d. increased loss of "life and limb" expected because of military traffic
   e. adverse impacts to residents along the trafficroutes (loss of tranquility, increased noise, dust, fumes, etc.). Evaluate quantitatively with "distance/density traffic assessment model" or other state-of-the-art engineering model of traffic impacts (for an example of this type of assessment, see Impact

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Assessment of Proposed Mining in the Dingman Peatland prepared by Ecological Research Services, Inc. and on file with MDNR Geological Survey Division - contact William Walden).

3. Evaluate in terms of total traffic (cumulative Guard activities in relation to total traffic) impacts rather than just those added by the proposed EMAP actions, since these actions will have the effect of continuing and sustaining present levels of impact.
4. Bonding should be required to assure road maintenance or a more vigorous implementation of existing agreements for road maintenance by the Military should be required and insisted upon. Roads sustaining significant damage through use by military vehicles should be matted, paved, and maintained at the expense of MDMA. If year around training activities are permitted, a code of use should be developed to protect roads during spring thaw.
5. A traffic routing and timing plan should be developed to minimize traffic conflicts between both local and out-of-state citizens and military vehicles. Major troop (including out state) movements should be scheduled to coincide with minimum traffic times for civilian traffic movements.

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5-3. Aesthetics

What is a clear view of the night sky worth? Perhaps the value of being able to walk out on a clear night and look up with unobstructed view to a billion stars can't be measured. Likewise the value of the solitude of nature - being able to stroll through the woods or fish in a stream in soul-refreshing tranquility and quiet broken only by the song of a bird or the croak of a frog.

Aesthetic values are difficult to measure and impacts to the aesthetic qualities of the environment are difficult to assess. In the Camp Grayling situation NOISE is the big offender. With its incrementalism/justification approach, the DEIS tries to skirt even this major factor. George Kamperman's Technical Review III provides clear focus on the problem and offers suggestions for solution.

But there is more to aesthetics than quiet. An unobstructed view, the presence of sensitiv species of songbirds (e.g. warblers) in bushes or at your feeder - even those that may not yet have been declared officially threatened or endangered, freedom from offensive odors, safety, freedom to go for a drive on public lands to observe deer, turkey, or other animal and plant life, reasonable freedom from excessive levels of human activity - to get away from it all. These and other factors of the environment contribute to the more general factor: quality of life. For those who live in or travel to Crawford, Kalkaska, and Otsego Counties, there is an added dimension -- quality of life in the northwoods.

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Within quite broad limits quality of life considerations can be modified by conditioning. Humankind is very adaptable. But the expectations of those who live or recreate in the north central Michigan heartland can only be stretched so far. Many consider aesthetic qualities of an environment unspoiled by human offense, within the limits of accepted tradition, to be among the more important rights and freedoms of being an American, a Michigander, and especially one who treasures the natural values of northern Michigan. They ask, "Is it really necessary for the military to destroy these rights and freedoms in the process of training in order to protect other economic and social freedoms?" If such "simulated warfare" training activities are necesssary, and if the Grayling area proves, after careful, comprehensive, and responsible assessment (with public review), to be the best place, then is it not reasonable to make every effort to protect the environment and quality of life in the process?

Recommendation(s) -

1. Require and provide training in environmental science and ecology as recommended in Section 2-15, with addition of training relative to regional and local culture, history, valuse, and quality-of-life (the human environment) as part of the training mission.
2. Include aesthetics in the assessment for redraft of the DEIS (as required by MEPA). Provide state-of-the-art assessment of important aesthetic variables.

TECHNICAL REVIEWS

6.0

Jun 94

TECHNICAL REVIEW I.

CRITIQUE OF THE E.I.S. FOR THE PROPOSED EXPANSION OF CAMP GRAYLING

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6-I

CRITIQUE OF THE E.I.S. FOR THE PROPOSED EXPANSION OF CAMP GRAYLING

William E. Cooper, Ph.D.
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Public Sector Consultants, Inc.
June 6, 1989

GENERAL COMMENTS

1. The EIS considers only the impacts during the construction phase; the environmental impacts of the operational phase are dismissed since most of the environmentally sensitive operations will require a Department of Natural Resources (DNR) permit. The unstated assumption is that once the State permits an action, there will be no deleterious activities. This is blatantly false. Most of the environmental cases that involve litigation or negotiated settlements in Michigan involve permitted operations.

   Recommendation: The EIS process should not be considered complete until the DNR has provided for public review an appendix containing all of the draft permits needed to implement the statements in the EIS.

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2. The only regulatory control over Camp Grayling activities lies in the DNR permits. Regulations usually are minimal standards—the result of compromises negotiated during the rule-making process. Camp Grayling is located at the headwaters of the Au Sable and Manistee rivers, adjacent to the Hartwick Pines State Park, and contains a significant portion of the breeding habitat for the Kirtland Warbler, a federally designated endangered species. This area deserves more than the minimal standards of environmental protection. Rigorous standards can be promulgated and enforced through a consent agreement signed by all parties.

   Recommendation: As part of the EIS process, the DNR should draft a consent agreement that augments the regulatory permits to assure appropriate and adequate protection of this ecologically unique area.

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3. The State of Michigan is attempting to demonstrate leadership in environmental protection and management. The Department of Military Affairs (DMA) should incorporate this admirable goal in its proposal to modernize and expand the largest military facility in the state. There are six areas in which the department obviously has failed to understand the State's policies.

51

A. **Solid Waste Management** All of state government has declared war on solid waste. The number one priority for solid waste management is waste reduction. Landfilling is last. The Camp Grayling EIS recommends the least desirable alternative: landfilling. It does not mention the alternative technologies that are high priorities. The Solid Waste Management Plan is unacceptable and must be redone.

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B. **Fuel Storage Tanks** In Michigan there are hundreds of leaking underground fuel tanks that have caused soil and groundwater contamination. Millions in private, State, and federal monies will be spent trying to mitigate these impacts. DNR Director Ronald Skoog issued an order (letter 89, 1985) in which he directed that "effective immediately, no new underground storage tanks shall be installed at Department facilities except where authorized by the Regional Director on the basis that there are no viable alternatives." The EIS only vaguely discusses the above- and below-ground options. To follow current DNR policy, a detailed technical assessment must be provided to demonstrate that there are "no viable alternatives" to environmentally risky underground storage. The LUST unit of the DNR should draft a permit that incorporates the engineering designs of monitoring and pollution control technology that will be required for the permitted alternative.

C. **Noise Standards** The EIS points out that the State has no noise standards as a regulatory tool and implies that therefore the issue is outside State control. However, such social nuisances as noise and odor have been regulated both by consent agreements and by litigation in Michigan since 1910. Several years ago a case brought by The Barn Theater near Augusta against a nearby landfill expansion was successfully litigated by the attorney general to the Michigan Supreme Court. As a result of that case, all new landfills are required to provide 1500' setbacks from the nearest residences. Although this case involved odors, noise also is considered a social nuisance. The Department of Transportation sets 70 decibels as the design standard; noise above this level is considered a social nuisance. The EIS demonstrates noise isopleths that exceed nuisance levels (classifications II and III) extending off the reservation and impacting on private properties. Given the attorney general's position in earlier environmental social nuisance cases, a violation of defensible standards should be acknowledged publicly and defended as a variation in policy. Otherwise, the DMA will be vulnerable to civil social nuisance suits under the Michigan Environmental Protection Act.

D. **Shoreline Development** The EIS discusses a proposed 500' greenbelt buffer zone along the shoreline of the major rivers. The preservation of riparian vegetation is stressed as essential for maintaining the ecological stability of the coldwater fisheries and as desirable for aesthetic reasons. The EIS also mentions that a DNR permit will be obtained for any exceptions to this general policy. The Au Sable River is designated a "scenic river" by the State of Michigan. Such designations are given only to rivers of such value and beauty that no exceptions should be tolerated. The EIS process should not be considered complete until the DMA and the DNR have publicly disclosed and defended each and every permit exception under consideration.

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E. **Off-road Traffic** The EIS is very naive about winter ecology in Michigan. The statements that the ground always is frozen and the ecology dormant are just wrong—there are many mid-winter thaws in Michigan. The DNR has worked for years to restrict off-road vehicles to designated trails so as to protect vegetation, reduce soil compacting, and reduce erosion. The DMA should follow the DNR's lead and allow off-road activities by tracked and wheeled vehicles only when the ground is frozen and the ecology dormant. On lands under DNR control, policies should be strictly adhered to by the DMA and rigorously enforced by the DNR.

F. **Wetlands Protection and Enhancement** The director of the DNR has publicly announced his goal of enhancing and developing 10,000 acres of wetlands in Michigan. Three of the many wetland issues in the EIS follow.

- Pg. 4-4.17, "renovations within 500 feet of a water body." In all cases, the EIS did not identify and analyze the impacts on wetlands. The precise locations of the exceptions to the 500' buffer must be identified before impacts can be assessed.

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- Pg. 4-8.13, "will continue to discharge into Bear Swamp." Continued discharges to Bear Swamp are discounted because the C-1 project will upgrade sewage treatment and improve water quality. The old facility lost 96 percent of the effluent before it reached Bear Swamp. The new facility will remediate these losses and increase the volumes 24 times. Effluent generated in the winter must be stored and spray irrigated only when the ground is not frozen and not already saturated with water. These conditions exist for only six months each year. This will increase the loadings to 48 times the

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existing levels. The analysis in the EIS is totally flawed.

- Pg. 4-8.26, "the remaining wetland area is north." This raises the question "remaining after what event?" To look for wetland violations, the DNR should obtain aerial photographs of the wetland areas from overflights in 1978 and 1987. If violations are found, appropriate actions to assure mitigation should be undertaken.

Recommendation: An appendix to the EIS should be provided that demonstrates to the public that the DMA at least conforms to existing State environmental policies.

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4. A major issue involves the public trust: Will the scale of operations at Camp Grayling be limited to that described in the EIS? The "NO FURTHER GROWTH" image is scattered throughout the EIS. If true, the new sewage treatment system should be limited in design to a capacity of 4,000 people per day. The proposed design is for 11,000 people per day. If built to the proposed design, operations could be scaled up at a later time with no public discussion. If designed only to proposed need, then further upgrading would require a new DNR permit and the opportunity for additional public hearings. Designing only to proposed need will assure there is no violation of the public trust.

   Recommendation: The DNR should not permit any oversized design in infrastructure.

5. U.S. Department of Defense facilities across the country currently violate state and federal water quality regulations. Camp Grayling supposedly is in violation only of its surface water discharge permit. Either the camp has operated a uniquely clean operation since the 1930s, or the DNR has not looked at the facility very closely. Abandoned landfills, fuel storage facilities, discharges of TCE (degreasers) and 1,4-Dioxane (ethelene glycol), and heavy metals (Hg, Pb, Zn, Ni, Cu, Cr) from exploded ordinances all are prime sources of environmental contaminants. The environment impacts on Barnes Lake, which is the headwater of the east branch of the AuSable River, should be given special attention.

   The only water quality data in the EIS involves groundwater analyses taken up- and down-gradient from the abandoned landfill. The data indicates that total organic carbon is greater up-gradient. Since this old landfill is unlined and located in sandy soil, the results are highly suspect.

A recent report of the Indiana Department of Environment estimates that the costs of sanitizing a munitions testing facility to be decommissioned is more than $550 million. Closer to home, at Fort Custer—a decommissioned military installation now used as a public park—parts of the park are closed to the public because they have not been sanitized. Areas used for detonating live ordinance must be considered as an irreversible taking of public property. Furthermore, the mass balance of residual heavy metals should be calculated to indicate the extent of existing and future contamination. If adjacent areas are to be maintained for public access and hunting activities, heavy metal residues in harvested game animals should be analyzed and monitored annually. This is the current policy at such federal facilities as the Oak Ridge National Laboratory in Tennessee.

Recommendation: The EIS process should not be considered complete until a scientifically sound environmental audit of toxic substances has been conducted and is available for public inspection. Both existing and proposed conditions should be included.

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6. The lease agreements between the DMA and the DNR should uphold the public trust, that is, assure public access and hunting on all but the most restricted lands. Use and noise controversies exist currently to the point that military operations are shut down on the opening day of trout season and during the rifle deer hunting season. The Wildlife Division of the DNR should evaluate the impacts that the Camp Grayling expansion will have on such hunting promotion activities as expanding the turkey planting program and modifying habitat for anticipated introduction of exotic game birds, and if the expansion will necessitate restricting hunting activities if heavy metal residues are found in game species. The public should be told up front if and how the public trust provisions of the lease agreements will be protected.

   Recommendation: The Wildlife Division of the DNR should project impacts on public hunting rights associated with activities in the EIS and inform the public of them during the EIS review process.

7. The Kirtland Warbler is the animal species of most social awareness and concern in the Camp Grayling area. Its nesting habitat is jack pine of 8 to 18 years old. A significant proportion of this habitat is within the Camp Grayling firing range. The federal Endangered Species Act

mandates that the habitat of such species be protected and maintained, without exception.

The DMA and DNR have attempted to mitigate a difficult situation despite this restriction. Their plan, which is good in concept, is very risky in operation: In any given year, any 40-acre block of previously used breeding habitat not currently having a breeding pair of Kirtland Warblers is removed from a protective classification. The assumption—that such a block no longer is a suitable breeding habitat—is wrong. There is considerable year-to-year variability in density and location of breeding birds. When a restriction is lifted, the DMA can make sure that the birds will not return by implementing "range improvement."

A further assumption is that other areas of 8- to 18-year-old jack pine are available and will be used by the birds as breeding sites. If these areas already exist, why are they not currently supporting a larger breeding population? Restrictions on current habitat should not be lifted until it can be demonstrated that shifts in breeding location have indeed taken place.

Recommendation: The DNR should renegotiate the Kirtland Warbler protection plan so as to abide by the Endangered Species Act and to assure the survivorship of the warbler population

SPECIFIC ISSUES

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1. Pg. 1-31, Fig. 2-31. The trend data does not support a "no-growth" profile.

2. Pg. 2-3.9, "move three times per day," "construction of fortified emplacements," "set up in tree lines and dig in," "fire five day interval in a two week period." These imply considerable physical disruption. What happens in the winter?

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3. Pg. 2-3.10, "infrequently, fortified emplacements are constructed," "engineering battalion needs winter experience." Again, how much? Where? Is blasting required? If so, the DNR radio collars should be put on deer and turkeys to determine if negative impacts result.

   Pg. 3-3.21, winter training, "excavations by mechanized crews or demolition crews." Same as above.

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4. Pg. 3-54, C1 project impacts. No estimate of material loadings (phosphorus and water) into Bear Swamp. No estimate of impacts on white cedar are available; white cedar is critical habitat for deer in the winter and it does

not successfully regenerate. The increase in volume retained far offsets treatment reductions. Much more documentation is needed on vegetation impacts. There basically is no good ecological science in this EIS.

5. Pg. 3-5.5. Two state endangered plant species are to be surveyed prior to construction. So what? What will the DMA do if they are present? "Dormant vegetation." The DMA implies no possible damage. Again, this is an example of bad ecological understanding.

6. Pg. 3-5.6, "no impact since it involves types of existing training." There is no baseline data on existing impacts, so how can it be concluded that the existing situation is acceptable?

7. Pg. 3-5.8. There are many issues here.

- Solid waste landfill. For how long? Conformance with Act 641?
- Nonexploding shells. Where are they? How is disposal handled? What liability?
- Heavy metal residuals from exploded shells?
- PIP plan for fuel and ammunition storage?
- Phosphorus shells. What are the residuals? Where?
- TCE. Degreasers for aircraft and dry cleaners; major groundwater contaminant at most military installations. How much?
- Pesticides. Insect control. Lyme disease. How will disease vectors be controlled?

8. Pg. 4-2.5, "artificial smoke." How much? What are the chemical residuals? Fog oils? Tear gas?

9. Pg. 4-2.7, "asbestos." Does the removal or containment procedures meet EPA standards?

10. Pg. 4-2.11, "submerged fuel pipes." What kind of monitoring system to detect underground leaks?

11. Pg. 4-3.28, "indicate no significant variations from existing." The existing conditions are unacceptable; they are a major source of social complaints.

12. Pg. 4-4.17, "move plants to protect them." The Endangered Species Act does not permit this option. How will the DMA do this? What alternative suitable habitat is available?

13. Pg. 4-5.21, "recently cleared 35 acres of jack pine." Was this suitable Kirtland Warbler breeding habitat?

14. Pg. 4-5.25, "heavy snow conditions are relatively common." Is the DMA willing to operate only when these conditions exist? How many days per year during the last five years did such conditions exist?

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15. Pg. 4-5.47. The new loadings must be calculated before conclusions can be drawn on impacts.

16. Pg. 5-5.48, "T1 should not significantly impact." Tag deer and turkeys with radio collars and demonstrate this as was done with elk in the Pigeon River Forest.

17. Pg. 4-5.51. All of these training activities will have little environmental impact only if the DMA is able to control the actions of individuals roaming the woods. How does it propose to manage human behavior to this extent?

18. Pg. 4-6.2. How can one define the past boundary to include private lands without the consent of the owners?

19. Pg. 4-7.2. Antifreeze contains 1,4-Dioxane.

20. Pg. 4-7.7, "40 acres of oak and conifer." Is this area part of white cedar habitat for deer?

21. Pg. 4-7.9, "training activities will not generate any additional waste." What about heavy metal residuals from exploded ordinances?

22. Pg. 4-7.10. Explain in more detail how sewage is to be handled during the winter months. Remember, no winter spray irrigation.

23. Pg. 4-8.5, "discharge their wastewater effluent to the swamp." The Surface Water Division of the DNR must look at this in great detail. I do not believe these statements!

24. Pg. 4-8.27. No discussion of chemical fates.

25. Pg. 4-10.10, "2.1376." Someone should learn about significant figures!

26. Pg. 8-1.3. Where are 2-3.9, 2-3.28, 2-3.24, etc?

TECHNICAL REPORT II.

REVIEW, EVALUATION, AND CRITIQUE OF
CAMP GRAYLING DRAFT EIS

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REVIEW, EVALUATION, AND CRITIQUE OF CAMP GRAYLING DRAFT EIS

REVIEW OF SOCIOECONOMICS SECTION OF DRAFT E.I.S.
MISSION/MULTIPLE CONSTRUCTION: CAMP GRAYLING ARMY NATIONAL GUARD
TRAINING SITE, MICHIGAN, MARCH 1989

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22 June 1989

SOCIOECONOMIC ASPECTS OF THE DRAFT CAMP GRAYLING E.I.S.

SUMMARY

The draft EIS estimates the aggregate social and economic impacts of the entire set of elements of the proposed Camp Grayling expansion and renovation plan ("the project"). It concludes that the project would economically and socially impact the three-county region positively, and would have no important negative economic or social impacts.

Our evaluation shows that the draft EIS omits several important kinds of social and economic impacts, and inaccurately assesses others. It estimates economic impacts, mentions a few social values, and ignores economic values.

As a result, it does not fully consider the importance to the public of the negative impacts of certain training activities facilitated by the project. Six major public values do not appear to be fully considered:

81 1. Most importantly, it does not fully consider the impacts of noise on the nationally significant recreational values of the Au Sable River system.

82 2. It does not evaluate the feasibility of moving all or a major portion of the proposed training activities to another site in the state or region, nor does it evaluate the social and economic values and impacts of such a move.

3. It does not evaluate the socioeconomic consequences of the possibilities that uncertain assumptions about future camp activities may be incorrect.

4. It does not fully consider the social importance of the Kirtland's warbler in its plan to convert scarce nesting habitat to other uses.

5. It does not fully consider the impact of camp activities on recreational uses of camp lands leased from the Michigan DNR. Thus,

83 MDMA does not appear to fully comply with its lease agreement.

84 6. It does not assess possible terrestrial contamination in Ranges 40, 13, and possibly 30, and associated human health implications (eg, possible contaminated deer and other game).

The draft EIS may also be misleading in that it uses inaccurate information to assess economic impacts.

THE ROLE OF ECONOMIC AND SOCIAL EVALUATION

The purpose of economic and social evaluation

The Michigan Army National Guard and the Michigan Department of Military Affairs were created to help provide for our national defense and other important public services. They were created by the public, for the public. They continue to enjoy a high level of public support.

They are also very costly. Both their direct costs--what we pay for personnel, equipment, and supplies--and indirect costs--social, environmental, and land use commitments, for instance--represent large economic and social commitments.

The public willingly pays such costs when they think it is in their own best interests to do so. We choose to pay the cost of MANG and MDMA because we think the returns are greater than the costs.

However, simply to know we need a strong national defense does not mean there are no limits to our willingness to pay directly and indirectly for improvements in that defense. Further, when we reach these limits, the choices become difficult. The choices are continually debated. Debate at the national level is even extensively covered by the news media. Again, the debate is not over whether we need national defense. We debate the upper limits to and methods for attaining national defense.

The purpose of economic and social evaluations is to objectively document public preferences for such choices. Objective evaluations help us choose

more wisely, accepting those expenditures that are in our best interests, and rejecting those that are not.

Such evaluations are not easy. National defense and environmental values are classic examples used by economists to illustrate the difficulties of estimating public values. We return to this topic below.

The task of economic and social evaluation, then, is to objectively document the entire public interest--all economic and social costs and benefits--in relevant choices. In this case, the public is being asked to review and comment on an economic and social evaluation of the multiple Camp Grayling projects in the draft EIS. The general idea here is that direct public review will add information about public values to the information in the draft EIS, improving the evaluation. Further, the review process provides an opportunity for public oversight: an opportunity for the public to see whether its values are really being considered.

To be complete, economic and social evaluations must include three elements:

1. economic impacts,
2. economic values, and
3. other social values.

These elements are often defined differently by different authors. The differences are often confusing to the public; sometimes even to social scientists. To clarify those differences, the rest of this section first defines the three elements, then describes their collective role in the decision making process for public choices like this one.

The following section reviews and critiques the draft EIS's economic and social evaluation. There, we conclude that the draft EIS partially evaluates economic impacts, mentions a few social values, and ignores economic values.

Economic and social evaluation

The sum of economic and social evaluation of public choices is intended to document the aggregate public interest in a given choice--the pros and cons, or advantages and disadvantages, of the choice.

This evaluation is similar to the kinds of evaluations made by "the invisible hand" of free markets. The invisible market forces of economic demand and supply determine that we should expand our use of personal computers, fax machines, and VCRs; that gasoline is preferable to diesel fuel in autos; and countless similar decisions. The economic "pros" are measured by the market in terms of the willingness of buyers to pay for the various goods and services available (demand). The economic "cons," or costs, are measured in terms of the willingness of sellers to sell the goods and services at going prices (supply).

Publicly provided goods must be evaluated slightly differently. Markets do not evaluate them well for any of several reasons. In the case of national defense, the "good" (eg, deterrence of war) is shared by everyone, no matter who pays for it. It would make little sense for each person to buy national defense separately in the open market. In the case of environmental protection, the lack of private ownership of environmental amenities (eg, clean air) permits people to use its capacity for carrying wastes without having to pay for the associated degradation. We establish acceptable standards of behavior toward the environment as a simple means of preventing degradation.

In cases in which markets reasonably reflect all social values, market values generally provide sufficient information for public choices. In fact, in such cases, private choices are usually better than public choices. It is those instances for which market values provide insufficient information for public choices, that public action is necessary. We, through our government

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or public referenda, need to consider more about social values of such goods than the information available in the market. We need to consider both market values and several kinds of non-market values.

For our purposes, we can divide all social values into four kinds:

1. MARKET ECONOMIC VALUES: Those values expressed in market transactions; in other words, the going market prices of goods and services.
2. NON-MARKET ECONOMIC VALUES: Social values that economists can estimate directly or indirectly in terms of willingness to pay or willingness to sell. These values would be the same as market economic values if market forces worked perfectly. They may be difficult to quantify, and appropriate estimates may not be available. National defense is a classic example. National defense benefits have rarely been quantified in dollar terms. If economic estimates are not available, such "non-market economic values" are often classified instead as "non-economic social values" (below).
3. NON-ECONOMIC SOCIAL VALUES: Social values that cannot easily (or at all) be expressed in terms of willingness to pay or sell. For example, the importance of social equity in public affairs cannot be fully expressed in economic terms.
4. ECONOMIC IMPACTS: The change in the magnitude and distribution of the economy in response to a given event. Impacts are expressed as total sales in the economy, personal income, and employment, by region and economic sector. Its significance for public choices is that it helps people evaluate whether the given event is likely to provide employment opportunities or otherwise improve our ability to participate in the economy. It also helps one evaluate the types of economic activities offered by a community, and thus the community's "character," or life style. In these respects, economic impact information is an indicator for

draft EIS. It provides an early opportunity for the public to express its values and concerns, and for the agency to use this information to improve its estimates of public preferences and reconsider its plans. The overall process may provide sufficient information to permit the agency to modify its plans to increase the net public benefits received from public expenditures.

The draft EIS has not demonstrated that the Michigan Department of Military Affairs (and the federal Department of Defense) has sufficient information to decide whether the project is in its own best interests, let alone in the best interests of the wider public. In other words, it has not demonstrated that the benefits to the national defense of the country, and other benefits of the Army National Guard resulting from the project outweigh the costs involved. Further, it has not demonstrated that it has considered several options that might greatly reduce the negative impacts on the public without reducing the military benefits.

Whatever action MDMA (and DOD) decides to take on this project, they must decide to do so on the basis of some information not documented in this draft EIS. The decision must be made in one of at least four possible ways: (1) MDMA could study the issues further (eg, in developing the final EIS), evaluate all undocumented economic and social benefits and costs of the decision, and conclude, first, that it is a good choice for the public because overall public benefits outweigh overall public costs, and second, that those benefits that apply only to MDMA's mission outweigh the costs to MDMA. (2) MDMA, in a more narrow approach, could evaluate only those undocumented benefits and costs that apply to MDMA's mission, plus the potential political and social consequences to MDMA of all other impacts, and conclude that the choice will be good for MDMA. (3) MDMA could forego much further evaluation, and decide based on partial information that either (1) or (2) would be true if they had full information. (4) In the narrowest approach, individual

particular types of non-economic social values (despite the apparent contradiction of terms. That is, it helps one assess the possibility of being employed or of engaging in business in a given community, and values related to community life style.

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The public choice process

Our constitution and government are based on the principle of individual sovereignty: the individual is the best judge of what is best for him/her. Government exists to serve the will of the people. Voters elect representatives and top government administrators to represent their best interests in government decision making.

The primary criterion for public decision making, then, is public preferences. This applies to the complex budget processes by which the public agrees or disagrees to provide public funds for projects such as those proposed for Camp Grayling, among other things.

As mentioned above, the purpose of economic and social evaluations is to objectively document public preferences for difficult choices. Such documentation does not dictate decisions, but is useful information in the decision making process. One reason we do not permit it to dictate decisions is that the documentation is never perfect. There is always some degree of error of estimation. Another reason is that there is no single best way of "adding up" preferences. For instance, economic evaluations are based on a "one dollar, one vote" criterion, whereas political evaluations are based on a "one person, one vote" criterion. There are other difficulties as well. For practical purposes, individual budget choices are, and must remain, judgments by public officials for the public--judgments of the best public interest--combined with judgments and oversight by public referendum.

In this case, the public is being asked to review and comment on an economic and social evaluation of the multiple Camp Grayling projects in the

decision makers in MDMA could each decide that the choice will be good for them because their personal economic and/or social benefits outweigh their personal economic and social costs.

Alternative (4) seems highly unlikely, despite some cynicism to the contrary. The mission of MDMA is public service, and its leaders are selected on the basis of their ability to conduct this mission. Further, such decisions are subject to administrative, legislative, judicial, and, ultimately, voter oversight. Finally, the EIS process itself is intended to provide more immediate public oversight, among other things.

Some balance between alternatives (1), (2), and (3) is most likely. As a public agency, the MDMA will undoubtedly consider the entire public interest as best it can. The main question is between alternatives (1) and (3): A question of how much further evaluation and reconsideration of options is desirable. Again, no estimates of future human behavior are completely certain. There is always some degree of error. (There is even an optimal level of error; the point at which the costs of greater certainty outweigh the advantages.) Our review demonstrates that large returns to further evaluation are possible.

What is possible, however, is that undocumented estimates--judgments--can be influenced by the kinds of partial information made available to decision makers. It is also possible that agency decision makers differ in their assessment of public values than the public. (People heavily involved in an activity of any kind are likely to develop different views related to that activity than the general public.) In other words, the initial information provided may seem convincing enough that further evaluation does not seem necessary, when in fact large improvements are possible. The EIS process is intended in part to provide an open forum; a check against such biases (intended or unintended) in the information used for decision making.

The public also does not yet have sufficient information to decide whether or not the the projects are in its best interests. However, judging by their actions and statements, many of the public who wish to use the natural resources in the vicinity of the Camp feel that their values have not fully been assessed, and fear that they will not be fully considered in the decision on the project.

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REVIEW, EVALUATION, AND CRITIQUE

The draft EIS estimates the aggregate social and economic impacts of the entire set of elements in the proposed expansion and renovation plan, rather than considering each element separately as it does elsewhere.

Its main thrust is an economic impact assessment, that shows that the sizes of Michigan's economy and the three-county economy would grow as a result of the project. It concludes that the project would economically and socially impact the three-county region positively, and would have no important negative economic or social impacts.

We conclude that the baseline economic impact assessment is misleading because it does not evaluate what the alternative might be to the camp. It also may be somewhat inaccurate in some respects. However, its assessment of the economic impact of the project may be reasonably accurate if its assumption of only a 16% increase in training is accurate.

A major omission of the draft EIS is that it does not consider the possibility that its assumptions about future use levels and patterns could later prove erroneous. The draft says that the improved facilities will greatly enhance the relative ability of the camp to provide certain kinds of training. This would increase pressure to increase training there, and the MDMA apparently would have little power to control it. If the assumptions of

the draft EIS are violated, it will have fallen far short of its intended mission of evaluating the possible impacts of the improvements.

Equally as important, the draft EIS omits several other important kinds of social and economic impacts. It completely ignores economic values. Therefore, it does not fully consider the importance to the public of the negative inpacts of certain training activities facilitated by the project. Five major public values do not appear to be fully considered:

1. The most socially significant omission is that the draft EIS does not fully consider the impacts of noise on the nationally significant recreational values of the Au Sable River system.
2. It does not evaluate the feasibility of moving all or a major portion of the proposed training activities to another site in the state or region, nor does it evaluate the social and economic values and impacts of such a move. If recreational values in the Grayling area are high and greatly negatively affected, moving some troop training to other sites might be in the greater public interest, even if training costs increase.
3. It does not seem consider the social importance of the Kirtland's warbler in its plan to convert scarce nesting habitat to other uses.
4. It does not fully consider the impact of camp activities on recreational uses of camp lands leased from the Michigan DNR. Thus, MDMA does not appear to fully comply with its lease agreement.
5. It does not assess possible terrestrial contamination in Ranges 40, 13, and possibly 30, and associated human health implications (eg, possible contaminated deer and other game).

Below, we examine these and several other shortcomings of the draft EIS in detail. First, we present certain conclusions of the draft EIS with which we have found problems. Then we discuss the problem we see with the

values of increased winter training.

EXPECTED FINDINGS:

A. The noise and toxic substances released by post-project training activities may significantly negatively impact economic and social values in the area. Economic values at risk just from noise disturbance to anglers and canoeists in Crawford County may be in the order of $6 million per year.[1] That is, they would be willing to pay that amount to maintain their uses in a high quality environment (such as was generally available in the 1970s) rather than forego those activities in that particular area. This is the maximum potential economic value of the loss that could be experienced by those particular users due to noise disturbance. (In addition, there would be a negative economic impact on the area from the loss of just those uses of perhaps $10 million per year.) These are based on current levels of use, assuming no present impact on use numbers of present noise emissions. They represent only a portion of the recreational values that are at risk. We have not estimated the potential losses to other recreational users, cottage owners, and others.

B. The project will change the location and timing--and therefore the amount—of present noise impacts on economic and social values.

C. The project could facilitate and promote future increases in troop training, particularly in the MPRC, thereby increasing negative noise and toxic substance impacts on economic and social values.

[1]This estimate is based on an estimate (based on creel and canoeist surveys from 1985 to 1987) provided by DNR biologist Gaylord Alexander of about 66,000 angler days and 50,000 canoeist days of use of the Main Branch (Grayling to McMaster's Bridge) and North Branch (dam in southern Otsego Co. to mouth) of the Au Sable, an estimate of economic values of $30 per day by economist D. R. Talhelm (based on Talhelm, D.R., 1988, Economics of Great Lakes Fisheries: A 1985 Assessment. Tech. Rept. 54, Great Lakes Fishery Commission, Ann Arbor), and the assumption that total angling and canoeing effort affected would be 200,000 user days. Our economic impact estimate of $10 million per year is based on estimated expenditures of $35 per day and a multiplier of 1.5.

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Appendix M

conclusion, recommendations for providing a better assessment or otherwise resolving the problem, and the findings we would expect if our recommendations were followed.

1. NOISE/TOXICS IMPACTS ON RESIDENTIAL AND RECREATIONAL VALUES OMITTED

The draft EIS concludes that the project would not significantly change the noise produced by the Camp. It does not evaluate possible heavy metal contamination from bombs and projectiles.

PROBLEM:

A. It does not evaluate possible changes in toxic contamination.

B. It does not estimate the aggregate expected post-project impacts on economic and social values of the noise and toxic substances produced by training activities.

RECOMMENDATIONS:

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A. Test for surface contamination and associated terrestrial animal contamination in impact areas in which live ordinance has exploded, and areas in which armor piercing projectiles have been used. Experience elsewhere has shown high levels of heavy metal contamination from evaporated casing material. Problems include uranium contamination and low level radioactivity from uranium used in armor piercing projectiles.

B. If game animals are contaminated, appropriate warnings and regulations must be issued by the DNR. Wildlife and other uses in the areas may have to be discontinued.

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C. Estimate the impacts of noise levels and frequency of occurrence on recreational values and property values in the area, with particular emphasis on trout fishing values and vacation home ownership. Determine trade-offs between volume/frequency of occurrence and recreational and property values to see if placement or training patterns could be more socially optimally allocated. Determine the impact on winter recreational

2. SIGNIFICANT ALTERNATIVES NOT EVALUATED

The draft EIS assumes on one hand that relocation alternatives for the MPRC need not be evaluated in detail because any single element of the project could not be accommodated elsewhere in isolation (section 3-2), while on the other hand assuming that if the entire project were not completed, troops would go elsewhere to train (p. 3-4.1), causing a negative economic impact in the area. The only effective alternative evaluated in the socioeconomics section is "no action," meaning continuation of present management without the project.

PROBLEM:

A. It does not evaluate the feasibility of moving all or a major portion of the proposed training activities to another site in the state or region.

B. It does not evaluate the likely positive economic impacts at the other location(s) at which some or all troops might train instead of Grayling, nor the costs of training at such alternatives.

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C. It does not evaluate the likely positive impacts on economic and social values of reduced noise and/or toxic substance emissions resulting from shifting some troop training elsewhere.

RECOMMENDATIONS:

A. Conduct evaluations A-C, above. Since complaints have greatly increased with the large increase in training since about 1978, the 1978 level of training may be reasonably tolerable. If Range 30 (proposed MPRC) or Range 40 activities (air-to-ground and/or artillery) could be shifted to another military base, perhaps the current level of remaining activities could be better accommodated in the additional space made available by the move. Perhaps remaining activities could also be shifted to more interior locations if the inholdings could be acquired. This could leave room for future expansion, which would be difficult under current conditions.

Assuming the base to which certain activities would be shifted would have a much lower impact on off-site social values than does Camp Grayling--since a site could likely be found in an area less highly prized for its off-site values—higher training costs could be justified by the move. Further, since troops from other states now train at Grayling, there would seem to be no barrier to having non-Michigan and even some Michigan troops train elsewhere in the region at a different site.

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EXPECTED FINDINGS:

A. There are likely one or more alternative training sites elsewhere in Michigan or in the region at which some or all of the training could be accommodated, for which the net impacts on economic and social values, and the net economic impacts on the regional economy, would all be positive. Negative impacts in the area would be more than completely compensated by increased military and personnel spending elsewhere. This would also likely be accompanied by increased recreational spending in the Grayling area. The result would be positive net changes in economic and social values.

B. Our review of Base Realignments and Closures: Report of the Defense Secretary's Commission (1988) suggested that the only base that might be newly available for such a mission in the region is Jefferson Proving Ground, Indiana. It has severe soil contamination problems, and is only about the size of Camp Grayling's north post, but perhaps it could accommodate a regional replacement for air-to-ground, heavy artillery, and/or the MPRC activities. Otherwise, perhaps an active base can be found.

3. POSSIBLE ERROR IN ASSUMPTIONS NOT EVALUATED

The draft EIS assumes that the total noise emissions of the post will not increase in the future, and that flight patterns of the new assault landing

strip would be directed in patterns that would not greatly disturb nearby anglers and campers.

PROBLEM:

A. There is no guarentee that these assumptions would hold for the future, and there is no evaluation of the impacts associated with relaxing these assumptions. The project would increase the attractiveness of the training available at Camp Grayling, and thus could facilitate and promote future increases in troop training, particularly in the MPRC.

RECOMMENDATIONS:

A. In addition, the impacts of possible changes in projected future use should be estimated. These include possible future increases in use of all kinds,

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possible decreases in training or noise emissions, possible changes in use patterns of the assault landing strip, and possible change from inert to live ammunition at the MPRC.

EXPECTED FINDINGS:

A. We expect that great socioeconomic impacts are possible from possible increased noise impacts.

4. INACCURATE ECONOMIC DATA

The draft EIS estimates a baseline economic impact on the three county area of $435 million, an employment impact of 14,435 (including military personnel), and a net impact on local government revenue of $2 million. It used an employment multiplier of 2.1376 and a sales multiplier of 2.1376. It also states that average state park visitor expenditures are $5.10 per visit.

PROBLEM:

A. The estimates of trainees' spending in the area are based on questionable

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data. The data came from a non-random survey conducted by the Grayling Area Chamber of Commerce in 1980. Since then, training patterns have changed. Annual trainees now spend more time in the field, and spend much less time, and presumably money, off camp in the three county region. Further, an unknown proportion of this spending occurs outside the three county area by troops while en route.

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B. Apparently no multiplier was used to estimate the total impact of trainee spending in the area. Normally a multiplier of 1.3 to 1.6 would be used for this kind of spending.

90

C. It seems extremely unlikely that the employment multiplier exactly equals the sales multiplier in an economic impact model.

D. It is not clear whether the "net change to local government" estimates include indirect effects such as the impacts of military vehicles on county road maintenance costs.

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E. Spending in the vicinity by state park users was reported by Fridgen, et al. (Fridgen, J.D., E. Mahoney, and C.M. Nelson, 1986, Michigan State Park Study: Campers and Day Users, 1985, Lansing, Mich. Dept. of Nat. Res.) to average $5.10 per person per day for resident day users, $5.45 per person per day for non-resident day users, and about $3 per person per night for campers. However, these estimates do not include any spending inside the park. Those expenditures were not estimated, but could be on the same order of magnitude. Park users purchase permits, groceries, snacks, ice, and many other items inside parks. Also the reference cited for these figures in the draft EIS (p. 4-10.20) is not listed in the references.

RECOMMENDATIONS:

A. Conduct a new survey of trainee spending patterns.

B. Reestimate the total impact of trainee spending.

92

C. Reestimate the multipliers. At least one of those cited is probably erroneous.

D. Either include all indirect fiscal impacts on local governments or clearly

explain all limitations in the estimates.

E. Recalculate the economic impact of recreation in the area.

EXPECTED FINDINGS:

A. Trainee spending in the area is probably overestimated.

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B. The economic impact of trainee spending may be underestimated or overestimated.

C. At least one multiplier cited is probably incorrect.

D. Fiscal impacts on county government seem overstated (too positive).

E. Economic impacts of recreation and tourism are larger than stated.

5. IMPACTS OF NEW CONFLICTS WITH RECREATION NOT EVALUATED

The draft EIS concludes that the project "will have no potential to impact recreation," except snowmobiler conflicts with new winter training activities (p. 4-10.26).

PROBLEM:

A. The effects on recreational uses of relocating and apparently expanding the safety fans eastwardly as the MPRC is installed (the change is not clearly delineated in the draft EIS) were either assumed to be zero or not evaluated.

B. The effects on non-snowmobile recreational uses of expanding winter training were either assumed to be zero or not evaluated.

93 C. The effects on recreational uses of occupying several acres of land for the assault landing strip were either assumed to be zero or not evaluated.

D. The effects of additional noise at the assault landing strip year around, and of additional winter noise disturbances on recreational uses were either assumed to be zero or not evaluated.

E. The effects on recreation of more frequent closures of lwased lands due to increased training schedules is not evaluated.

RECOMMENDATIONS:

A. These impacts should be evaluated in the EIS.

EXPECTED FINDINGS:

A. Each of the above instances (under "problem") represents a loss of social values derived from recreational use of wildlife, scenic, fishery (summer and winter lake fishing), and related resources in these specific areas and in the winter noise impact areas.

B. The frequent closure of leased lands can reduce the value of "access" so much that it is nearly the same as no access. The DNR should consider altering its plans for turkey, deer, and other wildlife management accordingly, considering the impact on hunting.

6. UNSUPPORTED MITIGATION

The draft EIS states that "...during (winter) tank training activities, snowmobilers will be prohibited from entering the parts of the trail which enter the safety fans." Later, it minimizes the problem by stating "if winter tank training activities conflict with snowmobile use, it is likely the snowmobile trail will have to be rerouted... A trail could be built..." (pp. 4-10.26, 4-10.27; emphasis added).

PROBLEM:

A. There is no commitment stated here to actually mitigate the obvious conflict. The lease agreements state that use will be continued on leased lands as was the practice at the time of the leases.

94 RECOMMENDATION:

A. A plan satisfactory to the snowmobilers, county commissioners, DNR, and other concerned parties needs to be developed and agreed to by all concerned, and the impact of that plan needs to he evaluated in the final EIS.

95 B. Reconsider the leas agreement. Either the DNR must agree to relinquish these and other uses, or training activities must be altered to accommodate them.

7. BASELINE SOCIOECONOMIC DATA OMITS OPPORTUNITY COSTS

The draft EIS evaluates the economic impact of the post--the role of Camp Grayling in the three-county region's economy (ie, the size of the economy with vs. without the post). It does not evaluate the economic value of the post--the post's social value in economic terms. This value is estimated in terms of society's willingness to pay to have the post vs. not having it (ie, having to conduct the post's functions elsewhere or to do without).

PROBLEM:

A. The draft EIS only presents half of the evaluation of the status of the economy without the post: It neglects to state what would be in the post's place if it did not exist--the "opportunity cost" (to the economy) of the post, in economics jargon. Economic impact evaluations generally do not estimate such economic impact opportunity costs because of difficulties in

96 forecasting, but this practice is misleading. A large opportunity cost would imply that the loss would be replaced by something else (eg, tourism), such that the size of the economy would (eventually) remain fairly constant with or without the loss.

B. The draft EIS does not evaluate the economic value opportunity cost of the post.

C. It also does not evaluate the positive impact elsewhere if the same training were provided elsewhere in the absence of Camp Grayling.

RECOMMENDATIONS:

A. Estimate the economic impacts and economic values of the alternatives to the post for baseline evaluation purposes.

EXPECTED FINDINGS:

A. A good case could be made that the economic impact opportunity cost of the post is of the same order of magnitude as the economic role of the post. In other words, the economy of the region could be about the same with or without the post, perhaps even larger without it. One would have to show that without the post the area would have a much larger tourism/resort business volume, such that the total economy would roughly equal the present one. Camp Grayling occupies an extremely valuable recreation resource: world renowned trout fishing and canoeing streams, prime scenic and forest land resources, and endangered species habitat; in a location as close or closer to the populations of southern Michigan, Ohio, Indiana, and Illinois than most competing recreation sites. Tourism and resort-related businesses rank high in the economies of many counties of northern lower Michigan. Grayling would be in a good position to "capture" a larger share of this market.

B. Similarly, and even more importantly, a good case could be made that the economic value opportunity cost of the site about as high as or even higher than the present economic value of having the post at that particular location. The same training could probably be obtained at any of several locations elsewhere at little additional cost. In contrast, the recreation and ecological opportunities of the site are unique and highly valued.

C. A good case could be made that the positive economic impact on the Grayling area of the camp were $435 million, the negative economic impact of the camp on the rest of the country (particularly at locations at which Camp Grayling's training would occur if Camp Grayling were not providing it) is an equal $435 million. The balance is zero because regional economic impacts are almost entirely transfers of economic activity from some regions to other regions.

8. IMPACT OF PROJECTS ON FOREST AND ENDANGERED SPECIES VALUES NOT ESTIMATED

The draft EIS states that unspecified acreages of timber--mostly jack pine, oak, and cedar--would be cleared by several of the projects, and that the Kirtland's warbler could be affected.

PROBLEM:

A. It does not estimate the economic and social values of these changes cited.

B. It does not estimate the losses in timber and endangered species values attributable to explosions, projectile injury, metal fragments in trees, injury due to off-road/trail activities, fires, wire, nails, etc., nor the changes in these values attributable to the projects. 97

RECOMMENDATIONS:

A. These timber values could be fairly easily assessed. The endangered species values would be difficult to assess, but it is possible.

EXPECTED FINDINGS:

A. We estimate that several acres of low-value (apparently) timber will be removed from production, with a net economic value loss of $5 to $10 per acre per year.

B. We estimate that the loss of Kirtland's warbler habitat could be valued in hundreds of thousands of dollars per year. The mitigation project for the warbler, if successful, could add habitat elsewhere of equal or greater value. Economic studies have shown that the public is willing to pay millions of dollars per year to protect endangered species (eg, see Boyle, K.J., and R.C. Bishop, 1987, "Valuing wildlife in benefit-cost analysis: a case study involving endangered species." Water Resources Research, 23:943-950). However, the mitigation project does not alter the fact that habitat loss caused by not maintaining present warbler habitat represents a large net social cost.

C. We estimate that several hundred to several thousand acres in the MPRC will be lost to timber harvesting due to additional projectile injury fragment deposit, and troop activity in the MPRC development.

9. BASELINE SOCIAL IMPACTS NOT ASSESSED

The draft EIS does not assess the periodic social impacts of a large number of temporary-duty soldiers on the Grayling community.

RECOMMENDATION:

A. Because there have been a number of complaints of negative troop behavior, and associated resident behavior (and many examples of positive behavior by troops), the possible impacts of the project on social living conditions in the area should be evaluated. 98

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TECHNICAL REVIEW III.

REVIEW OF NOISE IMPACT SECTION FOR DRAFT E.I.S. "MISSION/MULTIPLE CONSTRUCTION: CAMP GRAYLING ARMY NATIONAL GUARD TRAINING SITE, MICHIGAN

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REVIEW OF NOISE IMPACT SECTION FOR DRAFT E.I.S. "MISSION/MULTIPLE CONSTRUCTION: CAMP GRAYLING ARMY NATIONAL GUARD TRAINING SITE, MICHIGAN," MARCH 1989

Presented to:

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1. Introduction

This report discusses the noise impact issues in the draft Camp Grayling Mission/Multiple Construction Environmental Impact Statement (E.I.S.) released April 1989. At the present time the National Guard training activities at Camp Grayling are causing a very serious noise impact for the residents living near Camp Grayling. The severity of the already existing noise impact around Camp Grayling is not discussed in the draft E.I.S. The draft E.I.S. concludes that the proposed construction will not significantly increase the noise impact[1]. This is probably true in light of the excessive noise impact that already exists in the residential areas surrounding Camp Grayling.

Some of the technical aspects of blast noise impact around Camp Grayling are covered in this report. Blast noise is the source of the highest noise impact for most residents followed by the noise impact from helicopters, fixed wing aircraft, and surface vehicles.

2. Blast Noise Level Prediction

The U.S. Army Corps of Engineers, Construction Engineering Research Laboratory in Champaign, Illinois (CERL) has researched blast noise extensively during the past 16 years. These studies have produced a powerful computer program called MicroBNOISE that is designed to run on IBM-compatible microcomputers[2] to develop noise level contours similar to those shown in Figure 4-3.1 in

the draft E.I.S. MicroBNOISE can give Camp Grayling personnel the ability to calculate their own noise contours. In addition, they could calculate the changes in the contours when weapons and operations were changed -- the so-called "what if...." scenario investigations to reduce noise impact. MicroBNOISE contains Firing Point and Target Point blast noise data files for every weapon at Camp Grayling. The program input requires detail where and what types of guns are fired, and bombs dropped, during the day (0700 to 2200 hours), how many times during the night (2200 to 0700 hours),the TNT-equivalent propellant charge and projectile charge, whether the projectile explodes above, below, or at ground level, and the target point for each event.

MicroBNOISE calculates contours based on the C-weighted, day-night levels, CDNL, discussed in the draft E.I.S.[1] The algorithms used to calculate the CDNL are based on extensive blast noise propagation measurements and weapon directivity assessments[3,4] performed by CERL. The basic blast noise propagation data was obtained using a 5 pound charge of C-4 plastic explosive set off at ground level and recording the blast sound at numerous distances from 1000 feet to 15 miles in the four directions of the compass. Immediately prior to the test a specially instrumented aircraft climbed aloft to measure wind direction, velocity, and temperature as a function of elevation to enable one to compute the sound velocity profile above the blast event. The blast sound propagation tests were repeated

more than 700 times to record sound propagation data under all types of weather conditions during daytime and nighttime. Over 11,000 blast recordings were analyzed by CERL to evolve a blast noise level prediction scheme based on measurable weather parameters and explosive charge weight. A simplistic summary of the 5 pound explosive charge data is shown in the following table.

Blast Noise Level in Decibels vs Distance

For a 5 pound charge weight

Distance In miles	CSEL Min.	CSEL Ave.	CSEL Max.	Peak Min.	Peak Max.
1 mile	76	103	114	101	138 dB
2	65	91	104	87	127
5	48	82	96	66	111
10	41	77	89	58	110

The 700+ explosions of the 5 pound charge produced the same acoustic energy each time but, the distant blast noise level varied between about 40 dB to 50 dB due to the local meteorological conditions. The same spread in the blast noise level applies to all weapons whether they be small arms or 500 pound bombs. The local meteorological conditions at Camp Grayling have far more influence on the blast noise impact off-post than the difference in the noise output of a shotgun and a 500 pound bomb blast.

The following table gives correction factors, for different charge weights, to be added to the blast noise levels in the table above.

Charge Weight Correction Factor

Charge Wt. Lbs.	1	2	5	10	20	50	100	250	500
Correction, dB	-6	-3	0	+2	+5	+8	+10	+14	+16

The C-weighted, day-night average noise levels (CDNL) are derived from the C-weighted, sound exposure levels (CSEL).

$$CDNL = CSEL + 10\ Log(N_d + 10\ N_n) - 49$$

Where: N_d = number of events during daytime (0700 to 2200)
N_n = number of events during nighttime (2200 to 0700)

From the tables above the CDNL for one blast of 5 pounds of TNT at one mile is 103 - 49 = 54 CDNL. Ten 5 pound blasts during daytime plus ten 5 pound blasts during the nighttime will give an average CDNL at one mile of 103 + 10 Log(10 + 100) - 49 = 74 dB. Ten 500 pound bombs during daytime at one mile will give a one day CDNL of 103 + 16 + 10 - 49 = 80 CDNL average with a range between 53 and 91 CDNL depending on the local meteorological conditions.

MicroBNOISE can accurately predict the blast noise level out to 15 miles within a few decibels when provided specific meteorological data prior to the blast. The normal weather observations plus the information from a Doppler weather radar

will permit the computation of the sound velocity profile above the blast site. Using readily available instrumentation, Camp Grayling can forecast and control the blast noise impact over a very wide decibel range as implied in the first table above. To achieve the desired accuracy and control, it will be important to monitor the blast noise level at numerous locations around Camp Grayling in the residential areas. CERL has the necessary technical resources for implementing a weather and noise monitoring system to complement the MicroBNOISE computing program.

3. Community Response to Blast Noise

Table 4-3.1 in the draft E.I.S.[1] is a conversion table to estimate the percent of the population that is highly annoyed as a function of the noise impact level ADNL and CDNL. The A-weighted day-night average noise level, ADNL, for surface traffic and commercial aircraft noise has been related to the percent of population highly annoyed in numerous studies throughout the world. This information has been organized by T. J. Schultz[5] and is the basis for the ADNL and Percent of Population Highly Annoyed in Table 4-3.1. The C-weighted levels, CDNL, in Table 4-3.1 were derived from sonic boom tests performed over Oklahoma City in 1965. These were 6 to 8 week tests with an average of 8 sonic booms per day. An attitudinal survey near the completion of the sonic boom testing showed that residents were most annoyed by "house rattle" associated with the sonic booms. The low

frequency energy in the sonic booms excited resonances in the dwellings and caused many elements in a dwelling to rattle for a brief moment.

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Blast noise from artillery and bombs also causes "house rattle." CERL has conducted very extensive blast noise attitudinal surveys, at Fort Bragg and Fort Lewis. The results of these surveys are in very close agreement with each other but, different than the results obtained from sonic boom exposure. Blast noise is now known to be more annoying that sonic booms for the same noise level, CSEL and CDNL. Paul D. Schomer of CERL has published several technical papers[6,7,8] on the relationship between blast noise level and annoyance. The survey results show blast noise level vs annoyance to be very close to the ADNL column in Table 4-3.1 shifted downward 10 dB. Thus, the middle column labeled CDNL should have the precent dBC values replaced with the dBA values under ADNL but, with each value reduced 10 dB. A blast noise level of 55 CDNL = 15 percent of the population highly annoyed and a blast noise level of 65 CDNL = 39 percent of the population highly annoyed (HA). The U.S. Department of Housing and Urban Development will not fund or guarantee loans with outdoor noise levels above 65 ADNL (15% HA) without special provisions for sound proofing the dwelling. Levels above 75 ADNL (39% HA) are unacceptable to HUD. The CDNL computation does not include blast noise levels below 85 CSEL. This is an unfortunate holdover from the sonic boom era. For

example, a thousand artillery rounds during the day (low for Camp Grayling) just under 85 CSEL for each round are presently not included in the projected noise impact. However, if we were to include only these data the noise impact from this so called low level noise activity would result in 66 CDNL which is at the HUD level of unacceptable land use for residential housing. There is no logical rational for retaining this 85 CSEL threshold.

Figure 4-3.1 indicates there are many residents located inside the 62 CDNL and 70 CDNL contours shown. Most of the residents within the outer contour (Zone II) are above the HUD unacceptable level for residential land use. The contours in Figure 4-3.1a should be extended farther out for two reasons. First the contours should reflect the correct 15 percent (Zone II) and 39 percent (Zone III) annoyance levels based on blast noise research. And secondly the contours should include blasts from 250 and 500 pound bombs, which the present contours do not.[9]

The draft E.I.S. repeatedly states the CDNL contours shown in Figure 4-3.1 represent "Busy Day" a three month period and not a full year. The CDNL and ADNL concept are based on a full year average of the ambient sound level. The historical studies in support of this one year average concept showed only small variations in the average sound level from month to month. This is not the case for the residential areas near Camp Grayling. The U.S. Army Environmental Hygiene Agency (AEHA) has shown[10] the noise level around Guthrie Lake to be about 50 ADNL in August

1984 the week before training. During training week at Camp Grayling the daily noise level at the same locations around Guthrie Lake ranged between 80 and 90 CDNL. From these results we would predict that less than 3 percent of the population were highly annoyed with the noise environment at Guthrie Lake before training and 95 to 100 percent of the residents were highly annoyed with the noise environment during the training week. Indeed "During the 1984 Division Artillery training, noise complaints were received by Camp Grayling every day from Guthrie Lake residents".[10]

Some of the residential areas around Camp Grayling are probably receiving more noise impact than any other community in the United States located adjacent to an Army base. A high percentage of the residents around Camp Grayling spend only the summer months living in the area. The high noise impact is also during the summer months. If the 3 months of high noise impact were averaged with 9 additional months of quiet, the blast noise level contours shown in Figure 4-3.1 of the draft E.I.S. would then shrink 6 dB. This certainly would not make any sense to the summer residents that are exposed only to the high noise impact while they reside near Camp Grayling. The full time residents around Camp Grayling are benefited by 9 months of reduced noise impact. This benefit cannot be quantified because no attitudinal surveys have been conducted where residents are exposed to such high blast noise impact. The residential area around Camp

Grayling is unlike any residential area around an Army base. The attitudinal surveys around Army bases[7] can shed some light on this difference. "For a given noise level, annoyance on-post is, statistically, significantly lower than annoyance off-post. There is no statistically significant difference in annoyance levels between respondents who own or rent their homes. There is no statistically significant difference in annoyance levels between respondents off-post who do or do not have a family member working for the government. Since 43 percent of off-post respondents contained at least one household member who worked at or for some government facility (this 43 percent figure does not include households of retired military), there is no reason to assume that there would be any small levels of annoyance in a community which was less heavily made up of households who had family member working at some government facility. On the other hand, communities around Army bases with far lower percentages of government workers might exhibit higher annoyance levels. However, such communities do not generally exist."

4. Recommendations

Camp Grayling can exercise significant control over the noise impact on the nearby residents. The recent availability of instrumentation hardware and computer software is making it practical to take advantage of meteorological conditions to minimize noise impact off-post. It is recommended that Camp Grayling utilize the services of CERL to establish permanent

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noise monitoring devices in the noise impacted residential areas near Camp Grayling. The noise monitoring system should be connected with a dedicated microcomputer that will run MicroBNOISE for blast noise plus appropriate programs to generate aircraft noise contours. A doppler weather radar plus more conventional weather monitoring instruments must also be an integral part of the noise monitoring and noise impact forcasting system. With the overall system in the hands of a skilled operator Camp Grayling can begin to review and modify all noise generating activities to minimize noise impact off-post and with minimum interference with the National Guard training objectives.

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The Army and the National Guard should retain CERL to perform an attitudinal survey of the residents around Camp Grayling to understand the response of residents to the present high noise impact. The research to date has concentrated on the response of residents exposed to less than 65 CDNL. Some of the residents near Camp Grayling are exposed to daily levels as high as 90 CDNL. In the meantime, the 85 CSEL threshold should be deleted from the computation of CDNL. There is no threshold below which impulse noise should be deleted, any more than there is a threshold below which aircraft noise or vehicle noise should be deleted from the ADNL computation. Until further research is done on blast noise impact and response, the ADNL curve or table for predicting the percent of "highly annoyed"[5] should be used for CDNL but, plotted at a 10 dB lower level for CDNL to predict

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the percent of "highly annoyed" for blast noise. An alternative would be lower, by 5 dB, the currently used CDNL values to predict percent "highly annoyed" (see Table 4-3.1 of the draft E.I.S.[1]). Either technique will yield a more realistic relationship between blast noise impact and percent of population "highly annoyed."[8]

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Further development of Camp Grayling facilities should not be permitted until the existing incompatible high noise impact problems in the residential areas are resolved.

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10. Army Environmental Hygiene Agency (AEHA), "Environmental Noise Assessment No. 52-34-0445-85, Noise Environment From Operations, Camp Grayling, Michigan, 30 July - 24 August 1984," Letter, Aberdeen Proving Ground, Maryland, November 26, 1984.

TECHNICAL REVIEW IV.

SELECTIVE REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED EXPANSION OF THE CAMP GRAYLING NATIONAL GUARD TRAINING, MICHIGAN

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Jun 94

SELECTIVE REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR THE PROPOSED EXPANSION OF THE CAMP GRAYLING

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DRAFT EIS CONTENT: Pg. 3-5.5, para. 3

"Since frozen ground, dormant vegetation and a relatively heavy snow cover are common conditions during this period of time, the dangers of disturbing ground cover or damaging understory vegetation is significantly reduced."

EVALUATION:

Relatively heavy snow cover in almost all cases precludes frozen ground. Snow effectively insulates the earth, trapping warmth at the soil interface. Available moisture in this unfrozen soil allows some evergreen conifers to actively photosynthesize on mild winter days; in such cases, the vegetation is not "dormant" nor is it protected from disturbance due to military activities. Potential damages include general habitat destruction as well as mortality of small mammals (shrews, voles, mice) active at the soil interface.

RECOMMENDATIONS:

102 To DMA (Michigan Dept. of Military Affairs): Reevaluate impacts of cold weather training on vegetation, soils and small mammals, using biologists who understand the winter ecology of northern latitudes.

EXPECTED OUTCOMES:

Reevaluation will reveal that cold weather training does not cause a significant reduction in disturbance or damage to vegetation, soils and associated wildlife. Winter training modifies and destroys habitat in a way analagous to summer training. Potential damages include soil compaction, erosion, and the destabilization of plant communities as succession is set back to an earlier stage. Admission that cold weather training can severely damage an ecosystem finally occurs on page 4-5.22, para. 3.

DRAFT EIS CONTENT: Pg. 3-5.6, para. 4

"Project T3, Assault Landing Strip - as proposed will have an insignificant impact on wildlife. The nearest warbler management area is more than 1 mile to the west."

EVALUATION:

To state that the noise associated with an aircraft landing strip has an insignificant impact on wildlife is presumptuous. Objective data, derived from on-site testing, is clearly lacking. Noise can have a profound, long-term adverse effect on the behavior and distribution of wildife.

RECOMMENDATIONS:

103 To DNR (Michigan Dept. of Natural Resources): As part of the EIS process, request that the DMA commission a long-term, non-partial scientific study concerning the effects of aviation noise on wildlife within the Camp Grayling area. The study should include the Assault Landing Strip, the Grayling Army Airfield Area, helicopter landing fields, and ALL overflight corridors. Research should focus not only on the Kirtland's warbler (Dendroica kirtlandii) and bald eagle (Haliaeetus leucocephalus), but also the wild turkey (Meleagris gallopavo) and selected other birds as well as noise-sensitive mammals like the black bear (Ursus americanus) and bobcat (Felis rufus). If adverse effects are found to exist, mitigative measures designed to minimize or eliminate impacts should be undertaken immediately.

Concerning overflights, the DMA has demonstrated in the past that it does not always live up to a mitigative commitment or else is incapable of adequately policing pilot actions. For example, the Guard agreed this year to alter several flight lines passing directly over a bald eagle nest on Dog Lake in Cheboygan county, but left the responsibility for oversight and enforcement in the hands of individual squad leaders. Compliance therefore was much less than 100%. If overflights or other aviation effects are shown to be a problem for wildlife in the future, the DNR should insist upon written assurances of compliance and accountability.

Since bald eagles often nest above the surrounding canopy (in the "supercanopy"), they are likely the species to be most adversely affected by overflights. The EIS process should include a field study of how current overflights affect the five eagle nesting areas within or adjacent to post boundaries. Current overflight routes should be altered if necessary to give nesting eagles adequate solitude. Future overflight routes should be planned accordingly.

EXPECTED OUTCOMES:

The study outlined above would facilitate better management of rare, threatened and endangered wildlife inside the Camp Grayling boundaries. Since more than 80% of the acreage within the post belongs to the State or Federal government (and hence the tax-paying public), both the DMA and DNR are clearly mandated to insure the ultimate well-being of such wildlife.

DRAFT EIS CONTENT: Pg. 4-5.28, para. 4

"The introduction of new species such as the pine martin (sic) or wild turkey will likely take place off-post in forest areas controlled specifically for DNR wildlife management. In those sites the DNR staff will be able to implement its management programs specifically for-

Appendix M

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wildlife without having to consider the needs of military training or associated training activities."

EVALUATION:

The establishment of reintroduced wildlife would be easier if individuals stayed in one place. Both wild turkeys and pine martens (Martes americana, a State-threatened species) tend to venture into new areas; wild turkeys, at least, are already common on Camp Grayling property. Pine martens disappeared from the Lower Peninsula around the turn of the century but have been reintroduced recently (ca. 1986) into the Pigeon River Country State Forest and the Manistee National Forest. At least some individuals have wandered far from release points (Bill Irvine, Manistee National Forest - pers. comm.). It is likely that pine martens will become established within the Camp Grayling area at a future time if they are not already present.

RECOMMENDATIONS:

To DNR: Proceed (or continue) managing turkeys on-site in accordance with the statewide Wild Turkey Management Plan. Request similar management on Federal lands.

104 Also request that the final EIS include a management plan for pine martens, involving all suitable habitat types. Based on known marten habitat preferences in the Lower Peninsula, suitable habitats include major river valleys (e.g. Manistee, Au Sable) and associated drainages, upland coniferous swamps and mixed stands, and mature northern hardwoods. Old-growth stands with numerous hollow trees and blowdowns are favored.

EXPECTED OUTCOMES:

Abundant numbers of wild turkeys and, perhaps someday, a well-established population of pine martens.

DRAFT EIS CONTENT: Pg. 4-5.41, para. 3

Significant content omitted (see below).

EVALUATION:

The Draft EIS makes no mention of the red-shouldered hawk (Buteo lineatus), a species officially listed as Threatened by the State of Michigan (according to the Third Biennial Review of Endangered and Threatened Species). The red-shouldered hawk has experienced a drastic population decline since the early 1900s, both statewide and nationwide. Widespread fragmentation and destruction of nesting habitat in southern Michigan has eliminated virtually all former breeding populations there,

and remaining populations are today restricted to the northern periphery of the species' historic range. The Camp Grayling North Camp falls along the southern boundary of one of two regions (the other is Manistee/Grand Traverse) where breeding pairs are the most concentrated (Ebbers 1986).

According to Michigan Breeding Bird Atlas data from 1983 through 1987, three townships that fall partially within post boundaries had red-shouldered hawks present during the breeding season (Ray Adams, Kalamazoo Nature Center - pers. comm.). The description of vegetation presented in the EIS documents the presence of about 7600 acres of potentially suitable nesting and hunting habitat (Upland/Northern and Lowland Hardwood Forests plus Wetlands, pgs. 4-5.12, 5.13), or 5.5% of inventoried forest lands. In general, the habitat of greatest potential includes forested lowlands (like those found along the Manistee and Au Sable Rivers) and adjacent, upland stands of mature northern hardwood forest; areas of secondary potential include northern hardwood stands in the vicinity of lakes, wetland complexes and grasslands (B. C. Ebbers, unpubl. data).

RECOMMENDATIONS:

105 To DNR: Under authority of the Michigan Endangered Species Act, and under direction of the Endangered Species Coordinator (Wildlife Division), request that the DMA conduct a study to assess the impacts of military training on nesting red-shouldered hawks and habitat. Since extant data on red-shouldered hawk distribution and density within post boundaries is presently lacking, the study must begin with an extensive Phase I field survey (during April/May) for nesting pairs. If red-shouldered hawk nesting is documented, a Phase II evaluation of impacts will be necessary. Mitigation (Phase III) may also be necessary if military activities are found to disturb, destroy or otherwise infringe upon red-shouldered hawks or their breeding habitat.

EXPECTED OUTCOMES:

The study outlined above assures that red-shouldered hawks nesting within Camp Grayling boundaries will be afforded due protection from adverse military activities.

DRAFT EIS CONTENT: Pg. 4-5.43, para. 3, and 4-5.48, para. 3

"In return the military has less restrictive use of the Range 30 lands and a goal of no restrictions on critical training areas once the warblers leave an area."

"When the land becomes vacant of nesting warblers, control over vegetation within the area (Project T2) will revert to the military and jack pine conditions favorable to warblers will not be allowed to develop."

EVALUATION:

Although a cooperative agreement concerning Kirtland warbler management on military lands was achieved at the State level between the DNA and DNR (see EIS Appendix A), the DMA is nonetheless in violation of the Federal Endangered Species Act when it implements certain aspects of the plan. Through statements like those above, the DMA admits to willfully planning the permanent destruction of Kirtland's warbler nesting habitat, an action that Federal laws do not allow.

RECOMMENDATIONS:

106 To DMA: Revise or renegotiate those parts of the Kirtland's warbler management plan that are in violation of the Federal Endangered Species Act. Military activities should be further scaled back or eliminated in the vicinity of all current Kirtland's warbler nesting areas. Existing habitat should be preserved and carefully maintained, so that numerous stands of 8-18 year old jack pines are always available. No trades should be made for newly created lands with unproven potential.

EXPECTED OUTCOME:

DMA compliance with the Federal Endangered Species Act.

DRAFT EIS CONTENT: Pg. 4-5.45, para. 1

"No ospreys have been sited on Camp Grayling lands in recent years (Perez, June 30, 1986)."

EVALUATION:

The osprey (Pandion haliaetus) is a State-threatened species that is finally beginning to rebound from the catastrophic effects of DDT. The osprey population in Michigan is increasing rapidly, and numerous pairs are establishing new territories annually (Postupalsky 1986-88; Tom Weise, DNR Endangered Species Coordinator - pers. comm.). An assessment of the status of ospreys in relation to Camp Grayling lands made June 30, 1986 is now outdated. Given the number of small lakes within the post and proximity to two major river systems, it is likely that one or more pairs of ospreys are currently nesting and/or hunting on Camp Grayling lands.

RECOMMENDATION:

107 To DNR: Under authority of the Michigan Endangered Species Act, and under direction of the Endangered Species Coordinator (Wildlife Division), request that the DMA address the possibility that ospreys are now nesting on Camp Grayling lands. The request should call for a field

107 survey during the breeding season, and a discussion of potential impacts and mitigation alternatives if the species is present. Future management should be considered even if no pairs are now present, given the likelihood that a population will become established during the next decade.

EXPECTED OUTCOME:

A management plan for ospreys and their nesting sites, affording due protection from the adverse effects of military activities.

GENERAL COMMENTS:

Overall, the Draft EIS prepared by Eugene A. Hickok and Associates is deficient in data relevant to wildlife inhabiting the Camp Grayling site. The gross oversimplification of the area's ecology, derived in principal from old published information or personal communications (but no fieldwork), benefits neither the wild plants and animals involved nor the document review process. Any biologist familiar with northern Michigan could have produced a more insightful report.

E. A. Hickok and Associates should consider hiring a biologist to write about biology. Of the ten advanced degrees (M.A., M.S. or Ph.D.) collectively held by the preparers, none is in a field of biology. The two preparers claiming Natural Resources as an "Area of Expertise" hold M.S. degrees in Water Resources Management, and only one majored in biology as an undergraduate. Although educational background is by no an absolute indicator of expertise, it at least reveals where a person's interests lie.

REFERENCES CITED:

Ebbers, B. C. 1986. Distribution, status and reproductive ecology of red-shouldered hawks in the northern lower peninsula of Michigan. Report submitted to the Nongame Wildlife Program, Michigan DNR.

Postupalsky, S. 1986-88. Studies of ospreys, bald eagles, and other raptors - 1988. Circulated annual reports.

APPENDICES

APPENDIX I.

MATERIALS RELANTING TO TOXIC AND HAZARDOUS WASTE

A. Preliminary Monitoring Baseline Study of Chemical Contamination in Areas Surrounding Range 40

UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010-5422

WATER QUALITY ENGINEERING STUDY
NO. 32-24-0881-89
EFFECTS OF FIRING RANGE 40 ON WATER QUALITY
CAMP GRAYLING, MICHIGAN
23-27 MAY AND 23-31 AUGUST 1988

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DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ME-WM

WATER QUALITY ENGINEERING STUDY NO. 32-24-0881-89
EFFECTS OF FIRING RANGE 40 ON WATER QUALITY
CAMP GRAYLING, MICHIGAN
23-27 MAY 1988 AND 23-31 AUGUST 1988

I. REFERENCES. See Appendix A for a list of references used in this report.

II. AUTHORITY.

A. Memorandum, ARNG, NGB-ARI-E, 7 July 1987, subject: USAEHA FY 88 Environmental Support to the National Guard Bureau.

B. FONECON, 3 March 1988, between Mr. Jim Albert, U.S. Army Environmental Hygiene Agency (USAEHA) and Mr. Greg Huntington, Michigan Army National Guard, concurred with Mr. Matt Andrews, Army National Guard, on 7 March 1988, subject: Effect of Firing Range 40 on water quality at Camp Grayling, Michigan.

III. PURPOSE. The purpose of this study was to determine if Army National Guard training conducted at Firing Range 40 has had any adverse environmental impact on surface water, ground-water quality and soils in that area.

IV. GENERAL.

A. Personnel Contacted.

1. Greg Huntington, Environmental Coordinator, State of Michigan Department of Military Affairs, Lansing, Michigan.

2. LTC Lee E. Lawson, Chief, Facility Engineers, Camp Grayling, Michigan.

3. Andrea Sikkenga, Environmental Specialist, Camp Grayling, Michigan.

Use of trademarked names does not imply endorsement by the U.S. Army but is intended only to assist in identification of a specific product.

B. Background.

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1. During the scoping process for an Environmental Impact Statement being prepared for Camp Grayling, it was determined that data were needed to address the possible impact of training on the water quality in the area of Firing Range 40.

2. Firing Range 40 has been used from 1940 to the present for all conventional tactical weapons including an 8-inch Howitzer, helicopter gunnery, T.O.W. and Dragon missiles, and Air National Guard Bombing. Excess powder is open burned at the firing points.

3. Firing Range 40 is located within the headwaters of three drainage basins which are all within the watershed of the Au Sable River (Appendix B).

4. The potential hazards associated with drainage basin contamination are as follows:

a. direct soil and/or water contamination by exploding munitions,

b. surface water contamination by soil erosion,

c. ground-water contamination by leaching,

d. biological uptake of contaminants, leading to either direct toxicity, or biomagnification in the food chain which may cause problems even as high as man.

5. It is feasible that soils within Firing Range 40 could contain elevated concentrations of contaminants such as phosphates, nitrates, explosives, and heavy metals. The existence of these elevated concentrations may or may not have significant effects on the natural and human environment of the area.

6. Regarding the potential for ground-water contamination, much of the surface soils in the Camp Grayling area exhibit moderate to high permeabilities in the range of 1.5 x 10^{-1} centimeters per second (cm/sec) (reference 1) and the subsurface soils exhibit a moderate permeability in the range of 1.0 x 10^{-2} cm/sec (reference 1). Also, these are classified as sandy, acid soils that have a pH in the range of 3.6 to 6.8 and

less than 10 percent clay. The cation exchange capacity of these soils is 1.4 to 6.8 MEQ/100 g (this study). The high surface permeability, low pH, and absence of significant quantities of clay in these soils would allow the ground water to be more easily affected than in areas with different soils.

7. There are significant quantities of nitrates, phosphates, and several metals associated with explosives, propellants, smokes screens, and the projectiles and casings used at Firing Range 40.

8. This study represents a preliminary assessment of environmental impact on the water quality around the Firing Range 40 area. A more detailed analysis would involve significantly more data collection, and individual drainage basins would have to be analyzed separately. Therefore, the conclusions drawn in this study are for broad overview purposes and should not be interpreted as a detailed and comprehensive environmental assessment.

C. Sample Site Locations. See Appendix B.

D. Sampling Scheme, Methods, and Rationale. See Appendix C.

E. Analytical Methods. See Appendix D.

V. FINDINGS AND DISCUSSION. In Appendix C there is an outline of the characteristics studied at each of the sample sites and the sample site locations are presented in Appendix B. The results of the physical, chemical, and biological analyses of stream and lake water, stream and lake sediments, soils, fish, ground water, diatoms, and macroinvertebrates are presented in appendices E through J.

A. Water Analysis. The results are presented in Appendix E.

1. Stream water analysis gave no indication that Firing Range 40 was having any effect on either the North or East Branch of the Au Sable River. The bacterial counts at sample station STR1 were slightly above criteria for body contact (reference 2). However, the fecal coliforms/fecal streptococci ratio indicates the contamination is not of human origin (reference 7). Also, the entire watershed above that sample site is in the impact area where no one is allowed. There was an active beaver dam just above the site. The dissolved oxygen was slightly depressed (5.8 milligrams per liter (mg/L)) at that same sample site likely due to the beaver dam. Other than the beaver-related activities, water quality criteria for aquatic life was easily met (reference 2).

2. Lake water analysis indicated all characteristics tested were within water quality criteria (reference 2) and there was no indication that activities at Firing Range 40 were having any effect on the water quality of the lakes.

3. Ground Water.

a. Comparison to Background.

(1) Analysis of the data presented in Table E-5 indicates that the concentration of metals and nonmetals in the ground-water wells sampled during this study are very near or below the metals and nonmetals concentrations observed in the ground-water monitoring wells sampled in Land Treatment Feasibility Report No. 32-24-0807-88. The ground water wells in the land treatment feasibility report No. 32-24-0807-88 were drilled and sampled in July 1987 to establish background ground water quality near Lake Margarethe, about 20 miles southwest of Firing Range 40. They thus represent comparison to regional background data.

(2) Analysis of the data presented in Table E-5 indicates that the concentrations of metals and nonmetals in the ground-water wells sampled during this study are very near or below the metals and nonmetals concentrations observed in the public water supply wells in the vicinity of Firing Range 40. The public water supply wells (Appendix B) were used as background comparison and have not been influenced by Firing Range 40 activities.

b. Comparison to Maximum Contaminant Levels (MCL). Analysis of Table E-5 shows that the metals and nonmetals concentrations in the ground-water wells sampled for this study are near or below MCL concentrations. The metals and nonmetals data indicate that the ground water in the Firing Range 40 area would be classified as potable by both Federal and Michigan standards.

c. Explosives Analysis. Analysis of the explosives parameters in Table E-5 for monitoring wells (MW) 1 to 5 indicates no detectable quantities of explosives were found.

d. Volatile Organics Analysis. Analysis of the volatile organics parameters in Table E-6 for MW 1 to 5 indicates all analyses were below the limit of detection for the analytical method used [3 micrograms per liter (ug/L)]. Thus, no significant quantities of volatile organics in the ground water around Firing Range 40 were detected.

e. Acid Extractable and Base/Neutral Extractable Organic Analysis. Analysis of the acid extractable and base/neutral extractable organic parameters in Table E-9 for MW 1 to 5 indicates all analyses were below the limit of detection for the

analytical method used (10 ug/L). Thus, no significant quantities of acid extractable or base/neutral extractable organics in the ground water around Firing Range 40 were detected.

f. Hydrogeologic Analysis.

(1) The subsurface soil of the five ground-water monitoring wells was logged during drilling. These logs are found in Appendix K. The data indicate that the vadose zone is represented by a relatively homogeneous blanket of medium-to coarse-grained, well rounded to angular sand, with trace amounts of limestone and mafic fragments. No hydraulic barriers were encountered from the surface to the water table. The water table depth is variable and ranged from 9 feet to 61 feet. Local topography seems to control water table depth. The aquifer material was found to be the same soil and composition as the vadose zone material.

(2) An attempt was made to determine the aquifer flow direction in MW's 1, 2 and 3. Monitoring Wells 4 and 5 were too deep to determine flow direction with field equipment. The flow direction for MW 1 was N 10-30° E, away from Firing Range 40 and toward the North Branch of the Au Sable River. The flow direction for MW 2 was S 40-45° E, away from the Firing Range 40 and toward the North Branch of the Au Sable River. The flow direction for MW 3 was S 20-30° W, away from Firing Range 40 and toward the East Branch of the Au Sable River.

g. Summary of Ground-Water Quality Analysis. The ground-water data indicate that for the metals, inorganic nonmetals, explosives, volatile organic and acid base/neutral extractable organics samples, no contaminants of concern were found around Firing Range 40. Further, the data indicate that the ground-water quality around Firing Range 40 meets Federal and Michigan criteria for health and public welfare. The levels of sampled parameters found in the ground water are therefore indicative of current naturally occurring concentrations of these parameters and show no signs of adverse impacts from Firing Range 40 training activities. There is no way to know whether these levels have changed over time.

B. Sediment Analysis. The data are presented in Appendix F.

1. Stream sediment analysis did not indicate any buildup of nitrogen, phosphorus, metals, explosives, pesticides, or organic pollutants in the sediments. When comparing the nitrogen and phosphorous data, they had to be adjusted (normalized) for

the percentage of organic matter because of the variance between sites. There seemed to be a slight buildup of either nitrogen or phosphorous at a couple of sample sites. However, this did not hold true for both sampling periods so no trend could be verified.

2. Lake sediment analysis did not indicate any buildup of explosives, pesticides, or organic pollutants. However, there seemed to be slightly higher nitrogen, phosphorus, aluminum, barium, and/or zinc at some of the sample sites compared to the control. The control lake, however, was extremely oligotrophic (deep and clear with little nutrient value) with a Secchi disk reading of 35-40 feet compared to less than half that for the other lakes. The differences could possibly be due to the geological stage of lake succession caused by much greater depth of the control lake. Even if the differences were caused by the activities on Firing Range 40, the water chemistries were extremely low in all lake samples for nitrogen, phosphorous, aluminum, barium, and zinc.

C. Soils Analysis.

1. Surface Soils.

a. Metals Analysis.

(1) Analysis of the metals data presented in Table G-1 indicates that the concentration of metals in surface soils in Firing Range 40 area are very near or below the concentrations observed throughout the eastern United States (U.S.) (Table G-1). Since the U.S. Geological Survey data in Table H-1 are for the eastern U.S., they represent a comparison to regional data.

(2) Analysis of the metals data presented in Table G-1 indicates that the concentration of metals in surface soils in the Firing Range 40 area (samples SS 3-10) are very near or below the metals concentrations observed in control samples SS 1 and 2 in all but a few cases. For aluminum, SS 2 has a value of 1,170 milligram per kilogram (mg/kg), SS 5 (1,570 mg/kg), SS 6 (1,580 mg/kg), SS 7 (2,260 mg/kg) and SS 8 (1,730 mg/kg). However, aluminum concentrations have a wide natural variability in soils and have been found to compose up to 15 percent of soils (reference 26). Therefore, the range of values for aluminum concentrations found in SS 3-10 is believed to represent natural variability. For barium, SS 1 shows the highest control sample concentration of 2.49 mg/kg. This value is exceeded by SS 3-7 and SS 10. However, the regional average background concentration of barium is 420 mg/kg. Therefore, it is believed

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that the barium concentration variability of SS 1-10 represents natural variability. All other sampled metals concentrations are within the range of natural variability and do not seem to represent contamination.

b. Inorganic Nonmetals Analysis. Analysis of the nonmetals data presented in Table G-1 indicates that the concentrations of nonmetals in surface soils in the Firing Range 40 area are very near or below the nonmetals concentration in control samples 1 and 2 with the possible exception of phosphate. The highest value for phosphates in the control sample is 87 mg/kg (SS 2). This value is exceeded slightly at SS 3-8, but did not exceed 2x control. However, phosphates are a primary plant nutrient and range from 100 mg/kg to 2,000 mg/kg with an average of 400 mg/kg in humid region soils (reference 26). Therefore, the data indicate that the concentrations of phosphates in the Firing Range 40 area are indicative of natural variability. All other sampled inorganic nonmetals concentrations are within the range of natural variability and do not represent contamination.

c. Explosives Analysis. Analysis of the explosives data in Table G-1 indicates that all analyses are below the limit of detection of the analytical method used. Therefore, the data indicate that, for the munitions parameters sampled, no munitions contamination of the soil has occurred.

d. Summary of Surface Soils Analysis. The surface soils data indicate that, for the metals, nonmetals, and explosives sampled, no contaminants of concern were found around Firing Range 40. Furthermore, the data indicate that, although a large degree of chemical variability exists in the soils around Firing Range 40, this variability is typical of soils throughout the eastern U.S. and represents natural variability. The data show no signs of adverse impacts from Firing Range 40 training activities.

2. Open Burn/Open Detonation (OB/OD) Soils Analysis.

a. Metals Analysis. Analysis of the metals data presented in Table G-2 indicates that the concentration of metals in OB/OD soils in the Firing Range 40 area are very near or below the background metals concentrations shown in Table G-1 with some important exceptions. Zinc was observed at elevated concentrations of 9,200 mg/kg and 220 mg/kg at OB/OD 6 and 7, respectively. Although these concentrations exceed background levels by as much as two orders of magnitude in some cases, soil samples from areas around this location (OB/OD 5, SS 3 and OB/OD 4) do not show elevated zinc concentrations. This distribution

is not believed to be indicative of overall Firing Range 40 training activities. However, the detection of zinc at such high levels at a known open burning site is believed to be an isolated case of OB/OD activities on the ground surface. The areas on which the smoke pots and smoke grenades were burned at OB/OD 5-7 were not larger than 2 square feet. As such, this high zinc concentration in such an extremely localized area would indicate that zinc is not a widespread contaminant of concern. In addition, lead at sample OB/OD 6 is shown to be 33.6 mg/kg. The average background concentration for lead in soils for the eastern U.S. is 17.0 mg/kg (from Table G-1). Although lead concentrations in OB/OD 6 exceed background concentrations by about two-fold, soil samples from around this location (OB/OD 4, 5, 6 and SS 3) do not show elevated lead concentrations. This lead distribution is not believed to be indicative of overall Firing Range 40 training activities. However, the detection of lead at high levels at a known open burning site is believed to be an isolated case of OB/OD activities on the ground surface. Again, because such small areas are involved, lead is not considered a widespread contaminant of concern. All other sampled metal concentrations are within the range of natural variability and do not seem to represent contamination.

b. Inorganic Nonmetals Analysis. Analysis of the inorganic nonmetals data presented in Table G-2 indicates that the concentration of nonmetals in OB/OD soils in the Firing Range 40 area are very near or below the background concentrations shown in Table G-1. Although nitrate + nitrite-nitrogen, total organic carbon, pH and total organic matter values for OB/OD soil samples exceeded background levels found in Table G-1, the variability of these parameters found in the OB/OD samples is believed to be natural rather than human induced. Comparison of the inorganic nonmetals data of Table G-2 with the inorganic nonmetals soils data of USAEHA Report No. 32-24-0807-88 indicates that these parameters are all within the same order of magnitude. For USAEHA Report No. 32-24-0807-88, the soils were collected from an area outside of the influence of training activities, and therefore should reflect natural chemical variability. Thus, data indicate that all sampled inorganic nonmetals concentrations are within the range of natural variability and do not represent contamination.

c. Explosives Analysis. Analysis of the explosives data in Table G-2 indicates that all analyses were below the limit of detection of the analytical method used. Therefore, the data indicate that for the munitions parameters sampled, no munitions contamination of the soil has occurred.

d. Summary of OB/OD Soils Analyses.

(1) The OB/OD soils data indicate that, for the metals, nonmetals, and explosives sampled, no contaminants of concern were found around Firing Range 40. However, it was found that current munitions burning practices on the ground surface may create highly localized elevated concentrations of metals such as lead and zinc. Although no adverse environmental impacts from current OB/OD practices and metals dispersion in the environment were observed during this study, this may not be true in the future. In order to attenuate possible future environmental problems and concerns, OB/OD of munitions compounds should not be conducted on the ground surface. All munitions compounds should be placed in burn pans prior to burning. The containers should be designed to trap the residue and prevent it from getting onto the soil surface. After the munitions have been burned, the containers should be removed from the site and the residue disposed of in an environmentally acceptable manner.

(2) Overall, the data indicate that, although a large degree of chemical variability exists in the OB/OD soils around Firing Range 40, this variability represents natural variability with the important exceptions mentioned above.

e. Fish Tissue Analysis. The data for chemical analysis of fish tissue are presented in Appendix H. All pesticides were below detection limits and very few fish anywhere are that low in pesticides. The fish tissue was somewhat variable in metals. Some of the higher predators have bioaccumulated some mercury. None are over the Food and Drug Administrations action level of 1 mg/kg mercury (reference 3). This level is natural background. The zinc and copper seemed to be highly variable even within the same species and lake. One of the large mouth bass in K P Lake had 196 mg/kg of zinc while another fish the same size and species only had 7.3 mg/kg. Since the zinc and copper concentration in the water was undetectable and far below the aquatic life criteria (reference 2), the variable tissue concentration is likely insignificant with even the control being 49 mg/kg zinc. The rest of the metals were either not detected or were very low.

f. Macroinvertebrates. The macroinvertebrate data are presented in Appendix I.

(1) The diversity and number of species slightly increased from control through the downstream locations with clean water species found at all sample sites. Sample site STR 1 had the highest number of species even though [illegible] the location

that received the most direct runoff from the impact area. There was no evidence from the macroinvertebrate populations of any impact from Firing Range 40 activities.

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(2) The macroinvertebrate data from the lake samples were more variable than the streams. The diversity and number of species in the kicknet samples were consistent and showed no impact except for River Lake (L1) where there was an abundance of amphipods depressing the diversity even though there was as many species present as the control (L4). The large flow through rate caused by the East Branch of the Au Sable River continually feeding through this lake could supply the added nutrients to support the moderate amount of filamentous algae that was not found in the other lakes. This added growth supported a much higher invertabate population. The dredge samples all had as many or more species as the control except for Section One Lake (L4) where no invertebrates were found in the sample. The diversities were too variable to compare mainly because of the low number of individuals collected at each sample site. This is not unusual for lake sediments that make a poor substrate for invertebrates to live on or in.

g. Diatoms. Diatom data are presented in Appendix J. Diatoms were collected only at the stream sampling locations. The diversity and number of species indicates no impact from the activities on Firing Range 40. The diversity actually increases from control through down stream locations on the North Branch of the Au Sable River. However, sample site STR1 was slightly lower in diversity than the control but it was in the upper reaches of a different watershed (East Branch of the Au Sable River) and could easily be natural variability.

VI. CONCLUSIONS. Overall there has been no adverse environmental impact on the water quality of the Firing Range 40 area. Although this study represents a preliminary assessment, the data indicates that a follow-up study of a more comprehensive and detailed nature is not warranted.

A. The physical, chemical and biological data collected from the streams indicate that activities at Firing Range 40 were having no detectable adverse impact on the water quality of either the North or the East Branch of the Au Sable River. The only observed impact seemed to relate directly to a beaver activity.

B. The physical, chemical, and biological data collected from the lakes indicate that activities at Firing Range 40 were having no detectable adverse impact on the water quality of the lakes associated with the range.

C. The ground-water data indicate that, for the metals, inorganic nonmetals, explosives, volatile organic and acid base/neutral extractable organics sampled, no contaminants of concern were found in the ground water around Firing Range 40. Further, the data indicate that the ground-water quality around Firing Range 40 meets Federal and Michigan criteria for health and public welfare. The levels of sampled parameters found in the ground water are therefore indicative of naturally occurring concentrations of these parameters and show no signs of adverse impacts from Firing Range 40 training activities.

D. Stream sediment analysis did not indicate any buildup of nitrogen, phosphorus, metals, explosives, pesticides, or organic pollutants in the sediments as compared to the control.

E. Lake sediment analysis did not indicate any buildup of explosives, pesticides, or organic pollutants compared to the control. Even though nitrogen, phosphorus, aluminum, barium, and/or zinc was higher than the control in some of the lakes, the water chemistries for these substances were extremely low. It is believed the geological stage of the control lake (oligotrophic) and natural variability is responsible for the differences.

F. The surface soils data indicate that, for the metals, nonmetals, and explosives sampled, no contaminants of concern were found around Firing Range 40. Further, the data indicate that, although a large degree of chemical variability exists in the soils around Firing Range 40, this variability is typical of soils throughout the eastern U.S. and represents natural variability. The data show no signs of adverse impacts from Firing Range 40 training activities.

G. The OB/OD soils data indicate that, for the metals, nonmetals and explosives sampled, no contaminants of concern were found around Firing Range 40. However, it was found that current munitions burning practices on the ground surface may create highly localized elevated concentrations of metals such as lead and zinc. Although no adverse environmental impacts from current OB/OD practices and metals dispersion in the environment were observed during this study, this may not be true in the future. Overall, the data indicate that, although a large degree of chemical variability exists in the OB/OD soils around Firing Range 40, this variability represents natural variability, with the important exceptions mentioned above.

H. Macroinvertebrate populations in the stream samples indicated no adverse impact from, activities on Firing Range 40. The macroinvertebrate populations in the lakes were all

comparable to the control except for River Lake (L1) where high numbers of an amphipod reduced the diversity even though more species were present.

I. Diatom populations in the stream samples indicated no adverse impact from the activities on Firing Range 40.

VII. RECOMMENDATIONS. Open burning and open detonation of munitions compounds should not be conducted on the ground surface at the firing points in the Firing Range 40 area. All munitions compounds should be placed in burn pans prior to ignition. The containers should be designed to trap the residue and prevent it from getting onto the soil surface. After munitions have been burned, the containers should be removed from the site and the munitions residue disposed of in an environmentally acceptable manner.

VIII. TECHNICAL ASSISTANCE. Informal technical advice and/or assistance may be obtained from the Chief, Water Quality Engineering Division, AUTOVON 584-3554/3816 or commercial (301) 671-3554/3816. Requests for services should be directed through appropriate command channels of the requesting activity to the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-ME, Aberdeen Proving Ground, MD 21010-5422, with an information copy furnished to the Commander, U.S. Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000.

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Loren F. Phillips
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APPROVED:

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APPENDIX A

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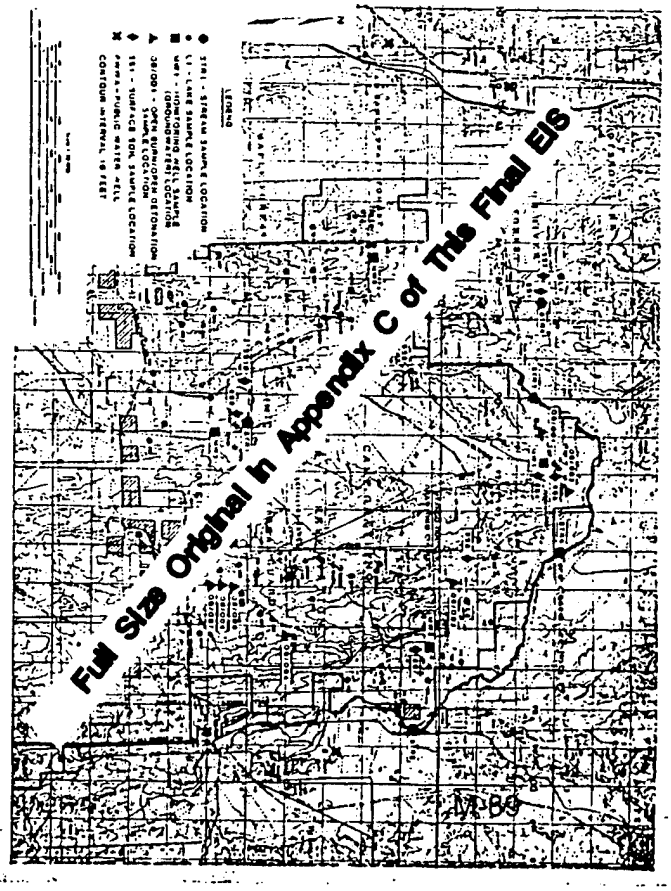
APPENDIX B

SAMPLE SITE LOCATIONS



Jun 94

B. Excerpts from Hazardous Waste Cleanup Feasibility Study at the Jefferson Proving Ground -- Madison, Indiana

7-I.B

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
GORDON E. GUYER
KERRY KAMMER
O. STEWART MYERS
DAVID D. OLSON
RAYMOND POUPORE

STATE OF MICHIGAN
JAMES J. BLANCHARD, Governor
DEPARTMENT OF NATURAL RESOURCES
STEVENS T. MASON BUILDING
P.O. BOX 30028
LANSING MI 48909
DAVID F. HALES, Director

May 5, 1989

Mr. Dan Alstott, Executive Director
AuSable - Manistee Action Council
Route 3
P.O. Box 3510 A
Grayling, MI 49730

Dear Mr. Alstott:

At the request of Delbert Rector, Deputy Director of our department, the State of Indiana was contacted for information about a munitions testing site near Madison, Indiana. The Indiana Department of Environmental Management provided us with a copy of the executive summary of their Report to the Governor about this site. We are forwarding a copy of that executive summary to you.

I hope this report will provide the information you desire. If you wish more information about the site, you may contact me or as discussed over the telephone, you may directly contact:

Ms. Jackie Strecker, Chief
Project Management Branch
Office of Environment Response
Indiana Department of Environmental Management
(317)243-5055

Sincerely,

Claudia Kerbawy

Claudia Kerbawy, Unit Chief
Superfund Section
Environmental Response Division
(517)373-8448

cc: Delbert Rector, DNR
James Truchan, DNR
William Bradford, DNR

SITE INFORMATION SUMMARY
(from Report to the Governor)

JEFFERSON PROVING GROUNDS
Madison, Indiana

Jefferson Proving Grounds in Indiana is an old Department of Defense munitions testing site which has been in use since 1941. It is currently being investigated by the Indiana Department of Environmental Management as a Superfund site. There is widespread contamination at the site due to many years of testing conventional weapons. Some specific facts are known about this site:

*Of the total site area, 8,600 acres is considered to be heavily contaminated target impact area. The remaining area contains 26,000 acres of safety zones and another 16,000 acres of minimally contaminated area. All areas require additional investigation.

*There are an estimated six million downrange potentially explosive devices in existence at this testing site.

*Projectiles are found as deep as twenty feet. A surface cleanup would only concern itself with those within three feet of the surface, as these would be subject to frost heaving and possible movement onto the surface.

*This site has a two square mile impact area containing depleted uranium. This area contains an estimated 60,000 kilograms of low level radioactive depleted uranium.

These are some of the facts known about the Jefferson Proving Grounds site in Indiana. The report estimates that it will cost more than $550 million just to undertake a surface cleanup of this site which would allow limited recreational use of the area. A complete cleanup of this site is considered unattainable.

Further information about this site is available from the Indiana Department of Environmental Management. The contact is Ms. Jackie Strecker, Chief, Project Management Branch; Office of Environmental Response. Ms. Streckers telephone number is (317) 243-5055. If you wish staff of Environmental Response Division to pursue additional information, please let me know.

Indiana Department of Environmental Management

Report to the Governor

U.S. ARMY
JEFFERSON PROVING GROUND
EVALUATION
Madison, Indiana

April 20, 1989

U.S. ARMY
JEFFERSON PROVING GROUND EVALUATION

Madison, Indiana

Indiana Department of Environmental Management
Report to the Governor

April 20, 1989

CH2M HILL, under contract to the Indiana Department of Environmental Management, prepared the technical, environmental, and engineering analysis and associated cost estimates contained herein. The opinions, regulatory interpretation, and recommendations contained in this document are those of the Indiana Department of Environmental Management.

GLT887/8

EXECUTIVE SUMMARY

This report, which has been prepared by the Indiana Department of Environmental Management (DEM) with primary technical support from CH2M HILL, is respectfully submitted to the Honorable Evan Bayh, Governor of the State of Indiana.

Jefferson Proving Ground (JPG) has been recommended for closure by the Department of Defense Secretary's Commission on Base Realignment and Closure, which was chartered by the Department of Defense to recommend military installations within the United States for closure. Although the Commission did not consider environmental cleanup costs in its recommedation, the Commission recognized that closure of JPG would result in "significant environmental impact." The environmental issues and estimated costs to return JPG to limited but productive use form the basis of this evaluation.

The primary environmental concern at JPG is the widespread ordnance contamination in the form of explosive munitions and radioactive penetrators. The problem of contamination will become more acute when the installation ceases operation as a munitions testing facility. Ordnance cleanup is an issue that cannot be separated from base closure. The funding needed to remediate the ordnance problem at JPG in a timely manner must be recognized as a cost of closure. The availability of adequate funds needs to be assured so that the ordnance problem can be addressed properly before facility closure.

FINDINGS

This evaluation has revealed three areas of overall concern to DEM should base closure be initiated:

- Cleanup Cost--As mentioned in the Commission report environmental cleanup of military installations are currently funded under the congressionally directed (PL 98-212) Defense Environmental Restoration Program (DERP). Reportedly, the requested appropriation for this program in 1990 is approximately $520 million. This would fund 1 year of environmental cleanup efforts at all military installations nationwide, including 37 Superfund sites. The cost to clean up JPG is projected to exceed the entire 1990 annual budget of DERP. Implementation of the cleanup at JPG would occur and be funded over several years. The adequacy of DERP to fund the cleanup in a timely manner is questionable.
  - The cost to clean up ordnance (explosive munitions and radioactive penetrators) is estimated to exceed $550 million.
  - The cost to close a 12-acre landfill onsite will probably exceed $5 million. Removal and offsite disposal could cost as much as $100 million.
  - The cost to close 54 underground storage tanks and encapsulate asbestos from the base buildings will probably exceed $3 million.
- Technology--Only a few range clearance operations have been completed to date and none were equal in magnitude to the cleanup required at JPG. The innovative clearance technologies and equipment tested for subsurface clearance are still developmental and lack demonstrated performance data. The use of remotely operated and armored heavy equipment for protection against the hazards from clearing impact fields containing live high explosive munitions is unprecedented and the number of trained explosive ordnance disposal professionals is few.
- Security--Because of the abundance of wildlife at JPG, trespassing and poaching pose a continual security problem, particularly in the northwest corner of JPG where the fencing is repeatedly vandalized by local poachers and hunters to gain illegal access. If test firing were to cease and the audible deterrent removed, trespassing and poaching would probably increase and be virtually impossible to eliminate. The need for improved security must be recognized and acted upon immediately upon closure. Many years of effort will be required to render the site safe for human activities, and steps must be taken to protect the public in the interim.

UNADDRESSED FACTORS RELATED TO COST

It must be stressed that the actual costs are expected to exceed the costs presented in this evaluation. The lack of pertinent site data presents difficulties in identifying and estimating a complete remedial scope. The estimates presented represent only the factors that could be reasonably quantified based upon existing information. Some of the numerous factors not included in the development of the cost estimate include:

- Additional Impact Fields--Unexploded ordnance is not confined to the identifiable designated impact areas and may be present virtually anywhere down range. Test fired items may fall short, fly long, drift left or right, skip or ricochet when they hit the ground. Furthermore, test firing records through the 1970s did not specify either the

intended impact field or the firing point from which the test was performed.

- White Phosphorous--The presence of munitions containing white phosphorus, which ignites on contact with air and is difficult to extinguish, will increase both the cost and hazards of ordnance cleanup. The white phosphorous can remain unburned for many years under the ground only to ignite when disturbed and exposed to the atmosphere.

- Depleted Uranium--The presence of depleted uranium will complicate and add to the cost of ordnance removal. More than 60,000 kg of low-level radioactive depleted uranium penetrators were fired on a 2-square mile area that also contains explosive ordnance. Only an estimated 10 percent (6,000 kg) has been recovered in the limited cleanup conducted twice each year. Therefore, closure would require addressing concerns associated with radioactive decay, including production of radon, as well as the hazards from explosive ordnance.

- Waste Management Units--There is insufficient information concerning most of the 36 potentially hazardous or solid waste management units on the installation to identify cleanup actions or costs. More data needs to be collected regarding the nature, types, concentration, depth, and areal extent of contamination, the actual physical location of the units, the groundwater flow direction, and a detailed analysis of health and safety concerns should be performed. The Gate 19 Landfill is only one of the few solid waste management units that has been investigated to some degree. It would be inappropriate to use the Gate 19 Landfill estimates to extrapolate an estimate for cleanup of other hazardous or solid waste management units. Additional study of these units could reveal the need to conduct remedial actions, which would result in additional environmental cleanup costs.

- Other Concerns--Environmental considerations that will add to overall remedial costs but were not factors in this evaluation because of a lack of information are potential insecticide and herbicide problems, PCB transformer disposal, potential leaking underground storage tank contamination, and asbestos removal and disposal.

SITE HISTORY

JPG has been used as a testing ground for ammunition and bombing since its purchase by the government in 1940. An

extremely wide range of munitions and ordnance items has been tested at JPG since 1941. Those items include propellants, mines, ammunition, cartridge cases, artillery projectiles, mortar round, grenades, tank ammunition, bombs, boosters, and rockets.

Land north of the firing line consists of about 51,700 acres. Of that, approximately 8,600 acres have been used as designated impact or target areas for test-fired ordnance. This represents the minimum area known to be heavily contaminated with unexploded ordnance.

JPG staff estimates that approximately 23 million rounds have been fired since 1941. Approximately 1.4 million of those items did not function and were considered duds. Ordnance items including duds are not normally recovered after they have been fired. High explosive rounds and duds are virtually never recovered after they have been fired because of the extreme hazards. Another 6.9 million rounds were inert projectiles, many of which were charged with live fuzes and spotting charges with explosive potential.

BASIS OF COST ESTIMATE

To develop a realistic estimate of cleanup costs, a clearly defined goal for cleanup must first be established. Recent public statements and correspondence from DOD reviewed for this evaluation imply that, with the closure of JPG, the property would be cleaned up and sold for unrestricted use, meaning that there could be no residual unacceptable risks even for residential use.

In accordance with DOD's own regulations, property cannot be released from DOD control to the public for unrestricted use unless it can be verified that no risk is posed by ordnance. Verification of risk may be impossible at JPG since, based on examination of data from numerous range clearance effectiveness studies, at best, a clearance effectiveness rate of 90 to 95 percent can be expected. Using the estimate of 6.2 million potentially explosive items at JPG, approximately 300,000 to 600,000 potentially explosive items could be left behind.

Recognizing the limitations of existing technologies and the purpose of this report, no attempt was made to quantify remediation that would be necessary to reduce the potential risk to a level that would allow unrestricted use. Rather, the cleanup envisioned would restore JPG to a condition that would allow the property to be maintained as a wildlife area open to limited recreational use with controlled access and

security provided by the DOD. This is believed to represent a realistic cleanup goal and a basis for estimating range clearance costs.

The cleanup alternatives presented are intended to be illustrative and are not to be construed as DEM's accepted or recommended cleanup alternatives for the site. This evaluation is intended to provide a realistic perspective of the cleanup and the associated costs.

The technologies, range clearance procedures, and unit cost estimates used in this evaluation were based upon review of DOD reports concerning actual range clearance experiences at other locations. While some useful information was obtained, it was obvious from the review that none of the clearance operations conducted to date come close to matching the complexity, scope, or magnitude of the ordnance cleanup at JPG. To accomplish a limited use cleanup at JPG, three levels of remediation would need to be undertaken.

About 8,600 acres of designated impact fields would require subsurface clearance. A controlled burn would be performed to remove vegetation, the ground surface would be cleared, surface ordnance would be detonated in place, and trees removed when necessary. Then excavation would be performed to a 3-foot depth using remotely controlled and armored equipment, ordnance brought to the surface would be detonated, metal fragments would be collected, and the site would be revegetated.

Another 26,600 acres of land that encompass the "safety fan" areas surrounding the impact fields would be subjected to a controlled burn followed by a surface sweep to locate and detonate in place exposed ordnance. The surface sweep would be followed by a magnetic survey to locate subsurface ordnance. No attempt was made to provide a cost estimate for subsurface clearance of items in the safety fan areas since there was no way to determine the number of subsurface items that could be encountered.

The 16,500 acres down range believed to be minimally contaminated would be subjected to a magnetic survey and visual sweep for in-place detonation of surface ordnance. While there could be an increased risk of overlooking ordnance by not clearing away the vegetation, an attempt has been made to present a range clearance process that could render the property reasonably safe for limited recreational purposes yet would not result in devastation of the natural resources.

ENVIRONMENTAL CONCERNS

The environmental concerns are not limited to the widespread ordnance contamination. Previous reports have described

36 potential hazardous or solid waste management units at JPG: 22 south of the main firing line and 14 north of the firing line or down range. They are 7 landfills, 3 thermal treatment areas, 2 abandoned farmstead well sites, 2 munition test ponds, 1 demilitarization area, 2 ordnance disposal sites, 1 wastewater treatment plant and laboratory, 2 incinerators, 3 solvent disposal areas, 6 temporary storage facilities, 2 abandoned waste piles, 1 photographic laboratory, a red lead disposal area, an indoor firing range, and a fire training pit.

Very little information is available concerning these sites and the potential environmental problems they may pose. Releases to the environment have been documented for only four areas. The other identified units have not been studied sufficiently to determine whether significant environmental problems exist.

Other environmental concerns include the potential for residual pesticide contamination, the potential of leakage from underground storage tanks, the disposal of transformers and capacitors containing PCBs, and the presence of asbestos in base buildings. More information is needed to evaluate the affects those items could have upon the overall cleanup.

Considering the number and complexity of environmental problems at the site, the high degree of wildlife productivity is somewhat surprising. Although the main use of the property since 1941 has been as a munition testing range, other land uses have included timber harvesting (over roughly 15,000 acres), recreational hunting, fishing, and camping. Portions of the property have also been kept relatively undisturbed as wildlife habitat. Approximately 35,000 acres of JPG are heavily wooded.

Paradoxically, the wildlife at JPG has adapted well to the constant exposure to the firing of munitions. Although the areas north of the firing line have been used to conduct munitions testing, they offer a large range of continuous prime wildlife habitat. A white tailed deer population persists at a density two to three times higher than that found in surrounding counties. Restricted deer hunts administered by JPG and the Indiana Department of Natural Resources have been conducted annually since the 1960s.

The JPG Natural Resources Manager has reported sitings of a variety of State of Indiana endangered and threatened mammals, birds, reptiles, and amphibians, including the bald eagle and bobcat. JPG is also believed to provide habitat for the Indiana brown bat and is known to contain an important Great Blue Heron rookery and habitats for Kirtland's snake and smooth white violet populations.

Jun 94

CLOSING REMARKS

The intent of this report has been to provide an overview of the environmental conditions at Jefferson Proving Ground and a perspective of the cost to remediate the installation to a level of reasonable safety should its current use as a testing range be altered. It is hoped that this evaluation will serve as a useful tool for sound decisionmaking concerning the future of Jefferson Proving Ground.

GLT887/10

Jun 94

APPENDIX II.

PUBLIC HEARING COMMENTS

A. Public Hearing - Camp Grayling Management Advisory Committee; Gaylord, Michigan

PUBLIC HEARING

CAMP GRAYLING MANAGEMENT ADVISORY COMMITTEE

Hidden Valley Resort, M-32 East,
Gaylord, Michigan

August 29, 1988 - at 4:00 p.m.

COMMITTEE MEMBERS PRESENT:

RONALD L. STEFFENS, Chairman
LLOYD E. STAHL
ELIZABETH WEILAND
DAVID R. SMETHURST
WILLIAM F. CARSON
GERALDINE H. GURZENDA
CHARLES J. GUENTHER
JAMES L. WILLIAMS
ROSS FOWLER
JAMES D. SCHRAMM
BLAIR C. BEDIENT

REPORTED BY:
Denise N. Ballou, CSR/CER-2880
Certified Shorthand Reporter

Denise N. Ballou, CSR
206 North Fourth Street
Roscommon, Michigan 48653
(517) 275-5761

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MR. WILLIAMS: My name is Jim Williams. I live on the North Branch of the AuSable River south of Kellogs Bridge, for those of you who are familiar with the area. My background is in public service primarily. Presently, I am a management consultant in particular to Alpena Community College as Director of the Center of Economic Expansion.

MR. GUENTHER: My name is Charlie Guenther. I am a graduate forester from the present Rose Bowl Champions.

MR. STEFFENS: Who might they be?

MR. GUENTHER: I worked thirty-five years for the Department of Natural Resources in many capacities from conservation officer to executive assistant director. I retired from the Department of Natural Resources as Wildlife Chief in 1985, and retired to a home on the banks of the AuSable River. Shortly after that, Tom Weston, who is Executive Director of Michigan United Conservation Clubs, asked me to serve as a field representative. And I now work for Michigan United Conservation Clubs serving the upper two-thirds of Michigan. I was very happy to be appointed to this committee. I think it is a pressing question, but I think that there are problems that can be solved.

MRS. GURZENDA: I am Geraldine Gurzenda. I am from St. Helen, which is near the Houghton Lake area. I am with our real estate and insurance office, and I have been on the Board of Canvassers for six years.

MR. CARSON: I am Bill Carson. I am an attorney from Bloomfield Hills. I have a practice, a general civil practice, in the City of Detroit. I am a supporter of the environment as well as the military. And my goal here is to try to find some middle ground that everybody can walk away happy.

MR. SMETHURST: My name is Dave Smethurst. I am a schoolteacher here in Gaylord. And in terms of experience, I have been an officer of Trout Unlimited and a member of the Pigeon River Country Advisory Council.

MRS. WEILAND: My name is Beth Weiland. I have been a resident of Crawford County for about twenty-eight years. I currently hold the office of County Clerk-Register of Deeds. And I have been on various boards in our community, both governmental and social groups.

MR. STAHL: I am Lloyd Stahl of Lovells, and I am a retired senior citizen. I came up here about twenty-five years ago and bought, and settled, about fifteen. I was involved with a board on zoning and recreation in Lovells and the fire department. And I was past president of Lois Harper Improvement Association in Monroe. And I retired as a chief of research and development at Libby-Owens Ford in Toledo, and involved in all interior trim of cars and trucks, boats, motor homes. And I enjoy being up here. I hope we can kind of balance the scales and come to some kind of conclusion

right back down. This occurred long enough for me to go outside and look and watch him make two passes, go into the house, call Camp Grayling, get transferred twice. I finally get a helicopter detachment. All they are concerned about is my name, my address, and what is my complaint and do I want somebody to call me in the morning. And I held the phone outside. I said, "Listen to this, will you?" I held the phone outside, and the helicopter continued to make passes.

Another instance: My wife and I are in bed. We have a water bed. Oh, it is a heck of an awakening in the morning. How about an A-10 aircraft from the Indianapolis, Indiana Air Guard dropping six five-hundred pound bombs at one time. The impact area is approximately five miles away from my house. The dog has a heart condition. It's going absolutely nuts. My wife says, "What in the heck is going on?" And the rest of the day -- they were programmed for about three days of dropping six five-hundred pound bombs at one time. They normally drop a twenty-five pound practice bomb.

There are so many instances of this. How about another one. Firing of the eight-inch gun. It is unbelievable. My wife and I are sitting in the front room. And right above her head -- it was on the news. I had news reporters at my house. We had a big meeting at my house. Right above my wife's head -- you understand when they fire

the artillery on raining, low-cloud-cover days, the shock waves that bounce off the clouds is unreal.

Ladies and gentlemen of the panel, I will make you an offer. We are sitting here at Hidden Valley quite a ways away from the impact area. You have my invitation, if you an arrange for the Air Guard to drop six five-hundred pounds, to be at my house. And then to see it at its maximum, have them fire an eight-inch gun when it is low cloud cover or raining where that sound just bounces back down.

It is just unbelievable. You would not believe what we feel. The bombing and the shelling were never this bad. I was never aware that it's this bad. I had no idea. To tell you the truth, I don't know who would buy my house. I would sell it tomorrow. It's not worth the taxes that I pay for it.

I am sure none of you people on the panel would buy a house that you know that you are going to be shaken severely, where your front picture window -- when I call on the telephone, I can see my front picture window, and I can see the reflection of the t.v. You could not see the t.v., the picture window was shaking that bad.

The only thing I have to say: If you want to give the Governor your insight into what is going on, you can visit Camp Grayling, you can see what is going on, but come to my house. You have that standing offer to come to my

And money-wise, I don't see any money from Camp Grayling. They say they are pumping in about twenty-five million a year. It doesn't mean a thing to me when I am sitting and the house is moving, and I am not moving it. I am terribly upset. I am trying to put it in nice words. I am trying to tell you that there is no compromise, there is no compromise to my house moving. I don't want the house to move. And it is moving. It is moving violently. The curtains are being blown in about a foot and a half, two foot, from the shock waves five miles away. This is what we are experiencing.

And I would love, I would dearly love, for each member of the panel to be at my house and see how my house shakes, see how the curtains blow in the window. You would not believe it, nor would you want to live there. Thank you very much.

MR. STEFFENS: Thank you, Mr. Pallarito. Sounds like the person who evaluated your damage was my builder. He says the same thing when I have problems.

By the way, do you live in Guthrie Lakes?

MR. PALLARITO: No, I don't. I live halfway between I-75 and Guthrie Lakes. I am exactly two miles east of I-75. Guthrie Lakes would be in the neighborhood of about four, four and a half.

MR. STEFFENS: Thank you. Unless there are any

questions from the committee, the next speaker is Carl Lord.

MR. CARSON: I do have a question.

MR. STEFFENS: Yes, sir. Bill, please identify yourself also.

MR. CARSON: For the court reporter, Bill Carson. When this helicopter made this diving gesture at your home, were you getting the identification of the aircraft number or anything else that would aid the Guard in finding who that pilot was?

MR. PALLARITO: Sir, you have to understand, first of all, it is a camouflage helicopter, and they are not going to run around with fluorescent numbers. And the diving run it was making at the house when it pulled out, I would estimate about eighty, ninety miles an hour. It was long enough that I had the telephone receiver out and identified them. If I may, just one more, and it will be really quick.

My wife and I were walking down a road, Sherman Road. To the north, I guess it is called Kenyon Trail. We do high-speed walking for the aerobic exercise. An Army vehicle -- obviously, of course, there is no reason for them to be down there -- drive by. And to my wife, they say, "Hey, baby." Now here is a vehicle doing about twenty-five or thirty. It is a camouflage vehicle with black spray painted numbers on the bumper; very, very difficult to see it at twenty-five miles an hour, dirt road, kicking up a little

There is two reserve units presently in the vicinity of Guthrie Lakes firing eight-inch self-propelled weapons. And they rock my house. They really do. There is damage to property. And I will admit that the Guard, in most cases, is sympathetic to the damage. A year or so of processing the claims, all the way up to Ford Meade, Maryland, and claims are maybe paid.

I think of one example of a twenty-eight hundred dollar claim, and by the time the claim was paid the price of repair was up to thirty-two. So there is a time lag. But they do come out and do take a look.

There is noise pollution, and this is worse than the blast of the weapon or the blast from the impact area. The Guard's own studies show that Guthrie Lakes area is in a Zone 3 posture. And the Zone 3 posture is an area where no weapons should be fire. It's not conducive to residents in the area and their health and enjoyment. I will get to that a little bit later if I can.

But we do have noise pollution, which damages plaster and causes it to deteriorate faster than normal. And this is by their own studies. I am quoting.

Firing points are located too close to sensitive areas or the dwellings. Now we get in the argument of the chicken and the egg: which came first. The Guard has been here, and we admit that. Some of us came after the Guard

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was that environmental study.

And I think that it would be prudent on their part if they would automatically monitor the noise without being called. And I hope that they will do it -- you know, stay a while, so that -- because when they come out, there is no firing, then there is no noise, and they think we are crying wolf.

And I appreciate the opportunity to speak before the committee, and I hope you can help us resolve our problems. Thank you.

MR. STEFFENS: Thank you, Mr. Lord. Do you have a question?

MR. SMETHURST: Could you furnish the committee with the document that relates to the zones, and also perhaps give our staff some guidance on the Harvard evaluation of decibel levels?

MR. LORD: I would be glad to share my entire file if you would like to have it. If someone will give me an address, I will Xerox appropriate material and send it to you. I would be more than happy to do that.

MR. STEFFENS: Mr. Lord, following up on the question that Mr. Carson asked of the last speaker: How long has it been since the noise has gotten to the levels that it is right now? Is that the last three years, five years, ten years, forever?

MR. LORD: My information is that the previous speaker was accurate. The last five years we have seen an intensity in the noise. And it breaks away the -- you know, the warning that property owners had when they purchased property, that distant thunder and so on. It's a matter of intensity, I think. More firing, more people.

MR. STEFFENS: But about five years since it has been very loud?

MR. LORD: I think so.

MR. STEFFENS: Any other questions? Thank you very much, Mr. Lord.

The next speaker is Robert Hartwig from Grayling.

MR. HARTWIG: I am Bob Hartwig from KP Lake, which is just south that way about as far beyond the Range 40 as we are from Range 40. And I want to bring up just one or two little things.

We have about sixty-five homes around KP Lake. And, of course, it is much less than the area around Guthrie Lakes. Let me just tell one or two little incidents, not by my house. We have a neighbor lady who I have known for about forty years. And she and her husband, like most of the rest of us, bought property after World War II, with the intention of coming here after retirement. And many folks have. And a good many of the folks in our area are retired or maybe, shall I say, a little past sixtxy. Let me bring just two

black marker so they could tell where it hit, which was a good thing. They could get their practice in. About a year or so ago, they started using live five-hundred pounders. Then we had the big incident. After that, it turned off a little bit. And I asked General Andrews why we couldn't have more use of practice ammunition. And he answered it, if I can find it. I am not very well prepared, am I? Anyway, his general answer was that practice ammunition is dangerous, more costly. I should read it. Yes.

(Reading) It is not only dangerous, but does not adequately train our soldiers to defend our great nation.

It's a great nation.

(Reading) In addition, Army research and development has concluded that it costs the taxpayers more to produce practice ammo than to reduce the hazard and produce the high explosive rounds.

In other words, the high explosive rounds of an eight-inch gun costs less to produce than the similar weight in a little 12-gauge shell with some black powder in the front of it for a practice round. Now for the 155's, they do have practice rounds. For the 105, they don't. For the eight-inch ones, they don't. They do have practice rounds for the airplanes, and they are using them now.

I have a whole list of things. And I know a number of people who would like to talk. I will just bring you those two examples of what is happening.

I might add one more thing. There is no doubt that in many minds Camp Grayling should be made into a regular Army base. I am not sure that that is the answer. If it is absolutely necessary, then it should. Then there is no reason in the world -- they should leave these little spots of population in the reservation, like KP Lake.

Now once upon a time, they were talking about buying KP Lake. Over the past forty years, there have been several times. But not too long ago they let the information loose that there was much interest in buying it. We are direct in line with the new proposed installation off North Down River Road. So I know they wouldn't dare fire from that without KP Lake being removed as a residential area. Maybe they should do it. Maybe they should buy the residential area that is within the firing range, make it a regular Army camp, if necessary, if that is the way to go. I wouldn't like it. I wouldn't like to move. I am happy where I am, and several other people are. Thanks a lot.

MR. STEFFENS: Questions?

MR. HARTWIG: Yes, I would be glad to answer them.

MR. STAHL: What house is that, near you?

MR. HARTWIG: Mrs. Heinrich? Go south from us about

DR. FREYBURGER: I am not Harold Hickman. Harold Hickman would like very much to be here today, but for medical reasons, he is unable to do so. And he has asked me to make a short presentation for him. Harold Hickman is a regular visitor to a property just downstream from our place, and we live just south of Twin Bridges on the river.

(Reading) Since it is impossible for me to attend the Camp Grayling Management Advisory Committee meeting and offer my opinions on management, future operations, and expansion of Camp Grayling, I am writing to present my comments on the various subjects, which I hope you will take into consideration.

Let me explain that I am not a Crawford County property owner. I do not have any business or financial interest in the area. I am not a gung ho naturalist. I do not fish or hunt.

As an Army engineer and a professional engineer, I have been involved in numerous engineering, flood control and ecological problems in this area since the early 1930's. I am well acquainted with the pros and cons of development and expansion.

I am interested in the preservation and the well-being of the area as well as our entire State

and surrounding Great Lakes. We have spent a lot of time and energy, as well as considerable public funds, to maintain our natural resources, to develop new forests, and to promote the continuance of wildlife in the area.

The lumber barons long ago almost desecrated the area. The people of Michigan, with the help of many state and private agencies, have worked hard to keep this area one of our country's greatest treasures. Why should it be turned over to another agency to destroy?

Getting to some of the major points of controversy brewing over the development and expansion of Camp Grayling, I and many other people are of the opinion that all factions now using this area can continue to use it in harmony with each other's interests if all parties will consider and accept usual rules and regulations.

Camp Grayling was originally given to the State for use by Michigan State militia only. It was not given for use of black-beret, German speaking combat units that float down the streams in rubber rafts among our fishermen. Bigger is not better. Expansion of facilities to accommodate up to sixty thousand troops becomes a problem.

Our next speaker is Daniel Lewis, Jr.

MR. LEWIS: Good afternoon. Thank you for the opporunity to speak. First of all, I can only echo to you some of the things that have been previously brought up. I have way down in here, (indicating), a great love for this country. I take offense with the position that Major General Vernon Andrews makes when he tries to draw adversarial analogies between the "fighting men and the fishermen." I am, ladies and gentlemen, a retired United States Navy submarine C.O. There is no rafting exercise that you can perform on the AuSable North Branch that is going to have any effect in a real war zone. That discussion was passed on to Schmidt, Commander of Camp Grayling, to stop rafting exercises.

To play with the Lovells bridge or the Twin Bridge -- and I am a resident of Lovells, Twin Bridge Road. I live two houses south of Dr. Freyburger. And I live here year-around. I have been coming here since 1954. I swore to myself that if I survived two tours in 'Nam in my military career, I would come back here to live. I am the only one who put a bid on my house from the gentleman that owned it, a very gracious engineer, who tried for five years to sell his big house. And I was the only customer in five years.

I take offense at what General Andrews says. I take offense at the statements that are made to the effect that

all other state units must come to Michigan because if we go to war, we have got to fight together; therefore, we have to train together. You will find in your research that nowhere, nowhere do you see the Michigan National Guard interacting with other states' Guard units. The other states come up here, they train by themselves, and they leave. There is no local control of those Guard units.

When I see a military vehicle parked outside of the Riverside Bar in Lovells, Michigan at one thirty in the morning, and it has been there for three hours, I question that. In my Navy, you wouldn't do that.

And as far as the shelling -- I am qualified for an observer, I did my time in the bush -- when it gets dark, it's dark. It is just as dark at ten o'clock at night as it is at one o'clock at night.

I have called the Guard. I put up with it for a couple of years, and I finally called this spring. They were playing the game to see how loud they could go before they had some calls. I called Grayling. I talked to some poor sergeant who said, "Chief, I can't tell you what is going on there. Let me talk to the artillery officer. Stay on the line." He patched me through on the "'twix." And I talked to the artillery officer. That was at 11:10 on May the 26th, I believe it was. And at 11:20, the last series of shells went on. I talked to the guy. And this first lieutenant

the commissary. I wouldn't have to go to Oscoda to go to the dispensary. I mean, it would be really convenient for me, twenty-seven miles into town, versus a hundred-something.

But that is not why I moved here. When I was a boy fishing the same waters that I fish now, traversing the same land that I traverse now, I didn't hear any Guard. I didn't hear any. When I came back from 'Nam, I came up here, I still didn't hear any Guard. It has only been in the last four or five years that the activity has intensified to a level that seems to have no control.

When they come down Twin Bridge Road in the military vehicles that is supposed to have a governor on it, and they are doing better than sixty miles an hour -- because I am following them in my truck -- something is wrong. You don't fight wars on paved roads. And you don't antagonize the residents. We try to adhere as best we can and be good neighbors.

The Guard is necessary. But I, too, am a member of the total force concept. And God forbid there should be another war and another mistake like the last we had. I will go before the Guard, though, because there aren't too many left like me around. But when and if the Guard goes, I want them to be ready. But they are not the sole defense of the United States of America. And that is all I have to say.

MR. STEFFENS: Thank you, Mr. Lewis. Questions by

the committee? Thank you very much.

Our next speaker is Reed Draper.

MR. DRAPER: Thank you, Mr. Steffens. I am Reed Draper. I am from Saginaw, Michigan. And I am the head of a company, Clearwater Realty, which owns eighteen hundred acres on the North Branch of the AuSable river contiguous to the now existing air-to-ground range. It was interesting to me, my past being somewhat of a political analyst, that during the time of the celebration of seventy-five years of the National Guard, I predicted that the military activities would not be as intense, and they weren't. I also predicted this morning that the activities of the Guard in view of these hearings would not be as intense, but I was wrong. As I walked out my building this morning, my caretaker came to me and said, "Two military helicopters just landed in the field about a hundred and fifty yards from the house." And he said one had a red star on the side and one had a cross on the side, and we assume that they were engaged in war games.

I purchased property up here in 1960. The property that I purchased originally belonged to Mrs. Arnold Boutell (phonetic), of Saginaw. And since that time, I added to the acreage. In about the early '70's, the military took it upon themselves without allowing me to act at all, or even -- the only thing I had to do was react -- to place approximately three and a half miles from our area an air-to-ground range.

military activities. I think it is a violation of that trust.

I think the economic benefits that we sometimes imagine come to the Grayling area from the military, I think are more imagined than real. I submit to you that the fall of the real estate values alone, that if the county tax authorities would recognize that, the loss would be astronomical in just their tax base.

I further submit to you that the tourists coming to the State of Michigan, if they know of it, avoid the Grayling area as if it had the bubonic plague.

I further submit that the National Guard outside the State of Michigan do not have the respect for the property upon which they are allowed to use as they would if they were Michigan residents.

I think it is a great tragedy that the Governor of this State and the legislature would even consider expanding the National Guard in the face of what is going on in the world today. I am talking about the National Guard activities in the State of Michigan.

This is probably going to become a political issue, because ultimately it gets to the legislature. And we are all very fortunate. We all vote. And I am going to do everything in my power to see that this becomes a political issue, because that is the only language that politicians

understand, is the power of the voter. So I submit to you.

I appreciate the opportunity, first, to appear before you. I have been writing letters for twenty-five years with regard to the activities of the Air National Guard -- and I have been met by deaf ears, all the way up to the President of the United States -- as to what was happening. But this is the first time I have been able to ever act rather than just react, and I appreciate that opportunity. Thank you very much.

MR. STEFFENS: Questions? Thank you, Mr. Draper. Speaking of politics, I have a feeling if you were running for something today, you would have made it.

Our next speaker is Joseph Sircone, (phonetic). I hope I have that right.

MR. SIRCONE: My name is Joseph Sircone. I am from Rogers City, Michigan. And my interest in the controversy centers around my love, I guess you would say, of the AuSable River as a place to fish. And I will be very brief. It is just so obvious to me that certain things are wrong when they are allowed to happen, and this is one of them. There are so few places left like the AuSable River that it can't be -- nobody can allow it to be destroyed. And that is exactly what is happening. It cannot be enjoyed the way it used to be enjoyed. And, again, it has been in the last few years that this has been the case. Prior to that, the Guard was

reverberations actually created -- you could feel it. You could feel the river shake under your feet. And it was just constant. It went on for probably -- I don't know how long it went on. We only stuck around for about an hour, and then we had enough and left. But you could not -- you could not enjoy fishing under those conditions.

MR. CARSON: Follow-up question. Is the damage you are talking about a long-term ecological damage or is it an interruption of the AuSable fishing and your enjoyment of it?

MR. SIRCONE: It's an interruption. I don't think that any permanent damage has been done to the river by this. The damage occurs when the noise and the training occurs. And when the noise and the training stop, the damage stops.

MR. CARSON: Thank you.

MR. STEFFENS: Mr. Sircone, the incident you just mentioned, did you say the last weekend of trout season?

MR. SIRCONE: I think it was. I believe it was the last weekend in September, last year.

MR. STEFFENS: Thank you very much. You were particularly brief. But we would like to thank on behalf of the committee all of the speakers for being as succinct and concise as they have up until now. It has certainly helped get the information across but get through a number of speakers.

The next speaker is Robert McCloud (phonetic).

MR. McCLOUD: I am Bob McCloud. I lived in Saginaw Michigan. Our family since 1938 has vacationed every summer at the east end of East Twin Lake. That is over by Lewiston. That is about twenty, twenty-two miles from Grayling and all the activity. My wife and I drove over here today because we wanted to follow and support all the complaints about the activities at Grayling. They are getting out of hand, I think. I think they need some control. I think the worse thing is during July when everybody vacations up here, at two o'clock in the morning, three o'clock or four o'clock a.m., to have bombs go off or explosions go off so that they shatter your windows twenty-two miles away. Something has to be done. Now we are all for National Guard. We are all for defense and all that sort of thing.

But I do think that they have to have some control. And I do think there are night hours that are previous and prior to twelve o'clock midnight.

Also, we haven't had the experience that some of the other people have had with the low flying airplanes. But why twenty-two miles away they like to come down and within a hundred, two hundred feet of East and West Twin Lake is beyond my understanding.

In other words, it all adds up to that if this committee can do nothing else, that they should come up with

because I was one during two wars and we have two sons in the Army: one in the Army and one in the Air Force that are regulars.

But the Michigan National Guard also has a responsibility to the residents of the area, our tourists and our visitors, and above all, responsibility to protect and maintain the natural resources which they are expected to use with reason.

I hope you panel members can find and encourage compromise on both sides so that our country can maintain a well-trained and disciplined National Guard, use our natural resources intelligently, and still keep peace with the neighbors. Such areas of compromise might include altitude controls for incoming and returning jets and helicopters. Limitations on size and numbers of bombs and shells. Days or hours of activity or inactivity. Visible efforts of trying to work together to solve the problem. That, hopefully, compromise will create cooperation without continued confrontation. Thank you.

MR. GUENTHER: Could I ask a question, please?

MR. STEFFENS: Please, Charles.

MR. GUENTHER: Pete, I guess I may be the one you are referring to. I don't know. We are long-time friends in the department. And I guess I would like to ask you the same question that some of the other panel members have. I know

you have lived there for fifty years or had a place. And I have enjoyed some nights there. Let me just make part of a statement. Part of the controversy involves around the status quo or a proposed expansion of the National Guard facilities here. In your opinion, Pete, has there been an escalation of noise and activity? And if there has, if you could categorize that for us, I would appreciate it.

MR. PETOSKEY: Well, we have lived there -- we moved there in 1984. We built a hermit home in 1979, and I came up for a couple of weeks on vacation. We have had bombing and cannon fire, et cetera, as long as I can remember. I spend more time at the lake than I used to. I think probably there is intensified activity. Personally, we live, I would say probably ten miles from the impact area as the crow flies. I think there has been some, to me, disregard -- and I would echo the previous speaker's remarks -- that there is no real excuse for some hot rod in a jet coming over the lake at a hundred and fifty feet. I think that the one speaker that lived there and talked to somebody's commanding officer and made them move up higher -- I think that is the sort of controls we need. I think that if they use the area with respect for the neighbors and with respect for the rest of the people that are around the countryside, I think a certain amount of activity, decreased activity, could be tolerated. I don't want to get into that.

an analysis, and a response.

MR. STEFFENS: Any other questions? Thank you, Mr. Petoskey.

MR. GUENTHER: Thanks, Pete.

MR. STEFFENS: The next speaker is Richard Croft (phonetic).

MR. CROFT: I am Richard Croft. I am a resident of Montmorency County, approximate location about twenty-three miles northeast of here, which puts me about thirty-five miles from Camp Grayling. And I want to say to those who were sold property in Guthrie Lakes with promise it would be like distant thunder, I want to let you know that that is what we hear thirty-five miles away.

My complaints seem like very small potatoes indeed compared to the stories I have heard so far. The property I live on is named Stellarmaris (phonetic). It is a recreational and a religious retreat formed by seven Catholic priests thirty-five years ago. We now number nine. And one of our county members was the named Catholic Chaplin for Camp Grayling for many, many years, Father George Develka (phonetic).

And we have never been bothered too much, again, until recent years. But our problem is not the distant thunder but the low flying jets and helicopters. I am the only one who is a resident there year-around. So I observe

a great deal. And I have been in contact with many people in the area who have the same complaints. It seems that we are on the major flyway towards the ground-to-air target region. Although there has been some meeting with Camp Grayling people and the Phelps-Collins Airfield people about the altitude of the jets, and some kind of agreement to stay at a thousand feet over Pigeon River forest country, which I am in, or on the east edge of, the planes keep -- we have noticed no real difference. Some of them fly at a thousand feet, so I can say I have got a pretty good ability to judge what a thousand feet is.

And just even this past Saturday, we had four F-4's come over, ranging from four to six hundred feet above. And I immediately called Phelps-Collins to make the report, as I was urged to, I believe by Major Miller. And the desk sergeant says, "No planes here. They aren't ours. I don't know whose they are. Must be from Selfridge or from out of State." Now, normally, I answered with a great deal more courtesy. In fact, last year I received an interesting call from a Lieutenant Sikorski (phonetic) as a result of having complained about helicopters flying. And I thought the name was kind of ironic. We were being repeatedly subjected to night maneuvers around our place in the middle of January, running ten, eleven o'clock at night. And I complained.

And they said, "We didn't know anyone lived there.

MR. STEFFENS: My apologies for lying to everyone. That was longer than seven minutes, but then again, the lines in the men's room were longer than at Joe Louis Arena during a hockey game.

There are three other very important people that I would like to introduce to you. And I think they represent the interests of the Governor's office, the DNR and the National Guard.

First is David Dempsey, who is the Governor's environmental advisor in working with the committee.

Second, and I hope he is back in the room, is John MacGregor. John, I don't see you. There he is. John MacGregor is the District Director for Northern Michigan with the DNR, and is also working with the committee as the official liaison from the DNR.

And, finally, I saw Brian Downey here earlier. I will introduce Brian when he comes in. But Brian is the Lieutenant Colonel who is the public information officer for the Michigan National Guard, and was working with us this morning to show us the National Guard's training area.

Again, we have completed a little over fifty percent of the people who have requested time to speak. And we very much appreciate the fact that you have been concise in providing us with information.

The next speaker is Lou Doyle. Lou?

MR. DOYLE: Thank you, Mr. Chairman. I am a

resident of peaceful, quiet, serene Farmington, Michigan. I only come up here in the summertime. I say that because my family has three houses at Guthrie Lakes. So everything that has been said so far, I have been hit three times.

The only other thing I want to bring to the committee's attention -- I don't think anyone has mentioned it yet -- is money. And you are going to be hearing a lot about that from the people that live and do business in Grayling, or maybe you already have. I don't know how much the Indiana National Guard, the Ohio National Guard, the Italian Air Force -- I hope they don't come over here with an air show -- I don't know how much those other outfits pay the State of Michigan or the DNR or whoever gets the money. But it certainly isn't worth the agony that they are putting the people in Guthrie Lakes and surrounding area.

I think that the legislature in Lansing -- if it is a hundred or two hundred thousand dollars a year that we get from those other outfits outside of Michigan, the legislature in Lansing spends that kind of money in a day. I would like to see the committee downplay, hopefully ignore, the fact that other National Guards and even foreign contingents come in here and use our land and cause the people of central Northern Lower Michigan the agonies that they do. That is all I have to say. Thank you for listening to me.

MR. STEFFENS: Any questions? Thank you, Mr.

sixteen-inch guns. It is unfortunate this meeting is being held on a Monday. I have a strong feeling if it had been held on a Saturday, there would be standing room only. But just as an indication, I would like to ask the people here from Guthrie Lakes to please stand. Thank you.

MR. STEFFENS: Any questions? I am not an expert, but I think that the rumor about sixteen-inch guns is false, because there is probably not a road in Michigan that could stand up to sixteen-inch guns. They are pretty big. Battleship guns. The battleship will probably go up in Indian River or someplace like that.

UNIDENTIFIED SPEAKER: Down the AuSable.

MR. STEFFENS: The next speaker is Gerald Benaway.

MR. BENAWAY: I am Gerald Benaway. I am an Otsego County resident, and have been for most of my life. I used to live in Waters. And somehow or another, I was able to move out to Sparr, which is northeast of Gaylord. For years, I have put up with the National Guard in our little town, and that was just something I had to live with. Now I am about thirteen miles from any other land boundaries. And at eleven, twelve o'clock at night, it is not unusual for them to have helicopters out in the fields out by where I live. I don't really believe that they should be there. They have all the acreage down in Waters where they could do all their maneuvers with their helicopters. I have to put up with jets

buzzing my house. That is something I could probably live with. The thing with the helicopters hovering over the private lands, whereas, I believe if we went into the military reservations, did those kind of things, they would have us into a Federal court. They would, you know, figure that we had trespassed on them, which is the way that I feel that they do with me.

And my second comment would be that Michigan has decided to really come down on drunk drivers. If any of the members of the committee were to sit in my parents' restaurant in Waters and watch the party store across the street, you would be just amazed at the military vehicles that go into the party store there and carry out massive amounts of beer, liquor, all kinds of things. If they are here to train, let's train, not have a party, see what we can tear up. And that is all I have to say.

MR. CARSON: Bill Carson asking a question. Mr. Benaway, these helicopters, have they landed on your private property; is that what you are telling us?

MR. BENAWAY: In the next field over. In the next forty acres.

MR. CARSON: How often does this happen?

MR. BENAWAY: Last year, I had it that I knew of, it happened three, maybe four different times. I contacted the Camp, and was given the standard response, I will get a call

years to erase itself. How many years does it take for the tracks of an eight-inch self-propelled howitzer crashing through the woods, pulverizing everything? I am sure they will remain for our children to witness.

Colonel Hampton, commander of Camp Grayling, admits he has no authority to control the out-state Guardsmen. All the more reason for them to disregard local citizens and environment. Let them ruin their own land. I have worked too hard for mine to release it to the rape and pillage of Hoosiers and Buckeyes.

An example that I would like to point out is the total disregard of out-of-state units for the people and environment of Michigan. Part of my way of life is to take a two-mile walk around the lake behind my house, which is very close to the fence which surrounds the artillery range impact area. In recent years, several firing points have been set up there. You can automatically tell where the troops have come because of their trash and their total destruction of the environment.

When I encountered a group of Lansing soldiers here a month ago, and asked them why they left all the trash on the ground, I was told to probably go have intercourse with myself.

What I am speaking of here is what a good friend of mine calls a "military condom." This is an M.R.E. wrapper,

which stands for "meal, ready to eat," number nine on the menu, chicken a la king is this one. I spoke with the manufacturer of this polyvinylchloride wrapper. And they told me that there is no specific test, but that they probably would last fifty years. Inside is another wrapper which is a foil, which would last even longer.

Now each troop is issued three of these for his stay in the field. Depending on how long he is out in the field and depending on how many troops are going to be training at Camp Grayling, there could be the possibility of a million of these deposited in the woods around all of our homes and lands that we berry pick, mushroom hunt on. If you are ever out there, you are sure to find one.

Let me read you a paragraph from the book that every soldier is issued, The Soldier in Camp Grayling Resources. On page 12, it says:

> (Reading) Do not bury trash. Used cans and bottles and boxes seem to last forever, as do M.R.E. wrappers. M.R.E. wrappers are even worse than cans. Trash bags are available upon request at logistical support building number 560.

Why aren't trash bags issued to the people? Why aren't they forced on putting these things in there?

I would like to invite you at any time to come around the forest land in our area and visit a firing point

the Air Force. They were flying in continually, usually six aircraft at a time. And when six would leave, six would arrive.

I was given the run-around by Grayling telling me various different things. But they failed to inform me that if I had a complaint with the Air National Guard, I was supposed to call Alpena. So finally, when I woke up to that after two or three visits back up here, I got in touch with a Colonel Roebuck (phonetic), who was a training officer from the Ohio National Guard. And he invited me to come up there and talk to his commanding officer, which I did; and he visited me, and witnessed the air traffic. He immediately called Lansing. And at that time, I went to General Haun (phonetic) it was, flew up, and witnessed the very same thing. And he said, "My God, this is terrible."

So some steps were originated and are still in effect today. And that is we will not have continuous aircraft pattern following each other, coming over the target area to perform their mission. That we will sustain time frames. And they reduced it usually to three aircraft, sometimes it is four aircraft. But as usual, we have complications of long-range refueling and all kinds of problems when a five-hundred pound bomb, on target, it's easier to drop them all on one side. And what am I supposed to do? And, of course, nobody knows nothing.

The one thing I want to emphasize, in this particular situation, I did contact General Andrews at Camp Grayling, who by mistake happened to be there when this occurred, and requested, "General, would you please postpone the bomb drop at four o'clock?" We had the bomb drop at four o'clock.

The other addition with the Air National Guard is, well, basically, the National Guard aircraft pattern as discussed again by the other people as very regular. We have the hot shots that fly at different altitudes, arrive over the target area, not following prescribed formation. And you can only notify -- the range officer, of course, who is in charge of the range, will not answer the telephone. And, of course, he is not controlling anything anyway. And when you contact Alpena, they don't have the courtesy of maybe calling you back.

Most recently, it was discussed with these guys on Saturday, flying in a formation, cutting low to the lake, crossing the lake, circling, and then finally doing whatever they had to do, and then reforming and zooming south. They were from Illinois. It's south, but I guess you have to go southwest to get there.

But a phone call was received. I did get a response back from a sergeant, and I am waiting for the letter. But it didn't change things, and it repeats itself. And,

units who lease the Grayling facilities. As a result, the objectionable activities continue until that particular unit has completed its exercise. And then as we see the trucks roll in, we find a repeat performance waiting for us that we are going to experience on a day-to-day, hour-to-hour basis.

In the past, relationships have been developed over a period of time with the base commander. We have been encouraged by their responses and unquestionably misled, and understandings of our problems, only to have them transferred or retired. And this requires that we return to square one to reorient the replacement after he states, "What is the problem?" It seems that Camp Grayling is a "repo depo." You get the guy's last promotion to a bird, and then he is retired. This, to me, shows poor command.

I think the most -- and probably, you know, you can put up with a lot of things. But we had made an investment here. And concerning property values, as I stated in my opening remarks, I purchased my property in 1982 to enjoy the natural resources of the area. As any other property owner expects, I anticipated the value of my property would appreciate. Don't we all do that: buy a home and they tell us about inflation, and we say, "Well, ten years from now when I go to sell it I am going to benefit by all the improvements I am making, and this is going to be fine." I was totally dismayed. In July of last year, I had the

National Bank of Detroit reappraise my property. And I quote from the appraisal:

> (reading) The Army National Guard has a bombing range a few miles east of the subject. As such, there is a considerable amount of noise during the summer months. This results in some external obsolescence. Due to the rural area and bombing noise, it generally takes more than six months to sell a house in this area. Some external depreciation is charged to the nearness of the bombing range in the rural area.

The appraisal reflects that the purchase price that I -- I bought this home over six years ago. There has been no appreciation whatsoever. And other homes in our development have been sold for less than the property tax appraisal amounts. Thus, the valuation has been reduced.

When you purchase something, you hope to benefit by it years from now. You have, and I have when I lived in Bloomfield Hills, only to find out there is a negative impact, and what I paid for I am not going to -- I am going to get less when I try to sell this property.

To summarize, I have attempted to enlighten this committee regarding the concerns of one resident living almost adjacent to the range. You call this a fact finding meeting at the request of Governor Blanchard in order to

obvious.

I also include in my commentary a map which shows the proximity of our property and particular artillery range. Thank you for your time.

MR. STEFFENS: A couple questions before you sit down. Bill?

MR. CARSON: Bill Carson. It is actually not a question. On behalf of myself, and I think for the rest of the committee, if you will supply us with specific claims that you have -- not generalizations, not policy, but rather specifics: this occurred on this date at this time, that will allow us to ferret out those responsible --

Let me finish. That will assist us to ferret out those people that are responsible, and find out if there is a good explanation. And if not, to find that out. And then to be able to react to your specific problems.

MR. STOFA: Mr. Carson, you are exactly right. You know, I started immediately when I moved up here in '82 to get involved. I have been in Lansing. I have been before the EPA. I have been so many times to Camp Grayling and Alpena and other areas discussing exactly what you just asked for.

And I will be very blunt with you, then. There has been a deliberate attempt by the National Guard to avoid documenting exactly what you want. And if you get a copy

of the article of the study of what was going on in Massachussets, you will see it is no mystery, that this is a planned tactic because we have -- and I will say this sincerely -- people in the military service, but they are not talking to the battalion. They are talking to the citizens. And they don't know how to cope with it. So they treat the citizens like they are a Private. And they try to be nice and they try to go through all that, and they try to say, "I am God here, and when I say I am going to do something, you better listen to me." Unfortunately that is the problem. We have struggled to try to document this. We know exactly what you are talking about. You gentlemen here and ladies have a very difficult course, because you are not going to get documentation. And for us to start creating documentation is to repeat the conditions that are continuing to go on.

Now the only way I suggest you get firsthand exercise is, I suggest you have the Governor order all those shells and be within one mile of that area, and experience it yourself. Have them do what they normally do and continue. And I am telling you, it is very simple.

MR. STEFFENS: We have another question.

MR. STOFA: Yes. I am sorry.

MR. STEFFENS: Dave, did you have a question?

MR. SMETHURST: Yes. And, again, it is a similar line that Bill has suggested. I understand your problems

request under the Freedom of Information Act. We are presently in litigation over that.

The Army Hygiene Agency in Carl's document, attempted to extrapolate the explosive effect of a 105 gun into a five-hundred pound bomb. That seems to be unrealistic when they can come up here and bring an airplane over and drop a five-hundred pound bomb and measure the effect. Again, up-to-date noise information is badly needed. And it should exist, because a well-managed army base, if done professionally, will have this information. You have to know what to ask for.

I would like to talk about a tour. I realize that you have been in the company of Camp Grayling officials who have shown you around. I would like you to take a tour with me and Ron Schwarz. We will show you what you need to see.

We will show you areas where the Earth is being ground into powder. And where it rains, if you drive through, you push waves of slop in front of your vehicle. We will show you an area that looks like the moon with targets on it. And the gentleman, Mr. Stofa, spoke and suggested that you be permitted to see this at a time when the Governor orders Camp Grayling to do what they normally do, is an excellent suggestion.

The guns that they are using here, the eight-inch gun, is capable of shooting a two hundred five pound

projectile, high explosive, twenty miles. I am informed that recently one of those guns had erroneously received a full charge of propellant. And it was only within a matter of seconds that the lieutenant discovered this and unloaded some of the propellant, or that two hundred five pound projectile would have gone twenty miles and would have landed somewhere in or near Gaylord. Thirty-seven pounds of TNT are a high explosive. The fact is that that gun is just too big for Camp Grayling. The impact area is out near Guthrie Lake inside a fence, which, incidentally, is not a security fence. That fence is what we call a C.Y.A. fence.

MR. STEFFENS: We know. We know.

MR. ALSTOTT: I am sure you do. It is terribly dangerous in there. I don't go in there, because you can be killed in there from duds that have slowly surfaced and are just waiting for someone to walk by.

The problem is: The area is just plainly too small to do what is being done. Keep in mind, the gun will shoot twenty miles. And if I am at war, I would like to have my guns as far away from the enemy as I can. And I would like to have my gunners proficient in hitting the target twenty miles away. The fact of the matter here at Camp Grayling is that those guns are permitted because of constraints on the size of the range to shoot only between four and five miles. The range is just too small.

MR. STEFFENS: Questions from several people.

MR. GUENTHER: I had a question or part of a question, Dan. And then I would like to make a statement on behalf of the committee here, an unrehearsed statement. At our early organizational meeting, we discussed how we should go about our charge. And we are all taking this very, very seriously. We asked General Andrews, who was at our initial meeting, and were given a nonrestricted pass for all of Camp Grayling. Needless to say, I don't think any of the committee members is going in an unrestricted area (sic). I wouldn't recommend that. We are not going to ask for that. And there will be areas of the military reservation that we are going to ask for conducted tours other than the tour that we had this morning. And I am sure some members of the committee will avail ourselves of private tours, because this is a look-see, and it is a difficult decision. And, frankly, we are not going off half-cocked.

MR. ALSTOTT: I appreciate that. Our offer to take you on a tour is made with the greatest sincerity.

MR. GUENTHER: I appreciate that. We will probably take some of you up on it.

MR. STAHL: As a neighbor, Dan, I was just a little bit worried. I hope you don't take us into that area you are talking about where we are going to be shot.

UNIDENTIFIED SPEAKER: By either side.

MR. ALSTOTT: But you can drive around the outside of this fence and around in the woods, and you can see all you need to see. And you should do it. You can't appreciate what is out there until you do. Any other questions?

MR. STEFFENS: Jim Williams, did you have a question?

MR. WILLIAMS: Yes. Dan, we have heard several times today that the noise has increased over the last five years. Is it because of the type of artillery that is being used, or is it the intensity that it is being used?

MR. ALSTOTT: It is probably both. In this 1983 noise study, there was -- they told about twenty-eight thousand five hundred-some rounds fired during the annual training of that year, which equates over a three-month period to two hundred twelve big ones a day. I guess one thing I would like to ask the committee to do is find out exactly how many rounds of these heavier calibers are fired now. It might be real enlightening. I think the comparison between a twenty-eight thousand and what is going on -- not this year -- look at last year. This year is down a little bit because of all the bad guys floating around in the civilian corp, myself included. Okay. It's down a little bit because your committee was formed. Look at last year, 1987. Other questions?

MR. SMETHURST: Although not too many speakers

appreciate your indulgence. If there are no other questions -- I will be pleased to answer any more.

MR. STEFFENS: Thank you very much.

MR. ALSTOTT: Thank you.

MR. STEFFENS: Mr. Schwarz, do you happen to recall the date on that power outage, or could you get it to us at some later date? Glad I asked?

MR. SCHWARZ: I am having trouble reading my notes.

MR. STEFFENS: That is okay.

MR. SCHWARZ: I have it all documented. And thanks to Dan Alstott, he requested a written report from the engineer, who wrote back a written report that the outages were caused by gunfire. Okay. We are not saying -- we cannot prove the military shot out the insulators on this line. But one thing I can prove is that my power outage was prolonged by the fact that service trucks could not get through there because the tanks had destroyed the right-of-way. And I do have it all documented.

MR. STEFFENS: If we could get it from you, we would appreciate it.

The next speaker is Bill Routella (phonetic). I hope I am close.

MR. ROUTELLA: Thank you, Mr. Chairman, committee members. I also live at Guthrie Lakes. And I am going to try to make this as brief as possible. And I do want you to know

my exact feelings in regard to the National Guard. We purchased our property in Guthrie Lakes in 1973, December. And the purpose was for recreation for my family, and eventually, my retirement home. That day has now arrived. I retired in December of 1986. My wife and I moved here in April of '87 as a permanent residence. We love the area, the people and all the natural resources and the wildlife.

Attached, I say, but I have a copy of the State of Michigan report that I received -- property report that I received. And I am going to give you a copy of this that I am reading to you at the moment, which clearly states -- and I would like to read that for the benefit of some of the people here that don't know what this exactly says. But it is on page 7, and it is item (D). It says:

> (Reading) That the list of all existing or proposed unusual conditions, material circumstances, features, relating to the location of the subdivision and to noise, safety, and other nuisances, which affect or might affect the subdivision.

The answer to this says:

> (Reading) Adjacent to this development to the east and south is Camp Grayling. This area is used for military training by the National Guard, including jet aircraft, artillery, during portions of the

down in Florida. I received a check for this twenty-eight hundred dollars and change. Well, when I got back up here, I got the chimney fixed. I got all of the -- well, first off, I went back to the same builder. And I said, "Look, I am ready to go. I want to get this all fixed up." And Carl was a little incorrect in his second number that he quoted. But now the builder wanted three thousand forty-five dollars to do what he did prior.

So, anyway, over the summer I have had work done in order to try to stay within the twenty-eight hundred that the government had given me. I went to different contractors and had it subcontracted myself. And I did all of my deck work myself in order to save some money in that respect.

So, anyway, I am kind of rambling on here. But to make a long story short, I did receive payment. And, really, it is remuneration. But it is only happening again. I already have additional cracks in my plaster. I have a brand-new crack in my basement wall, which is in the front portion of my basement. And this has happened over the heavy bombardment that we have experienced. And the days -- June the 14th was real heavy. I called Major Foehl. I was referred to the range officer. The range officer said, "Well, I can't do nothing about it. I got my orders," you know, and just give me sympathy.

Then again on June 16th, heavy. July the 14th,

early a.m., heavy bombardment. July the 18th, heavy, 11:15 a.m. July the 31st starting at 7:12 in the morning. How would you like to get woke up to that in the morning? It's no fun, really. It is a bad experience.

I served in World War II myself. I was an engineer-gunner on a B-17 flying combat out of England. So I know we need the National Guard. Otherwise, our country wouldn't be as great as it is today, because over the many years, the National Guard has helped to make it that way. But there surely has to be some middle of the road where we can all get along happily together, that surely they can depress the noise level of those bombs, of the heavy guns.

And in conclusion, I feel that there is enough technology today to where the impact load of the shells used can be lessened and still record their effect.

My wife and I have led a good life together. We have not had to beg for anything in our entire life, fortunately. We have been fortunate. But I am coming to you people today begging that you do something to help us get out of this dilemma. Thank you for your indulgence.

MR. STEFFENS: Thank you, Mr. Routella. Any questions from the committee? We appreciate the dates. It will be very helpful.

MR. ROUTELLA: Thank you.

MR. STEFFENS: Mr. Peter Gustafson.

on into the wee morning hours. It was not the most severe noise disturbance that we have had, but it was an example of the kind of explosions and concussions that pass out over the main stream and South Branch, which are audible, which shake the building that one is in, and which obviously disrupts sleep or any other kind of normal activity, to say nothing of the kind of recreational experience that we as Michiganders ought to hope can be enjoyed on places like the AuSable River.

It is clear to me as it has been to some of the other speakers that this activity has increased in the last several years. I don't know why. I think that that probably could be gleaned from the records available to the National Guard in terms of increased training activity, the type of weapons used, perhaps the locations.

I read one interesting comment by someone who indicated that some clear-cutting of timber had occurred in areas that would have otherwise buffered the ranges from the AuSable River area and certain other places, which I think is the height of folly, for us to take natural sound buffers and cut them down or eliminate them.

But clearly, the noise has intensified. And as increased use of the base and increased use by out-of-state units occurs, there is a threat that this will exacerbate further.

We have not only the concussions from the explosives which can shake buildings and which are of that degree of magnitude in my area -- and I would hope that you would speak with others on other parts of the river so that you could gauge where these events occur and how far the problem reaches. But in my area, we have audible machine gun fire. And for those of you who have not been in the armed forces, what I am speaking of is the audible "rat-a-tat-tat", a machine gun sound, of a 50 caliber machine gun, not distant rolling thunder any more, but the actual sound of machine gun fire while you float down the river or stand in the river or, in my case, stand in my front yard.

We have occasional low flying aircraft. I did, for example, this June write a letter because I was sure that the helicopter gunship that flew south over the main stream down the South Branch at -- I won't say treetop level, because it was not, but it was certainly under a thousand feet. And those are very, very loud aircraft, again, for anyone who has been near one.

It then circled again north. On that particular incident, I wrote because I was reasonably certain that the aircraft was not where it should be, probably lost. It just happened to be at the height of the caddis hatch, for those who are fishermen, and put everything down on the river, including a few fishermen, I expect, maybe face down on the

redirected us around a very soft sand, rutted trail. We got stuck with my camper, my motor home. Well, fortunately, the National Guard very graciously almost lifted the camper out for us.

Later that day, I think this was the same time. I can't be sure of that. I believe these were Indiana National Guard at that time. At about that same time, we were in there, and there was a fire going, smoldering, approximately fifty to a hundred feet in diameter. No one was concerned about it. So we found one of the gun crews and reported the fire to them. We continued on into our property.

About two and a half hours later, we returned. The fire was still smoldering. Nothing had been done. Luckily, there must have been a lot of rain, so the soil was damp, and there was no wind. Otherwise, we would have had a tremendous forest fire in there. On our way out, I tried to call the natural resources. It was after six o'clock, so they didn't answer their phone. So I called the State police and gave them the information. They must have put the fire out, because later on we went back in and it had not spread. I feel that that is very poor supervision. It is an indication of poor leadership.

Now I have a letter here that I am going to leave with the committee, and I would like to read this, as our minimum, minimum concern, minimum recommendations.

(Reading) To the Management Advisory Committee: We and our sons have forty acres on the North Branch of the AuSable River, colored blue on the plat map which we enclose, showing our property. The AuSable area of our property is south. The useable area of our property is south of the river. Due to the marsh and water on the north side of the river, our only access is Ford Road coming in from Waters.

We wrote a letter to our representative in Michigan explaining some of the problems we have had traveling the Ford Road to our property. We received a telephone call from a National Guard colonel -- unfortunately, we don't have his name. He said he was calling from Lansing -- stating that the Ford Road is a public road and that we have safe access at any time except when it is posted for artillery activities, which would be for only a few minutes.

However, on the morning of August 29th, 1988 -- that is today -- we found a permanent sign, see photo, on the Ford Road stating, "Danger. No trespassing. Release of ordnance is continuous and unannounced. Therefore, your safety cannot be ensured beyond this point."

Also, one-quarter mile east of a similar

kids that have no experience. They aren't doing us any good. All they are doing is making a racket and tearing up the area.

And I would like to know, and I would like you to find out, just what kind of equipment they are training on. There is no member of this board that is in the military that I could ask a question: How new is this equipment, how necessary is this equipment.

If you think that the people of Northern Michigan are going to put up with this much longer, you are crazy. Because I am like the guy on television, I am mad as hell. And if it was necessary, I would say fine. But it is not. Most of the racket and noise is made from obsolescent equipment which will never, never, never be used in any war.

As far as the economic benefits, I own a small store, my wife and I, in Gaylord. We never have had any business that we can relate to the army from Grayling. Not a nickel. So I just wanted to put my two cents' worth in. And if you will, please, find out what kind of equipment is making this racket, what are these people upset about, is this equipment necessary to use, why is it necessary to use.

If it is not necessary, if it is not valid training, let's have them knock it off. Thank you.

MR. STEFFENS: Thank you, Mr. Shirk. I sincerely hope you are wrong about them taking the old veterans first.

Hal Green?

MR. GREEN: My name is Hal Green, and I am from the area of Lewiston, which is approximately thirty-two miles east of Gaylord. I don't have any prepared notes. And I came here specifically to listen to the people and their problems. And their problems, I submit that they sound a great deal more serious than mine are. Mine only consist of being awakened at two thirty in the morning or three or four or all of those hours when my house starts rattling. And it took me a while to realize that the house wasn't going to fall in on me. And all I had to do was get up and read a book and stay up all night.

But my biggest problem is that I have been coming up here since before World War II with my father, the Atlanta area. We did a lot of hunting. And that is when it used to take seven hours to get up here. The last few years have been absolutely unbearable for anyone to try to come up here. And now I am retired. But my wife won't come up here and stay. She won't stay with me because she thinks that, you know, the noise is just too much for her. And she doesn't sleep at night, and she is grouchy enough without that. The fact of the matter is, she won't stay here.

MR. STAHL: Is your wife here?

MR. GREEN: No, she is not here. I had to go to Wendy's for dinner tonight. I hope you had a better dinner

And we come up on the weekends. And we weren't bothered. We didn't mind the jets flying over and the various things of that type.

In the last couple, two or three years, I think it has gotten a little out of hand. And I have got a picture here to show you that the day -- I don't remember the exact date -- when they dropped the five-hundred pounders and the three-thousand pounders, that I was standing out in the driveway ready to go back to my office, and my wife was standing there with me. When they hit, the gospel truth is, I was actually pushed against my car from the concussion. Maybe they fill more. Maybe that is the reason we got it, but we really got it.

And when they dumped the whole load, there was a horrible crack. And my wife and I didn't know if our house was going to come down or what was going on. We went through the whole house. What happened, the weathervane thing was knocked off the wall, dropped down into a nice space she had for some begonias, and knocked that all to pieces. Plaster come off the wall by our kitchen. In one of our closets, all our shoes on the shelf had come off of it and down. And after we got outside again, I said, "There is something else cracked bad around here." And what it was, and I have pictures to show you, that one of the posts under our deck was actually broke and knocked out from under our deck.

And I sent those pictures down to Lansing. And the thing that kind of irked me was it come back and said, "You have got a construction problem." My answer to that is, we haven't got a construction problem; we have got a destruction problem.

And we have laid up many nights. In fact, when they were bombing last year, it reminded me of fireworks. You hear the "thoom", then you wait. Then it goes "bam". We laid there one night for about two hours. We finally got the gist of what was going on. There would be a rumble. And then I started counting, "one thousand one, one thousand two, one thousnd three, one thousand four, bam." "One thousand one, one thousand two, one thousand three, one thousand four, five and six, bam." And I am telling you, if you want to roll out of bed -- I have invited the people to come up and stay in our place. I will give you the key. Let them come up and stay there, and have this go on, and hear the dishes rattle in your cupboards.

We sometimes come up, when we get there, we don't dare open the cupboard door for fear of dishes falling out. I mean, this is no joke as far as we are concerned. It hasn't been that way. And we love the National Guard. I mean, there is no problem there. I have got good friends in the National Guard. I have got friends all around the country in the National Guard. That is not the thing.

the records clearly.

As some people have attested, there appears to be a problem with drinking and driving military vehicles, as well as civilian vehicles. I myself four years ago was the victim of a head-on collision on South 27 with my wife and my daughter in the car. I had a brand-new, custom-built, eighteen-thousand-dollar van. I got hit by a brand-new Corvette driven by an army lieutenant from Indiana that had no insurance and no current driver's license stationed at Camp Grayling, two o'clock in the afternoon, drunk enough to pass out at the wheel of his Corvette, cross over both lanes, and onto the extreme shoulder and hit me -- an innocent civilian traveling on a public highway -- head on.

If you just drove out of the bars, the party stores, you can plainly see the military vehicles in there on Friday night and Saturday night and Sunday afternoon buying their supply. It's public record, folks. All you have got to do is look. There are two such party stores right in Waters that do a booming business just from alcohol. I could tell you the millions of dollars that Camp Grayling brings in to the local economy. One gentleman in Gaylord attested that very little of it comes to him. So Grayling must be getting the bulk of it.

I have some suggestions. If the commander of Camp Grayling does not have any control of the outstate Air Guard

and the Army regulars that come here to train, then you as a committee, to us as taxpayers, must put someone in control of Camp Grayling that does have some power over them, some disciplinary power. You could ask that a three-quarter mile buffer zone be put around all residential areas. You could limit eight-inch gunnery and any air strikes to cease their fire at midnight six days a week, and none on Sundays.

As the one gentleman said, it is as dark at ten o'clock as it is at midnight. And I can tell you that. I am a Vietnam veteran of two terms, and a retired Air Force sergeant. And we train just as well at ten o'clock at night as we did at one o'clock in the morning.

We used modern equipment. We didn't use outdated M-60 tanks. These tanks that they are using, as this one gentleman asked, I helped engineer and build some of those programs at Chrysler Corporation in 1970. So they are obsolete.

Please put some constraints on the pilots and flight groups. Force them to stay in their designed air patterns. And if they don't, use the current regulations that you have at your disposal to take disciplinary action. It is a lot cheaper to court martial a renegade than it is for him to crash into somebody's house.

Put some constraints on the personnel that continually violate these property owners' private posted

But I just was so stirred by you people from Guthrie Lake. And I wanted you to know: There are those of us in Grayling who do care.

MR. STEFFENS: Thank you, Mrs. Caswell.

Unless there are any others who wish to be heard, I would like to thank Dave Dempsey from the Governor's office, John MacGregor from the DNR, Lieutenant Colonel Downey from the Guard, Verna Cartow from Representative Ostling's office, Kelly Rossman, and Nancy Cain from AAA, and most of all, Denise Ballou. Those fingers must be awfully sore. And thank you, ladies and gentlemen, for your time.

UNIDENTIFIED SPEAKER: I, for one, and I know other people here, want to thank you people for being patient and listening to our grievances.

MR. STEFFENS: Thank you.

(Hearing adjourned at about 7:45 p.m.)

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STATE OF MICHIGAN)
) ss.
COUNTY OF OTSEGO)

I hereby certify that the foregoing pages 1 through 118, inclusive, comprise a full, true and correct transcript, to the best of my ability, of the proceedings reported on August 29, 1988.

September 12, 1988

Denise N. Ballou, CSR/CER-2880
Notary Public, Roscommon County, Michigan, acting in Otsego County, Michigan
My commission expires: 1-29-90

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Roscommon, Michigan 48653
(517) 275-5761

B. Michigan Department of Military Affairs National Guard Bureau, Public Hearing; Grayling, Michigan

Complete May 17, 1989 Transcript is Provided in Larger Type in Section 4 of This Final EIS

7-II.B

Jun 94

C. Letter to Mr. Greg Huntington, Environmental Coordinator, Michigan Department of Military Affairs

Note:

The transcript of the DEIS hearing held at Kalkaska June 13, 1989, was not available at the time of the printing of this document. The following letter was recieved as a courtesy and represents a portion of what was read at that hearing.

7-II.C

DAN L. ALSTOTT

Route 3 • Box 3510-A • Grayling, Michigan 49738 • 517-348-8294

6/8/89

MI Dept. of Military Affairs
2500 S. Washington Ave.
Lansing MI 48913

Att: Mr. Greg Huntington
Environmental Coordinator
Construction and Facilities Office

Re: Draft Environmental Impact Statement (DEIS)
Mission Multiple Construction:
Camp Grayling Army National Guard
Training Site, Michigan

Dear Sirs:

In the last paragraph on page ii of the DEIS EXECUTIVE SUMMARY, it is stated:

> "This document fulfills the purpose of an environmental impact statement by presenting a full and fair discussion of significant environmental impacts of proposed actions."

This statement is untrue in view of the content of the DEIS, which essentially addresses ONLY the consequences of the proposed action during the CONSTRUCTION PHASE.

It is imperative to present the WHOLE TRUTH in the DEIS, and to do this will require a massive revision and re-issue of the revised document. It is to that end that this letter speaks.

Further, the DEIS makes few, if any, committments nor does it provide needed assurances. Instead it is filled with phrases such as "are not anticipated to, should be compatible, computer simulated, expected to, after mitigation", ad. infinitum. This tactic simply does not suffice to assure that the proposed action is environmentally sound. It further lacks any binding committment to insure that sound practices will be followed.

Instead, the DEIS is, in Pentagon parlance, a "Tap Dance", which is defined as "a slick briefing, usually lacking in substance".

The DEIS does not address ALL concerns raised during the scoping process. For example, it is silent on "Concerns expressed over water pollution from explosive's residue and ammunition dumped in waters within the Camp", as listed near the end of the Final Scoping Document, dated october 13, 1986. This is one of the most serious concerns regarding this facility. We are concerned about TOXIC POISONING.

Please tell the truth about what the millions of pounds of exploded and un-exploded ordnance expended at Camp Grayling HAS DONE, IS DOING and WILL DO to the land and water in and down gradient from the firing and bombing ranges. Please include the effect of BOTH Army and Air Guard operations over the historical life of the Camp. We drink this water and are becoming afraid.

Please tell the truth about the effect of Radioactive Penetrators lying about the ranges. Are these fired only at the tank ranges, or do the armor piercing rounds shot here by the Air Guard contain the same material? The DEIS is silent on the entire subject of Radioactive Penetrators

Please tell the truth about NOISE, which is violating standards set for the HUMAN ENVIRONMENT. According to the Camp Grayling Management Analysis and Plan (EMAP), despite hundreds or thousands of complaints, your noise data is woefully incomplete and much more firing must take place before you can get a handle on this, other than to recognise it is a problem of unknown, but great magnitude and potential legal consequence.

It is obvious from noise studies we have in our files, that your methods of trying to extrapolate noise from 105mm guns to generate equivalents for 8" cannons and 500# bombs will not suffice, regardless of the power of the computers used.

Admit that you simply DO NOT KNOW what noise your activity generates, and ABSOLUTELY STOP your expansion plans until you can ACCURATELY MANAGE these impacts to a level that can be tolerated by the HUMAN RESIDENTS of this region.

Please tell the truth about your "Installation Compatibility Use Zone" (ICUZ) program. Tell how this intends to influence local governments to zone property lying "in your way", so as to create it useless for habitation and thus lessen its worth. Tell how this will lessen tax revenues causing the surviving lands to pick up the slack. Tell it like it is, instead of trying to make the ICUZ proposition look like a cure-all.

Tell about the property taxes in Crawford Co. being the highest in the Continental 48 states, based on Per Capita Income, due to the vast amount of public land the Military occupies at Camp Grayling.

Tell the truth about the proposed Multi-Purpose Range Complex (MPRC), as it is called in the DEIS. You have ommitted the "H", which stands for HEAVY. That is the way it is listed in the Federal Budget requests; Multi-Purpose Range Complex Heavy (MPRC-H)

Tell the public that "Combined Arms Training" at the MPRC-H means ALL WEAPONS INCLUDING ARTILLERY. General Andrews has said "not so", but you have it obscurely listed as "Combined Arms Training" in the DEIS. Tell it like it is, or like it will be. To quote earlier writings of Gen. Andrews, who has honestly listed the proposal as an MPRC-Heavy Range, he states:

> "We have also designed it so that field artillery can also fire into the impact area to provide complete fire control and coordination for every element on the battlefield."

What this means is that artillery will fire from the MPRC-H, across County Road 612 and KP Lake into the impact area.. The DEIS is absolutely silent on this. Tell the public how this will require buying out the 65+- homes at KP Lake and closing Co. Rd. 612, cutting Lewiston and Lovells from ready access to I-75, unless you actually intend to fire live wartime ordnance across these areas.

Please tell the people that figure 2-3.1 demonstrates and confirms that total troop training from 1980 thru 1986 increased nearly 62%, and this means at present rates the training will DOUBLE every 7 years or less. Tell it like it is, in terms we can ALL relate to, instead of trying to obscure the facts.

Why, on 2-3.7, do you talk of tanks with 105mm guns, when as early as Jan. 1987 General Andrews wrote about the MPRC-H being "designed to handle the new 120mm tank gun that is upgunning the M1A tank?

How can you possibly contend there will be <u>less</u> noise at the MPRC-H when the tank guns will be larger and "every element on the battlefield" will be present? This is a totally non-realistic assumption. Your statement that the MPRC-H will have laser target capabilities rings hollow. Why do you not instead give assurance that lasers will be used exclusively? The answer is simple. Lasers will not satisfy the basic urge in military training to MAKE NOISE to simulate combat; to BLOW THINGS UP to simulate combat; to DESTROY to simulate combat. These are the elements of war and since you intend to simulate war in this place, why do you not come out and say so, instead of presenting your plans in the bland terms contained in the DEIS?

Project T3 - Assault Landing Strip appears on 3-2.6 to further involve "Combined Arms Training". Does this mean you will have artillery there also? What do you mean when you say "further analysis will offer productive environmental insights."? Is this an environmental experiment like the MULTIPLE 500# bomb drops conducted for determining "worst case" noise levels described on 4-3.15?

DEIS, Page 4

This Assault strip obviously has a larger purpose than expressed in the DEIS. Col. Downey has stated that "The MI National Guard has only ONE (1) C-130, thus the strip will not be used very much.". This being the case, the Assault Strip is either a monumental waste of money, or it represents the beginning of the conversion of the site into a new Military Airfield to replace what exists near Grayling. Please tell the whole truth about this project with its associated fueling facilities alongside the Manistee River. Please do this or provide legally binding guarantees of non conversion into any other use.

You describe on 3-3.7 how the new Wastewater Plant will allow you to service lakeshore residents in Grayling Township. What is your underlying motive in this? It sounds like the "Olympic size swimming pool" that was dangled before the Kalkaska community a few months ago. This treatment of private sewage will benefit a select few well-to-do citizens, most of whom favor Guard expansion. You had best get a legal opinion from the US Attorney General or the Comptroller General in Washington before continuing this unsavory practice of legalized bribery.

Your Rail Siding Project C11 will no doubt serve as a stationing site when MX Missiles are rail garrisoned in Oscoda. You should tell the citizens about this, or give irreversible assurances to the contrary.

Project C12 ASP/LSF Railroad will serve the siding, so the same applies. It is also very unclear in the DEIS how you propose to construct this Railroad across I-75. The proposed new underpass construction will be a massive undertaking with serious consequences on tourist and commercial traffic trying to reach points North and West of that site. Tell how this will compromise places like the Traverse City area, Gaylord, the Upper Peninsula and elsewhere. Do this instead of trying to obscure things, as you have done, by using an ancient map in Figure 3-3.3 which does not even show I-75.

On 3-3.15 you honestly admit that the MPRC-H will SIMULATE A BATTLEFIELD, right adjacent to the AuSable River and a new emerging residential condominium and golf course development. You forgot to indicate that in addition to "every element on the battlefield, you will also have many Jet Aircraft present so as to "attack" the forces using the MPRC-H. This introduces a new noise element, previously confined to the Air/Ground Range. How do you intend to mitigate this new attack on the HUMAN ENVIRONMENT?

DEIS, Page 5

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Please tell the truth about why "covered bleachers" are proposed at the MPRC-H. We know they are not for entertainment purposes such as rock concerts, and are convinced they will serve as viewing places for Politicians and Military Brass during such things as FIREPOWER DEMONSTRATIONS which are designed to impress upon the viewer the full DESTRUCTIVE FORCE of weapons in use. Tell us why such an amphitheater, and all that goes with it, is proposed in such an environmentally sensitive area which, incidentally, is growing fastest in population of any place in the Region

The MPRC-H drawing in Figure 3-3.5 shows a huge area to be involved. Certainly more public roads and snowmobile trails will be closed as a result of construction and use of this MPRC-H. No mention of these closings, which will further impair recreational use, is made in any detail in the DEIS. Please tell the truth about this. If there will be no such closings, then provide absolute legally binding assurances.

Please provide detail covering the Wetlands shown on Fig. 3-3.6 lying North of the West 1/2 of the Assault Strip. How do you plan to protect or preserve these during "Combined Arms Training? Or have you already destroyed this asset? Please tell the people the truth.

Please also list the flight paths to be used at the Assault Strip. None are shown in the DEIS, but they are vital. Please also show the GUARANTEED traffic pattern and altitude restrictions that will apply. Please do not write up a bunch of FAA jargon, but instead tell all this in a fashion understandable to non aviators, who will suffer the brunt of noise and air pollution arising from this Assault Strip.

On 3-4.1 it becomes abundantly clear at the bottom of the page that Camp Grayling intends to grow thru competition with "other National Guard Camps".

This has been verified by this writer who monitored a radio interchange at the Air/Ground range on May 24, 1989. A two seater A-7 with a photographer in back came in to check out the area. His call letters were "Tulsa-19. He was very thorough and made repeated passes while talking to the Range control officer, who was promoting the attributes of Camp Grayling. At the end of this very friendly exchange, the Camp Grayling range officer offered to send promotional material to Tulsa 19 who gave his ZIP Code as, 74115 which has been verified as Tulsa, Oklahoma.

DEIS, Page 6

The DEIS claims no growth, but the reality is that Camp Grayling is in the MARKETING BUSINESS, trying to entice Guard units from Oklahoma and elsewhere to come here and BLOW UP OUR ENVIRONMENT. The "Italian Bombing" in June, 1987 is another example of marketing by design.

This acts to totally invalidate any expressions of "No Growth" in the DEIS, and calls for major revisions, if the document's legal process and its authors including the Pentagon, The MI DNA and the consultants are sincere about the truth being known.

On 3-5.7, the second paragraph dealing with land use is INCREDIBLE. It speaks as tho the status quo will not be altered or increased. It also contends that the status quo is acceptable. Both are assumptions, totally lacking in substance. The noise discussion is so shallow it is a travesty, considering what is already happening. To continue along the expressed course will increase citizen outrage beyond current high levels and present-day problems will be minor by comparison. PLEASE take a realistic approach to your problems instead of trying to talk them away.

The last paragraph on access is also very wrong. Weekly newspaper notices, describing Range usage, for all intents and purposes, TOTALLY CLOSE the majority of Camp Grayling land to the public, who is warned to stay out during training times. This multi-use PUBLIC land is no longer available with any reliability except for two weeks each year during deer season. Please tell it the way it is, not as you want it to look!

In 4-3.1 you state the Post has been in existence since 1913. This is at best only partially true and applies to only a very small portion of the overall reservation. To use this as a premise to justify the proposed action is misleading. You state noise outside Camp boundaries "can annoy people". This is a gross understatement and, to be accurate, you should state that noise DOES annoy people.

Noise from your operations is creating threats to the health and welfare of many private citizens OUTSIDE your boundaries. Your refusal to reduce excessive noise levels in favor of trying to justify them via computer extrapolation of nine (9) year old data has taken Camp Grayling into the worst period of controversy in its history.

DEIS, Page 7

You state in 4-3.3 that a noise level of 55 decibels (dB) will protect public health and welfare. Then you go on in an attempt to justify noise levels at my residence (outside the Camp boundary) of more than 200% of the safe level. This simply will not wash, and you are in harm's way legally if you do not change your approach. Tell the truth. You make noise outside the post, at Guthrie Lake, over 250% of the so called "safe" level. People are suffering both physically and mentally from your noise harrassment.

You describe noise from airplane overflights in Fig. 4-3.1c as having both Zone II & III contained in a "tadpole" shaped area near the Air/Ground Range. This may represent ideal conditions, but is far from the truth. Even as I write this letter in my residence, the jet noise is ABSOLUTELY DEVESTATING. It is just like living at the end of the departure runway at Detroit Metro Airport as the fighter-bombers roar overhead and conversation becomes impossible.

Years of complaints to your officers have changed this condition not ONE IOTA. Your planes do not follow your own rules and are instead more interested in "blowing leaves" or "dusting civilians". Tell the truth. You cannot control what your people do and they will continue to create noise problems any time they wish --- until you establish better discipline.

Perhaps if you get away from your computers and get out into the field and talk to the people, and listen objectively to your own sounds, you will eventually realize the true problems your projects and operations are creating for not only the Natural Environment, but also for the HUMAN Environment, which is after all what you are here to protect.

You contend on 4-3.26 that the lands adjacent to the MPRC-H, "are all owned by the military". This is not true. Those lands are owned by THE PEOPLE OF MICHIGAN, and are merely leased to you by the DNR for you to to tear up. Why do you continue to lie?

You say "no growth", but on 4-3.28 you describe a MPRC-H operating year around, 16 hours per day. This over-rules your "no growth" contention. Your theory, or supposition that winter training will offset summer usage is either false or stupid. You state that Camp Grayling is the best training site in the nation, and to believe the Pentagon will allow any investment such as the MPRC-H to lie idle is pure hog wash. Tell the truth, Camp Grayling will be FULLY BOOKED winter and summer, especially with Washington's desire to consolidate and close outmoded military bases. You may not "anticipate" it, but common sense dictates that is the way it will be.

DEIS, Page 8

On 4-4.1 you tell of basing your entire soils section on data that is 62 years old. Soils are the very earth we live upon. You have mixed and ground the soils here for many years with tanks, bombs, etc. The least you can do in your attempt to legitimize your activities is to get a current soil survey before continuing. Please stop all new activities until this is completed and thoroughly analyzed.

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You have completely ignored a major gas field on Figure 4-5.1. Haven't you heard about the 15 or so gas wells on the Draper land in "North Camp"? Or did you omit this to avoid having to explain how much money the state will lose by not being able to lease North Camp out for oil/gas due to the conflicting military activities and ordnance pollution in this place? Don't keep trying to mislead the public. This is not a Public Relations document. It is supposed to be a DEIS -- or is it really PR? Any way, please show the big gas deposit as it relates to North Camp.

It is interesting on 4-5.13, that DNR has not surveyed the Camp wetlands. How in the world can you go forward with all your rhetoric about "protection" when you do not even know where the wetlands are? Please STOP EVERYTHING until a survey is completed and analyzed.

Your Bald Eagle section on 4-5.43 may not be valid because the Wildlife and Flora-Endangered map is innacurate. You have ommitted the Eagle nest at Firing point #117, despite the fact it has been in the same tree for 15+- years. This is the one you finally decided to protect after it was publicly exposed that your operations were causing this nest to fail thru parental abandonment of baby eagles every year. By the way, Col. Downey's PR on the traditional nest tree blowing down last year is totally false.

On 4-5.45 you talk of no Ospreys. This was not always true, but seems to be now. This is particularly alarming, since the Osprey is an "indicator species", and will leave a polluted area long before man realizes what is happening. You had better take a VERY HARD LOOK at all aspects of your operation to determine what made this bird disappear about 3 years ago.

We agree with you on 4-5.51 about your "creating noise which may scare animals". It scares people too. What we really need to know is about "the quiet, undisturbed areas available in post". Where are these places? We want to go there too for some tranquility. Please include a map of these in the final EIS for our personal use.

DEIS Page 9

You have again erred on 4-6.3 as you talk about the Hanson Land Grant. Hanson left this land , restricting it to 4 distinct purposes: Forest Preserve, Game Preserve, Fresh Air Camp for Gov't. employees and "As a permanent encampment and maneuvering ground for the militia OF THIS STATE and for NO OTHER PURPOSES WHATSOEVER". Please so note in the DEIS to avoid further confusion on this subject.

In the discussion of Act 192 on 4-6.4, please elaborate on why the DNA DOES NOT maintain roads so as to make them passable. This law apparently removed these roads from local jurisdiction and it is your duty to keep them in good condition for public use. You HAVE NOT done so and are thus in violation of the law. Please explain this in the DEIS.

Despite your attempt to explain it away on 4-5.5, there are 50,342 acres of private land zoned RESIDENTIAL within the area considered in this section. This extends to a maximum of 3.5 kilometers outside the post. This is an area over 34% as large as the camp itself. Please explain how you intend to grow, or stay as you are without severely impinging on these lands with your noise, dust, smoke, fumes ,etc.. Please do not try to take these lands thru the ICUZ. That is confiscatory. Explain how you intend to modify your operation to resolve this situation.

On 4-6.13 you again go on saying new troops are not anticipated, however elsewhere you have stated that ultimate winter training will involve Brigade/ Division levels. Please explain what you really mean. Is it no new troops, or is it a division? You cannot continue to double talk this issue.

Please elaborate on the "refueling" aspect of the Assault strip as noted on 4-8.26. State EXACTLY what you intend to do here, and guarantee not to exceed those limits. As this stands now, you give yourselves a BLANK CHECK in practially every instance, to do ANYTHING YOU PLEASE anywhere you wish, after completing the EIS process which, by this point in your book, seems little more than a charade.

Probably the most OUTRAGEOUS statement in the DEIS is on 4-10.27, where you state:

> "No significant adverse effects upon psycological, physiological or community needs and lifestyles of residents of the area are perceived as a result of full implementation of these actions."

You obviously have no perception of the ABSLOUTE STRESS your noise and harrassment has upon the civilian population. A professional Noise Expert, employed by the AuSable Manistee Action Council has very recently stated in a written report:

DEIS Page 10

> "Some of the residential areas around Camp Grayling are probably receiving more noise impact than any other community in the United States located adjacent to an Army base."

It is those people in those areas, wherever they are, and others, having been hit, forced off roads, raped, groped, insulted, trespassed upon, etc. by "visiting" military personnel, who have already been affected psycologically or physiologically. The expansion of Camp Grayling will serve only to worsen this VERY serious problem.

In closing, I reiterate that subject DEIS is lacking in truth, fact and substance to the extent it DOES NOT present a full or fair evaluation of Human or Natural Environmental consequences arising from the proposed action. For those reasons it must be either wholly discarded or given a major overhaul.

Sincerely,

Dan L. Alstott

Dan L. Alstott
Rt. 3 Box 3510 A
Grayling, MI 49738

APPENDIX III.

CONFLICT AND REASON: A PERSONAL PERSPECTIVE
ON THE CONFLICT SURROUNDING THE
CAMP GRAYLING ENVIRONMENTAL IMPACT STATEMENT

Prepared by

Donald P. Richards

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June 21, 1989

Dr. F. Glenn Goff
Vital Resources Consulting
P.O. Box 22116,
Lansing, MI 48909

Dr. Goff:

Per your request, enclosed is my report to Vital Resources Consulting on the Draft Environmental Impact Statement and many other documents reviewed, persons contacted, hearing attended at Grayling, etc., relative to the National Guard Bureau and Michigan Department of Military Affairs Mission/Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan, March 1989 and subsequent events.

I have not attempted to replicate the work of the other reviewers of the DEIS as I am not trained in the environmental sciences. What I have attempted to do is to objectively review the developed facts and lack of facts; looking into possible causes/motivations and developed circumstances due to the total situation and from this provide my professional observations, relative resource references regarding how this type of situation can and does occur, how existing conflict can best be resolved and prevented, through professionally proven conflict management and reconciliation methods and futuring processes; and from all of this I have made my professional recommendations.

Thank you for the opportunity to participate in this most worthy work. If I can be of further assistance to the remediation and resolution of this conflict I am most willing to be available.

Donald B. Richards

Donald B. Richards, Consultant

Encl: Report document

CONFLICT AND REASON:
A Personal Perspective on the Conflict
Surrounding the
Camp Grayling EIS

By

Donald B. Richards, Consultant
Richards Consulting:
Education and Educational Technologies

Jun 94

AMAC has asked VRC to review, evaluate and critique the Camp Grayling DEIS "in a timely and professionally competent manner."

The contract between AMAC and VRC states that VRC,

> "Shall conduct the review, evaluation and critique in a scientifically objective manner, making use primarily of extant data, and shall be expected to release any and all pertinent findings to the public. AMAC shall not attempt to control or bias the findings of the REEC in any manner, except that members and staff of AMAC may provide information to VRC. The method of procedure to be used in conducting the REEC shall be determined by VRC and may include public informational or educational meetings, solicitation of public comment, and other information gathering, research and evaluative procedures. The purpose of the REEC shall be to evaluate the adequacy of the EIS, to recommend modifications if inadequacies are apparent upon review and evaluation, and to professionally substantiate such recommendations."

We wish to acknowledge our appreciation to AMAC in their honoring of this contractual agreement as we have moved through the REEC process.

As indicated earlier in the VRC report and evidenced in the "Technical Reviews" section, VRC engaged professionally competent and highly regarded experts in fields related to the various aspects of the DEIS to provide the REEC. Their efforts, presented in the "Technical Reviews" section of the REEC, stand on their own merits and have fulfilled the intent of our contract with AMAC. We have been honored to have been associated with this caliber of professional effort and present this documentation as the best response possible, given the time and other constraints under which we worked.

My input into the REEC of the DEIS is from the perspective of:

1. retired professional educator of 31 years experience (9 years as Consultant and 14 years as administrator: President, Treasurer and Standards Committee Chairperson of a statewide professional organization),

2. ordained minister of 39 years (Pastor of 4 congregations, District President of a tri-county area, Counselor to 5 consecutive Michigan Region Administrator/Presidents, specialist and statewide/area organizational presenter on conflict management and resolution),

3. father of 4 children who are all professionally involved in human service occupations (3 of whom are currently successful administrators in their professions), and

4. son of a now retired minister, political leader and labor union president.

I have lived through and presided over (by invitation of public officials, fellow professionals, citizens groups, a medical doctor and Board of Trustees, families, administrators, statewide professional and other organizations, married couples, etc.) a multitude of conflict resolution situations and training sessions.

In 1955, after completing my M.A. degree at Michigan State University, I volunteered for the draft and within two weeks began my two years with the U.S. Army, serving 17 months in Germany as an Analyst in the C.I.C., and held clearance for Top Secret documentary access. I am currently friends with several reservists and have established and enjoyed professional and personal relationship with a high ranking officer of the Michigan National Guard.

Dr. Goff of VRC, knowing somewhat of my background, engaged me in the REEC process as project manager and, because of my professional involvement in futuring and organizational planning, has invited me to provide this report on my personal perspective of the total REEC and known related factors.

I have -

1. reviewed the DEIS, correspondence, documents, news articles,

2. toured a large portion of Camp Grayling and environs, and,

3. attended the hearing, held in Grayling, regarding the DEIS,

and am quite aware of the situation of conflict that exists in the Grayling area communities.

Never having met the Executive Director of AMAC previously, but, finding that we have both friends and acquaintances in common, I have queried them and found that he is, although an offended citizen of the Camp Grayling activities, a highly respected co-worker and friend of these persons: and, true to the language in AMAC's mission statement and the VRC contract, genuinely interested that the full truth of circumstances surrounding the DEIS and this conflict, and objectivity of VRC's team of experts be properly expressed. He also possesses a strong military background and expresses high regard for the military mission, as well as concern for continuation of the mission of MDMA in Camp Grayling.

Having met with some of AMAC's leaders I have found them to be equally supportive of the same intent as their Executive Director. Their concern is that their neighbors, the Camp Grayling MNG personnel, have not only invited outsiders into the Grayling area community and resulting activities are posing a public offense, but, more particularly, normal procedures and efforts to mediate and mitigate the offenses have allegedly been frustrated by insincere patronizing and insensitivity of Camp Grayling management personnel to

community and environmental concerns, uncompromising determination, and high level political maneuvering.

After our,

1. professional REEC of the DEIS and related documentation,

2. our witness and review of the testimonies at DEIS hearings,

3. reading of the "Report to the Governor" by the Camp Grayling Management Advisory Committee (CGMAC), January 1989, State of Michigan, and the minority report of that committee, "The Camp Grayling Controversy,"

it is now quite obvious that AMAC and many other environmental organizations and citizens have legitimate concerns. A conflict of near crisis proportion exists in the Grayling area community as a result of inappropriate military and intergovernmental administrative action and lack of action.

OBSERVATIONS

1. We (everyone involved in this issue!) need to commend the CGMAC for their intensive and conscientious work in response to their charge by Governor James J. Blanchard, in his Executive Order #1988-7. The lack of appropriate information available to them was both obvious and acknowledged by them at various points in their report. Their perceptivity cut quickly to the lack of needed data collection and/or retention of data by government agencies, the cursory manner of addressing many issues, and, the need for more in-depth and competent investigation and projection of need and implications of intended actions as they reflect on the Grayling area community, the State of Michigan and globally.

2. It is quite difficult to maintain objectivity when trusted agencies and fellow professionals obviously have not done so. In most DEIS documentation reviewed, the DEIS, almost always, either skirts the issues or fails to cite the need for further impartial expert study, especially when referring to topics of great sensitivity. For those issues there is a need for public information and reassurance, but information is lacking for them. "Trust," while frequently implored in the DEIS, is betrayed by such action and conflict has subsequently moved to near crisis proportions.

TOWARD RESPONSIBLE MANAGEMENT OF CONFLICT

In the following section, I provide excepts from recent published works on conflict management and futuring, with occasional comments as to their relevance to the Camp Grayling situation. This is offered in the hope that (a) Responsible management of existing conflicts in the Camp Grayling situation may lead to genuine resolution, satisfying all legitimate concerns, and (b) A more responsible approach to future conflicts and/or of effective responsible prevention may indeed be worth a pound of cure!

Appendix M M-629

The following were selected because they represent state-of-the-art thinking--some of the most perceptive and helpful understandings offered by futurist leaders in regard to conflict management and resolution. These and the advice accompanying them should prove of value to those who are charged with the responsibility of reconciling and mitigating this circumstance.

Scott Schroeder[1], Dean of Business Operations and Dean of General Education, DeVry Institute of Technology, Phoenix, Arizona, speaks to the identification of crisis [illegible] and remediation as follows:

> "Generally, "a crisis is a critical situation, a turning point... characterized by a sense of urgency" (Horne). In a business sense, however, there are five specific characteristics which would lead a situation to be labeled a crisis. There must be the risk that the situation will 1) intensify, 2) lead to close scrutiny of the organization by the media or the government, 3) interfere with customary operations, 4) damage the image of the organization or its C.E.O., and 5) harm the company's bottom line in any way."

The situation under study qualifies on all five counts. Mr. Schroeder continues.

> "The importance of handling issues as they arise is underscored by the fact that only fifty percent of corporations have a plan for managing a crisis. Furthermore, even among those companies with a plan, crises are frequently dealt with improperly or in a superficial manner. By identifying the pattern of typical crisis mismanagement, a basis can be formed for constructing an effective response method. As should be clear by the first step toward mismanagement involves failing to recognize and act upon warning signals until a crisis actually exists...The second step...is to employ, due to mounting pressures, the most immediate solution....The third step...is the inability or unwillingness to communicate with the public...Finally, poor managers never rise above the emotional aspect of the crisis...."

Again, it would appear, all four points seem to apply to the Grayling area community situation. His further explanation provides timely counsel and hope for resolution.

> "Thus, the steps toward mismanagement provide a foundation for the design for an effective crisis management method. Implied in this discussion is the requirement of planning for crisis. One approach...is to establish a crisis management team, comprised of leaders within the organization...In addition, although this point is often debated, it is important that the top executive of the organization, either in business or in government, be involved...The third guideline...is that the organization involved should take the initiative in handling the situation...The next aspect...is communication... with the media and the public as soon as possible during a crisis, if only to express awareness and concern...saying nothing can hinder crisis efforts and make the organization appear as though it has something to hide...keep

> communication lines open during non-crisis periods, informing the public of significant issues concerning its operations...The final guideline...is that action is required...True crises,...require resolution, not coverup or 'massaging'...Although initiative and communication are needed, only action will provide successful results...
>
> "...basic characteristics of an effective crisis manager...must be forward thinking and have a broad view of the situation...must be flexible and willing to depart from established rules if needed...must be able to foster 'cooperative confrontation' (Horne, p.22). Cooperation here means the ability to get individuals representing different, often opposing, sides of the issue or crisis together in order to communicate. Confrontation should not be taken in a negative sense but rather as a willingness to discuss the real problem, not just side issues or symptoms of the crisis...
>
> "In order to resolve the larger crises of our time, it is necessary to develop specific plans which will result in concerted and effective effort rather than disjointed complaints never followed up by meaningful action... As Aurelio Peccei states in One Hundred Pages for the Future, 'The main thing is to begin, and to begin well'."

Another author, Mr. Wallace Warfield[2], sheds further clarity on the issue of conflict. Mr. Warfield is the Associate Director for Field Coordination for the Community Relations Service, Department of Justice.

> "Sociologists and human relations specialists often view society as a series of interactions taking place along a continuum. This can best be exemplified in the Laue-Cormick model of an interactive society which is illustrated below:
>
> - o Cooperation exists when elements of a society can agree upon the distribution of resources.
> - o Competition exists when the legitimacy of power is questioned or the allocation of resources is in question.
> - o Conflict arises when the existing power arrangements are seen as non-legitimate and resource allocation is inadequate. No quid pro quo exists. The status quo is challenged through a series of actions, i.e. strike, sit-in or work stoppage.
> - o Crisis occurs when conflicting groups undertake unusual action to make their desires or fears known. This is often violent action, or some method of inaction carried to the extreme that traumatizes the system...
>
> "I have modified the continuum to add Heightened Tension as an interim stage between Competition and Conflict because it more accurately reflects the deterioration of dialog between parties in a community dispute."

Michael Blinick[3], a lawyer in New York City suggests a procedure which could prove helpful for resolution of the conflict in the Grayling area community.

> "Reverse negotiation... Its purpose is to assist the parties in discovering, analyzing, and accommodating all legitimate interests concerned,... Parties should refrain from advocating particular solutions until each side has stated and explained: (1) just what it thinks the problem is, (2) what it thinks the legitimate interests of each party are (with respect to the conflict and whatever has brought about the conflict), and (3) where relevant, what goals it is trying to achieve both in solving the conflict and in related contexts."
>
> "Reverse negotiation is a considerable departure from what others have urged in regard to 'conflict resolution'. They have recommended better techniques of communication, more willingness to compromise, understanding the other parties' background and feelings, and improving the human relationships involved.... It's based on a fact that underlies all these steps: defining the problem, analyzing legitimate interests, examining goals, and finally agreeing on a solution in both theory and practice. They all involve questions of values... Public policy questions...cannot be settled without making value judgments (...decisions about which values deserve more priority than others, and how values are to be institutionalized or enforced).
>
> "In order to make such judgments, we should be quite explicit about just what our values are. But we usually are not. To illustrate this, let's take a value that would seem to be the most essential one of all, and that would deserve priority over other values when a clash is inevitable: the protection of human life, health, and safety. Surely, this is one point on which those occupying all sides of the political, economic, and social spectra should be able to agree. What could be more basic? Yet we hear, all the time, spokesmen for government and industry alike talking blithely about "trade-offs," "interest-balancing," and "cost-benefit analysis" with respect to environmental protection, occupational health, product safety, auto speed limits, aircraft and airport safety, chemicals in food -- just to mention a few. But it is "trade-offs" of human lives that they're talking about. It is "costs" of severe, often irreparable impairment to the health of millions...
>
> "The ideological differences that divide us are largely rooted in the different emphases and priorities we place on certain values, goals, and interests that most of us nonetheless hold in common to some extent. But as long as protection is given to whatever is most important to us, we will tend not to object to others receiving what they want. The "either-or" situations where one side must triumph and the other be defeated are not as frequent as might be supposed, although they often seem to exist because one or both sides have:
>
> (a) analyzed the issues improperly,
> (b) allowed polarization to develop unnecessarily,
> (c) do not know what their opponents are really seeking, or
> (d) are ignorant of options and alternatives, ...

> "There are other points to bear in mind during the reverse negotiation process:
>
> - o No legitimate interest may be left unprotected...
> - o Always prepare the other side's case along with your own...
> - o Concentrate on avoiding negatives rather than on seeking positives...
> - o Don't worry about being unable to solve all aspects of a problem at once.
> - o Analyze on the basis of individuals, not groups or entities.
>
> "A corollary of this guideline was suggested by the legal philosopher Edmond Cahn. He said that the justice or "rightness" of an act or policy should be assessed from the standpoint of the individuals affected by it, not from that of the government or "society." Rather than talk about the rights of society versus the rights of the individual, it might be more illuminating, and more correct, to speak of the rights of one individual versus the rights of other individuals. "Society" is an abstraction symbolizing all of us, viewed collectively; the government, regardless of agency, level, or branch, should be required to represent legitimate interests of individuals. If we cannot articulate precisely what legitimate interests are being protected by particular governmental action or inaction, or by some claimed "right of society," we had better take a much closer look. Illegitimate interests can wrap themselves in a false cloak of outward propriety."

Leigh S. Shaffer and Samuel F. Moore, OF the Department of Psychology at West Chester University, address the issue of building boundaries between persons to avoid conflict. They state,

> "...the territorial solution is a habit which was essential in ages past, but disastrous in our age. Attempts to invoke a territorial solution on environmental problems are doomed to failure, because the air, the oceans, the soil, radiation, and other agents will not respect territorial boundaries...
>
> "...while the territorial solution cannot work, it may be useful to have territorial designations and responsibilities in workable solutions. That is, for purposes of monitoring environmental quality, of determining the compliance of individuals or groups with negotiated solutions, and of holding individuals and groups accountable for their actions..."

Alfred Bernhart is a consultant on environmental planning and engineering who notes,

> "As part of a community, individuals surrender some of their freedom of decision-making, and simultaneously gain from joint achievements. The framework of advantages and restrictions is laid down by codes of law that the community as a whole establishes and enforces."

The issue seems largely to be that of "community", which implies neighboring, rules, rights and that of interrelationships. The Grayling area community is no exception to these imperatives and any attempts to isolate or impose rules or priorities (most naturally in our society) will be met with concern, as has been so aptly demonstrated in this situation.

LOOKING TO THE FUTURE

As frustrating as it may seem for individuals or smaller organizations to be able to have any impact on government agencies, the non-human environment is even more vulnerable. It can only plead its case silently and is noticed only after it is too late. Government "of the people, for the people, and by the people..." must look to the future and weigh the impacts and implications of today's decisions upon tomorrow's resources and opportunities. To win today's battle but lose tomorrow's war cannot be an option. Persons in leadership positions must be those of vision who can think globally.
Susan M. Linderman[6], Director of Consensor Research and Development, Applied Futures, Inc., Greenwich, CT states & quotes it most aptly -

> "The failure of governments to engage in long-range planning is hardly a new phenomenon. Toffler (in THE FUTURIST, October, 1975) notes the results of such a situation: 'The energy shortage, runaway inflation, ecological problems--all reflect the failure of our political leaders at federal, state, and local levels to look beyond the next election.' In a rapidly changing society a myopic political system can be devastating. Problems, unanticipated, fester and soon outgrow any remedy."

The following is illustrative of a growing awareness of the increasing severity of environmental change that may threaten the future of humankind. In the last few years the media have been filled with news of global warming, massive oil spills and other environmental contamination, ozone depletion, etc. This growing awareness underlies much of the concern for the quality of their environment that is being expressed by the people of the Grayling area community. Norman Myers[7], a Consultant in Environment and Development, Nairobi, Kenya (Adapted from his book "The Sinking Ark", Pergamon Press, Oxford, 1979) speaks to just one of these issues which is representative of the total concern -

> "Of earth's five million species, we could well lose at least one million by the end of the century. Within the foreseeable future of the next 3-5 decades, i.e., until growth of human numbers levels out and until growth of human appetites for raw materials stabilizes, we could say good-bye to probably one-quarter, possibly one-third, and conceivably one-half of the planetary spectrum of species. It is far from unrealistic to reckon that we are already losing one species per day, and that by the end of the 1980s we could be losing one species per hour.
>
> "Extinction of species constitutes an irreversible loss of unique natural resources, now and forever. Earth is currently afflicted with many other forms of environmental degradation; but form the standpoint of permanent despoilation of the planet, no other form

> is anywhere so significant as the fallout of species. When a species disappears, it is gone for good. Often enough, that will be for bad. Of the small number of species already investigated for their economic value, many have made significant contributions to industry, agriculture and medicine...
>
> "The main process by which species are driven extinct is loss of habitat. Loss of habitat occurs mainly through economic exploitation of natural environments: and natural environments are exploited mainly to satisfy consumer demands for numerous products..."

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The loss of species is illustrative of the reality of the more general concerns being expressed. These local residents not only suffer a decline of property values, tranquility, control of their environs, etc. but feel frustrated in their loss of ability to maintain the quality of environment and life that they once enjoyed. Because protecting the environment "in their own back yard" is their way and felt obligation, in addressing the global issue of deterioration of life quality and environmental balance, many of them have adopted this as a moral cause worthy of their deepest committment.

Harlan Cleveland[8], Director of the Hubert H. Humphrey School of Public Affairs at the University of Minnesota, has also been U.S. Ambassador to NATO, President of the University of Hawaii, Director of the Aspen Institute's Program in International Affairs, Princeton, New Jersey. He writes,

> "A fresh look at the international system must begin with an effort to summarize, in a comprehensible framework, a myriad of trends that constitute 'the transition we are in.' The 'transition were are in' is a variety of changes in beliefs, loyalties, fears, aspirations, doctrines, and assumptions about personal and national futures. They involve, in effect, widespread changes in the meaning of, and the relative priority given to, three basic motivations in social and political behavior:...
>
> "1. Security
>
> From: Military defense:
> To: Wider concepts of defense (e.g., energy, balance of payments, environmental risk, religious and cultural tradition)...
>
> "2. Values
>
> From: Exclusive national sovereignty over people's livelihood:
> To: International economic/social entitlements ("basic human needs")...
>
> "3. Resources
>
> From: Focus on nonrenewable resources and energy:
> To: Focus on recycling the nonrenewables.
> Focus on renewable (biological) resources and energy.
>
> From: Limits to growth
> To: Limits to governance

> From: Fossil fuels and nuclear energy.
> To: More emphasis on "soft energy paths".
>
> From: Centralized systems:
> To: More emphasis on decentralized systems...
>
> From: Waste disposal:
> To: Waste as raw material.
>
> From: Focus on short-term advantages/profits
> To: Focus on wider (ecological) consequences of today's actions.
>
> From: Exploitation: "slash and burn":
> To: Focus on interest of future generations...
>
> .
> .
> .
>
> "6. The Global Commons
>
> From: Local environmental awareness
> To: Awareness of global environment risks (CO_2, ozone, ocean pollution).
> Awareness of threats from "national overspill" (air and water pollution, acid rain).
> Awareness of global threats to biosphere's resource base (overcropping, overgrazing, overcutting, overfishing, desertification).
>
> "7. Planning and Management
>
> From: Concepts of automatic self-regulating systems...
> To: Concepts of social determination to serve human needs and purposes.
>
> From: Government as problem-solver.
> To: Shared public-private responsibility for outcomes.

We live in a unique age - an age of rapid social, economic and technological change - which should not be news to anyone. The dinosaurs and monoliths of change are readily acknowledged by leading futurists as bigness and power. It should, therefore, be no surprise that governmental agencies will need help in moving their thinking into the 21st century! Unfortunately, smaller organizations, individuals, and the environment can't wait. Randall Scheel[9], President of R.L. Scheel and Colleagues, a consulting firm specializing in issues management makes this point well -

> "In spite of a seemingly conservative political shift in the U.S. we are witnessing a dramatic resurgence of environmentalism. Only this time it's different. Environmentalists are joining other groups for greater clout. Consumer, labor, and environmental

> groups are demonstrating a striking new ability to work effectively with each other. Furthermore, there has recently been a tremendous growth of grass-roots activism. Unlike the handful of national groups that led the environmental movement of the 1970's thousands of small, local groups are currently springing up to put pressure on business. The strong public demand for a clean environment has resulted in intense pressure at the state and local levels. This sudden shift to local politics has caught business lobbyists by surprise; they have previously concentrated on Washington. The new laws tend to be tougher and costlier for business than those previously enacted at the federal level. It is easy to believe pollster George Gallup when he recently called the commitment to the environment the most deeply and widely held value his research has ever uncovered among Americans."

We would hasten, in view of the above references, to state:

1. Conflict is not inherently bad. Without conflict there would be no change nor growth - no democratic action.

2. The recent demonstrations and slaughter in China are atypical, as was the Kent State University demonstrations and slaughter, the Martin Luther King assassination, etc. God forbid that power and might makes right. The great eagle emblem of our country holds arrows in one claw and an olive branch, the symbol of peace, in the other. Since the civil war in the 1860's our military have never been the aggressors instigating conflict, unless done at the whim of individuals. Personal aggrandizement may be more the reason for the contributing factors to this conflict than the purposes of the military and should be carefully scrutinized by those in positions to do so.

3. The wise proverb that "there must be opposition in all things" and corollary axiom that it is possible to have "unity in diversity," need to be reviewed again. Just as truly as when one set of muscles move they must then relax and rely on opposing muscles to move them back into position to act properly again, so also must this realization be applied between Camp Grayling and the Grayling community. To allow one to overpower the other is a spasmodic condition rendering both useless and the rest of the body suffers as a result.

RECOMMENDATIONS

1. A change in relationships must soon be effected between those of the Grayling area community before irrepairable harm is caused. The Governor's Camp Grayling Management Advisory Committee (CGMAC) has made several excellent recommendations. We do have concerns and cannot agree with some of their assumptions and conclusions, among which are:

> #1. <u>Camp Grayling Civilian Oversight Committee (CGCOC) and citizen Ombudsman</u> - Undoubtedly, the military will take strong objection to this recommendation. We are told that there are

are already many compromises, from the original recommendations of the Camp Grayling Management Advisory Committee, in order to bring this report forward. To compromise in regard to any aspect of item #1, would be totally counterproductive to the conflict management process as confidence in the integrity of the military officials and their ability to perform stated functions has eroded too much. It would only erode further if they were perceived as the cause of such changes.

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Almost all other recommendations hinge somewhat on maintaining the integrity of this first recommendation. Those specifically referencing #1 include: #5, 8, 13, 17 & 19.

#22. Restrict air-to-ground range use to between sunrise and three hours after sunset and.
#32. Restrict tank and artillery firing to between sunrise and up to three hours after sunset, with exceptions permitted by the Camp Commander only with justification of need and lack of alternatives. - We would point out that summer sunsets occur later in the evenings which would allow firing up to 1:00 A.M. during the longer daytime period. The lack of specific criteria for justification of need and lack of alternatives, as well as no designation as to whom this justification would be presented, leaves a lot of latitude in the hands of the Camp Commander and potential for new conflicts and negative implications for conflict continuation and prevention. We would recommend that specific hours be set (e.g. 9:00 A.M. - 9:00 P.M.). Departure, if made, should be specifically justified to the citizen Ombudsman for review by the CGCOC.

#19. Restrict the use of 500-pound bombs...proportionate to reciprocal training activities - We would hold up for review the report and positive recommendations of Kamperman and Associates to be found in our PEEC "Technical Reviews" section.

#7. Develop a "Major Training Agreement"... - We would highlight the need for immediate attention to this recommendation, and, the need for the CGCOC and citizen Ombudsman involvement as well as the need for concensus agreement between the Military and the CGCOC on the contents and terms of this agreement. Such action would demonstrate to the Camp Grayling area community the sincerity of intent for conflict management and resolution by the military.

We do recommend immediate action on the other CGMAC recommendations but with intended civilian involvement as recommended by the CGMAC.

a. The leaders of both sides of developed issues must be brought together, by a neutral and qualified agent for reconciliation, following the principles of conflict management, possibly as delineated above, to hear each other, agree on the real problems, suggest possible solutions and to work out an agreeable consensus. This action is considered highly urgent! The office of the Governor, a special appointee of this office

(perhaps a representative of the Governor's Camp Grayling Civilian Oversight Committee or CEO), or a widely respected leader in the MDNR appear to offer the best hope for leadership of such reconciliation.

b. If item "a" is not possible, new leadership for MDMA should be found who are willing and can effect reconciliation.

c. Emphasis, as suggested above, should be on competent resolution of existing conflicts and prevention of further conflict, rather than reaction to problems after they occur (although that cannot be totally avoided), by long range planning, good public relations, effective management and discipline, and non-partisan involvement in MNG activities.

2. Our PEEC of the DEIS points out several inaccuracies, needs for further study and information, and recommendations for correction of these errors and other required information prior to making a decision on the proposals of intent; we understand that the MDNR critique and other public comment does likewise. We feel, for the DEIS to be complete, our recommendations must be fulfilled and incorporated.

3. The restoration and preservation of the Grayling area community & environment is part of our debt to the past and committment to future generations and should not be bargained away. If the area were a waste area the story might be different. The fact of the matter is, however, that the community is already established, the value of that particular environment is already acknowledged as exemplary, and many of the citizens are very concerned, to the point of severe sacrifice, to maintain its integrity.

4. The role and control of the U.S. Military agency, foreign nations and other states in the Camp Grayling activities needs to be carefully reviewed in view of the problems created by the present lack of functional centralized Michigan National Guard control over these out-of-state units.

5. Michigan agencies, responsible for regulation and maintenance of standards, supervision of lease agreements, and other control functions at Camp Grayling, need to be accountable and allowed to do their job in a professionally competent manner.

6. Despite projections of levels of activity there is no guarantee that major increases in troop numbers & training demands made upon this facility will not be made upon this facility. Accident and worst case conditons, some of which are to be realistically expected, judging from past incidents, are omitted from consideration in the DEIS. Recent national and international disasters, natural and otherwise, should serve as grim reminders of the need to develop, teach and rehearse plans of action in regard to worst case scenarios, i.e. tornado, earthquake, flood, air crash, range firing miscalculations, terrorist action, etc. The above point to the need for a more comprehensive assessment, which we recommend.

7. In view of the many closings of military establishments in recent months and years, similar action regarding Camp Grayling, while not presently known to be considered, needs to be given consideration as to environmental, socio-economic & recreational impacts should that occur. What if Camp

Grayling is closed? An assessment of the cost of closing, cleanup, social and economic impacts, as well as other consequences should be included in the DEIS.

8. Peacetime military powers, prerogatives and their relationship to the civilian population ought not need to be debated or need to be rewritten at each military encampment, range, etc., except in regard to special circumstances peculiar to specific locations. Even then, good management principles would dictate that this be done prior to the establishment of the facility. American values, as written into the constitutions of Federal, State and local governments should preclude the recurrance of such conflicts as are in existence in the Grayling area community.

While difficult to control, personal ambitions and partisan (e.g. bureaucratic) gain need to be carefully watched for possible breaches of ethical action. It is unbelieveable that military rights should take precedence over civil rights, or depose or deprive citizens from their properties or daily routines and privileges, in times of peace. There are always possible alternative actions and locations which can be more favorably employed if sincerely sought out.

The following quotations from the Declaration of Independence, July 4, 1776 need to be reviewed in light of what is happening:

> "...We hold these truths to be self-evident, that all men are created equal: that they are endowed by their Creator with certain unalienable rights: that among these are life, liberty, and the pursuit of happiness. That, to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed; that, whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to acolish it, and to institute new government, laying its foundation on such principles, and organizing powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes: and, accordingly, all experience hath shown, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it it their right, it is their duty, to throw off such government and to provide new guards for their future security..."

While existing laws and procedures should negate the need for exercise of these recourses to felt injustice; personalities, personal motives and prejudices of those charged with responsibility for the fulfillment of intent of these laws and procedures have occasionally placed individuals and groups into felt adversarial roles. Such is the case in the Camp Grayling conflict.

That not-for-profit special interest groups, organizations or corporations should have to enter into adversarial roles with those who are charged with their local, state and/or national security, in a "David vs. Goliath" type of encounter, is a waste of the frustration, torment and expense (sometimes not

possible and negating access to due recourse), as is evidenced in the Grayling area community, is sad commentary on the leadership of those governmental entities, whoever and wherever it may be.

Effective advocacy, outside of the vested interest agency, needs to be provided and is highly recommended.

9. Leading futurists agree that looking ahead requires a global view for responsible planning, a determination of facts & trends, making assumptions based upon evidence, determining options and their possible effects, involvement of all levels, representation of persons to be involved in decisions which will affect them and consensus determination of courses of action, as well as joint responsibility for the success of determined courses of action. Personal ambitions & hidden agendas at the expense of others, overwhelming pressure or influence and special privileges are contrary not only to futuring, but, also to the success of the democratic process.

These considerations are recommended for incorporation into the future planning and conflict management/resolution processes to be employed, or as referenced above.

10. Compromise, mutual respect/consideration and responsibility, preservation of individual and minority rights, trust, and empathy all work together for the prevention and resolution of unnecessary conflicts and are recommended to all sides to the current dilemma in the Grayling area community. The absence of these result in needless conflict, crisis and trauma; draining constructive energies, funds and relationships; weakening and destroying that which has been established as good and necessary for the proper functioning of our community.

The pain and despair of any one individual in society inevitably affects us all in the form of diminished productive capacity, need for social welfare care, social disease, destruction of life/property or freedoms, etc. The "high cost of low living" demands payment and military preparedness and presence is one of the realities of that fact. God, and responsible leadership persons, forbid that the treatment of these ills should become yet another disease for those afflicted!

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APPENDIX IV.

A VEGETATION SAMPLING PROCEDURE FOR SITING STUDIES, BASELINE CHARACTERIZATION AND MONITORING

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A VEGETATION SAMPLING PROCEDURE FOR SITING STUDIES, BASELINE CHARACTERIZATION AND MONITORING

TECHNICAL REPORT NO. 21

MAY 1982

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CONSUMERS POWER COMPANY
JACKSON, MICHIGAN

Technical Report No 21

INTEGRATED PLOT SAMPLING

A Vegetation Sampling Procedure
for Siting Studies, Baseline
Characterization and Monitoring

Prepared for the
Environmental Department
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May 1982

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I. INTRODUCTION

A large variety of sampling methods has developed for vegetational investigations over the past several decades. These differ depending upon the structure of the vegetation studied, purposes for which the sample is obtained, and the philosophical orientation and prior experience of the investigators conducting the study. Kershaw (1964) has stated "No hard and fast rules can be laid down; each sampling procedure should be thought out in relation to a specific problem." Nevertheless, it is possible to suggest a general sampling design for forest vegetation that has several inherent advantages and that may be expected to be widely applicable. This procedure is intended for sampling small or medium stands (on the order of 0.5-2 acres or 2-10 acres in extent). The same basic plot design is recommended at both of these scales and could be employed for larger stands by increasing the number of plots to achieve the desired sample grade. The purpose of this report is to recommend a vegetation sampling method appropriate for final stages of siting as well as for baseline characterization and monitoring studies.

The procedure suggested has been tested in research sampling for analysis of soil-vegetation relationships (Milfred, et al, 1967).

A sequence of steps is presented to lead an investigator through the process of vegetational data collection at a site. The sequence stops short of data analysis and summarization, but it does describe, in technical detail, the steps leading up to and resulting in the generation of vegetation data. The suggested methodology is designed for integration of information on several aspects of the ecosystem:

1. Strata of vegetation with one another,
2. Vegetation with soils, geology and other terrain information,
3. Vegetation with animal components,
4. Ecosystem process information (eg, biomass productivity, nutrient cycling, etc), and
5. Other ecosystem components.

Sampling of vegetation is emphasized in this report. Sampling of soils is treated briefly:

1. To illustrate, by example, the integrated sampling of a second ecological variable complex, and
2. To suggest an efficient soil sampling procedure for site characterization.

While the sampling regimes to be used for ecosystem components other than vegetation (and briefly soils) are not fully developed, it is important to note that the basic design of this integrated plot system is compatible with a more comprehensive, process-oriented analysis of ecosystem properties. Yet simplicity is not compromised in the design if it is applied to only a few variables to efficiently yield data for preliminary vegetation description. If sample plot centers are permanently marked, other parameters can be investigated subsequently. Although it is anticipated that most of the data summarization will take place at the "whole stand" level, the design of the sample plot deliberately provides for the possibility of examining relationships between vegetation layers, or between vegetation and soils, at the

individual plot level. In this manner it is somewhat akin to the relevé sampling approach (Mueller-Dumbois and Ellenberg, 1974). The integrated plot design is most suited for sampling forest vegetation. However, where a tree stratum is lacking, as in sampling shrub lands, old fields, prairies or marshes, the suggested procedures for nontree strata can be employed.

In the following sequence, preliminary steps are suggested prior to actual field sampling.

II. STEPS IN CONDUCTING A STUDY

Step 1 - Characterization of the Setting

Once the site has been identified, the setting of that site should be characterized. Setting characterization provides relevant information on the regional ecology surrounding the site. It may also include aspects of regional culture that bear upon the ecology of the site. Setting characterization should include:

1. Description of historical vegetation, animal life, and other biota.
2. Characterization of surrounding patterns of biotic composition and successional trends.
3. Regional "terrain" characterization - geological patterns (bedrock and recent), topography, soils and hydrology.
4. Regional climatological characterization.
5. Regional cultural characterization (past, present, and anticipated).
6. Current resource utilization patterns.

These characterizations should place selective emphasis on patterns and processes that are related to vegetation of the site (eg, past forestry practices that have resulted in current plant community composition and successional trends, agricultural practices, and commercial development that has brought human pressure on the site). Significant archaeological and/or historical sites should also be identified at this point.

Studies have been conducted in several regions to describe historical vegetation characteristics by using the land survey records. Surveyors blazed witness trees at the corners of townships and recorded the size and species of these trees. From these data it is possible to reconstruct presettlement forest composition. Even though studies of survey records cover a much larger region than that of concern in most site-oriented environmental assessments, the techniques and some of the results of these studies are useful. Where such studies have been done, they provide a quantitative as well as qualitative description of historical vegetation characteristics.

Maps and related documents are also highly useful. Interviews with experts and/or locally knowledgeable citizens can sometimes yield excellent insights, but care must be exercised to avoid undue influence of limited or parochial viewpoints. There is really no substitute for firsthand, professional experience in the region.

Characterizing the setting is an information gathering, selection, and synthesis process. It provides a "bird's-eye" view of the region with particular reference to site vegetational patterns, processes, and issues. It also provides useful constructs for the local site assessment.

Step 2 - Delineation of Field Units

Aerial photographs of the site should be obtained. After or concurrent with general field reconnaissance the photographs are examined (stereoscopically, if possible), and approximate stand boundaries are drawn to delineate field units of comparable internal uniformity on the basis of vegetation structure. With photographs in hand, the stand boundaries are confirmed or adjusted in

the field to correspond as closely as possible to changes in vegetation structure or composition of the dominant and lesser vegetation. In Michigan, the Michigan Land Cover/Use Classification System (Michigan Land Use Referencing Committee, 1975) provides an excellent hierarchical set of classes with numerical codes, as well as helpful criteria, for stand delineation. This system is recommended. Mapping should be done either to Level III for reconnaissance studies or Level IV for more detailed studies. Where local detail is required, for example, in the immediate vicinity of the plant, a further level of classification, Level V, may be developed to provide greater precision. If stands are to be used as actual units of future land management, boundaries may be surveyed with precision.

Step 3 - Determination of Desired Sample Grade and Number of Sample Plots

Depending upon the purpose of the investigation, a determination is made regarding the grade of sample required. In general, reconnaissance studies or preliminary screening studies for site selection will require Grade C or lower sampling, while final stage siting and baseline characterization for monitoring will require Grade B or better sampling. Once mapping is completed to a given level, giving rise to stands of a characteristic size, the desired grade is decided. Table 1 shows the number of sample units needed to achieve various sample grades with 1/10-acre tree plots (Goff, 1982).

Step 4 - Location of Sample Plots

Depending upon the size of stand to be sampled and the sample grade specified, a predetermined number of plots is randomly located within the delineated

Table 1

Number of sample units needed
to achieve various sample grades with
1/10-acre plots.

MAPPING LEVEL/ STAND SIZE	NUMBER OF 1/10 A PLOTS					
	1	2-4	5-9	10-19	20-39	40+
V/MINI STAND <(0.5A)	B	A	AA	—	—	—
IV/SMALL STAND (0.5-2.0A)	C	B	A	AA	AAA	—
III/MEDIUM STAND (2.0-10.0A)	D	C	B	A	AA	AAA
II/LARGE STAND (10-60A)	E	D	C	B	A	AA
I/MACRO STAND (60-235A)	F	E	D	C	B	A
MEGA STAND (235-3700A)	G	F	E	D	C	B

stand. A recommended procedure for locating plots is to transfer the stand boundary from the aerial photograph to X-Y coordinate graph paper (Figure 1). At least 4, and if possible, more major divisions of the graph paper should fall within the stand in both the X and Y dimensions, giving at minimum a 40 x 40 matrix of points. With a little practice it is possible to very quickly rescale the graph to meet this criterion. The major divisions of the graph paper are numbered 0 through 9 in each dimension. Next, the sample plots are located on the stand map by use of a two-digit (00 through 99) random numbers table. The first number chosen from the table is the coordinate position of the plot along the X axis, and the second number is the position along the Y axis. The requirement of independence (randomness) of plot location is not seriously compromised by avoiding measurement repetition. One-tenth acre circular plot centers must be at least 75 feet apart and at least 37.5 feet from the stand boundary to avoid overlap and insure that the plot falls entirely within the stand. When these criteria are not met, an alternative point is chosen. After all sampling points are placed on the grid map, these points are located by pacing with compass in hand from a designated origin and marked with a stake. If it is necessary to assure with confidence that plots can be relocated, they can be precisely surveyed. Other methods of randomizing sample locations are possible, but this way is simple and provides a map of the sample plots as a bonus.

Step 5 - Sampling of Vegetation

Figure 2 is a diagram of a hypothetical small stand sampled by the suggested method. Lines along the four cardinal directions serve to divide each circular plot for woody species into four pie-piece-shaped quadrants. Species

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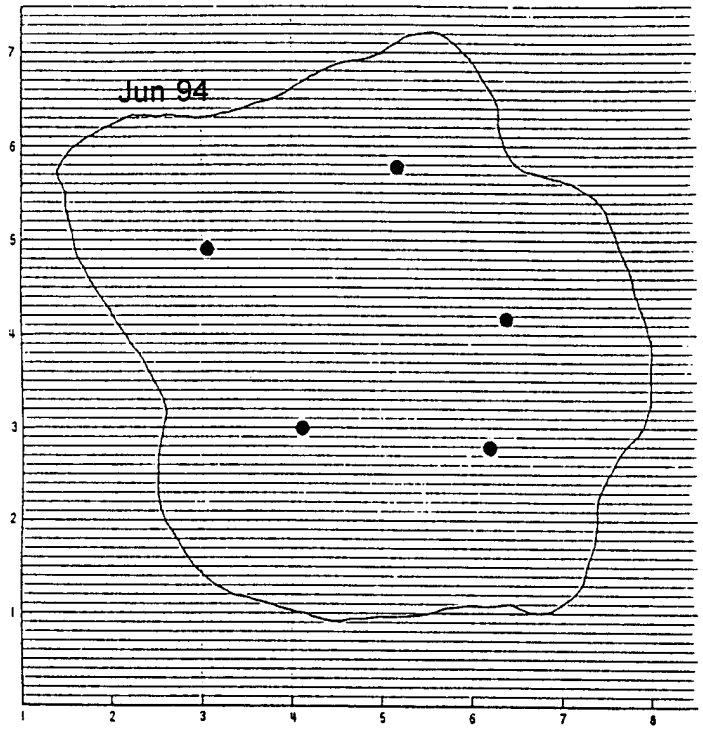

Figure 1 Map of hypothetical stand showing graph-paper-mapping procedure for locating five plots at random coordinates. Two-place number pairs are drawn from a standard table of random numbers to provide coordinate positions.

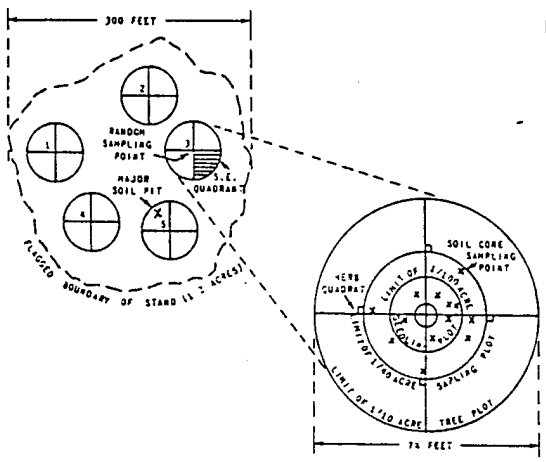

Figure 2 Diagram of a stand and the plots and points established in it for integrated plot sampling of vegetation and soils.

name is recorded and basal area is measured for each tree over 4.5 inches dbh within each 1/40 acre pie-shaped quadrant. Density and frequency values for each species are calculated directly from basal area tally forms. Density may be determined by diameter class, with 3-inch class intervals usually providing a suitable population structure summary (Table 1). Saplings and shrubs between 0.5 and 4.5 inches dbh are tallied by 1 inch dbh classes in 1/160 acre quadrants about the same center point as trees (Table 2). Seedlings and shrubs less than 0.5 inches dbh but greater than 6 inches in height are tallied in two 1/4 inch classes measured at 6 inches aboveground with one transitional seedling class comprised of stems larger than 1/2 inch at 6 inches above ground but less than 1/8 inch dbh (Table 2). A variable plot radius is used to tally seedlings depending upon their density in the area. Plots of 1/1,000, 1/300, 1/100, or 1/40 acre (corresponding to quadrants of 1/4,000, 1/1,200, 1/400, and 1/160 acre) are used. Plot size is noted on the data form. The criterion for selection of plot size is an average tally on the order of 5 to 10 stems per quadrant. A notched Masonite or Plexiglas template may be used to tally seedlings and saplings.

Herb frequency and density of seedlings below 6 inches in height are recorded within square meter quadrats located clockwise and outside a point 18.5 feet from the plot center in each of the cardinal compass directions. In addition, a complete listing of species present on the plot is made, and optionally the cover-abundance ratings of Braun-Blanquet are recorded for each. Voucher specimens should be collected for all "undetermined" species as well as for any specimen that cannot be identified with absolute certainty.

TABLE 2

Explanation of Suggested Tree Diameter Class Divisions

Diameter Classes of Trees	Explanation
S	Seedling[1] > 6" in height and < 0.5" in diameter breast height (dbh)[2]
2"	0.5" - 3.5"[3] dbh
5"	3.5" - 6.5" dbh
8"	6.5" - 9.5" dbh
11"	9.5" - 12.5" dbh
14"	12.5" - 15.5" dbh
17"	15.5" - 18.5" dbh
20"	18.5" - 21.5" dbh
23"	21.5" - 24.5" dbh
26"	24.5" - 27.5" dbh
G	27.5" <

[1]The term "seedling" is used here to denote a size category and therefore includes sprouts.

[2]It is of course understood that most seedlings do not even reach breast height.

[3]Interpret this to mean 0.5" to 3.49" inclusive.

Step 6 - Field Interpretation

In addition to the plot data, tree ages should be obtained on representative specimens and general observations should be made on the growth form of trees, presence and abundance of cradle knolls and other phenomena of ecological significance. Items of circumstantial evidence relating to an interpretation of stand history such as presence of charcoal, stumps, trees growing on top of cradle knolls, etc, should be systematically noted and a preliminary reconstruction of the history of each stand made in the field. At this point, the history of the particular stand under consideration is related to the "setting" analysis carried out earlier for the entire site. While reconstruction of stand history is perhaps as much an art as a science, requiring a substantial familiarity with the landscape and large measure of intuition on the part of the investigator, this aspect of the assessment may provide some of the most useful information as far as actual planning and management decisions are concerned. Therefore, though this is not an easy task, it should not be ignored or passed over lightly in favor of more rigorous but possibly less informative data. A page or two of notes and informed speculation regarding stand history and current process should be made. It is very helpful at this point if two or more individuals can engage in dialogue to develop such a statement. The field notation and interpretation of stand history, current status and process is akin to the case history and diagnosis made on a patient by a physician and bears a similar relationship to the "hard data" on stem density, basal area, etc, as does the physician's determination of pulse rate and temperature.

Step 7 - Floristic Examination

The timed meander search procedure of Goff, Dawson and Rochow (1982) is suggested to provide a systematic examination of the flora of the entire stand. The main point that needs to be appreciated here is that even a very elaborate set of measurements on a rather large number of plots or other sample units for description of the vegetation provides no assurance that adequate attention has been given to the flora. Vegetation analysis is generally focused on the dominant or ecologically influential species of the site. Floristic examination, on the other hand, gives equal attention to species whether they are dominant or inconspicuous. In fact, in order to discover rare, threatened, or endangered species, a diligent search should be made for species that are by nature sparse, inconspicuous or otherwise nondominant.

After the vegetation sample has been collected on all plots, a consolidated list of the species encountered is assembled. A timed meander-search is then conducted of the entire stand, taking particular note of peculiarities of composition, topography, etc, and collecting voucher specimens of any questionable species encountered.

III. INTEGRATED SAMPLING FOR DESCRIPTION OF RELATIONSHIP BETWEEN SOILS AND VEGETATION

As an example of including an ecological variable complex other than vegetation, soil sampling is considered. In Figure 2, the sampling design is intended not only to provide a description of vegetation but also to give a sample of the soils of the site at a sufficient level of detail to permit analysis of soil-vegetation relationships. The following sampling procedure is suggested: Surface soil samples for nutrient analysis are taken at each point. Twelve to fifteen cores of soil are collected with a 6" channel probe so as to represent the microedaphic conditions within the center 25 percent of the 1/10-acre tree plot. Each sample consists of 6" of mineral soil in addition to the overlying organic layers. These samples are consolidated and mixed for each of the five plots. At a representative site within each stand, one major soil pit may be excavated and a detailed profile description made. Samples are collected from each horizon or 6" interval, whichever is smaller, for laboratory analysis. Probably for most assessment work soil sampling would not need to include the major pit. In one application of this design it was found that the surface soil "grab samples" (6" probe samples) provided as good a representation of the nutrient regime of the stand as could be developed from the much more difficult to sample "major pit," since the upper 6" zone of the profile serves as an ecosystem level integrator and index of the effective nutrient distribution of the entire profile as well as of the biota.

Although more detailed information on the distribution of nutrients with horizon and depth could be obtained from the profile data, when the attempt was made to integrate these data into a single measure showing the nutrient

status of the stand as a whole, difficult questions of functional root distribution and below-ground ecological processes were posed. The biological integration accomplished by the vegetational pumping of nutrients to the soil surface, and microbial activity releasing and recycling these nutrients, seemed to be fairly accurately expressed in the nutrient content of the surface soil.

IV. ADVANTAGES OF THE SUGGESTED METHOD

A. Efficiency of Effort - It has often been claimed that distance methods (particularly the point-centered quarter method) are more efficient than plot methods. However, since more trees are measured at each location, I have found the 1/10-acre circular plot to be the most efficient sampling method for most forest tree sampling. (In graduate school at the University of Wisconsin, several years ago, there were challenges among the graduate students favoring various methods as to which method was the fastest and gave the most data per unit of field effort. If tree density and diameter were to be determined, the 1/10-acre circular plot, sampled by an experienced field ecologist with a minimum of appropriate equipment, proved to be the most efficient!)

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In their test of field efficiencies of forest sampling methods, Lindsey, et al (1958), found 1/10-acre circular plots to be more efficient than any other method tested, other than the "Rangefinder Bitterlich" method, in terms of the total field time required for an adequate sample. The "Rangefinder Bitterlich" method simply estimates 4-inch diameter classes for trees, so it is not strictly comparable to the sampling methods that actually measure trees. Of these, the 1/10-acre plot method is ranked No 1 by Lindsey, et al (1958). Other efficiency features of the combined plot design suggested included:

1. Division into quadrats provides a very efficient (practically no additional effort) way of achieving increased sensitivity in the frequency scale and also provides two scales for detection of species association or other relationships at different levels,

2. The same lines that divide the tree and sapling plots into quadrants are used to locate herb and seedling quadrats,

3. The radius of the sapling-shrub plot provides the distance from the plot center point to the herb-seedling quadrat.

B. Dimensional and "influence" linkages among vegetation strata - The size and design of this plot arrangement were worked out to facilitate a study of soil-vegetation relationships, including the influence of soils on productivity and successional rate, and the influence of vegetation on soil genesis. For such a study it was necessary to consider the dimensional relationships between tree size, canopy extent, litter fall zone, and root zone. The diameter of the plot was chosen to be approximately equal to the height of the dominant trees on the premise that a 45-degree zone of influence about each tree would maximize the relationship between edaphic and understory conditions at the plot center and all of the overstory vegetation measured on the plot, and furthermore, would not be highly influenced by trees growing outside the plot. Similarly, the diameter of the sapling-shrub plot was set to approximate the "zone of influence" of the sapling-shrub stratum, given approximately a 45-degree radius of influence with the bole of each sapling forming the axis of a right triangle. These relationships are not precise. However, it is obvious that if the plot is too small, understory and soil conditions will be greatly influenced by tree vegetation outside the plot, thus rendering plot-by-plot analysis of relationships relatively meaningless, and if it is too large, only a portion of the understory and soil information for each plot will relate to only part of the tree data for that plot -

measurement of relationships will, in effect, be averaged out. This design was originally developed to allow a plot-by-plot analysis of the data (as well as analysis of whole stand averages). Using a plot design in which plot sizes are selected on the basis of functional relationships between edaphic conditions and various strata of vegetation seems highly advantageous even if it is known in advance that data will be analyzed on a whole stand basis.

C. Population structure analysis - One of the advantages of the integrated plot design suggested is that it provides good data for population structure analysis. The population structure; ie, density by diameter distribution, of trees by species within a forest stand, gives a better indication of the dynamics of the stand than almost any other type of data. For example, if the understory is dominated by sugar maple (Acer saccharum) and the overstory by red oak (Quercus borealis), an inference can be quite reliably made that this stand is undergoing progressive succession from the intermediate stage (red oak predominant) to more "climax," locally self-perpetuating stage (sugar maple predominating). To construct such diameter-density distributions requires:

1. An accurate measurement of the diameter of each stem, or at least a reliable placement of stems into dbh classes;

2. A locally integral sample that portrays the canopy/understory interaction effects within the stand (see Goff and West, 1975);

3. A sufficiently large number of stems to construct the distribution without sampling error per species per size class being so large that

population structure patterns are obscured - on the order of 0.5-acre total sample is required for construction of a meaningful density-diameter distribution in most forests in the Great Lakes Region;

4. A relatively intensive sample of the smaller diameter classes.

The integrated plot design provides for these requirements.

D. Relative ease of permanently locating plots - The suggested plot design lends itself very readily to permanent location (ie, relocation) of plots. We used 1-inch x 3-foot aluminum channel stakes. Aluminum markers can be easily stamped with identification numbers and they are inert and resistant to weathering. Steel markers have the advantage of being relocatable with a metal detector. A map of the stand, showing plot locations, is developed in the process of locating plots, so very little additional effort is required to permanently locate sample plots. Since intra-plot dimensions and directions are known, the location of the sample units used for all strata is established by a single stake at the plot center. Nails can be driven into the soil at quadrat corners to provide a means of precisely locating these for up to several years after initial sampling. Permanent location of sample plots is recommended for purposes of monitoring or assessment of vegetational changes over time. Knowing plot locations also makes it possible to add studies of other ecological variables subsequent to initial sampling. In this way an integrated ecological data set can be accumulated as collection of new data is indicated or required.

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es1081-0434a-48-71

DOCUMENT 17

Susan Seifert
RT 2 Box 2765
Grayling MI

June 30, 1989 Jun 94

Dept. of Military Affairs
ATTN: CF FO (DEIS)
2500 S. Washington Ave.
Lansing, MI 48913-5101

Dear Greg,

Please add my written comment to the others regarding the DEIS/"Master Plan" for Camp Grayling.

I have just read a copy of the MDNR critique (June 13, 19 and it sums up my concerns accurately.

In addition, the statistics were announced yesterday on the singing male Kirtland Warbler. I hope you are aware now that the Kirtland Warbler is a Federally Protected Endangered Species. The census for 1989 revealed 55 singing males in Crawford County. In 1988 there were 63, in 1987 there were 66, in 1985 there were 80, in 1983 there were 72. I am not an ornithologist however, these statistics show a dramatic decline of warbler population in Crawford County. I was also offended by the inference that the Kirtland Warbler is somehow trespassing on Military land — excuse me?

1 In closing I will cite section 1502.9 of the National Environmental Policy Act and request a Revised Draft (not a Final EIS) with these issues incorporated — and addressed.

Sincerely,

Susan Seifert

DOCUMENT 18

Nora, Hemming, Essad & Polaczyk, P.C.

COUNSELORS AT LAW
27218 MICHIGAN AVE.
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JOHN J. NORA
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TIMOTHY L. CRONIN
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LINDA A. PHILLIPS
MRS. ERIC HANSEN
SAMUEL G. FIPPARALDI
SCOTT A. SMITH

OF COUNSEL
ROBERT C. LAW
DONALD L. MEYERS

June 30, 1989

Greg Huntington
Department of Military Affairs
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913

RE: E.I.S. - Mission/Multiple Construction:
Camp Grayling Army National Guard

To Whom It May Concern:

Without waiving our objections to the arbitrary time limits set for responses to the E.I.S., we make the following comments. The proposed use of Camp Grayling will definitely impinge on private property, and is not sensitive to its impact on the environment. The E.I.S. does not provide for proper resource management and enjoyment of our natural resources of this area by residents and visitors. Huge airplanes and artillery do not belong in these forests. There is no reason to desecrate additional lands, when presently used lands can continue to be used.

1
2

The E.I.S. fails to take into account the wetlands contained within the proposed area, as established in a 1950's study. It fails to address the dangers to the Kirtland Warbler, an endangered species. For at least five (5) years, an area just east of the proposed assault landing strip, was posted off-limits in the summertime to any type of travel or use in order to protect the Kirtland Warbler critical nesting habitat. All of a sudden this year, that same area no longer needs posting, because the Kirtland Warbler moved or will move to another area! That is the same mentality that the E.I.S. uses. The proposed uses are not a problem to these areas, because no problems exist within these areas.

3
4

Sincerely,

Chris B. Polaczyk

C. Gerald Hemming

DOCUMENT 19

June 28, 1989

Michigan Dept. of Military Affairs
Sirs:

I have read the information you sent out on the plans of the National Guard at Grayling, Mi. Although I do not disapprove of improving the Camp Grayling I strongly protest utilizing larger and expanding air to T-1 and T-2 areas. We have a place on the North Branch where has been an overlook for a 100 years and don't want to see the woods get all torn up.

Having served in the 83rd Infantry Div. in World War II then the Ardennes, Rhineland and Central Europe I hate to be woke up by the sound of artillery again.

Improve your Camp Grayling but please don't keep moving further away from Grayling into the woods around Lovells on the North Branch

Mrs. Mrs. Fr. Kimball
14777 Stanton Rd
Chesaning, Mi. 48616

DOCUMENT 20

June 28, 1989

Michigan Dept. of Military Affairs
Attn: E.I.S. Response
Construction & Facilities Office
2500 Washington Ave.
Lansing, MI 48913-5101

Jan 94

Gentlemen:

I demand the EIS on the MCRP proposed for Camp Grayling be dismissed and a new study be performed, for the following major, and yet, what should be very basic reasons:

1 There was no soil testing of the current Camp Grayling area, or on the proposed expansion area. The soil study mentioned in the EIS was over 60 years old.

2 There is absolutely no current testing of water wells. I feel water contamination is a major problem in the present Camp Grayling surrounding areas and expansion would only worsen the situation. It seems to me that the Guard would want current testing data so that if the expansion was approved, they would be able to maintain the same standards.

3 Noise Pollution - A major factor!! Presently, surrounding inhabitants find the artillery and aircraft noise absolutely intolerable. Expansion and increased usage of the range area can only prove to be detrimental to inhabitants as far as noise pollution. Civilian population surrounding the present range area has increased drastically since the origination of the Camp and THIS is a major issue that the EIS never evaluated. One of the reasons for the increase in civilian population is due to this region being so prime for outdoor recreation. The impact of the proposed MCRP never mentioned this major issue!

4 This area is now beginning to receive recognition as the "Crossroads of the North" and the "Golf Mecca" of Michigan - two very lucrative and prosperous forms of recreation. Both also do two major things - pump thousands of dollars into the Northern Michigan economy and promote a form of growth which can be ecologically safe. The EIS makes no mention of the impact of the expansion of Camp Grayling on this type of growth in Northern Michigan.

What's the matter with our bureaucracy when civilians have to fight their own government for a country without induced air, soil & water pollution? It is time for the persons in office to either stand up for us, step down if the task is too big, or for the voters to say OUT and get some real representation!

With sincere concern,

Michelle J. Schwartz
Michelle J. Schwartz
RR 1 Box 340, Frederic Mi

DOCUMENT 21

June 29, 1989

Michigan Department of Military Affairs (DMA)
2500 S. Washington Avenue
Lansing, Michigan 48913

Attention: Greg Huntington
Construction and Facilities Office

Subject: Draft Environmental Impact Statement (DEIS)
Mission/Multiple Construction: Camp Grayling Army
National Guard Training Site, Michigan

Dear Sir:

The DEIS is the most shallow of documents that I have read in my lifetime. Documentation for this view is contained in the Anglers of the Au Sable response to the DEIS, a response that I fully support. The purpose of this personal response is to expand on a few points and to challenge the preparers and governmental reviewers of the DEIS to begin to act responsibly.

We are at a watershed in this conflict between the environment of training for war and the environment of life. The DEIS is so deficient in addressing this conflict that I charge the DEIS is not a environmental analysis having to do with the impact of the expansion on the environment of life but a broad generalized proponent for the environment of training for war. At issue is the quality of life in the primary effects area, not only today but for the generations who follow. Some examples among many:

1 (1) The toxicity from explosives' residues and unexploded ordnance on all the ranges is not addressed even though in the scoping document for the DEIS it was stated that this concern would be addressed. Further, even the head of the DMA is on record as to the pollution and contamination of these ranges. I believe the reason for this overwhelming silence is quite apparent. The recognition of this danger would require the DMA to address the future impact of the continuing and increased pollution and contamination. The recurring failures in the DEIS are to ignore the past and dismiss the future with words such as "not anticipated" and "mitigation". There is limited testing currently being done on just the range 40 complex and, regardless of what this limited testing shows, the aquifers that provide water for the residents of numerous communities are in harm's way. The ultimate question needs to be addressed. WHEN THE AQUIFER BECOMES CONTAMINATED WHAT DO THE COMMUNITIES DO? This DEIS failure is blatantly irresponsible.

2 I further charge that what the DMA has possibly brought to the residents are Hazardous Waste Sites, as defined under the Resource Conservation and Recovery Act, domiciled on the ranges by storing waste munitions, burying waste munitions and detonations of such munitions. There is not one word in the DEIS concerning this potential or whether federal regulations are being followed. The DEIS is completely sterile on the entire question of the handling of munitions from transportation, receipt, storage, delivery to sites, and disposal of waste munitions. Over five miles of a railroad spur will be built

3 with the contents of the railroad cars not disclosed (but obviously ammunition) and complete silence in the DEIS! In simple terms, that even you can understand, I say

DOCUMENT

Page Two
June 29, 1989

ammunition, waste munitions or not, is hazardous to the human environment! The silence in the DEIS on this entire subject is deafening and shows the true goal of the preparers of the DEIS, a complete dismissal of any concern for the human environment and the quality of life.

4 (2) The socioeconomic analysis in the DEIS is a farce. The past build-up of the military presence has had and the future impacts of the expansion will have serious harmful effects on an area that relies on tourism and retirees for its economic and social well being. Further erosion of the local infrastructure will result. The Governor will bring some dollars into the area and in the process destroy the very core of the economic base. I say this is complete madness.

(3) A decent quality of life requires a time and place for refreshment, recreation, reflection, solitude, and the opportunity to hear silence. The highway corridors to this area from the south on weekends and during the vacation months are a testament to this human condition. The narrowness of view as demonstrated in the DEIS in this regard is a disgrace.

(4) In January, 1988, at a meeting with Mr. Andrews and the DMA I personally challenged Mr. Andrews on the DMA priorities in seeking federal funds. Andrews had mounted an intensive campaign for funding of the Multi-Purpose Range Complex, (MPRC), as opposed to campaigning for funds for a wastewater treatment system to bring Camp Grayling into compliance with the NPDES permit and to stop the pollution of Bear Swamp. To my knowledge the MPRC and the Assault Landing Strip continue to have the priority in Andrews' pursuit of funds and the wastewater treatment facility goes begging. Worse, the Governor and Senator Levin continue to acquiesce with the DMA is this major slight to the environment.

Permit me to end this letter with a pleading to the Governor, our U.S. Senators and all government agencies who should review and critique this highly deficient document. I say to you that the residents and the citizens of this state have been ignored in the DEIS. They have been given zero standing. I say to you that the land, the wildlife, the streams, the trees - all have standing in this conflict. I plead with you to give such recognition and honor not only the present but the future. I urge you to completely reject the DEIS and demand a proper and responsible Environmental Impact Statement be undertaken.

Sincerely,

Richard B. McGlinn

Richard B. McGlinn
11516 Burger
Plymouth, Michigan

cc: Governor James Blanchard
Senator Carl Levin
Senator Donald Riegle
David F. Hales
Vernon Andrews

M-40

Appendix M

To: Natl Guard Bureau
& Mich. Dept. of Mil Affairs

Subject: Environmental Impact Study

Dear Sirs:

In my brief study of this E.I.S. one of the most obvious omissions is one of the prime reasons which 1st get citizens agitated and started some of the 1st controversial issues yet this study almost entirely passes over it without any mention and has no mention of any remedy to overcome the problem.

It is as I'm sure you know the helicopters on the Airport located just North of the city on Old 27.

Nearly 2 years ago the people in the Subdivision of Elmwood Forest circulated a petition and nearly every person in the Sub signed asking for relief from nighttime & helicopter training & maneuvers that were at times unbearable & with noise levels way above human tolerance. Nothing was done but promises to "look into it" & continued with still more promises

All this isn't bad enough then the Military proposes a year round helicopter group w/ more helicopters - and a ½ million Dollar housing project on this airport which even they agree (by their own General Order * 10, 1967) and it's worse now - "that this field is to close to civilian business & private homes & subdivision for tactical training"

For what reason is this subject been sidestepped?

Whom ever did this study either Completely disregarded all the complaints over the past years - OR was not given the information to report on - which is it? And why is this report full of discrepancies on other subjects?

If it has one error in the Draft - Was it intentional or was it prepared w/o proper homework & study

EXAMPLE - My mobile Home park is Named TIMBERLY VILLAGE - NOT Ingersoll Camp as reported on 4-3-20 Land Use Area - and the new motel is located N.E. of Grayling NOT N.W as reported in 2-2.1.

Also on 2-2.1 last paragraph it states the Airfield operates 16 hrs per day during training - How can any human be expected to put up with this noise pollution - and it's not going to get worse why are they proposing a Parachute Rigging Facility at a Cost of 200 thousand Dollars? and all the new additions for year round troops & pilots?

The airfield is one of the foremost problems (Helicopters) night firing rate - etc.

These problems MUST be addressed by the E.I.S. or they will be addressed & acted on in the Courts after a waste of Taxpayer monies on these proposals which will be impossible to live with -

Jun 94

Sincerly

Don Welser

DONALD WELSER
PO BOX 123
GRAYLING MI 49738

DOCUMENT 22E

In 1967 the General Ishpiming signed a general order * 10 that said that the various guard units would NOT be able to train on the County - Army airfield "Because of the close proximity of civil homes & Business." -

Why would the military sign an order & put it into effect and not enforce it only on rare occasions? 22 years since the General signed this order to stop the tactical training and it's still going on - Helicopters are a nightmare in the vicinity of the airport. Hovering & up and down have often been.

Now you are talking of bringing in more helicopters & spending ½ Million dollars on new housing for more troops to make more noise for the people who live around the Airport which is now Completely surrounded by Civilians & business -

Surely somewhere in your empire of 76,000 acres there's got to be a better place - or move it to one of the CAMPS that the Pentagon says is no longer needed.

Surely in the past 22 years there hasn't been a decrease in Civilian homes & business near the airport - and the airport is still adjacent to the city property and at least several churches & the high school have been built very close to the airport so who is it that is doing the planning?

If any more helicopter activity is needed & I personally believe that the military will be forced to relocate - and rightfully so, our people cannot be expected to live with excessive noise pollution and all the monies spent will be wasted if they have to relocate.

Sincerly

Don Welser

Help Hospitalized Veterans
MR WELSER
P O BOX 123
GRAYLING, MI 49738

DOCUMENT 23

Department of Military Affairs
Attn.: C470 (DEIS)
25 Jun 94 Washington Ave.
Lansing, Mich. 48913-5101

Dear Sirs,

I am writing regarding the proposed 4½ million dollar new barracks & heli-copter facility at the air port in Grayling.

The noise from the existing helicopters has already created havoc with the citizens of Crawford Co. The expansion would surely create more resentment for the Guard if this goes through. Also there was no mention of the sewage plan for a project of this size.

If the National Guard wants to keep good relations with the people who live here then why do you keep expanding & creating more ill will. You already controll the majority of land. Don't create more noise & Pollution

Sincerely,
Richard Davis

DOCUMENT 24

June 26, 1989

Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913-5101

To whom it may concern:

I am writing as a matter of public record to oppose any future plans for increased activity and/or facilities at Camp Grayling, the site of national guard training. Experts more knowledgeable than I have already testified as to the many and severe inadequacies of the recently released Environmental Impact Statement. As a private citizen, long active in constructive preservation of Michigan's natural resources, I emphatically state that this E.I.S. statement is incompetent and misleading, as well as incomplete. Aside from the obvious white-wash treatment of existing Guard activities, the E.I.S. statement does not even deal with the environmental impact that will occur if the proposed MPRC and Assault Landing Strip are constructed. The usuage of these two facilities will have severe impact on this very fragile natural river system in the decades to come.

I ask you to review and consider the future implications that this proposed expansion will have on this entire area. And then, I ask you to reconsider such planned expansion and vote for Michigan's environment and her future and against Camp Grayling expansion!

Cordially yours,
[signature]
4070 West Valley Rd.
Bloomfield Hills, MI 48013

DOCUMENT 25

June 26, 1989

Department of Military Affairs
Attn: CAFO (DEIS)
2500 S. Washington Ave.
Lansing, MI 48913-5101

Dear Sirs,

I am writing you to express my complete opposition to the expansion of Camp Grayling, Grayling, Michigan.

In my opinion, the construction and utilization of the proposed Multi Purpose Range Complex - Heavy (MPRC-H) and the Air Assault Landing Strip would cause grievous and irreparable harm to the environment and the historical recreational use of the area. I am enclosing my comments made at the public meeting held June 13, 1989 in Kalkaska, Michigan and also a copy of my letter to the civilian advisory committee appointed by Governor Blanchard for your review.

I sincerely urge you to consider the tremendous negative impact that the proposed construction and expanded use of Camp Grayling will have on this area.

Thank you for your consideration.

Sincerely,
[signature]
Art Schwerm
11602 N. Bluff Rd.
Traverse City, MI 49684

August 29, 1988

Camp Grayling Management Advisory Committee
P O. Box 20241
Lansing, MI 48901

Dear Committee Members:

As a home owner in the CCC Bridge area along the Manistee River (Cold River Gardens subdivision - Bear Lake Township). I wish to express my complete opposition to the expansion of National Guard activities at Camp Grayling.

The AuSable/Manistee River areas which are currently impacted by Guard training encompass some of Michigan's most historic and finest hunting, fishing, canoeing and camping opportunities - especially when one considers their proximate location to the population centers of lower Michigan. These rivers are famous throughout the country for the quality trout fishing they offer.

The present situation is barely tolerable. Let us remember that the National Guard has not been what you would call a careful and sensitive neighbor. When the Guard is in training, it is not unusual to have the deafening noise of low flying jet fighter aircraft during the day and/or helicopter gun ships with rocket fire all backed by the symphony of small arms and cannon fire shattering the solitude of a summer's night fishing. Last summer, my cabin, along with many others, were endangered by a significant forest fire that I understand was caused by Guard negligence. This was not the first such incident.

The plans to build an "assault" air field in the CCC Bridge area is especially onerous. Due to it's location well away from paved roads, this area has always offered our outdoors minded citizens the opportunity to enjoy their pursuits in the relative solitude that one expects to find in the north woods. Locating an assault air field would be especially degrading and totally incompatible to the traditional use of the area. The detrimental noise pollution and increased mechanical use that this endeavor would cause would seriously damage this unique and sensitive recreational and natural resource.

I sincerely urge the Committee to act to protect the recreational treasure that the Manistee/AuSable River areas represent. The historic use of these waters by the sportsman have far preceded the incursion by the National Guard. Today's citizens, their children and their childrens' children should also have the privilege to enjoy their heritage of this unique area. Allowing the National Guard additional access will deny this heritage.

Cordially,
[signature]
Art Schwerm
11602 N. Bluff Rd.
Traverse City, MI 49684

Comments made at Public Meeting on Camp Grayling Draft Environmental Impact Statement held in Kalkaska, MI June 13, 1989:

My name is Art Schwarm and I own a home and pay taxes on property located on the Manistee River, located approximately within a mile or so of the proposed assault landing strip, and I am speaking tonight in my own right. You have heard many comments tonight on the total inadequacy of the DEIS and I certainly concur.

In my opinion, allowing the overall expansion of Camp Grayling and specifically the construction and operation of the proposed assault strip would be a major and a tragic mistake.

The AuSable and Manistee River are absolute jewels in the recreational treasury of the state of Michigan.

These areas have always offered the outdoors-minded citizens the opportunity to enjoy some of the finest fishing, hunting, camping, and canoeing that can be found in the country and still be just 2-3 hours away from major population areas.

It is an area with significant current tourism impact & even greater potential - one that I might add that has already suffered mightly from proximity to Camp Grayling and the documented abuses that have occurred over the years.

But let's imagine, that just for a moment, that Camp Grayling had never been built and did not exist today.

Would anyone seriously think, in this enlightened environmental era, that the construction of a major military training base - right in the heart of this prime Manistee - AuSable recreational area - would ever get a credible consideration?

No! I think not! It would be completely incompatible with the most valuable use - to even comtemplate the taking of prime recreational lands that are located within easy reach of millions of our citizens and turn what only nature can give to us into a wasteland of noise and mechanical disturbance would be judged as outrageous at best.

Obviously then, if the citizens of Michigan would refuse to allow this degradation of blue ribbon recreational lands in this imaginery example...then they should refuse to allow any increase in the degradation of these areas in today's real world situation.

What isn't imaginary is if the expansion of Camp Grayling and the proposed assault landing strip and it's support services are allowed, then you and I, and all of the others that come after, will see another severe reduction in the quality of one of the state's finest natural resources.

The facts are very simplistic:

1.) The population of this country will continue to grow.

2.) The prime recreational lands of this country will continue to be under ever increasing pressure.

3.) Military training base activities are totally incompatible with the maximum enjoyment of nature and her gifts.

4.) Unless we stand up and say NO, the base will continue to ever expand it's operations in the future.

This would lead to the conclusion then that the acceptance of incompatible uses, (i.e. the expanded activities of Camp Grayling) will come at the direct expense and abandonment of one of our most valuable resources at a time when we can ill afford that. The trade-off is simply unacceptable.

Jun-94

DOCUMENT 26

DOCUMENT 27

Joseph A Cercone
165 Doris Lane
Rogers City, MI 49779

April 27, 1989

Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913-5101

To Whom It May Concern:

Thank you for the opportunity to review the executive summary of the Camp Grayling Environmental Impact Statement. Issues of trust notwithstanding, there is one area of the statement upon which I am compelled to comment -- that is the noise associated with recent training activities. I am confining my comments to this topic since I am primarily a transient user of the AuSable rivers. Current noise levels are relevant since the plans to expand upon the training facilities at Camp Grayling refer to "no significant increase" in those levels. This statement ignores the feelings of many that current noise levels are far too excessive. Maintaining the status quo is not enough. Noise levels must be significantly decreased for the area surrounding Camp Grayling to maintain its value as a source of prime outdoor recreation. 1

Very few people I have talked to are anti-military per se. We all recognize the need for the National Guard to be as well trained as possible, and would never propose to send inadequately trained men into battle. The only question is to what extent they should be trained at this particular facility. Of primary concern in this discussion is the ability of that training to "peacefully co-exist" with other historic uses of the area surrounding the facility.

As recently as ten years ago, the casual visitor to the AuSable would be hard pressed to recognize that a military training area was in close proximity. The guard's presence at that time was, for the most part, non-intrusive. However, over the past five to seven years, the intensified level of training at Camp Grayling has severely impacted the natural environment of the area. Given the fact that the AuSable river system has been the premier trout stream in the entire Midwest for well over 100 years, and given further that current levels of training and peaceful enjoyment of the river are mutually exclusive, one is entitled to ask which use should have top priority. Since the river can't be moved, the logical answer is to restrict the activities of the military.

Dear Sir:

I am writing to you regarding the proposed expansion of the Michigan National Guard Base, Grayling, Michigan. I have received and read the Documentation Designation Draft Environmental Impact Statement. My comments are as follows:

Expansion-Training area TI-Multi Purpose Range Complex-Heavy.
This expansion will increase the size of the training area three times the present area. It will comprise the whole East Branch of the Au Sable river, a prestine area. It will cause heavy military vehicle traffic through the Village of Grayling. The Village will become nothing but a military enclave. The sight of military vehicles in an area where they should not be causes a repulsive reaction by the civilian and gives an impression of a military rough shod take over. 1 2

Statement on noise level- The Draft Environmental Impact Statement relating to noise level dwells on noise related to construction of expansion rather then noise related to training which consists of the fireing of large caliber guns not only during the day but at all hours of the night. With the expansion in place the noise level will increase dramaticly, and with the proposed winter trainig the noise level will be year around. As is stated in the report,(No State regulations, permits, or approvals exist for the regulation of noise in the State of Michigan) This statement alone leads me to believe the military does will not consider the impact of training noise on the civilian residing in the area. 3

Military posture and training in peace time- An adequate military is essential but,with the war threat threshold in the world in the present reduced state a minimum military posture should be required. Therefore, there should be no increase in the present size of the Michigan National Guard Base, Grayling, Michigan.

Harvey B. Burkholder

Harvey B. Burkholder

Mr Harvey Burkholder
37756 Greenwich Dr
Mt Clemens MI 48043

Dept. of Military Affairs
- page 2 -

I do not expect that Camp Grayling will be closed any time in the near future and I don't propose that it be. My sole concern is that if its use is expanded, there is no possibility that the area can be returned to any reasonable semblance of the peace and tranquility that it has provided since the 1870's. Therefore, I must take exception with the Department of Military Affairs' plans to, in any way, expand upon the scope of the facilities at Camp Grayling.

Very truly yours,

Joseph A. Cercone

Peter L. Gustafson
900 Old Kent Building
Grand Rapids, Michigan 49503
(616) 459-6121
May 16, 1989

Michigan Department of Military Affairs
Construction and Facilities Office
2500 South Washington Avenue
Lansing, Michigan 48913-5101

Attention E.I.S. Response

Gentlemen:

I have not yet had an opportunity to review in detail the draft Camp Grayling Mission/Multiple Construction Environmental Impact Statement but wish to comment generally on the document at this time.

As stated in the Purpose and Need section, current military plans require "more realistic and varied training scenarios and experience with new training tactics and modern weaponry." The report also points out that Camp Grayling has been host to an increasing number and variety of military units in recent years. The key question is whether the expanded training facilities at Camp Grayling, particularly the Multi-Purpose Range Complex and the Assault Landing Strip, are compatible with the environmental values of this unique area. I believe they are not. Accordingly, I believe that the relocation option--to an off-post location--should be selected for these facilities. 1

It is unfortunate that Camp Grayling sprang up along the banks of the AuSable River less than 75 years ago. For most of the time since then the military training activity, involving earlier generations of weapons and fewer troops, has less significantly affected the surrounding area. This has changed dramatically in recent years, and it seems evident that the new facilities will further exacerbate conflicts with surrounding environmental

Michigan Department of Military Affairs
May 16, 1989
Page 2

uses and values. If the National Guard were prepared to covenant in writing and in a legally enforceable manner that the MPRC would reduce noise and concussion to acceptable levels, similar to what was experienced several years ago, this would be an important step. But it is disingenuous to attempt to justify the new facility by comparing anticipated noise levels to the intolerable sights and sounds of war that have permeated the area during the past several years. This is tantamount to saying that the Guard has despoiled the area since 1980, which justifies further damage and degradation because the future will not be much different than the worst of the recent past.

The AuSable area simply is not an appropriate place for the MPRC and an assault landing strip. Building these facilities will prolong and deepen the conflict between the military and the surrounding environment. The losers will be the citizens of Michigan and elsewhere who appreciate the AuSable and the unique natural values that have characterized this area from well before the establishment of Camp Grayling.

Yours very truly,

Peter L. Gustafson

kas

VIA TELECOPY

LEONARD S. GELL, M.D., P.C.
970 PARCHMENT DRIVE S. E.
GRAND RAPIDS, MICH. 49506
ALLERGY & CLINICAL IMMUNOLOGY
TELEPHONE 949-4840

May 15, 1989

Michigan Department of Military Affairs
Attn: E.I.S. Response, Construction and Facilities
2500 South Washington Avenue
Lansing, Michigan 48913-5101

Gentlemen:

Because I will be unable to attend the public hearing on 5-17-89 regarding expansion of the National Guard facilities in Grayling, I wish to offer the following comments.

First, I strongly oppose development of a new missile range which will create much more noise and a sense of constant warfare along the North branch of the Au Sable. Additionally, this facility will attract many more troops which will have an adverse impact on that area for those who choose to use it for recreation and solitude. The Au Sable river system, as well as the Manistee river system, are beautiful, unique national treasures, and noise pollution will destroy this as surely as if you put poison in the rivers. 1

I also strongly oppose the construction of a large airplane landing strip on the Manistee River for the same reasons - low-level flights with these giant aircraft will produce tremendous noise for long distances, destroying any solitude that one might wish to have in the area. We already are faced with the great expansion of the number of troops using the area, and further increases would be intolerable.

Sincerely,

Leonard S. Gell, M.D.

LSG/mc

DOCUMENT 30

LAW OFFICES
DAVID F. OEMING, JR.
1203 GRATIOT
SAGINAW, MI 48602
TELEPHONE (517) 799-2660

FREELAND OFFICE
7585 MOLAND ROAD
TELEPHONE (517) 695-5758

May 17, 1989

Michigan Department of Military Affairs
Attn: EIS Response
Construction and Facilities Office
2500 S. Washington Ave.
Lansing, Michigan 48913-5101

Dear Sirs:

I am a property owner on the North Branch of the Au Sable River, immediately north of Lovells, Michigan. I have examined the draft environmental impact statement prepared by the Michigan Department of Military Affairs concerning activities at Camp Grayling, and I have certain comments to make concerning this document:

1. I note from Section 4-3.3 that virtually all of the North Branch area from immediately south of Lovells through the source of the river, including my property (and that owned by many other people) is classified as "Zone II". I further note that,

> "Zone II is a transitional area is classified as normally unacceptable for noise-sensitive uses including residential use.

The qualifying language on page 4-3.6 provides that "certain building constructions providing an isolation from environmental noise" may produce an acceptable noise level.

I suspect the point of this environmental impact statement is to identify unacceptable environmental consequences to the proposed actions. Clearly, the plan itself points out that increased artillery and other noise-producing factors are unacceptable to residential use in the area described. The building on the North Branch and nearby areas are not constructed to provide "enhanced isolation from environmental noise"; they are constructed to be residential properties, many of them permanent in nature. Further, it is not unknown for the residents to venture out of their homes on occasion; certainly, any plan for use of Camp Grayling should consider the unacceptability of artillery, aviation, and demolition training which would produce noise levels as described in Zone II. Unless a better solution may be found to limit use of the area, I cannot see how this environmental impact statement is acceptable concerning the noise environment.

2. Concerning artillery and air-to-ground range training, I note that Section 4.3-Range 40 area measurements described on page 4-3.10 indicate simply that "a large portion of the Post's noise complaints associated with Range 40 use come from the Guthrie Lake area and the Lovells area", but the document does not go on to explain how the proposed uses of Range 40 and other Camp Grayling activities will address this problem. It would appear from figure 4-3.1c that air-to-ground range aircraft activities will produce Zone II noise levels in an around the Lovells area (as noted above, unacceptable for residential use); however, no comment is made concerning how this might be mitigated or even addressed. Finally, I note on page 4-3.15 that "the increased nonimpulsive noise attending active training produced by vehicle traffic, helicopter overflights, etc., is fully evaluated in the data"; nowhere, however, can I find any comment at all related to this "increased nonimpulsive noise". 1 2

The above problems are serious, and should be addressed in the environmental impact statement. The whole concept behind this procedure is to identify environmental issues, and address them in a satisfactory fashion. Clearly, this has not been done with regard to the noise levels in and around the Lovells area (and probably others); that being the case, approval for the proposed expansion and changes in Camp Grayling should not be provided.

We look forward to further comments concerning this issue.

Very truly yours,

D. F. Oeming

David F. Oeming, Jr.

cc: A.M.A.C.
DFO/jfh

DOCUMENT 31A

May 22, 1989

Department of Military Affairs
E.I.S. Response, Construction and
Facilities Office
2500 South Washington Avenue
Lansing, MI 48913-5101

Gentlemen:

We are unable to attend your Public Hearing on the "Environmental Impact Statement for the Mission/Multiple Construction: Camp Grayling Training Site", but would like to let you know that we have some concerns.

They are as follows:

1. Concussion and the shaking of our house when large explosives are detonated. 500 pound bombs, large artillery shells and so forth. Our painter's ladder moved when a bomb was dropped last year. A weather station was knocked off a wall, and boxes of shoes were knocked off shelves. A support post was knocked out of position from our deck. We do not feel they have to drop that large of live explosives. They could hit their targets with dead warheads and have the same results. Your target areas could certainly be moved away from Guthrie Lakes.

2. Our roads are being congested by their coming in and going out on Mariette Road. This A.M. we were stuck behind about ten units going 15 miles per hour. You could not pass them. They are chopping the edges of the road up, which in turn narrows it. 1

3. If they expand the facilities, then we are going to have more noise and congestion. They advertise for summer and winter tourists and then chase them out with this mess.

4. The lying done by those in charge is not appreciated. They say they want to be friends and neighbors and then do everything the reverse of what they say. Example: Nothing has changed. We have been here since 1976, and never had the 500 pound bombs and large artillery before. Our house never shook before. Return it to what is was then ten (10) years ago and we can be friends and neighbors.

We are not against the National Guard. We are for good defense, but let's use our head on how we do it. Don't drive everyone out. We are important to this community too.

Yours very truly,

Karl & Helen Leppien

Karl & Helen Leppien
11508 Enchanted Drive
P.O. Box 70
Waters, MI 49797

DOCUMENT 31B

June 10, 1989

Department of Military Affairs
2500 South Washington Avenue
Lansing, Michigan 48913-5101

Gentlemen:

Attention: E.I.S. Response, Construction and Facilities Office

I have talked by telephone and written letters to you. But I have yet to see one of your personnel involved with the National Guard-Grayling Affair appear in our area to see and hear our concerns at Guthrie Lakes.

Until you can be in our house or in the yard when the 500 pound live bombs or heavy artillery are going off, you cannot know what it is like. We do not think our good neighbors want to or care to know.

We would like to know what it would measure on a Richter Scale. Have you ever felt it?

When our painter on a ladder was

scared, due to the shaking of the house, you ought to know how bad it is.

Jun 94

1 Don't you have enough land to move the bombing and artillery range away from the Twin Lakes area? Grayling, Michigan it is more if down there the houses will shake, rattle and roll.

We are not against the military, but we do believe you could either move them or keep the five 500 pound bombs and heavy artillery out of here.

We still want to be good neighbors with you, but it cannot be one-sided.

Yours very truly,
Mrs. Helen Lippin
11508 Enchanted Drive
Wales, MI 48027

5/30/89

Michigan Department of Military Affairs
Attn: EIS Response
Construction and Facilities Office
2500 S. Washington Ave.
Lansing, Mi 48913-5101

I wish to comment on the recently (finally!) released Environmental Impact Statement for the proposed development at Camp Grayling. I reject it in its entirety and in its very existence. To have delayed its release to thwart access by the Camp Grayling Advisory Committee, to have testified in a recent FOIA court appearance in front of Circuit Court Judge Peter D. Houck that the Michigan DMA had little to do with the preparation of the EIS and to then have the EIS title sheet list the DMA as the preparer of the document, and to now try to push it through without adequate time for public comment is too typical of the shameless manipulations of the Guard and the DMA. I suppose I shouldn't be surprised by how things have developed in regard to the EIS, but I truly am.

1

I'm tired of a DNR that rolls over on its back and spreads its legs every time the military gets hungry for another piece of state property. I'm tired of a DNR that refuses to shut down activities at Camp Grayling that are currently in violation of 1978 lease agreements.

2

I'm tired of a governor who licks the boots of his buddies in the guard by taking an admittedly sabotaged, weakened, and flawed CGAC report and watering it down even more to the point where it could have no beneficial effect on any of the legitimate concerns in regard to Camp Grayling. I'm tired of a governor beating his chest on environmental concerns while quietly rescinding past environmental executive orders put in place by a more informed and truly progressive predecessor.

I'm sickened by the thought of "re-locating" the threatened Kirtland warbler population as the military systematically destroys its habitat, not only for the birds themselves but because I wonder if the same tactic is not now being attempted on the human populace in the area.

I'm tired of being called a communist and unpatriotic because I'm willing to defend something as precious as the Au Sable and its surroundings.

I'm tired of being ignored and treated as a second class citizen because even though I am a property owner, I'm not currently a full-time area resident.

I'm tired of the systematic lying, misquoting, heavy-handedness, the self-serving, the smugness, the distortion of facts, that have been all-too-often exhibited by the military.

I'm tired of the sweet stench of rotting pork that permeates the very air about Camp Grayling.

DOCUMENT 33

I ask, no I insist, that my comments be entered into the public record on the EIS. Much better minds than mine will attack it for its many errors of omission and commission, but I reject it as nothing more than propaganda not worth the paper it's printed on.

My comments in no way should be construed as a reply or comment on the behalf of the Anglers of the Au Sable. They will shortly provide a detailed, specific reply to the EIS. My comments are my own.

R. Bruce Johnson

R. Bruce Johnson
849 Langdon
Rochester, Mi 48063

cc: Gov. James J. Blanchard
Sen. Carl Levin
Sen. Donald W. Riegle, Jr.
Dave Hales, DNR
Maj. Gen. Vernon J. Andrews
Calvin L. Cole, Jr.
Edward J. McGlynn

12730 Clark St.
Crown Point, IN 46307
June 1, 1989

Mr. Greg Huntington
Environmental Coordinator
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, Michigan 48913

Dear Mr. Huntington:

As a landowner and taxpayer in Lovells Township, Crawford County, Michigan, I was recently disturbed by my review of the Draft Environmental Impact Statement. The deficiencies of the DEIS were brought to light by numerous experts at the public hearing held in Grayling on May 17, 1989. The alternative to conduct actions at another location was never fully explored but I feel this is the only solution to an overwhelming problem. The following is but a short list of factors that has led me to the conclusion that activities at Camp Grayling should be severely restricted if not completely halted:

1

2 1.) Loss of recreational value both within the camp and off site

3 2.) The question of underground fuel tanks was never addressed in the DEIS

3.) Heavy metals associated with explosives do not simply vanish. With this in mind, the lands used for this purpose could never be returned to the public for recreational use.

4 Off site pollution by these metals is a real possibility through ground water and wildlife contamination.

4.) The extensive noise has caused a decreased quality of life in the past and will only worsen as the camp expands. There was no

5 mention of range fire in the DEIS.

6 5.) Adverse effects of increased stream crossings brought about by the proposed expansion

7 6.) Probable negative social (ie. crime) health (through increased pollution) and economic consequences of increased Guard activity were not adequately discussed in the DEIS

7.) The DEIS did not address a very basic point -

8 the worst case scenario (ie. accidents, fuel spills, fires, etc.).

Please be advised that you are not in receipt of a letter from a draft card burner of the 60's. My political views

12780 Clark Street
Crown Point, IN 46307
June 1, 1989

have generally been conservative with a preference toward a strong military. However, the proposed area is simply too precious to be destroyed. I would again state that alternative sites should be considered.

Sincerely,

Ralph T. Rucinski, D.D.S.

RTR:nh

EDWARD J. MCGLINN
29933 Barwell
Farmington Hills, MI 48018

June 10, 1989

Jun 94

Michigan Departmen of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913-5101

The Anglers of the Au Sable will present a complete response to this irresponsible and inadequate Environmental Impact Statement. Though a modest contributor to this response, I also want to record my personal objections and indignation at this clumsy attempt to subvert the National Environmental Protection Act.

In summary, this document is unscientific, is antagonistic to environmental protection, and insults the legitimate processes of democratic government. Are these objections too shrill or strident? Probably, but that is the result of the deterioration of the condition at Camp Grayling. If the National Guard continues to have its way, the Au Sable and the Manistee are finished as blue ribbon trout streams where the trout fisherman can enjoy a quality fishing experience, and the contiguous pine barrens are finished as an area for a quality living experience. Since I have been renewing my spirit on these rivers and in this lovely area for more than three decades, becoming harsh with those who would diminish this area is the least of my concerns.

What can be said that hasn't already been said, or will be, in The Anglers Response, in that of Trout Unlimited, in the indignation expressed by AMAC and its consultants, and in the many individual responses that the National Guard will receive over the next few weeks? These responses will be complete and seemingly encompass every concern. So how can outrage be expressed with originality, and, in the spirit of NEPA, be relevant?

A good beginning, in my judgement, is to state that this document is most likely irrelevant, as well as being insufficient. The issue of Camp Grayling and its impact on the environment will ultimately be settled in the U.S. Congress, hopefully with the assistance of Senators Levin and Reigle, in the Governor's Office, hopefully with his recognition of the seriousness of the environmental issues, or in the courts, assisted by the National Environmental Protection Act and the Michigan Environmental Protection Act.

To hold that an Enivronmental Impact Statement may be irrelevant is an extremely pessimistic view. Yet it is a view that, if not inescapable, has a firm rational basis. Since the Michigan Environmental Review Board and the Michigan Guidelines for Environmental Impact Statements were recently eliminated by Governor Blanchard, we can be pessimistic about the responsible actions of any state agency. Since the National Guard Bureau, a Federal Agency, has avoided the responsibilities of being the lead agency, and since the Federal Guidelines and procedures have been ignored, violated or trampled over the last five years, we must be pessimistic regarding any responsible action on the part of the Pentagon. We will likely see a pretense at concern, a facade of "going through the motion," with some cosmetic changes to the DEIS, all to give the appearance that environmental law is followed and environmental concerns are addressed. The facilities and activities at Camp Grayling will then proceed unabated unless restrained by some other means.

This document is anti-environment. It assumes that the sounds and sights of war are consistent with an area noted for its recreational attributes including two blue-ribbon trout streams. It assumes that the training for war is compatible with the human environment -- that the everyday experiences in the homes, schools, businesses and parks of the communities surrounding the camp are unaffected by cannon, jets, tanks and other machines of war. It assumes that the earth, its forests and its wildlife, remain unaffected by military activities.

The rhetoric of the DEIS claims little if any deliterious environmental impact if the activities of the Guard are expanded. But it offers no evidence, refers to little scientific analyses, makes no cost-benefit studies; it seems to argue by simply stating "no problem", and by that statement, we should be convinced. This, the document assumes, is argument enough. Furthermore, by simply stating that "mitigation" measures will reduce any perceived impact, the impact should therefore be reduced.

As an intellectual document, the DEIS is without merit. As a scientific process, it is a travesty, a sham. As a political document, it is anti-democratic. As an environmental investigation, it ignores the human environment.

Aldo Leopold wrote:

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man, nor for us to reap from it the esthetic harvest it is capable, under science, of contributing to culture. That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics. That land yields a cultural harvest is a fact long known, but latterly often forgotten.

Those who prepared the DEIS certainly do not see land as a community and have lost their way in a bureaucratic jungle. But more importantly, the ethical extension of love and respect for the pine barrens, its forests and its rivers, and its inhabitants, both human and in the wild, is missing from this document. The DMA considers this land only as a commodity which it assumes is theirs to do with as it wishes. If the National Guard continues to hold dominion over this land, the abuse will far exceed any ability to recover.

We have a right, under environmental law, to see a moral and an ethical environmental assessment of what the activities of training for war does to the land, its people, its wildlife and the culture which enhances the central highlands of northern Michigan.

This environmental assessemnt should either be completely rewritten or the projects and activities it describes should be rejected as environmentally incompatible and destructive. I am not optimistic that the environment will prevail, with the DMA and the National Guard Bureau steering the course. I am certain, however, that it will prevail in the long run.

Sincerely,

Edward J. McGlinn

DOCUMENT 34B

Jun 94

EDWARD J. MCGLINN
29933 Darwell
Farmington Hills, MI 48018

June 20, 1989

Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, MI 48913-5101

A couple of friends, who live near Grayling in the Mainstream valley, recently expressed a concern regarding the reaction of their hunting dogs to the sound of cannon on the tank range. I did not pay much attention because we all have a startled and annoyed reaction to the sounds of war, especially to the "carroom ... boom" sequence of sounds that are so prevalent when the tank range north of the Mainstream is in use.

Over a year ago, as a board member of the Anglers of the Au Sable, threatened with a lawsuit by the big enchilada of the Michigan Guard, General Andrews, we met with him in his Lansing fortress, along with his aides, his staff, and his generals. The designer of the then proposed MPRC, while giving his carefully prepared briefing on the plans of the Guard, the design of this range, and the difficulties involved in its location, demurred when asked about the source of the second "boom" heard in the Au Sable valley. He, and as I recall, the other colonels and generals, including Andrews, were genuinely puzzled by this second boom, which immediately follows the propellant discharge, and which causes the most annoyance, foundation shaking, and window rattling, as the sound wave progresses down the valley.

They were puzzled because the rounds were inert, as most of the rounds fired in this range are, and expressed dismay since the source of the annoyance wasn't the impact explosion of the shell on the target. We gave them our opinion. The second "boom", following the initial charge, is the shock wave of the shell as it emerges from the muzzle -- the shock wave then moves down the valley, causing windows and foundations to rattle. Their reaction was startling, at least to me. They all agreed to this premise, evidently now comforted that this puzzle was resolved.

In our reply to the DEIS, we neglected to address this concern. I would however like to bring it to the booms, whether they emanate from jet aircraft or from shells fired from cannon, have an impact on human well-being and wildlife health.

Furthermore, on the North Branch, there is considerable jet noise and sonic booms, as the jets come down to the air bombing range, make their passes, and then turn on the afterburners as they pull up to go around for another pass.

The DMA, the Michigan National Guard, and Hickok Associates should not expect private organizations to do their scientific research for them. However, we would like to direct their attention to research that has been done in this area. The latest document that we can reference is "The Effects Of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis, " by Manci, Gladwin, Villela, and Cavendish of TGS Technology Inc. and The U.S. Fish and Wildlife Service. This document is dated February 1988. A companion document is titled "Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: Bibliographic Abstracts," also dated February 1988. We understand that the abstracts, at least, are updated every three months.

Why was this research not cited? Why was this whole area ignored by the DEIS?

1 The DMA and the National Guard Bureau are well aware that sonic booms have an adverse impact on wildlife and other animals. They therefore should have addressed this impact in the DEIS. We also are certain that there is additional research on the deliterious effects of sonic booms on human health and, especially, on wildlife and domestic animals, such as dogs and cats. We also repeat for emphasis, that the DMA should not, in the spirit of the National Environmental Protection Act, rely on private organizations to do their research for them.

Sincerely,

Edward J. McGlinn

DOCUMENT 34C

EDWARD J. MCGLINN
29933 Darwell
Farmington Hills, MI 48018

July 21, 1989

Michigan Department of Military Affairs
Attn: EIS Response
Construction and Facilities Response
2500 S. Washington Avenue
Lansing, MI 48913-5101

I had intended to give the enclosed presentation at the public hearing in Grayling tomorrow, July 22, 1989. Sickness in my family has prevented me from attending. Therefore, I request that you enter this presentation in the offical record of the EIS response. Thank you.

Sincerely,

Edward J. McGlinn

Enclosure

PRESENTATION ON CAMP GRAYLING DEIS
JULY 1989
BY EDWARD MCGLINN

THIS EXERCISE OF ENVIRONMENTAL ASSESSMENT ON THE PLANNED EXPANSION OF CAMP GRAYLING IS EITHER THE BEGINNING OF A BETTER FUTURE FOR THE AU SABLE AND MANISTEE WATERSHEDS OR THE END OF THESE BEAUTIFUL PINE BARRENS AND ITS RIVERS AS WE HAVE KNOWN AND LOVED THEM.

IF MILITARY TRAINING ACTIVITIES ARE REDUCED TO SOME PREVIOUSLY ACCEPTABLE LEVEL, THIS AREA WILL REGAIN ITS ATTRACTION AS A PREMIER RECREATIONAL, RETIREMENT AND TOURIST AREA. IF THEY ARE NOT, AND ESPECIALLY IF THE NATIONAL GUARD HAS ITS WAY, AND EXPANDS CAMP GRAYLING AND INCREASES THE INTENSITY OF TRAINING, THE AU SABLE AND THE MANISTEE WILL NO LONGER BE THE TWO BEST TROUT STREAMS IN MICHIGAN, AND THOSE WHO WOULD COME HERE TO RETIRE, TO REST AND RENEW THEIR SPIRITS, TO HUNT, TO SKI, TO CANOE THE RIVERS, AND TO JUST ENJOY THIS BEAUTIFUL AREA, WILL OVER THE YEARS LOOK FOR SOME OTHER PLACE WHICH IS NOT DOMINATED BY THE SIGHTS AND SOUNDS OF WAR.

I HAVE BEEN VISITING THE AU SABLE AREA FOR ALMOST FOUR DECADES TO REFRESH MY SOUL. A TRANSPLANTED KANSAN, I CAME TO MICHIGAN IN 1950, AND HAVE RECENTLY RETIRED FROM A CAREER IN TECHNICAL RESEARCH AND MANAGEMENT. IN THIS HECTIC PACE OF MODERN LIFE, CONFRONTED OFTEN WITH WAR AND FAMINE IN THE WORLD, WITH THE DETERIORATION OF THE QUALITY OF LIFE IN OUR COUNTRY AS WELL AS ABROAD, WE ALL NEED A SPECIAL PLACE AND A WAY TO ESCAPE THE PRESSURES OF OUR WORK, THE CROWDED URBAN AREAS WHERE MOST OF US MUST LIVE, AND, FOR AT LEAST A BRIEF PERIOD, THE MONSTROUS PROBLEMS THAT FACE MANKIND. THE AU SABLE WAS THAT PLACE FOR ME.

I JOINED THE ARMY ON MY SEVENTEENTH BIRTHDAY NEAR THE END OF WORLD WAR II. I ALSO SERVED IN THE RESERVES AS AN ARTILLERY OFFICER FOR SIX YEARS. (THIS IS ONLY IMPORTANT FOR COLONEL DOWNEY AND GENERAL ANDREWS.) THOSE WHO HAVE OPPOSED THE EXPANSION OF CAMP GRAYLING HAVE HAD THEIR PATRIOTISM QUESTIONED. IT HAS ALSO BEEN SUGGESTED THAT WE DON'T UNDERSTAND THE ARMY AND SINCE WE DON'T UNDERSTAND, WE HAVE NO STANDING IN THIS CONTROVERSY. THE IRONY IS THAT ANDREWS AND DOWNEY LACK AN UNDERSTANDING OF THE NATURE OF THIS CONTROVERSY. BY THEIR BLUNDERING, BLUSTER AND FLAG WAVING THEY HAVE LOST CREDIBILITY, AND THAT IS EVEN MORE CRITICAL THAN STANDING.

IT WAS OUR HOPE, MY WIFE'S AND MINE, TO RETIRE TO THE AU SABLE AREA. IN THE LATE 1960s AND THE 1970s, WE SPENT MANY VACATIONS AND WEEKENDS IN THE GRAYLING AREA. OUR YOUNGEST SON, AS I REMEMBER THOSE WONDERFUL TIMES, WAS ALWAYS EXCITED TO SEE A MILITARY VEHICLE ON NORTH DOWN RIVER ROAD. ON THOSE VISITS WE SOMETIMES HEARD A FEW GUNS, FELT SOME REVERBERATIONS, AND SPOTTED OCCASIONAL AIRCRAFT. HOWEVER, THE MILITARY WAS NOT AN UNPLEASANT AND RELENTLESS INTRUSION INTO OUR ENJOYMENT OF THE RIVER AND THE WOODS.

THIS HAS DRAMATICALLY CHANGED OVER THE PAST DECADE, AND MY WIFE HAS VISITED THE RIVER WITH ME BUT FOUR TIMES IN THIS PERIOD. THE RELATIVELY UNSPOILED ENVIRONMENT SHE RELISHED IN THOSE EARLIER YEARS HAS BEEN DAMAGED BY MILITARY SATURATION AND THE PEACEFUL AND VERDANT WOOD AND STREAM NO LONGER EXISTS FOR HER. UNLESS THIS MILITARY INTRUSION IS DRASTICALLY REDUCED, WE WILL NOT LIVE OUT OUR GOLDEN YEARS ON OR NEAR THE AU SABLE. I GUESS I WOULD STILL, BECAUSE I AM A CRAZY FLY FISHERMAN, AND THE AU SABLE WAS MY FIRST LOVE AS A FISHERMAN. IT HAS A SPECIAL PLACE IN MY HEART. HOWEVER, WHILE I LOVE THE AU SABLE, I LOVE MY WIFE SO MUCH MORE, EVEN THOUGH SHE SOMETIMES HAS DOUBTS, AND I RESPECT AND HONOR HER FEELINGS.

MY WIFE IS NOT ALONE IN THIS FEELING ABOUT THE MILITARY PRESENCE IN THIS AREA. I RECENTLY HAD THE OCCASION TO TALK WITH ONE OF THE LEADING BIOLOGISTS ON THE KIRTLAND'S RECOVERY TEAM. HE IS A TROUT FISHERMAN, AND RECENTLY HAD AN OPPORTUNITY TO SHARE THE PURCHASE OF A VACATION RETREAT IN THE GRAYLING AREA. WHEN I ASKED WHAT HIS PLANS WERE, HIS EMPHATIC RESPONSE WAS NEGATIVE, THAT HE ABSOLUTELY WOULD NOT INVEST IN AN AREA WHERE THE SIGHTS AND SOUNDS OF WAR WERE COMMONPLACE AND RELENTLESS. WE THEN TALKED ABOUT THOSE LITTLE BIRDS HE IS TRYING TO SAVE, WHO BY HABIT AND HABITAT RETURN EACH SUMMER TO THE GRAYLING BATTLEFIELD.

IS ANY OF THIS RELEVANT TO THE DEIS? I THINK SO. THE DEIS ASSUMES THAT THE SOUNDS AND SIGHTS OF WAR ARE CONSISTENT WITH AN AREA NOTED FOR ITS RECREATIONAL ATTRIBUTES INCLUDING TWO BLUE-RIBBON TROUT STREAMS. IT ASSUMES THAT THE TRAINING FOR WAR IS COMPATIBLE WITH THE HUMAN ENVIRONMENT -- THAT THE EVERYDAY EXPERIENCES IN THE HOMES, SCHOOLS, BUSINESSES AND PARKS OF THE COMMUNITIES SURROUNDING THE CAMP ARE UNAFFECTED BY CANNON, JETS, TANKS AND OTHER MACHINES OF WAR. IT ASSUMES THAT THE EARTH, ITS FORESTS AND ITS WILDLIFE, REMAIN UNAFFECTED BY MILITARY ACTIVITIES.

AS AN INTELLECTUAL DOCUMENT, THE DEIS IS WITHOUT MERIT. AS A SCIENTIFIC PROCESS, IT IS A TRAVESTY, A SHAM. AS A POLITICAL DOCUMENT, IT IS ANTI-DEMOCRATIC. AS AN ENVIRONMENTAL INVESTIGATION, IT IGNORES THE HUMAN ENVIRONMENT.

FORTY YEARS AGO, ALDO LEOPOLD WROTE:

WE ABUSE LAND BECAUSE WE REGARD IT AS A COMMODITY BELONGING TO US. WHEN WE SEE LAND AS A COMMUNITY TO WHICH WE BELONG, WE MAY BEGIN TO USE IT WITH LOVE AND RESPECT. THERE IS NO OTHER WAY FOR LAND TO SURVIVE THE IMPACT OF MECHANIZED MAN, NOR FOR US TO REAP FROM IT THE ESTHETIC HARVEST IT IS CAPABLE, UNDER SCIENCE, OF CONTRIBUTING TO CULTURE. THAT LAND IS A COMMUNITY IS THE BASIC CONCEPT OF ECOLOGY, BUT THAT LAND IS TO BE LOVED AND RESPECTED IS AN EXTENSION OF ETHICS. THAT LAND YIELDS A CULTURAL HARVEST IS A FACT LONG KNOWN, BUT LATTERLY OFTEN FORGOTTEN.

ALDO LEOPOLD WAS A WISE MAN. AND WISE MEN SHOULD BE LISTENED TO. YOU WHO HAVE PREPARED THIS DEIS DO NOT SEE LAND AS A COMMUNITY TO WHICH WE ALL BELONG. YOU HAVE LOST YOUR WAY. MORE IMPORTANTLY, THE ETHICAL EXTENSION OF LOVE AND RESPECT FOR THE PINE BARRENS, ITS FORESTS AND ITS RIVERS, AND ITS INHABITANTS, BOTH HUMAN AND IN THE WILD, IS MISSING FROM THIS DOCUMENT. THE DNR CONSIDERS THIS LAND ONLY AS A COMMODITY WHICH IT ASSUMES IS THEIRS TO DO WITH AS IT WISHES. IF YOU, THE NATIONAL GUARD AND THE NATIONAL GUARD BUREAU, CONTINUE TO HOLD DOMINION OVER THIS LAND, THE ABUSE WILL FAR EXCEED ANY ABILITY TO RECOVER.

THOSE WHO LOVE THIS LAND HAVE A RIGHT, UNDER ENVIRONMENTAL LAW, TO SEE A MORAL AND ETHICAL ASSESSMENT OF WHAT THE ACTIVITIES OF THE TRAINING FOR WAR DOES TO THE LAND, ITS PEOPLE, ITS WILDLIFE, AND THE CULTURE WHICH ENHANCES THE CENTRAL HIGHLANDS OF NORTHERN MICHIGAN.

KENNETH REXROTH, AN AMERICAN POET WHO LOVED THE OUTDOORS, WROTE:

THE TROUT IS TAKEN WHEN HE
BITES AN ARTIFICIAL FLY.
CONFRONTED WITH FRAUD, KEEP YOUR
MOUTH SHUT AND DON'T VOLUNTEER.

AS ANY TROUT FISHERMAN KNOWS, THE DELIGHTFUL FINNED CREATURES WHICH INHABIT THE AU SABLE AND THE MANISTEE TOO OFTEN REJECT OUR FRAUDULENT OFFERINGS. WE NOW REJECT YOUR ATTEMPT TO DEFEND THE ANTI-ENVIRONMENT ACTIVITIES OF THE NATIONAL GUARD AND THE EXPANSION OF CAMP GRAYLING. THIS DRAFT ENVIRONMENTAL IMPACT STATEMENT IS THE MOST FRAUDULENT DOCUMENT I HAVE SEEN IN FORTY YEARS OF SCIENTIFIC AND ENGINEERING RESEARCH. CONFRONTED WITH SUCH FRAUD WE ARE NOT BITING. TEAR IT UP AND START OVER.

DOCUMENT 35

DOCUMENT 36

Judith McGlinn
29933 Darwell
Farmington Hills, Michigan 48018

June 11, 1989

Michigan Department of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 South Washington Avenue
Lansing, MI 48913-5101

As a lifelong Michigan resident, I have had the opportunity of enjoying many leisure hours in northern Michigan. In the 1970's, most of these hours were spent in the Grayling area on the Au Sable River. Our youngest son, at 4-8 years of age, was always excited to see military vehicles on North Down River Road. We heard a few booms, felt some reverberations and spotted occasional aircraft; however, during those years, the military presence did not intrude unpleasantly and relentlessly into our enjoyment of the river and woods.

At one time, it was a foregone conclusion that my husband and I would retire to a year-round home on or near the Au Sable.

All this has changed drastically for me since 1980, and my Grayling area visits number less than five during this decade. The reason, of course, is that the relatively unspoiled natural environment I relished has been damaged by military saturation and the original appeal of peaceful and verdant wood and stream no longer exists.

The EIS is a vast disappointment and an insult to my intelligence. I applaud and wholeheartedly support the organized efforts of AMAC, Anglers of the Au Sable and Trout Unlimited in opposing the expansion of Camp Grayling and the construction of the MPRC.

Sincerely,

Judith McGlinn

Judith McGlinn

Mr. Frank W. Crawford
632 Weaver Ave., Kalamazoo, Michigan 49007

[illegible]

[illegible]

Frank W Crawford

DOCUMENT 37

Anne V. Fuller
632 Western Avenue
Kalamazoo, Michigan
7 June, 1989

Jun 94

Michigan Dept. of Military Affairs
Attention: E.I.S. Response, Construction and Facilities Office
[illegible]
Lansing, Mich.

Gentlemen: re [illegible]

[illegible] the environment, natural resources and quality of life in the upper Midwest and Canada [illegible] Michigan further caused by the expansion of [illegible] as proposed above.

It is Michigan's most precious play area in the lower peninsula and too valuable to us to further degenerate it in this proposed armor division.

Yours very truly,

Anne V. Fuller

DOCUMENT 38

Rama L. Stimpson
Route 3, Box 3749
Grayling, Michigan 49738
June 19, 1989

Michigan Dept of Military Affairs
Attn: E.I.S. Response
Construction and Facilities Office
2500 S. Washington Avenue
Lansing, Mi 48913-5101

Dear Sirs:

I have recently attended the public hearings held for people to respond to the draft Camp Grayling Mission/Multiple Construction Environmental Impact Statement. First I feel the hearing dates were deliberately chosen with a view to keeping attendance low. None were held in downstate areas where many people live who own property here but cannot make a meeting in mid-week 200 miles away, even though they are most concerned about military activities.

I attended both evening meetings, one in Grayling and one in Kalkaska. The one in Kalkaska was most frustrating as the auditorium's sound [illegible] was very difficult to hear even though officials tried to compensate for the lack of microphones. The military person in charge apologized but why was this not corrected or meeting re-scheduled?

The more I listened at these forums and the more I've tried to study the impact statement, the more I am convinced that this is a most unsatisfactory document. I urge that a new study be made by [illegible] other consulting firms. Surely we have knowledgable, ethically motivated, impartial environmental consulting firms within the State of Michigan who could be asked to do this job right.

Emphatically, I urge this impact statement be rejected as not addressing environmental concerns of our area residents, not being statistically sound in its studies (re economic impacts, for instance) not listing any data on future monitoring to enforce compliance with standards, and no sound study on the very real noise pollution of our space. Questions by experts were raised as to air and ground water pollution, both at present time and for the future.

Thank you for hearing of my concerns and feelings. I find I like on property held in the family since the 1920's, love it and do not want to be forced out.

Sincerely,
Rama L. Stimpson

DAN L. ALSTOTT

Route 3 • Box 3510-A • Grayling, Michigan 49738 • 517-348-8294

6/8/89

MI Dept. of Military Affairs
2500 S. Washington Ave.
Lansing MI 48913

Att: Mr. Greg Huntington
Environmental Coordinator
Construction and Facilities Office

Re: Draft Environmental Impact Statement (DEIS)
Mission Multiple Construction:
Camp Grayling Army National Guard
Training Site, Michigan

Dear Sirs:

In the last paragraph on page ii of the DEIS EXECUTIVE SUMMARY, it is stated:

> "This document fulfills the purpose of an environmental impact statement by presenting a full and fair discussion of significant environmental impacts of proposed actions."

This statement is untrue in view of the content of the DEIS, which essentially addresses ONLY the consequences of the proposed action during the CONSTRUCTION PHASE.

It is imperative to present the WHOLE TRUTH in the DEIS, and to do this will require a massive revision and re-issue of the revised document. It is to that end that this letter speaks.

Further, the DEIS makes few, if any, committments nor does it provide needed assurances. Instead it is filled with phrases such as "are not anticipated to, should be compatible, computer simulated, expected to, after mitigation", ad. infinitum. This tactic simply does not suffice to assure that the proposed action is environmentally sound. It further lacks any binding committment to insure that sound practices will be followed.

Instead, the DEIS is, in Pentagon parlance, a "Tap Dance", which is defined as "a slick briefing, usually lacking in substance".

1 The DEIS does not address ALL concerns raised during the scoping process. For example, it is silent on "Concerns expressed over water pollution from explosive's residue and ammunition dumped in waters within the Camp", as listed near the end of the Final Scoping Document, dated october 13, 1986. This is one of the most serious concerns regarding this facility. We are concerned about TOXIC POISONING.

DEIS, Page 2

Jun 94

Please tell the truth about what the millions of pounds of exploded and un-exploded ordnance expended at Camp Grayling HAS DONE, IS DOING and WILL DO to the land and water in and down gradient from the firing and bombing ranges. Please include the effect of BOTH Army and Air Guard operations over the historical life of the Camp. We drink this water and are becoming afraid.

2 Please tell the truth about the effect of Radioactive Penetrators lying about the ranges. Are these fired only at the tank ranges, or do the armor piercing rounds shot here by the Air Guard contain the same material? The DEIS is silent on the entire subject of Radioactive Penetrators

Please tell the truth about NOISE, which is violating standards set for the HUMAN ENVIRONMENT. According to the Camp Grayling Management Analysis and Plan (EMAP), despite hundreds or thousands of complaints, your noise data is woefully incomplete and much more firing must take place before you can get a handle on this, other than to recognise it is a problem of unknown, but great magnitude and potential legal consequence.

3 It is obvious from noise studies we have in our files, that your methods of trying to extrapolate noise from 105mm guns to generate equivalents for 8" cannons and 500# bombs will not suffice, regardless of the power of the computers used.

Admit that you simply DO NOT KNOW what noise your activity generates, and ABSOLUTELY STOP your expansion plans until you can ACCURATELY MANAGE these impacts to a level that can be tolerated by the HUMAN RESIDENTS of this region.

Please tell the truth about your "Installation Compatibility Use Zone" (ICUZ) program. Tell how this intends to influence local governments to zone property lying "in your way", so as to create it useless for habitation and thus lessen its worth. Tell how this will lessen tax revenues causing the surviving lands to pick up the slack. Tell it like it is, instead of trying to make the ICUZ proposition look like a cure-all.

Tell about the property taxes in Crawford Co. being the highest in the Continental 48 states, based on Per Capita Income, due to the vast amount of public land the Military occupies at Camp Grayling.

4 Tell the truth about the proposed Multi-Purpose Range Complex (MPRC), as it is called in the DEIS. You have ommitted the "H", which stands for HEAVY. That is the way it is listed in the Federal Budget requests; Multi-Purpose Range Complex Heavy (MPRC-H).

DEIS, Page 3

4 Tell the public that "Combined Arms Training" at the MPRC-H means ALL WEAPONS INCLUDING ARTILLERY. General Andrews has said "not so", but you have it obscurely listed as "Combined Arms Training" in the DEIS. Tell it like it is, or like it will be. To quote earlier writings of Gen. Andrews, who has honestly listed the proposal as an MPRC-Heavy Range, he states:

> "We have also designed it so that field artillery can also fire into the impact area to provide complete fire control and coordination for every element on the battlefield."

5 What this means is that artillery will fire from the MPRC-H, across County Road 612 and KP Lake into the impact area. The DEIS is absolutely silent on this. Tell the public how this will require buying out the 65+- homes at KP Lake and closing Co. Rd. 612, cutting Lewiston and Lovells from ready access to I-75, unless you actually intend to fire live wartime ordnance across these areas.

6 Please tell the people that figure 2-3.1 demonstrates and confirms that total troop training from 1980 thru 1986 increased nearly 62%, and this means at present rates the training will DOUBLE every 7 years or less. Tell it like it is, in terms we can ALL relate to, instead of trying to obscure the facts.

7 Why, on 2-3.7, do you talk of tanks with 105mm guns, when as early as Jan. 1987 General Andrews wrote about the MPRC-H being "designed to handle the new 120mm tank gun that is upgunning the M1A tank?

8 How can you possibly contend there will be <u>less</u> noise at the MPRC-H when the tank guns will be larger and "every element on the battlefield" will be present? This is a totally non-realistic assumtion. Your statement that the MPRC-H will have laser target capabilities rings hollow. Why do you not instead give assurance that lasers will be used exclusively? The answer is simple. Lasers will not satisfy the basic urge in military training to MAKE NOISE to simulate combat; to BLOW THINGS UP to simulate combat; to DESTROY to simulate combat. These are the elements of war and since you intend to simulate war in this place, why do you not come out and say so, instead of presenting your plans in the bland terms contained in the DEIS?

9 Project T3 - Assault Landing Strip appears on 3-2.6 to further involve "Combined Arms Training". Does this mean you will have artillery there also? What do you mean when you say "further analysis will offer productive environmental insights."? Is this an environmental experiment like the MULTIPLE 500# bomb drops conducted for determining "worst case" noise levels described on 4-3.15?

DEIS, Page 4

This Assault strip obviously has a larger purpose than expressed in the DEIS. Col. Downey has stated that "The MI National Guard has only ONE (1) C-130, thus the strip will not be used very much.". This being the case, the Assault Strip is either a monumental waste of money, or it represents the beginning of the conversion of the site into a new Military Airfield to replace what exists near Grayling. Please tell the whole truth about this project with its associated fueling facilities alongside the Manistee River. Please do this or provide legally binding guarantees of non conversion into any other use.

10 You describe on 3-3.7 how the new Wastewater Plant will allow you to service lakeshore residents in Grayling Township. What is your underlying motive in this? It sounds like the "Olympic size swimming pool" that was dangled before the Kalkaska community a few months ago. This treatment of private sewage will benefit a select few well-to-do citizens, most of whom favor Guard expansion. You had best get a legal opinion from the US Attorney General or the Comptroller General in Washington before continuing this unsavory practice of legalized bribery.

11 Your Rail Siding Project C11 will no doubt serve as a stationing site when MX Missiles are rail garrisoned in Oscoda. You should tell the citizens about this, or give irreversible assurances to the contrary.

12 Project C12 ASP/LSF Railroad will serve the siding, so the same applies. It is also very unclear in the DEIS how you propose to construct this Railroad across I-75. The proposed new underpass

13 construction will be a massive undertaking with serious consequences on tourist and commercial traffic trying to reach points North and West of that site. Tell how this will compromise places like the Traverse City area, Gaylord, the Upper Peninsula and elsewhere. Do this instead of trying to obscure things, as you have done, by using an ancient map in Figure 3-3.3 which does not even show I-75.

On 3-3.15 you honestly admit that the MPRC-H will SIMULATE A BATTLEFIELD, right adjacent to the AuSable River and a new emerging residential condominium and golf course development. You forgot to indicate that in addition to "every element on the

14 battlefield, you will also have many Jet Aircraft present so as to "attack" the forces using the MPRC-H. This introduces a new noise element, previously confined to the Air/Ground Range. How do you intend to mitigate this new attack on the HUMAN ENVIRONMENT?

DEIS, Page 5

15 Please tell the truth about why "covered bleachers" are proposed at the MPRC-H. We know they are not for entertainment purposes such as rock concerts, and are convinced they will serve as viewing places for Politicians and Military Brass during such things as FIREPOWER DEMONSTRATIONS which are designed to impress upon the viewer the full DESTRUCTIVE FORCE of weapons in use. Tell us why such an amphitheater, and all that goes with it, is proposed in such an environmentally sensitive area which, incidentally, is growing fastest in population of any place in the Region

16 The MPRC-H drawing in Figure 3-3.5 shows a huge area to be involved. Certainly more public roads and snowmobile trails will be closed as a result of construction and use of this MPRC-H. No mention of these closings, which will further impair recreational use, is made in any detail in the DEIS. Please tell the truth about this. If there will be no such closings, then provide absolute legally binding assurances.

17 Please provide detail covering the Wetlands shown on Fig. 3-3.6 lying North of the West 1/2 of the Assault Strip. How do you plan to protect or preserve these during "Combined Arms Training? Or have you already destroyed this asset? Please tell the people the truth.

18 Please also list the flight paths to be used at the Assault Strip. None are shown in the DEIS, but they are vital. Please also show the GUARANTEED traffic pattern and altitude restrictions that will apply. Please do not write up a bunch of FAA jargon, but instead tell all this in a fashion understandable to non aviators, who will suffer the brunt of noise and air pollution arising from this Assault Strip.

On 3-4.1 it becomes abundantly clear at the bottom of the page that Camp Grayling intends to grow thru competition with "other National Guard Camps".

This has been verified by this writer who monitored a radio interchange at the Air/Ground range on May 24, 1989. A two seater A-7 with a photographer in back came in to check out the area. His call letters were "Tulsa-19. He was very thorough and made repeated passes while talking to the Range control officer, who was promoting the attributes of Camp Grayling. At the end of this very friendly exchange, the Camp Grayling range officer offered to send promotional material to Tulsa 19 who gave his ZIP Code as, 74115 which has been verified as Tulsa, Oklahoma.

DEIS, Page 6

The DEIS claims no growth, but the reality is that Camp Grayling is in the MARKETING BUSINESS, trying to entice Guard units from Oklahoma and elsewhere to come here and BLOW UP OUR ENVIRONMENT. The "Italian Bombing" in June, 1987 is another example of marketing by design.

This acts to totally invalidate any expressions of "No Growth" in the DEIS, and calls for major revisions, if the document's legal process and its authors including the Pentagon, The MI DMA and the consultants are sincere about the truth being known.

On 3-5.7, the second paragraph dealing with land use is INCREDIBLE. It speaks as tho the status quo will not be altered or increased. It also contends that the status quo is acceptable. Both are assumptions, totally lacking in substance. The noise discussion is so shallow it is a travesty, considering what is already happening. To continue along the expressed course will increase citizen outrage beyond current high levels and present-day problems will be minor by comparison. PLEASE take a realistic approach to your problems instead of trying to talk them away.

The last paragraph on access is also very wrong. Weekly newspaper notices, describing Range usage, for all intents and purposes, TOTALLY CLOSE the majority of Camp Grayling land to the public, who is warned to stay out during training times. This multi-use PUBLIC land is no longer available with any reliability except for two weeks each year during deer season. Please tell it the way it is, not as you want it to look!

In 4-3.1 you state the Post has been in existence since 1913. This is at best only partially true and applies to only a very small portion of the overall reservation. To use this as a premise to justify the proposed action is misleading. You state noise outside Camp boundaries "can annoy people". This is a gross understatement and, to be accurate, you should state that noise DOES annoy people.

19 Noise from your operations is creating threats to the health and welfare of many private citizens OUTSIDE your boundaries. Your refusal to reduce excessive noise levels in favor of trying to justify them via computer extrapolation of nine (9) year old data has taken Camp Grayling into the worst period of controversy in its history.

DEIS, Page 7

You state in 4-3.3 that a noise level of 55 decibels (dB) will protect public health and welfare. Then you go on in an attempt to justify noise levels at my residence (outside the Camp boundary) of more than 200% of the safe level. This simply will not wash, and you are in harm's way legally if you do not change your approach. Tell the truth. You make noise outside the post, at Guthrie Lake, over 250% of the so called "safe" level. People are suffering both physically and mentally from your noise harrassment.

You describe noise from airplane overflights in Fig. 4-3.1c as having both Zone II & III contained in a "tadpole" shaped area near the Air/Ground Range. This may represent ideal conditions, but is far from the truth. Even as I write this letter in my residence, the jet noise is ABSOLUTELY DEVESTATING. It is just like living at the end of the departure runway at Detroit Metro Airport as the fighter-bombers roar overhead and conversation becomes impossible.

Years of complaints to your officers have changed this condition not ONE IOTA. Your planes do not follow your own rules and are instead more interested in "blowing leaves" or "dusting civilians". Tell the truth. You cannot control what your people do and they will continue to create noise problems any time they wish --- until you establish better discipline.

Perhaps if you get away from your computers and get out into the field and talk to the people, and listen objectively to your own sounds, you will eventually realize the true problems your projects and operations are creating for not only the Natural Environment, but also for the HUMAN Environment, which is after all what you are here to protect.

You contend on 4-3.26 that the lands adjacent to the MPRC-H, "are all owned by the military". This is not true. Those lands are owned by THE PEOPLE OF MICHIGAN, and are merely leased to you by the DNR for you to to tear up. Why do you continue to lie?

20 You say "no growth", but on 4-3.28 you describe a MPRC-H operating year around, 16 hours per day. This over-rules your "no growth" contention. Your theory, or supposition that winter
21 training will offset summer usage is either false or stupid. You state that Camp Grayling is the best training site in the nation, and to believe the Pentagon will allow any investment such as the MPRC-H to lie idle is pure hog wash. Tell the truth, Camp Grayling will be FULLY BOOKED winter and summer, especially with Washington's desire to consolidate and close outmoded military bases. You may not "anticipate" this, but combat needs dictates that is the way it will be.

DEIS, Page 8

On 4-4.1 you tell of basing your entire soils section on data that is 62 years old. Soils are the very earth we live upon. You have mixed and ground the soils here for many years with tanks, bombs, guns, etc. The least you can do in your attempt
22 to legitimize your activities is to get a current soil survey before continuing. Please stop all new activities until this is completed and thoroughly analyzed.

23 You have completely ignored a major gas field on Figure 4-5.1. Haven't you heard about the 15 or so gas wells on the Draper land in "North Camp"? Or did you omit this to avoid having to explain how much money the state will lose by not being able to lease North Camp out for oil/gas due to the conflicting military activities and ordnance pollution in this place? Don't keep trying to mislead the public. This is not a Public Relations document. It is supposed to be a DEIS -- or is it really PR? Any way, please show the big gas deposit as it relates to North Camp.

24 It is interesting on 4-5.13, that DNR has not surveyed the Camp wetlands. How in the world can you go forward with all your rhetoric about "protection" when you do not even know where the wetlands are? Please STOP EVERYTHING until a survey is completed and analyzed.

25 Your Bald Eagle section on 4-5.43 may not be valid because the Wildlife and Flora-Endangered map is innacurate. You have omitted the Eagle nest at Firing point #117, despite the fact it has been in the same tree for 15+- years. This is the one you finally decided to protect after it was publicly exposed that your operations were causing this nest to fail thru parental abandonment of baby eagles every year. By the way, Col. Downey's PR on the traditional nest tree blowing down last year is totally false.

On 4-5.45 you talk of no Ospreys. This was not always true, but seems to be now. This is particularly alarming, since the Osprey is an "indicator species", and will leave a polluted area long before man realizes what is happening. You had better take a VERY HARD LOOK at all aspects of your operation to determine what made this bird disappear about 3 years ago.

We agree with you on 4-5.51 about your "creating noise which may scare animals". It scares people too. What we really need to know is about "the quiet, undisturbed areas available in post". Where are these places? We want to go there too for some tranquility. Please include a map of these in the final EIS for our personal use.

DEIS Page 9

You have again erred on 4-6.3 as you talk about the Hanson Land Grant. Hanson left this land , restricting it to 4 distinct purposes: Forest Preserve, Game Preserve, Fresh Air Camp for Gov't. employees and "As a permanent encampment and maneuvering ground for the militia OF THIS STATE and for NO OTHER PURPOSES WHATSOEVER". Please so note in the DEIS to avoid further confusion on this subject.

26 In the discussion of Act 192 on 4-6.4, please elaborate on why the DNA DOES NOT maintain roads so as to make them passable. This law apparently removed these roads from local jurisdiction and it is your duty to keep them in good condition for public use. You HAVE NOT done so and are thus in violation of the law. Please explain this in the DEIS.

Despite your attempt to explain it away on 4-5.5, there are 50,342 acres of private land zoned RESIDENTIAL within the area considered in this section. This extends to a maximum of 3.5 kilometers outside the post. This is an area over 34% as large as the camp itself. Please explain how you intend to grow, or stay as you are without severely impinging on these lands with
27 your noise, dust, smoke, fumes ,etc.. Please do not try to take these lands thru the ICUZ. That is confiscatory. Explain how you intend to modify your operation to resolve this situation.

On 4-6.13 you again go on saying new troops are not anticipated, however elsewhere you have stated that ultimate winter training will involve Brigade/ Division levels. Please explain what you really mean. Is it no new troops, or is it a division? You cannot continue to double talk this issue.

28 Please elaborate on the "refueling" aspect of the Assault strip as noted on 4-8.26. State EXACTLY what you intend to do here, and guarantee not to exceed those limits. As this stands now, you give yourselves a BLANK CHECK in practially every instance, to do ANYTHING YOU PLEASE anywhere you wish, after completing the EIS process which, by this point in your book, seems little more than a charade.

Probably the most OUTRAGEOUS statement in the DEIS is on 4-10.27, where you state:

> "No significant adverse effects upon psycological, physiological or community needs and lifestyles of residents of the area are perceived as a result of full implementation of these actions."

You obviously have no perception of the ABSLOUTE STRESS your noise and harrassment has upon the civilian population. A professional Noise Expert, employed by the AuSable Manistee Action Council has very recently stated in a written report:

DEIS Page 10

> "Some of the residential areas around Camp Grayling are probably receiving more noise impact than any other community in the United States located adjacent to an Army base."

It is those people in those areas, wherever they are, and others, having been hit, forced off roads, raped, groped, insulted, trespassed upon, etc. by "visiting" military personnel, who have already been affected psycologically or physiologically. The expansion of Camp Grayling will serve only to worsen this VERY serious problem.

In closing, I reiterate that subject DEIS is lacking in truth, fact and substance to the extent it DOES NOT present a full or fair evaluation of Human or Natural Environmental consequences arising from the proposed action. For those reasons it must be either wholly discarded or given a major overhaul.

Sincerely,

Dan L. Alstott

Dan L. Alstott
Rt. 3 Box 3510 A
Grayling, MI 49738

DOCUMENT 40

June 13, 1989

MI Department of Military Affairs
2500 South Washington Avenue
Lansing, MI 48913

Attn: Mr. Greg Huntington
Environmental Coordinator
Construction & Facilities Office

RE: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
CAMP GRAYLING ARMY NATIONAL GUARD

Dear Sirs:

The Draft Environmental Impact Statement (DEIS) is seriously flawed. It is flawed from concept to conclusion. The Michigan Department of Military Affairs in its zeal to achieve its committed goals of expansion and construction have engaged, with the assistance of its hired consultants, in a despicable conspiracy to confuse, mis-lead, and deceive the people of the State of Michigan, and most importantly the people of Kalkaska, Crawford, Otsego, Roscommon, and Missaukee Counties. The DEIS in its attempt to be benign is guilty of gross error, both in commission and omission. It represents what is commonly called a "White Wash Job"! Tell them something but tell them nothing! The issues here are far too important to the future of this area to be so patently glossed over or ignored.

The DEIS speaks for itself in its woefully inadequate responses to our charges and criticisms.

In the interest of time and brievity I would like to offer just the following five issues as typical examples of the total and complete inadequacy of the DEIS.

FIRST - It is a construction document and addresses only that phase of the proposed Mission/Multiple Construction Project. All environmental concerns and impacts caused by the operations of Camp Grayling and its Ranges, are summarily dismissed by claiming a DNR permit will be required and that will make them acceptable. This is not only false and misleading but utterly ridiculous. It defies logic and is insulting to intelligent people.

SECOND - The DEIS is shamefully inadequate and almost silent in addressing the concerns and fears regarding Toxic Contamination of the land, its water, aquatic creatures, wildlife and most importantly the Human Creatures that inhabit the area. Over a half century of exploded and unexploded ordnance, dumped munitions, liquid and solid waste disposal is glossed over or ignored. The impact on the wetland chain from Barnes Lake thru the East Branch to the Main Stream of the AuSable River is totally absent from any mention. A complete and thorough analysis of all areas for toxic contamination must be made a part of any final draft EIS. A part of this study must be consideration of the impact of Radioactive Penetrators that are fired on the ranges. Data must be made available to the public regarding the impact of Toxic Contaminants and the effect of heavy metals residue on the wild life of the area.

1

Michigan Department of Military Affairs
Draft Environmental Impact Statement
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Page Two

2 THIRD - The DEIS says the State has no noise standards or laws that would govern or control the camp and yet it acknowledges that noise levels violate the acceptable standards for human existance. The DEIS falls horribly short in its content regarding a full and fair discussion of significant environmental impacts as it particularly pertains to noise. Let's face it and be honest, you do not have adequate data, your limited studies are sadly incomplete, you just don't know what the true impacts are. Admit it and don't deceive us with this document that would try to convince us noise levels may get better because of these proposed projects. That's what I call Hogwash! The DEIS completely fails to

3 address the impacts of Military Air Traffic over the ranges. Will it increase with the new MPRC? You treat it like it doesn't exist and yet it has been a constant cource of criticism and complaint for years.

4 FOURTH - The DEIS on Page 4-10.27 says, "No significant adverse effects upon psychological, physiological, or community needs and lifestyles of residents of the area are perceived as a result of full implementation of these actions". How can this be true when a committee appointed by Governor Blanchard to investigate the "conflicts" over the use of Camp Grayling heard hours of public testimony from residents of the area expressing great concerns for conflicts, controversy and confrontations with the Military. We already are experiencing the very effects this document would try to convince us will not occur. This statement pretty well sums it up! The DEIS is totally flawed and completely inadequate.

FIFTH - I ask why is there no mention Roscommon or Missaukee Counties in the DEIS. Can it be assumed there will be absolutly no impact on these two counties that contain land within the bounderies of Camp Grayling, or do we choose to omit them so that these people are denied opportunity to add their cry of concern to that already voiced at other public hearings?

FINALLY - In closing I would quote from Page One of the Executive Summary, Draft EIS "The environmental impact statement document contains a full and fair discussion of significant environmental impacts and informs the public and decision making bodies of reasonable alternative that would minimize adverse impacts before decisions are made. In the case of the subject DEIS this simply is not true, due to all the errors and flaws found in the document. It does not contain a full and fair discussion of significant environmental impacts. Quoting from Section 1502.9, Council on Environmental Quality under the National Environmental Policy Act - I read, "If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion".

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Page Three

Jun 94

This draft EIS is so seriously flawed, inaccurate, misleading and inadequate that it must in all good conscience be completely re-drafted. In short DMA returns to the beginning and start over to develop something meaningful instead of this eye wash document we have under consideration.

Sincerely,

Wm. D. Gregory
1009 South Henry Street
P.O. Box 1247
Bay City, MI 48706

George A. Bentley
P. O. Box 63
Grayling, Michigan 49738

22 July 1989

Department of Military Affairs
Grayling, Michigan

My name is George Bentley. My wife and I have been coming to the Au Sable-Manistee river system area for 38 years, visiting friends who reside here and renting living quarters in the earlier years. Some 23 years ago we bought property on the Au Sable, and then built our home there - on the banks of the river, below Stephan's Bridge. This is our retirement home.

While we knew, of course, guardsmen came to Camp Grayling for training, we did not anticipate the accelerated growth of this activity, nor the extent to which units from other states and, yes, countries - would enlarge the scope of the military. From the modest size of the original grant - (for the training of Michigan guardsmen) the military octopus has encroached upon our environment far beyond our worst scenario.

The noise factor has been a constant irritation - guns, tanks, planes, etc. At times, our solidly constructed house would have the windows and doors rattle - at all hours of the night - in response to the big guns firing. (This has not happened this summer - perhaps moved to another range, on a light schedule, until the local opposition quiets down?) For the past few weeks we have had to interrupt our conversations until the "choppers" go out of earshot - one after another - it seems endless.

Bentley Ltr. Pg. 2

The vast scarring of the terrain, with attendant damage to the environment - animal & bird life, is well recorded - and of great concern.

The disproportionate damage to paved roads, & trails - the tie-ups of traffic by convoys, with attendant dust and dirt - all have a deteriorating effect on this lovely land.

One military man wrote in the local paper "if you don't like it, move out!" The rivers were here - the military came later - the river system cannot be re-planted elsewhere. I suggest the self-serving merchants who don't apparently give a hoot about this natural environment, are more mobile, and could relocate!

I am not naive enough to expect the Camp Military Operation to "go away". I do propose a stop to the ever increasing encroachment on the area - the construction and expansion of facilities - if they are available, they will be used!

Finally, I propose permanent restrictions upon the amount and the hours of military activity that would alleviate the stress and annoyance suffered by the area residents.

While no weapons expert, I feel the military presence here is being trained for a war that was, and will never be again. Modern weaponry makes the tanks and artillery being used here, obsolete. If the guards' function is to be civilian control in State emergencies, let them be so trained!

Sincerely,
George A Bentley

July 22, 1989

Michigan Dept Military Affairs (DMA)
2500 S Washington Ave
Lansing, Michigan 48913
Attn: Construction and Facilities Office

Subject: DEIS
Mission: Multiple Construction: Camp Grayling Army National Guard Training Site, Michigan

Dear Sir:

To describe the document that has been produced by the MDMA as an environmental impact statement is to insult the citizens of the state of Michigan.

The D.E.I.S. is seriously deficient in the material it covers, with scientific investigations haphazardly carried out. Lacking, for instance, is a report of hazardous waste buried on the camp site. This should be a complete report listing items buried and stating worse case scenarios with possible evacuation plans

detailed.

Water and soil tests have been performed but not in a proximity close enough to note escaping contamination. If water tests have been performed without following "chain of custody" procedures, the integrity of these tests must be questioned.

To deliberately remove habitat of the Kirtland Warbler, an endangered species, from an area that this bird has been coming to for generations, indicates a callous manipulation of the environment to suit the purpose of the Michigan National Guard despite all cost to that environment and that endangered species.

Jun 94

1 Alternatives were not thoroughly explored. No alternatives, such as consideration of other sites outside the state of Michigan for the M.P.R.C. were even offered as a possibility.

2 The negative impact that City of Grayling has on the economy was not discussed. While in the committee hearings, many people testified that their families would no longer even come to the area to visit because the noise had become unbearable over the last 5 yrs. and a decent quality of life was no longer possible. There were others who testified that they were giving up and leaving the area.

3 A Grayling youth at the EIS Review held at the High School, stated his concern about the additional disruption to G.H.S. classes the additional proposed 2 helicopter visits would cause since, even now, each helicopter that hits the airport disturbed the concentration of the students. So much for the MDNA's concern for Grayling youth!

I submit to you that the M.P.R.C. and Assault Landing Strip will have a devastating effect on the recreational attributes and the quality of life at the Au Sable and Manistee area environs.

The plans for the M.P.R.C. and Assault landing strip, which would carelessly encroach on two Blue Ribbon rivers of the Au Sable and Manistee, should be terminated or redesignated for areas that would not destroy prime watershed environs.

Sincerely,

Elaine P. McGlinn

Mrs. Elaine P. McGlinn
11516 Berger
Plymouth, Mi.
48170

Jun 94

DEAR MR. ANDREWS

I WOULD LIKE TO LET YOU KNOW THAT THE PEOPLE THAT ARE CAUSEING SO MUCH TROUBLE FOR OUR NATIONAL GUARD AND FOR THE PEOPLE THAT ARE FOR OUR GUARD I WOULD LIKE TO SAY THAT THESE PEOPLE DO NOT SPEAK FOR ME NOR DO THEY SPEAK FOR THE PEOPLE OF MICHIGAN AND WE ARE THE ONES THAT HAVE EVERYTHING TO SAY BE GUARDING CAMP GRAYLING AND OUR GUARD AND I DO NOT KNOW WHY YOU PEOPLE CALLED FOR HAVEING THESE MEETING BECAUSE THEY DO NOT MEAN ANY THING ALL IT DID IS GET THE PEOPLE THAT HATE OUR NATIONAL GUARD TO GO TO THE MEETING AND LET YOU PEOPLE KNOW THAT THEY ARE GOING TO RUN OUR GUARD AND CAMP GRAYLING AND THAT IS WHAT IS WILL HAPPEN IF YOU GIVE IN TO THEM I LIKE IS ALOBEE FOR THEY DO NOT SPEAK FOR THE PEOPLE OF MICHIGAN AND THEY DO NOT SPEAK FOR ME BECAUSE I'M FOR OUR GUARD

THANK YOU

JOE STANEK Jr.

348-4395 PO BOX 29

GRAYLING

APPENDIX N

Public Hearing Transcripts - Mar 89 DEIS Review

Note:
Specific remarks and/or questions within the transcripts are acknowledged and identified with a large number in the margin. Each remark and or question identified is responed to in Apprendix O. The original transcripts are available for review at the Michigan Department of Military Affairs.

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NATIONAL GUARD BUREAU

PUBLIC HEARING

Grayling High School
Grayling, Michigan
May 17, 1989 at 7:00 P.M.

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- - -

LTC. WILKINS: I'm Lieutenant Colonel Ed Wilkins, and I'm the Facility and Construction Management Officer for the Department of Military Affairs in Lansing. I wish to welcome you here on behalf of the Adjutant General, Vernon J. Andrews, and Colonel David Hanson, the Commander of Camp Grayling. We're here to take public comment on the Draft Environmental Impact Statement covering the mission and multiple construction which has been proposed for Camp Grayling.

I'll cover a couple of administrative announcements. Smoking is not allowed in the high school, and if you need to get up to take a smoke, you need to go outside. The latrines are down the hallways. Most of you are from Grayling. You

probably know where those are. For those that aren't, you go out these doors and through the open area into the hallway, either left or right. As this progresses, we will be taking at least one break during the proceedings just to kind of regroup and give everybody a break. If you wish to speak, please note, we need you to fill one of these cards out. If you did not get one at the door and you wish to speak, maybe during the hearing as we go along you get the idea you'd like to speak -- well, the cards are out by the door, and if you'll get one and fill it out, we'd appreciate that.

Also, if you don't wish to make a verbal comment at the meeting, we are taking written comments until July 1st, and the verbal comments and the written comments have the same weight. We just need to, you know, to document that the comments have been made. The public comment portion of this hearing will be chaired by Mr. Judd Ebersviller of E. A. Hickok and Associates, a consulting firm which was hired to write the Environmental Impact Statement out of Minneapolis, Minnesota. Mr. Ebersviller is a senior environmental professional with the firm, and I'm going to turn that over to him very quickly here so we can get

started. Judd.

MR. EBERSVILLER: Thank you very much. Good evening. As said, my name is Judd Ebersviller. I'm with E. A. Hickok and Associates of Minneapolis, Minnesota. We are the contractor hired to prepare this Environmental Impact Statement.

The purpose of the hearing tonight is to allow you to express your verbal comments regarding the Draft Environmental Impact Statement Document. The verbal comments, as Ed said, are just as important to us as written comments which you might care to deliver. We'll take the comments tonight here at the registration desk, or you can mail those comments to the address on the agenda. The comments that we receive from you, whether verbal or in writing, will be incorporated into the final Environmental Impact Statement, and the Department of Military Affairs' responses will be included in that document at that time.

My role here tonight is primarily to ensure that everybody who has shown that they would like to speak, has the opportunity to do so. I would like to talk about two items before we begin the public comment portion of the meeting tonight. I'd like to give you a brief overview of the

National Environmental Policy Act and what it means in terms of this Draft Environmental Impact Statement Document, as well as do a brief review of the Draft Environmental Impact Statement itself. The public comment period will follow that, and due to the significant number of people who are requesting to speak tonight, we will have a two-hour comment period and divide that among those who have shown they would like to speak. So it will be necessary to put some sort of a time limit on the first round of public comments.

(Discussion off the record.)

The National Environmental Policy Act was passed in 1969. Its principal intention was to provide a means of incorporating environmental considerations into government decision-making process. The National Environmental Policy Act created the Council on Environmental Quality, who was responsible for providing some way to incorporate these considerations. The Council on Environmental Quality proposed guidelines for the preparation of Environmental Impact Statement as a vehicle to do so. The national legislation has been

adopted by the state of Michigan, and a similar process exists within the state of Michigan. A state board has been provided to provide outlines for the process of preparation of Environmental Impact Statements and the review.

The purpose of an Environmental Impact Statement is to provide a full and fair discussion of the environmental effects of the proposed actions, as well as those of alternatives to the proposed action which may have less adverse effects.

The Environmental Impact Statement provides several opportunities for public involvement, including the one here tonight, as a way of incorporating public concerns and scoping the document. The EIS relationship with permits and approvals is such that even though the Environmental Impact Statement process has been completed, permits and approvals will still be required for those projects which would normally require those permits and approvals, and will have to be obtained after the close of the Environmental Impact Statement process.

The Environmental Impact Statement process for this document began on July 22, 1986, when the notice of intent to prepare the document was

published in the Federal Register. On August 15, 1986, the same notice was presented in the Michigan Status Report. The public meeting to scope the document was conducted on September 4th, 1986, and noticed in the Grayling, Kalkaska and Gaylord papers one week prior. Comments were accepted till the 21st of September. The notice of availability of the Draft EIS Document was made on April 21st, 1989 in the Federal Register. On April 15th, 1989, the state Status Report provided notice, and on May 4th, a notice of availability of the documents was included in the Grayling, Kalkaska and Gaylord papers. Complete documents have been made available to those requesting them. The notice of this public hearing was presented in the papers on May 11th in Kalkaska, Grayling and Gaylord, and again in today's edition of the Grayling paper.

The comments presented here tonight will be addressed in the final EIS, which will be, again, redistributed for comment to those who received the Draft Environmental Impact Statement.

Future Environmental Impact Statement events include a public hearing June 13th at Kalkaska; the close of the comment period on July 1st, 1989; a notice of availability for the final

EIS; and followed by a final EIS comment period. And finally, a Record of Decision will be prepared by the Department of Military Affairs, which will be an official record of which actions will be implemented and the reasons for their decision.

The purpose for the projects addressed in the Camp Grayling Draft EIS include several items: deterioration of existing facilities, development of new training techniques and standards, environmental standards and regulations, and a cold weather training mission for the Army National Guard. To address these needs, the camp -- excuse me, the Department of Military Affairs, proposed a Camp Grayling Master Plan. The Master Plan includes plans for cantonment facilities, training area facilities and training operational activities. The document includes an alternatives considered portion which addresses the proposed projects.

The handout available at the door this evening outlined the proposed projects in table 1 and shows the location for proposed projects in figure 1 and 2.

The cantonment area projects include 15 of 18 of the proposed facilities. These projects include things such as the wastewater treatment

plant, new buildings, road and trail improvements -- excuse me, road improvements, and a fuel dispenser facility. The training area projects include three facilities: a road and trail improvement, the multipurpose range complex, and the assault landing strip. The training operational activities include cold weather training, assignment of new aviation units and lanes training.

The alternatives considered for these actions include no action, relocation and alternative siting. Not all of these alternatives have been determined to be applicable to each project. The retained alternatives are described in the executive summary at the door -- available at the door this evening. No action was retained in all cases. Other reasonable alternatives, which could mean the intended purpose of the proposed action, were also retained for analysis. The text also includes a portion addressing the affected environment and the environmental and socioeconomic consequences of the proposed actions and their alternatives. These actions are summarized in the environmental matrix presented in the executive summary available at the door this evening. This is an example of the environmental matrix. (Indicating

screen)

At this point, I'd like to make a few remarks before we enter the public comment period of tonight's meeting. I'd like to again stress that the verbal comments relating specifically to the Draft EIS will be incorporated into the final EIS Document, along with responses from the Department of Military Affairs. My primary role this evening is to make sure that everybody here who wishes to speak has an opportunity to do so. When you offer comments on the Draft Environmental Impact Statement, it helps us if you can be as specific as possible about which projects or aspects of the document you are referring to. Comments not relating to the Draft Environmental Impact Statement will be addressed by the Department of Military Affairs, but not included in the final Environmental Impact Statement Document.

The format for tonight's public comment period will include a two-hour public comment period, which will be divided among those who have indicated they would like to speak at the door tonight. That will be followed by a short break, where people who would like to speak, but have not had a chance to sign up, or people who would like to

continue speaking who have already spoken during the first period would like to have, again, have floor time. So during the break, if you would sign up on the sheets, two separate sheets, one for those who have already spoken and one for those who have yet to speak, we'll make sure that the public comment period following the break, you have an opportunity to do so.

Tonight we've had approximately 40 people who have indicated that they would like to speak this evening, so in the first comment period, we're talking about a period -- a time limit of three minutes per person. I'd like to stress that if, for some reason, you require more time, we can incorporate you into the comment period following the break. I would like to emphasize the opportunity for written comments that we will accept through July 1st, and another opportunity for verbal comments on June 13th in Kalkaska.

When you step up to the podium tonight -- I'll call your name, and when you step up to the podium, please state your name and adress so that the court reporter can get an accurate record of who is speaking. And from time to time, she may have to ask you to repeat something or slow down so that she

can keep up with your presentation. When we reach three minutes, I'll let you know, and you can conclude your comment or put yourself in a position so that you can continue your discussion after the break.

At this time, I'll get ahold of the cards here, and we'll open the public comment period. We have a group of several people from the -- representing AMAC, I believe, and they would like to compile their comment time together. The individuals are Dr. Goff, Dan Talhelm and Dr. Bill Cooper. So we would offer them a compiled period of nine minutes to make their presentation, and we will extend to them additional time after the break, if they require it.

So Dr. Goff, you have the floor.

DR. GOFF: My name is Dr. Glenn Goff. I represent Vital Resources Consulting. We have been retained by AuSable Manistee Action Council to prepare a review, evaluation and critique of the Environmental Impact Statement. Entering into this, we negotiated a very strong objectivity clause in our contract, and I'd like to read that to you. "Vital Resources Consulting shall conduct a review, evaluation and critique in a scientifically

objective manner making use primarily of extant data, and shall be expected to release any and all pertinent findings to the public. AMAC shall not attempt to control the bias of findings of the R.E. and C. in any manner, except that members and staff of AMAC may provide information to Vital Resources Consulting."

They entered freely into that, and essentially what we're saying here, is that we have assembled a team of professionals to prepare a critique of the Environmental Impact Statement. We're going through that process at this time, and we intend to do that in a manner that is as objective as possible, but we are working through it in considerable detail. That team consists of Mr. Don Richards, who is the administrative manager of the project; George Camperman, he's an engineer and an expert on acoustics and noise impacts; Dr. Dan Talhelm, a socioeconomic expert; Dr. Bill Cooper, who's an expert in the science of environmental impact from many different points of view; and some other assistants working with us, plus input from many other professionals that we're in contact with.

I have a letter from Mr. Camperman, who

could not join us tonight. I'd like to read that. It's addressed to me, dated May 11th, and he says this: "A review of the subject EIS reveals the operations at Camp Grayling are responsible for very serious noise impact problems at many homes in the area. The severe noise impact caused by Camp Grayling encompasses 50 square miles of area outside of Camp Grayling. I am studying the noise impact problems around Camp Grayling and the changes proposed in the subject EIS. My comments and recommendations will be submitted in writing, as requested by the Department of Military Affairs." Signed George Camperman.

I want to comment on one issue that is in the area of land use. I'm looking mainly at land use in the terrestrial index, and this issue has to do with what I will call the restricted use lease, lease 1479 that involves 50,000 plus acres of restricted use area, and the jurisdiction of administration on this area. Much of the Camp Grayling environmental management analysis and plan and accompanying EIS are based on the assumption that the lands upon which the proposed expansion would occur are under the complete control of the Department of Military Affairs, and a large portion

of the area proposed for expansion of training and for implementation of new technologies and training -- that assumption is not valid.

According to the EIS, 29 percent of the land within the proposed boundaries is in this lease category, which the EIS terms "under leases in perpetuity," which we would prefer the term "restricted use lease lands." Careful reading of the lease agreement between the DNR and DMA reveals that only limited rights were transferred to the DMA with respect to this extensive area. In fact, the terms of the lease, which I would like to project: "State authority to use said lands for military purposes in the same manner and to the same extent as is now exercised on and over the Hanson State Military Reservation.

That phrase, "in the same manner and to the same extent," was first drafted in 1948. It was renewed in 1978 to the then current technology and levels of use. Neither the plan nor the EIS makes mention of this primary lease restriction on the manner and extent of allowed use. The plan and the EIS do make reference to reservations of authority by the DNR in terms of game, fish, forestry and other interests, but this is a secondary

restriction. The primary restriction is the restriction against use of these lands in the manner and to the extent different from that which was exercised on the reservation at the time the lease was renewed in 1978. The secondary restriction is to be exercised within that manner and extent of use established by the primary use restriction.

Some idea of the extent of lands involved are shown on the map -- be figure 1. It's essentially the vast majority of the northern part of the range. And to help clarify the concept, I'd like to show you just one other diagram. It just conceptually clarifies manner and extent of use. This diagram shows what the original lease intended with extent of use; such things as numbers of troops, numbers of vehicles, seasons of use, geographic extent of use, and so on, shown on the bottom. And in 1948, that was quite limited and clearly intended to remain limited by the terms of the lease. Also, the manner of use involving the technologies of training at that time, and perhaps somewhat evolving over time, but foreclosing such things as major new technologies. One could think of such uses, for example, as limited nuclear, and so on.

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Well, the question is -- that isn't proposed in this, but several new technologies and new levels of training are, and obviously the framers of this lease intended for only restricted use to be made of those lands. That would be an army with the primary recreational purpose of the lands. In 1978, that scope of manner and extent of use was considerably expanded, and it has continued to be expanded, even beyond the terms of the lease. The EMAP certainly proposes a great expansion of that, and our reading and checking with others who are experts in this field clearly establishes that the authority simply does not exist to make use of these lands in the manner that's proposed by the EMAP, and that is not covered in any way in the EIS.

I will turn this to Dan Talhelm. I understand we have nine minutes each, or was it nine minutes combined?

MR. EBERSVILLER: I have six people from the AMAC association who would like to compile their time here, so I'll yield a period of ten minutes for you.

DR. GOFF: Okay.

MR. TALHELM: I'm Dan Talhelm. I'm a resource economist working in the area of natural

resources, particularly in recreation and tourism, fisheries, sport fisheries, and associated areas. I was asked to do an objective review of this Environmental Impact Statement just more or less as I would review any public document that was going to be published, and I review a lot of those in my work at Michigan State University. I have three concerns. I just want to talk very briefly about these three.

2 One is, there are impacts off sites, off the camp, on recreation values and tourism that are not assessed in the Environmental Impact Statement.

3 The economic impacts of training on the area are not based on objective scientific assessment of expenditure levels.

4 And the third one is, there is a loss in real recreation values on those lease lands, which could be a very serious loss in values amounting to loss of -- effectively nullification of that use clause we just talked about.

Now going back to the first one, omitted impact on off-site use, there is kind of a blanket statement treated at several places here in the Environmental Impact Statement that the proposed changes will not influence off-site use to a serious extent. And my first concern is that there's

5 basis for saying that, because there's no documentation on what our present recreation quality off the site is being influenced. How can you tell whether it's going to be worse or better? How much influence is there? Where is it? What could be done about it? Then we can tell what's the impact of the proposed changes. So my first concern is there's several things omitted here.

My second concern about the economic impact estimation is that the estimate that each guardsman spends $200 per annual training, it was not an objective assessment. It was done -- a nonrandom survey by the Chamber of Commerce, and not based on standard statistical procedures. In addition to that, since then, the training

6 procedures have changed in such a way that the troops are now in the field a lot more than they were before. They don't come into town as much, and something like that could change the range of expenditures. Now I don't know whether expenditures are more than that or less than that, but it's simply not based on an objective assessment.

The final point was about the loss in recreation values on those lease lands. Those are

7 public property, leased from the Department of

Natural Resources, and with the provision that public access to those lands would be made available under certain conditions. And my concern is that there's a possibility, not documented here, but there's a possibility that the noise and traffic and interference could effectively impact those users of Camp Grayling lands: anglers, berry pickers, hunters, hikers, skiers. The impact could be such that the value reduced to near zero, nobody comes, and effectively, that's, in effect, the same thing as restricting those uses or not permitting those uses.

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So those are my concerns, and I yield now to Bill Cooper.

DR. COOPER: My name is Bill Cooper. I'm an ecologist at Michigan State University. I live in Mason, Michigan. Up till last year, I chaired for the last 12 years, the Michigan Environmental Review Board. We're the organization that was involved in the early discussions of Camp Grayling, documented noise, related issues. The Michigan Environmental Review Board is now disbanded. The government is setting up a new one called the Council for Environmental Quality. It's not yet set up. That's one of the reasons that tonight I'm

addressing my comments, whether I'm talking to the Department of Military Affairs, the real object of my conversation is Don Inman, sitting right over here in the third row, because basically I learned the hard way: If you want to enforce environmental standards, you want to make sure that whatever's agreed to here in this process of the EIS is implemented.

MR. EBERSVILLER: Can you slow down a little bit?

DR. COOPER: Nine minutes. Okay. Whatever is implemented here as a promise is not enforceable if it's not embedded in a DNR permit, because if it's not embedded in a permit, nobody's going to monitor the effects. And so one of the big concerns I had with the document isn't critiquing it as an EIS, but looking at it as a vehicle of information to tell us which permit should the DNR specifically make sure they issue good permits. Now one of the problems is the EIS has no draft permits except one, is a surface water permit, and to illustrate why I think we need to see draft permits before this thing goes forward, and what I'm asking for is an appendix which the DNR puts together between now and July 1 that gives the public a

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chance to look at every permit they promise is going to be there to mitigate impacts. Because if it's not in the permit, don't rely on the mitigation.

The one permit's there, is the surface water permit for the new wastewater treatment plant. And to show you the reason you should see this, is the statement's all the way through there, "since we're going to increase water quality, you can't have anything but a positive effect on the ecology." There's one line in there that checks it off. "The past facility leaked so badly, that 96 percent of the effluent water never got to the pipe." Okay. And so even though they dropped the phosphorous standards by treatment, if you calculate what they're going to capture now with new sewage pipes, they're going to have a 24-fold increase in volume. So even if you drop the concentration by 10 percent with treatment, you increase the volume by 24 fold, and then if you're going to spray in the summer, what you're going to accumulate in the winter with your winter operation, you're going to go up as much as 48 percent, or 40 times more effluent.

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And I'm not at all convinced the calculations in that permit are correct. I definitely know the statement which is in there

since it didn't have an effect in the past, it won't in the future, is wrong, because they've increased the volumes by a fact of about 48. That's why you need to see the permits, so you can make sure what you read is what you actually receive. In that same way, the concern is there's swamp. It's a white cedar. It's a deer yard. You don't regenerate cedar in Michigan. It's a critical override of habitat. You load cedar swamps with phosphorous and water and you can have a very strong negative impact. A good plant ecologist should look at it. I don't think they have to date. The mass balance numbers are not in the EIS to do that kind of impact analysis.

So again, the whole concern I have is the DNR is going to be responsible for making sure that if they expanded Camp Grayling, both in terms of size and in terms of winter operation, you get a Cadillac and not a Volkswagon. The Kirtland Warbler, the AuSable River, the Hartwick State Park, all require that if you do it, you do it first class. The only way you can get those guarantees is if they're in writing and a permit. Then they're enforceable. If they're verbal statements, forget it. So one thing we ask for, Don, is an appendix by

July 1, which should be very fun to get out of the DNR.

There are about five more things that fall in the category of if you're going to upgrade Camp Grayling, the State Department of Military Affairs ought to at least reflect the new attitudes of the governor, of David Hales, of the DNR. We've heard a lot of statements about we're going to do things better with this generation of bureaucrats. So I went through the EIS comparing what they say they're going to do with what the new policies are.

Point one, solid waste. I just testified in legislature today on the new recycling, incineration. Number one on the bottom of the list of hazards of solid waste technologies is land filling. The only thing proposed up here is land filling. It's completely out of face with where the state government is going currently. Okay. It'd be very hard to believe the legislature would appropriate state money to do something when it's a second priority in their new list of how you approach the problem of solid waste.

If you look at, for instance, underground fuel tanks, I've got a letter here from the Director of the DNR, 1985. Don Inman helped write it. It

declared the DNR won't equip fuel tanks above ground from now on. Below ground fuel tanks leak. You can't tell they leak, and you've got programs all over the state now trying to clean up from various kinds of benzene-toluene-xylene. The EIS says most probably it -- well, they don't say. They say it could go underground; it could go above ground. The Fire Marshall wants it below ground. For environmental reasons, you want it above ground. I have no way of knowing what the DNR is going to require, except I know the policy is no underground storage for fuel tanks, and I assume that means aviation fuel as well. I think that point should be cleared up up-front. Because if you do have undergrounds, you have new technologies. It's not metal tanks with cathode sensors. It's double-lined fiberglass, and none of that kind of technology is in there, so you can't even tell if they know what they're doing or don't they.

If you look, for instance, at these isopleths, Michigan's had a history of social nuisance legislation -- not legislation. I'm sorry. Civil court suits. They started with odors. The DNR requires every landfill have a 1,500 foot setback from the nearest house because of social

nuisance odors. The EIS says we have no regulatory standards. We have no regulatory standards of odors or noise, but we have standards that we enforce, we enforce with civil litigation, and it's a social nuisance. And those two isopleths phase with this category two and category three. Both leave the boundaries of the land that's under the control of the Department of Military Affairs on private property, and if I was a lawyer advising the Department of Military Affairs, I'd say you're looking for civil suits on the Michigan Environmental Protection Act, and we've got a hundred years of law in Michigan that supports that.

And it makes no difference whether it's noise or odors. It's a social nuisance, and it is enforceable. Okay. The DNR does have a number that you can look at. The Highway Department uses 70 decibels. It's a social nuisance to design highways. If you look at shoreline development, you've got a designation of the AuSable as a scenic river. The EIS mentions several places that they'll go 500 feet away from the shoreline of a scenic river. If they're accepted they'll get a special permit from the DNR. As far as I can read the Scenic River Act, there's no room for variance.

There's no -- I don't believe the DNR has allowance to issue a variance to have some kind of development within 500 feet. You definitely ought to check that out. The concept of scenic river is not to issue variances; it's to protect it.

If you look at the issue of -- in here, the off-track movement of vehicles in the wintertime off the roads, I mean they claim the ecology in Michigan in the wintertime shuts down. You read it all the way through the EIS. I've got to find out who their ecologist is in Minnesota, because we have all kinds of things, like midwinter thaws -- even when the ground is frozen, and the reason the DNR has fought for years to get snowmobiles out of the woods and back on trails is because we have demonstrable damage -- small track vehicles. Under many conditions in the wintertime conditions, the ecology is not shut down for the winter. That concept is just not valid, and we can document it in many ways.

Again, I'm just taking policies of the DNR. This document does not reflect even the current policies. So the reason I'm picking on the DNR, is because they're going to have to justify issuing the permits, so you can argue with them, not

with the Deparment of Military Affairs.

MR. EBERSVILLER: Sir.

DR. COOPER: Yes.

MR. EBERSVILLER: Could you get to a point of conclusion or where you could continue at a later time?

DR. COOPER: Okay. Right. One more point, and I'll shut up. I've got a whole bunch of other things. The biggest impact -- well, we've got Kirtland's Warblers, are a real problem for the management program now. It's a phaseout where the Kirtland Warbler is going to lose, and I strongly disagree with what the DNR has agreed with. We can talk about it later, Don. It's a big environmental toxicology problem. We do a mass balance of lead, zinc, copper, chromium from exploding shells and bombs over the last 40 years, and do a mass balance as to where those heavy metals are, and I think you've got your major toxicological problem. And I have the name of the guy who is the head toxicologist at the Aberdeen Proving Grounds for the Army. His name is Harry Salem, and we're going to be getting his analysis of it very soon, so if you want, I can talk later.

MR. EBERSVILLER: Thank you very much for

your comments, sir. They will be in the final EIS. Mr. James McLennan, if you'd like to comment at this time.

MR. McLENNAN: I would like to relinquish my time to Dr. Cooper.

MR. EBERSVILLER: At this time, if you'll excuse me, I'd like to go through the list and allow everybody to have their opportunity, and we will return to AMAC at another time later in the program. William D. Gregory.

MR. GREGORY: I choose also to relinquish my time to Dr. Cooper, and I'd like to suggest that it be done now while he can continue in continuity with his remarks. Don't we have the opportunity of three minutes for each of us?

MR. EBERSVILLER: I would consider that.

MR. GREGORY: Thank you.

MR. EBERSVILLER: Okay. Is there anybody else who would like to relinquish their time to AMAC?

MR. WEAVER: I would, please. My name is Charlie Weaver.

MR. EBERSVILLER: One person at a time here. Let me get this straightened out. Okay. Let's proceed to determine how the time will be

yielded here.

MR. ALSTOTT: Sir, I would like to relinquish my time. My name is Dan Alstott.

MR. EBERSVILLER: Okay. Another person, please?

MR. RICHARDS: Don Richards. I'd like to relinquish my time.

MR. EBERSVILLER: Don Richards. Mr. Gregory and Mr. McLennan, I have you listed as well here?

MR. McLENNAN: Yes.

MR. GREGORY: Yes.

MS. CASWELL: We'll just stand at the back instead of sitting if --

MR. EBERSVILLER: Excuse me?

MS. CASWELL: We'll just stand at the back instead of sitting here if we relinquish our time.

MR. EBERSVILLER: Ma'am, could you come down to the podium, please? I just can't hear you. I'm sorry.

MS. CASWELL: I don't mean to steal your parade. I'm Linda Caswell, and my suggestion is that I see a number of people in the audience, and it's going to be confusing for you. Possibly we can either stand here or go to the back of the room so

that you can straighten out our names so that we can relinquish our time.

MR. EBERSVILLER: That'd be fine. If everybody who would like to relinquish their time would be willing to group together, it might expedite this procedure.

DR. COOPER: Could I suggest, sir, I only need about five minutes.

MR. EBERSVILLER: Is that the intent, then, that we need five minutes to finish the gentleman's remarks?

MR. GREGORY: As long as we can hear Dr. Cooper in his entirety.

MR. EBERSVILLER: Okay, Dr. Cooper. You're welcome to take five minutes.

DR. COOPER: Well, thank you very much. It's very difficult to go through that document in a very, very short period of time. Let me just hit the other highlights with you. I'm going to give both the Department of Military Affairs and the DNR this all in writing. I was asked just to let you know where we're coming from, so on July 1, it's not a surprise. Because some of this stuff, you might want to look at between now and July 1, so that's why we're doing this.

A general concern all the way through the statement is the public trust as to whether or not what you see proposed is as big as it's going to get. There's a statement all the way through this, "we won't get bigger," and obviously, the public distrust is to whether or not that's true. If you look at the growth trend in the last five years, it is growing. The statement says, "we stop now." One way to guarantee you stop now is for the DNR only to permit facilities that will handle 4,000 people a day. You propose a waste treatment facility that handles 11,000 people a day.

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It's the same thing we did with the Open Drain Commission when they wanted to build the Cadillac Plant. We had them put the sewer in only big enough to handle the Cadillac Plant, so you wouldn't force secondary development you didn't want. So why not just license the treatment facilities for what you say you're going to need, 4,000 people a day, and if you change your mind later on, you'd have to come in for a new permit and the public gets the chance to have their public hearing and find out why you changed your mind.

It's kind of public trust thing so you won't increment things up. Today in your mind it's

4,000. Somebody else, maybe not you folks, decides it's going to be 11,000 in a few years. They don't know it until it's too late. One way to make sure that doesn't happen, if you ratchet up the side, you ratchet up the permit, and that requires a public notification. And there's really no justification for 11,000 if you really mean that you're not going to get bigger than four. So it doesn't at all, you know, interfere with the things that are being planned.

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The environmental toxicity issue, you've got to understand an ecologist's skepticism that Camp Grayling appears to be the only military facility in the state of Michigan without environmental problems. I went through all the various files with the DNR, and except for the phosphorous, not in violation of a single permit. There is not another military facility in Michigan we don't have in court with some kind of groundwater, some kind of air. Kincheloe, Traverse City, you name it. I think you guys have got the cleanest record on history or the DNR hasn't looked very hard.

(Applause)

DR. COOPER: Well, you might very well be the cleanest operation going. I can't tell you, but I can tell you this, and ways to find out: The biggest problem -- well, the old landfill. One thing you have in your EIS is groundwater data, and I didn't even know there was an abandoned landfill, but there is. You groundwater data show that the total organic carbon is three times higher upgrade than downgrade. That doesn't make a lot of sense, and unless your landfill is absorbing organic carbon, it's not the source of it. So you might go back and check some of this water quality data, because the one thing you have in there doesn't match up.

Indiana, we got a study from Indiana just last week. They want to decommission a military facility that was an ordinance testing facility since 1941. They're comparable to our DNR. Their DNR just did a -- completed a study of what it would take to sanitize the top three feet so they could turn it back to the state for public access. The estimated cost is over $550 million. They physically can't be sure that they can clean it up. My first feeling is of Camp Custer here in Battle Creek. Fort Custer State Park now. There are

certain areas I think we ought to tell everybody if you use it for this kind of operation, it is irretrievably taken out of the public use. I don't think the state of Michigan could ever afford the liability of what we'd have to back up the public use in the future, because I've never seen one yet where you can go in and actually sanitize it afterwards. Which is fine, but tell them that so they know up-front. These particular areas are to be taken for public purpose. Take it and put it to it, and don't give the illusion that you can somehow change your mind and put them back into public recreation or public something else.

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The other thing that concerns me -- we're going to help you find some data on this -- the one thing about trying to find the chemistry of blowing things up, you know how shells are put together. They've got lead, zinc, cadmium, copper. You know when you blow those things up, you volatilize them. It immediately resolidifies, and you can find a halo of heavy metals in that soil if you go out on these blast sites. You won't find it in groundwater, but you will find it in terrestrial food chains, and that's where you ought to look.

I sat on the advisory board for Oak Ridge,

Tennessee. They allow hunting down there on the reservation, but they monitor every deer shot to make sure it's not hot with radioactivity. And about 1 percent a year, they have to confiscate, because these deer move around. And all I'm saying is either go out and see if that halo is there, or go out and have some kind of awareness that there's heavy metals, because you know they don't go away. The thing's shot off, and it's been there since the 1940's. You don't break down heavy metals. So again, there's the problem. You've got to address it and look at it. Particularly if they're opening these areas up to public comment, which is part of the DNR trust. They say, "Oh, people don't worry. You can still go on there and have public access."

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The other thing that I would strongly urge the DNR not to do, is you've got enough problem now during deer season not operating your military operations. Don't let them plant turkeys, because now that you've got it closed down to three weeks spring gobblers and three weeks fall gobblers, you've got yourself an automatic headache you don't need. So if the DNR wants to stay -- if you go with this turkey planting, go somewhere else. I mean that's the kind of thing that people need to know

what it's going to cost them for this thing to go the way it's going to go. At least they understand what the trade-offs are.

The Kirtland Warbler is one. The way I read the mitigation, it's assigned by DNR. I understand the problem you've got. The military is generating the prime Kirtland Warbler habitat by starting uncontrolled -- starting small fires that regenerate the jack pine. The prime habitat is 8 to 18 years, so the best breeding ground is where they had fires, and that's where they were shooting things, and so it's a catch 22.

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The plan is to let the habitat age beyond the 18 years, and management -- that is not management of habitat, which means we should let it do what it's supposed to. So there's a slight problem there with federal law, but you've got to get around it somehow, so you ignore the federal law and you won't be generating a whole bunch of areas, so the little dickey birds will abandon this area and go breed over there. All right. Now that assumes that you've got an area that's already 8 years old, but you've got jack pine in the right age stand right here, right now. And if that were the case, why aren't the birds already breeding there,

and you'd have three times more? Okay. Now if the habitat is not right there, then I'm worried about your mitigation plan. Your mitigation plan says if one year, this year, for one 40-acre block some little dickey bird doesn't breed -- who knows why. Maybe a raccoon ate his nest. Maybe he got killed between here and Florida. For one year, to go weeding, the rules are lifted on that 40 acres, and if I were managing that military operation, and I get a little wind that that bird wasn't there, I'd make damn sure he never came back, and you wouldn't have 8- to 18-year-old jack pine there. Okay.

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Now the problem is -- you know, I can see this. Well, it's natural. You know, it's instinct. Hey, the rules are, the bird's not back. He's somewhere else. We can do it now. We're free. The problem is, the population has varied every year, and you can't expect them to breed in every place you want them to every year. Once you do remove it, if the other habitat is not ready, your bird's dead. He's got nowhere else to go, unless you want to transplant 8-year-old jack pine, which I don't think you're doing. So one of the things you need to do is identify where the other habitat is, and you need to have a plan that the bird feeds there for at

least one or two years before you give up on the old habitat, or you will inadvertently jerk the rug right out from under him. So a word of concern that if one year they don't breed, then the rules are lifted, and I'll guarantee you that habitat won't be there the next year under normal kind of, you know, management responses.

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Well, those are -- I've got a bunch more little stuff, but those are the big ones. Thank you.

MR. EBERSVILLER: You're welcome, sir.

(Applause)

MR. EBERSVILLER: Mr. Edward Van Gunten, would you like to comment this evening?

MR. VAN GUNTEN: I'm Edward Van Gunten. I'm a landowner. I have a piece of property near Stephan Bridge. I'm also a Michigan attorney. I represent a township in a rural county. I've been the township attorney for 19 years. My family is also in the land development business. At this point, we're in the process of -- we're about halfway through a 300-lot subdivision in Melbourne, Florida.

I came to Crawford County this week for a muchly needed rest and to enjoy the beauty of Crawford County. I might tell you that I could have gone to Sun Valley, Idaho, because the family has a ranch out there with a trout stream, and instead, I chose to come to Crawford County. Instead, I spent this whole week reviewing the Environmental Impact Statement. Some of this has been prepared while sitting in my home listening to the sound of helicopters, low-flying jets and the firing of howitzers. I have been unable to extend my nighttime fishing because of the phosphorous flares, courtesy of the National Guard.

Crawford County is really blessed. It has an abundance of natural beauty, water and forests. The thing that the Environmental Impact Statement does not address is what the shooting, the bombing does to your ability to make this a fine place to live. The questions to be answered are, how much more construction of homes and businesses would be located in Crawford County if the owners were not subjected to regular helicopter overflights, howitzer concussions and the polluting of the land and water by these activities. How many more visitors would come to Crawford County to enjoy

Hartwick Pines, the AuSable, the Manistee, or just another quiet walk in the woods? How many additional business owners would establish their business in Crawford County if it was not that they move to the north? How much money would these additional people spend, and how many more jobs would they create?

That Environmental Impact Statement says that a guy coming up here for the weekend spends $20. That includes the gas coming and going. I spent $20, and I haven't even gotten to the cabin yet, and it was all in two stops in town. I could also tell you that anyone who's been here once to visit me, when I ask them to come again, they ask, "What's the situation going to be about the shooting and the overflights?" They simply don't want to be here if that's going on.

Sunday while conversing with a friend, there was a period of about 15 minutes where we had to simply quit talking because of the overflights and jets. I don't know why. I don't know why they're there. I do know that that Environmental Impact Statement says they expect the ability to line up and use the jets on that range. What does the Guard propose to do about this? They propose to

expand the construction in the winter. This, of course, means forcing the snowmobilers, cross-country skiers and other winter enthusiasts to go elsewhere if they want to enjoy the quiet forests and the rivers. And I can tell you that there are a lot of other places that are soliciting for them to come.

And I'll tell you something else, those of you who are in charge of preparing this. And the reason that goes on, it's your fault, because that Environmental Impact Statement says there are no local and there are no state regulations governing that kind of activity. You people, the township officials and as the Board of County Commissioners, have the authority to pass those kind of rules and regulations, and if they're not there, it's your fault.

And if you're proud of having a bombing range and the impact areas in your township and in your county, why don't you put them on the brochures that I read? I'll tell you this. I've read a lot of brochures from places all over the world, and I have had an opportunity to visit a lot of them, and I've never read one that says you've got the opportunity to listen to howitzers go off while

enjoy the fishing.

Dr. Cooper addressed the problem with the heavy metal, and I'll suggest one thing to you. On those heavy metals, he says they're there, and we know they're there. You cannot dump them in the Grayling dump. If you dump them anywhere, if you think you can, you just go out and ask that guy at the place, say, hey, I've got a pile of lead here I want to just throw in that dump, and he'll tell you you can't take it anywhere. It has to go in a specially licensed, federal landfill.

And the other thing is, is there are a lot of soil characteristics, and Dr. Cooper says they won't get in the groundwater. I'm a little skeptical, because I think they all tend to oxidize and do get in the groundwater sooner or later. And it's my opinion, based on what I know about engineering, that if they applied for a license to use this type of land for this area -- this type of activity today, it would not be granted, because the permeability of the sand and the ability of whatever happens to leach through the sand and grow very rapidly and go down into the groundwater. There are areas of the country where the leaching rate is about 1 inch per 100 years, and I think they found

that in the sand, it was -- I don't know. It's in there. It's a tenth of a centimeter per day or something, but it's awfully rapid.

MR. EBERSVILLER: Sir.

MR. VAN GUNTEN: Yes.

MR. EBERSVILLER: I have to remind you of the time limit.

MR. VAN GUNTEN: Okay. I'll wrap this up, and I'll tell you that the day the National Guard stops its shooting and the bombing in Crawford County, Crawford County will begin a new and enlarged economic life. And I urge you to do so. Thank you.

(Applause)

MR. EBERSVILLER: Thank you. Mr. Thomas Mastej. I understand that if you stay some distance away from the microphone, there won't be problems with it cutting out.

MR. MASTEJ: My name is Thomas Mastej, and I live in Grayling, Maple Forest. The gentleman that just left now come up with about the same thing I was going to say, outside of I already was on the horn at the base Mother's Day. I thought we were

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invaded by my place out by 612 and 93 with the jets. For an hour and a half, I thought they were going to bomb our house out, and this keeps going all the time. Now they've changed the area. Instead of going to Guthrie Lake, they're going to go south going toward North Down River Road if they build that modernized shooting gallery that they're planning on doing. And if they build that, I think I'm going to have to sell, if somebody wants to buy my house, because I don't think nobody would want it. That's all I have to say.

(Applause)

MR. EBERSVILLER: Thank you, sir. We appreciate your comments. Mr. -- or Dr. Robert Unsworth.

DR. UNSWORTH: I'm Bob Unsworth. I'm a taxpayer of the United States; a former naval officer. I've got a problem with what they're proposing here. I really support the military in this country, but I see Camp Grayling going from -- it's really general, but going from a place where they're supposed to train the National Guard, the Michigan National Guard, to, it looks like, a

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national or regular army fort. The environmental stuff, I don't, personally, I don't totally understand it. I don't see how it can wash. I just can't believe that with the ecology in this area, the waters, et cetera, that they can do what the military has to do. They have to do this. I just think they're picking the wrong place to do it, and the time has come -- sounds stupid, but I think they've got to go someplace else, or they've got to go back to what it was originally formed -- I mean developed for.

And you know, I'm really caught between it, because, you know, I saw the 60's and what the kids were doing, and it just ground the hell out of me. I was in the navy at the time, and now I find myself feeling like I'm on their side, because I see what's happening. We're not -- you know, the thing I read, the EIS I read, doesn't explain a damn thing to me. I've come to the conclusion that I can't understand what the hell I read. It doesn't answer anything. The environmental stuff just doesn't make any sense to me. I think to myself, is it me or the study? I think Dr. Cooper's right. I think we taxpayers -- again, my only claim to fame is, I guess, like most of you, I hope, are paying for

this. I mean we're going to pay for this. We paid for it through our taxes.

I've got to throw in one thing. I love the term "government money." The government hasn't got any money. The government confiscates our tax dollars, and they spend it.

(Applause)

DR. UNSWORTH: And the taxpayer today isn't getting his bang for his buck anymore. You know, we're the little guy. We pay the freight, and nobody listens to us. But I think the people in the state of Michigan, not just the people in the Grayling area, really need to make damn sure if this thing is going to fly, that it's stated in advance, because otherwise, I don't think it's going to happen. Thanks.

(Applause)

MR. EBERSVILLER: Thank you. Jacqueline Groff?

MS. GROFF: No.

MR. EBERSVILLER: Okay. Thank you,

Jacqueline. Don Welser, would you care to comment this evening? You can use the podium right in front of you too. That mike is live. It's fine.

MR. WELSER: I'm sorry?

MR. EBERSVILLER: You can use the microphone right in front of you there. That's fine.

MR. WELSER: I don't hear well, among other things. I'm like the previous gentleman. Nobody accused me of being too intelligent, but I've got a couple comments I'd like to make. The first one, I'd like to register my objection to this entire hearing held this evening. The Department of Military Affairs started this EIS in 1986, and they completed a draft two years and ten months later in April of '89, and now we have a hearing less than 30 days after they complete their study, and that's supposed to get our opinions, comments, et cetera, on the entire study. I'm not a very good reader, but I've wasted a lot of -- or spent a lot of time looking at this, and I don't believe that I'm capable of reading, comprehending, questioning and considering all the ramifications of this plan or these plans if they are implemented.

In my reading and paging through this

study, I've also found several errors of fact, and I -- even though I understand no one's ever perfect, when there's human error, I think the Hickok Associates were hired by the federal government, and are probably being paid big money to come up with the right answers, and if they have one wrong answer, how many more are there?

My name is Don Welser, and I own a little trailer park down the road across from the airport, less than 900 foot from where the helicopters train. And I've been there 25 years now, and they have in this book, they say that the Ingersoll Trailer Camp -- I don't know who Ingersoll is. I own the place. I built it. So that fact is wrong. They sent me the book, and on the back page, they have my name spelled wrong. That's just a little problem. But they also have down here that the new MATES building was built northwest of Grayling approximately two miles. If anybody knows the area, they know it's northeast of Grayling.

There's quite a few other proposals in here, or statements, that are in error. And one of the big proposals I'd like to find out about is they propose to build five, 100 person barracks and two, 200 person BOQ's on the airport. That's for a total

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of 900 aviation personnel at a cost of 4 1/2 million dollars. And they talk about the sewage on the main cantonment area, but they don't talk about any sewage out at the airport. Well, 900 people create quite a sewage problem, and the city of Grayling cannot handle 900 people on their sewage, and that's what they're on now. So I don't know what they plan to do with that. I don't think that problem has been answered.

I've got notes all through this book. There isn't enough hours in the day. They're limiting our time, and they want us to write, but the minute you write, then no one else can hear your complaints, and I don't think that's right. I don't see how -- I think every complaint from every person ought to be heard by anyone that's willing to listen to it, not put in writing to be thrown in the wastebasket or no one ever see it again or comment on. That's all I have to say.

(Applause)

MR. EBERSVILLER: Thank you, sir. Mr. Jack Layle, would you care to speak this evening?

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MR. LAYLE: I'm Jack Layle from Bay City, Michigan, and I'd like to express my concerns on the opposition of the expansion in its entirety. For the last several weeks, I've been taking a census in the tri-city area, and that's Bay City, Saginaw and Midland. The consensus of that is that the majority of the people that I've talked to are going to take their recreational activities to the other side of the state, providing this expansion does go through. Now I do believe tourism and recreation -- I've just heard the other night on the television set -- is the number two business in Michigan. I don't know what the people here are going to do that own the cottages. I see an awful lot of signs up for sale. The devastating effect that is going to have on the wildlife, the stream fishermen, and things in general, I think is beyond my comprehension. That's all I have to say. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, sir. Ms. Norma Wheeker, would you care to speak this evening?

MS. WHEEKER: No comment.

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MR. EBERSVILLER: No comment, ma'am. Thank you. Mary S. Hanika. Would you care to comment, please?

MS. HANIKA: My legal name is Mary S. Hanika, but everybody calls me Mary Joe. I happen to live at Higgins Lake on the southeast side. I have been civically active in this area for many, many years. My family has owned this land for 40 some years. My husband, or late husband, and I also bought 40 acres over in AuSable Township. Thank God I'm on the south branch before it even gets into Roscommon. At least I don't have some of your problems.

I'm very upset that Higgins Lake, which also comes into Crawford County -- the majority of which is in Roscommon County -- was not included -- the whole county was left out of your concerns. Your concern is Crawford, Kalkaska and Otsego Counties, and yet 27 years ago when I moved back to Michigan, one of your major runs for breaking the sound barrier was right over Higgins Lake, which shook my house like a Mack Truck ran into the corner of it. Last summer on August 6th at about 8:00 p.m., which was a lovely, quiet Sunday evening, my house shook four times. Now my house has been there

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many, many years. It is not one that was moved in in two sections and set on some poured concrete. I have -- I thought that something had really run in my house. This happened for four shots just like you'd fired a shotgun four times, and then it ceased immediately. I don't know whether some commanding officer found out that somebody was in the wrong place or firing the wrong size shells, but it disturbed me greatly that it happened, and many people in my area had the same problem that evening.

I agree with the gentleman earlier who talked about this becoming a national camp instead of a state camp. It also seems to me that it's becoming an international camp. I have seen many foreign soldiers up here. I spend much time in this community, although I do live south. Roscommon doesn't have much of a shopping area, as many of you know. But the international soldiers worry me. Yes, I know if our men have to go to war, that they will have to fight on foreign soil and in foreign conditions, and that some parts of our country don't have the winter conditions that we have, nor do they have the kind of terrain that would be needed. But I lived in Missouri for awhile, and you can't tell me that those guys that were shipped up the

Mississippi on barges, up through the Chicago River, across Lake Michigan and came by land from Ludington a couple of summers ago don't have any hills down in Arkansas? You'll never make me believe that. I'm originally from west Tennessee, and I'm a hillbilly at heart and run around barefooted most of the summer.

But this was started out to be a Michigan camp for the Michigan National Guard. Why do we have to have everybody from not just all over our country, but from all over the world coming here to disturb us who live here? I just sold a lovely home in Grosse Pointe and moved up here for retirement. I knew part of this was going on, but my house sure hadn't shook like it did last August.

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I am glad that you are looking into the noise control problem, because the noise, the repercussions from the noise is what disturbs all of our land, and when our land is disturbed, it disturbs all of these heavy metals that are in our land from the gun shells. It also disturbs all the water, because the water can drain differently once -- every time that land is shook. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, ma'am. Mr. Ronald Schwarz, would you care to comment this evening?

MR. SCHWARZ: Yes.

MR. EBERSVILLER: Thank you.

MR. SCHWARZ: My name is Ronald Schwarz. I live on the north end of the county on Section 1 Lake. I have reviewed the EIS statement. Fell asleep many times reading it, because it lacks the truths that keep me interested. Some of the truths that I'd like to bring up that aren't in here, a lot of times you'll come across a word in here that studies were conducted on computer-generated information. Well, I suggest that the people doing this study get up and away from their CRT's and get off the desk and get out in the field, and they'll find that there's a great many things that go on out there that cannot be computer generated.

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Range fires, I've been subjected to the last couple of weeks just about every day. There's no mention of the range fires in the EIS. I'd like to bring up an instance two weeks ago. When I came home from work, my area was enshrouded in wood smoke. I called Camp Grayling and asked them if they knew -- to ask them if they knew that there was

a fire going on in range 40. The phone rang 15 times. It finally was answered by a civilian security officer who answered it, "Camp Grayling MATES." And I said, "MATES? Did I dial the wrong number? I wanted the fire department." He said, "No, you got the right number, but there's nobody there now. They've all gone home for the day." I said, "Well, I'd like to report a fire on range 40." He goes, "Gee, I don't know what to tell you. Is it a big fire?" I said, "Well, I think the more appropriate question would be, is it going to be a big fire, and is it going to burn down my home?" He goes, "Yeah, you got a point there. Why don't I take your number, and I'll see if I can get ahold of somebody on my hand-held radio, because I'm locked in this building, and I can't leave."

So he took down my number. 15 minutes later, I received a call back asking me exactly where the fire was. I told them exactly where the fire was, and they said, "Oh, yeah. We fought that today, but it was time to go home. We figured we'd come back in the morning."

Well, this goes on all the time. It seems like if it's inside the fence, it doesn't matter. It doesn't matter how many animals it kills. It

doesn't matter how many bushes it burns up. It goes -- it's allowed to go on, because for one thing, you can't drive a fire truck through that fence without disturbing its integrity. So they fight it once in awhile with a Bambi bucket from a helicopter if, if it looks like it's going to spread over the fence and get into an area that it's going to go towards a civilian home, which is what happened yesterday. It was -- the wind changed. They shot some mini-guns and 275 rockets from helicopters, and they ricocheted and landed in an area west of the fence and in between Guthrie Lake. And they did call out two fire trucks and got in there and put it out before it could get to Guthrie Lake.

Trash --

MR. EBERSVILLER: Sir, I have to remind you of the time.

MR. SCHWARZ: Okay. I just want to bring up a real quick one on trash. Marlett Road is covered with trash. It's all got military insignias on it. It's all fallen off of mess trucks, and at least 500 vehicles, military vehicles, have driven past it not bothering to pick it up. I also observed a trash pile from a winter camp that was buried in the snow, but since the snow melted, it

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was quite conspicuous on top of the ground. And right in with all the Bacardi bottles and the beer bottles and the schnapps bottles, was a requisition from a sergeant to the camp supply for a shovel, the purpose of which to bury trash. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, sir. Mr. Henry Mason, would you care to comment this evening? Henry Mason?

MR. MASON: Right here.

MR. EBERSVILLER: Oh, pardon me.

MR. MASON: I'm Henry Mason. I live in Livingston Township, Otsego County, and I've lived there quite a long time. Been there 44 years, and we've heard the artillery and the bombs, the jets, helicopters. They get around our place too, and I'd like to encourage the Department of Military Affairs to continue using this area. If they've got to expand it, all right. If not, why then don't. But I get some sense of security out of knowing that we have some people in this state who are willing to take the time to train to use the weapons of war. Not that I'm anxious to have us involved in one

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And I guess I'm more concerned about this Impact Statement, because it -- I think it's a trap. If all the places in the United States feel that their own personal desires are more important than maintaining a good defense system and giving the people that are going to be in that defense system an opportunity to train, then we're in big trouble.

I was about 16 years old when the Bataan, Corregidor thing went off, and I remember at the time, our whole nation was mobilizing. And we paid a lot of attention to what was going on over there, because there was some very real fear that the Japanese were in a position to go on across the Pacific Ocean and invade this continent. Those people that were in Bataan, Corregidor stayed there as long as they could, and perhaps helped the rest of us get ready so that we could fight the war that we thought we had to fight. And I think it's a shame that we would deny these young people that are going to have to be in the military service in the future a place to train. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, sir.

Mr. Robert Franillin, would you care to comment this evening? Did I pronounce that correctly? Robert Franillin?

(No response)

MR. EBERSVILLER: Okay. I'll go on. Dr. Nat Rowe, would you care to comment?

DR. ROWE: Yes.

MR. EBERSVILLER: Thank you.

DR. ROWE: I'm Dr. Nat Rowe. I'm an owner of property down along the river on Shell Park Road. I came up yesterday to do a little fishing, and here I am spending this beautiful evening indoors here with you instead of out there by the river. But I think the topic is important, and I'm not going to debate whether an army is desirable or not. I'm a decorated civilian consultant with the Army, so it is desirable, but I'm also a pathologist. My job is to find out what causes cancer, and I'd like to ask one question and make one comment. The question is this: If it requires nitrogen in the compounds to explode shells, what happens to the nitrogen at the time of explosion and thereafter? Do you know that these things combine to make compounds called

nitrosamines, which cause cancer in incredibly tiny particles?

For example, the Environmental Protection Agency limits the amount of nitrosamines in baby bottle nipples to ten parts per billion. That's a tiny amount. Ten parts per billion. So I expect that this stuff is going to be on the ground when it's made, and you won't find it in your water. But after a period of time when you turn on the faucet and you think you're getting fresh, clean water, you're causing cancer in your gut and in your liver. And by the time that happens, it's too late to do anything about it, either for you or for your water supply.

So I think this Environmental Statement should be checked to make sure that the cancer-causing hydrocarbons and the cancer-causing nitrosamines are identified as to where they are, what happens to them, and what the probability is for their movement in your water supply.

And then I'd like to close with a comment, and the comment is this: That we've witnessed the dumping of oil outside of Alaska. They will probably crucify the captain of the vessel, but in truth, he's not the one responsible. The ones

responsible are the people that permitted that oil to be shipped out of Alaska Port of Valdez in the first place. Greed motivated their ignoring the possibility of tragedy.

I'm pleased to join the many here tonight to say, let's stop tragedy in Grayling.

(Applause)

MR. EBERSVILLER: Thank you, sir. R. W. Good, would you care to comment, please?

MR. GOOD: I'll relinquish my time to AMAC.

MR. EBERSVILLER: Mr. Good would relinquish his time. Is there somebody who would --

UNKNOWN MEMBER OF AUDIENCE: AMAC.

MR. EBERSVILLER: Pardon me?

UNKNOWN MEMBER OF AUDIENCE: He said to AMAC, he would relinquish his time.

MR. EBERSVILLER: Yes. Is there somebody from AMAC who is standing in for Dr. Good here?

ANOTHER UNKNOWN MEMBER OF AUDIENCE: Sir, unless our consultants, Dr. Goff, Talhelm or Cooper, have more to say, AMAC is finished for the evening. Thank you.

MR. EBERSVILLER: All right. The gentleman has reminded me that those who would relinquish to AMAC have completed their comments this evening. If you'd just remind me of that as we go through, that's fine. I have a card simply signed "Hicks." Is there a comment from this person tonight? When you're finished this evening, sir, would you complete the form for me?

MR. HICKS: Yes. Sorry. My name is Rick Hicks. My wife and I live on the south branch as long as we can get in the road in the wintertime. I'm here to do two things. One, to read a letter into the record from a neighbor of mine on the river and an attorney friend of mine, and his name will be up later, so I will utilize Mr. Gustafson's time. This letter is addressed to the Michigan Department of Military Affairs.

"Gentlemen, I have not yet had an opportunity to review in detail the Draft Camp Grayling Mission/Multiple Construction Environmental Impact Statement, but wish to comment generally on the document at this time. As stated in the purpose and needs section, current military plans require more realistic and varied training scenarios, and experience with new training tactics and modern

weaponry. The report also points out that Camp Grayling has been host to an increasing number and variety of military units in recent years. The key question is whether the expanded training facilities of Camp Grayling, particularly the multi-purpose range complex and the assault landing strip, are compatible with the environmental values of this unique area. I believe they are not.

Accordingly, I believe that the relocation options" -- which I don't believe, to ad-lib this letter a little bit, was discussed at any length in the EIS. "Accordingly, I believe that the relocation options for an outpost location should be selected for these facilities.

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It is unfortunate Camp Grayling sprang up along the banks of the AuSable River less than 75 years ago. For most of the time since then, the military training activity involving earlier generations of weapons and tour troops has less significantly affected the surrounding areas. This has changed dramatically in recent years, and it seems evident that the new facilities will further exacerbate conflicts with surrounding environmental uses and values.

If the National Guard were prepared to

comment in writing and in a legally enforceable manner that the MPRC would reduce noise and concussion to acceptable levels similar to what was experienced several years ago, this would be an important step. But it is disingenuous to attempt to justify the new facility by comparing anticipated noise levels to the intolerable sights and sounds of war that have permeated the area during this past several years. This is tantamount to saying that the Guard has despoiled the area since 1980, which justifies further damage and degradation, because the future will not be much different than the worst of the recent past.

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The AuSable River area simply is not an appropriate place for the MPRC and assault landing strip. Building these facilities will prolong and deepen the conflict between the military and the surrounding environment. The losers will be the citizens of Michigan and elsewhere who appreciate the AuSable and the unique natural values that have characterized this area from well before the establishment of Camp Grayling." Signed Peter L. Gustafson.

I'd like to read a letter or article -- excerpts of an article from the Arizona Daily Star,

January 1989. This article refers to Congress's closing of 86 small military facilities. It says, "As congress ponders a recommendation to close 86 smaller military facilities, the Army is preparing to buy 200,000 acres adjacent to its main training area to accommodate modern tanks, planes and electronic gear that need more and more room for large scale maneuvers. Army officials say they need $29 million to expand the National Training Center at Fort Erwin next to Death Valley in California. Congress has not objected to the Army's plans to buy 200,000 acres adjacent to the existing 632,000 acre Fort Erwin. The expansion conforms with the commission's expression of acute concern about the requirements of the armed forces for adequate training areas."

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The article goes on to say, "The increasing sophistication and extended ranges of modern weapons continually increase the requirements for training areas. The 5 nautical miles required by World War II fighter aircraft for air maneuvers have grown to 40 miles today, and that range will extend to 100 miles as the services introduce the next generation of fighters over the next decade." I would say that the lady from Higgins Lake, that

probably your county will be included very soon. I wonder, in light of this, if an alternate site for the MPRC and the assault landing strip is not a very worthy consideration.

(Applause)

MR. HICKS: I think this article says clearly that Camp Grayling is too small to meet the requirements that a modern facility demands. So now we have a question before us. How much growth is really planned? In its EIS, the Guard says none, but General Templeton, the National Guard Commander, has said that this expansion will make availabile this base for regular Army troop training. Now there's a dichotomy there, ladies and gentlemen, that needs to be answered.

I want to say that I support AMAC's position on the mitigation and permit process. I think that was very well stated. I would like to also say that the next time I get in trouble in Lansing with a little wetlands spot about the size of that screen that's contiguous to a wetland, I want these people to file my EIS, because I have a little one that I've been struggling with for two

years.

MR. EBERSVILLER: Sir, I need to remind you of the time limit.

MR. HICKS: Thank you. It worked out just right. I'm through.

(Applause)

MR. EBERSVILLER: William Meagher? W. G. Meagher?

MR. MEAGHER: I'll pass for now.

MR. EBERSVILLER: Okay. Thank you. Mr. Ed Kamm, would you care to comment this evening?

MR. KAMM: Yes, I would.

MR. EBERSVILLER: Thank you.

MR. KAMM: My name is Ed Kamm. I have property on the Manistee River about eight-tenths of a mile south on Down River Road near the bridge, Manistee bridge. My primary concern -- my primary concern is the impact on my own individual property. Now the Manistee where I am, we hear shells shot, we see helicopters flying over, and we see military vehicles going in and out and around the area on M 72. The problem is that on a beautiful day like today, my buddy and I were sitting out there,

sitting around thinking about coming to this meeting tonight. A beautiful day. The most beautiful birds I have seen this spring, or any other time. It just so happened there was a lull in all the training, for some reason, in our area. I enjoyed the beauty and the tranquility, which I'm sure a lot of you people are denied, because you're maybe closer to some of the ranges.

But I feel wholeheartedly that anything that could be started to hold down the growth of Camp Grayling -- I think Camp Grayling is a worthwhile cause. It's a need, but I think it should be maintained by its 1978 level of activity. Beyond that, I think it's just outgrowing the -- our own personal desires in this community. Thank you very much.

(Applause)

MR. EBERSVILLER: Thank you, sir. R. D. Hasson, I believe?

MR. HASSON: Close enough.

MR. EBERSVILLER: Thank you. Maybe you could correct me on this.

MR. HASSON: Hasson.

MR. EBERSVILLER: Hasson. Thank you.

MR. HASSON: My name is Dwight Hasson, and I'm President of the AuSable River Property Owners Association. I've been instructed by our board of directors to inform this group this evening that we are in support of AMAC's primary concern, I guess, to limit any expansion of the military. We do, of course, agree with many other things. Mr. Hicks, just prior, and Mr. Gustafson's letter pretty well states our stand, and we'd just like to go on record as saying that. Thank you.

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MR. EBERSVILLER: Thank you.

(Applause)

MR. EBERSVILLER: Ms. June Shafer, would you care to comment?

MS. SHAFER: Yes.

MR. EBERSVILLER: Thank you.

MS. SHAFER: My name is June Shafer. My husband and I have some property on the north branch of the AuSable River, and we've enjoyed it for 26 years. I would like to state that as a reasonably intelligent adult of a nonmilitary mind, I simply cannot believe that this proposed military base

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be built without great damage to the environment, the tranquility of the residents and damage to the tourist business of this area, despite the Environmental Impact Statement. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, ma'am. I believe it's Bob Andrus?

MR. ANDRUS: I'd like to relinquish my time to Tom Baird.

MR. EBERSVILLER: Okay. Thank you. I believe we have a card here for Mr. Baird. Maybe he'd like to speak at this time.

MR. BAIRD: My name is Tom Baird. I'm an attorney. My office is in Ingham County, Michigan. I'm here representing Trout Unlimited. We've had a very brief opportunity to review the DEIS. Our review is ongoing, and we will submit written comments later. However, we find it thin in all respects except inches. The fault started with the scoping document, several issues identified in there, including groundwater contamination from explosive residues were just not contained in the DEIS. The DEIS contains several general problems.

Some of them have been mentioned.

First, it is based on comparisons to already unacceptable conditions. Second, it often ignores the operational aspects of the proposed modifications. Third, it fails to reveal anything regarding the timing of construction or any plans for further development. It is not sufficient to say that further growth is not anticipated at this time. If there is any possibility of future growth, it must be anticipated at this time, and consideration of that growth cannot be put off until later. Fourth, it ignores the fact that the camp is supposed to be utilized for multiple uses, not only military uses.

And fifth, it is based on the erroneous assumption that the DMA owns the land and the camp. It fails completely to recognize that most of this land is leased land, and the lease dated in 1978 provides that the land may only be used in the same manner and to the same extent as it was being used at that point in time. I think, therefore, the DEIS fails to recognize an important economic fact. First, the DMA is in violation of that lease now, and therefore, second, it is subject to termination at any time. There is no such thing as a lease in

perpetuity to the extent that it cannot be terminated for substantial violations. If I were advising a client, I would not tell them to build major projects on land that they do not control.

Many adverse environmental impacts associated with the plan have been ignored or just glossed over. The social consequences, including crime and trespassers, simply ignored. The economic consequences of the plan have been discussed quite a bit. Essentially, only the Grayling area is discussed. There's three-county economic impact area here. Further, there are absolutely no discussions of the adverse economic impacts of this camp, either now or as proposed. It's a glaring omission. Human health hazards have been discussed. They've been ignored.

The effects of a possible continued buildup beyond present levels are ignored, notwithstanding that if this camp is built as proposed, it will attract units from throughout the country. You just can't deny that fact. It's being overbuilt for the current level of use. It's going to be state of the art, and this camp advertises itself trying to get other units to come here. This will simply make it more attractive for those other

units.

Water quality is discussed. It's pitiful. There is no discussion of the Barnes Lake Study, I don't think. I wasn't able to find it -- which was just undertaken by the Army Hygiene Agency regarding the effect of residues. The adverse effect of stream crossings is nowhere discussed, except to say that good practices will be used. Those of you that are familiar with the Portage Creek debacle know how good those practices are.

Finally, the cost of cleanup, I think was also mentioned. There's no indication of any of the economic resources that we will be needing to clean this place up. These leases will be terminated sometime in the future. This land will need to be cleaned up. There are irreversible commitments of resources in terms of cleanup costs, destruction of land and destruction of habitat, including Kirtland Warbler habitat. As I understand it, the Kirtland's ecology is that it flies back and forth between various developing stages of the pines. If every time you undevelop an area forever, it's going to be lost to us sooner or later, those little birdies somebody mentioned aren't going to have a place to go anymore. Monitoring mitigation is, again, not

well spoken to at all.

For example, on construction, there's a huge, huge appendix. All it is, is copies out of manuals. There is no cite of specific information at all. You know, reference to good practices is not enough. Frankly, they can't even get the slide projector and the microphones to work right. These are major projects, and we expect more than some copies out of Department of Transportation documents.

(Applause)

MR. BAIRD: I think very important is the ignoring to an ultimate extent -- there's no mention of the possibility of accidents. In the trade, these are known as worst-case scenarios. Let me give you a couple.

A C-130 crashes into the Manistee River. A tank crashes through one of these fine tank crossings and spills all its fuel into Portage Creek. Troop violations are well-known. We've heard about fires. Firing artilleries into Barnes Lake itself. None of this is discussed. None of these worst-case scenarios are discussed. Running a

military base is an ultrahazardous activity -- technically an ultrahazardous activity. These possible accidents need to be identified, discussed, and plans for abatement discussed also.

A lot of the available information hasn't been studied, including one study on the effect of residues that was done to consider the environmental effect of our activities in Vietnam. I did not find reference to it in the document. Most importantly, the alternatives have not been thought out at all. Most particularly, the other location alternative. How did they get away with that? They did it through the definitions. Lawyers do this all the time. How did they define other site and relocation? The only possibilities are on the camp or in the Grayling areas. There's no consideration of other areas of the state or the nation, or other countries throughout the world. By defining them out, then they don't have to consider them anymore.

These alternatives absolutely need to be considered. It's not enough to say that it's too expensive to send our troops somewhere else. Other states and countries have been sending their troops to Camp Grayling for years, and I think it's about time they might return the favor. At least we must

consider the environmental impact of those alternatives. NEPA and the CEQ regulations require that.

MR. EBERSVILLER: Sir, I have to remind you of the time limit.

MR. BAIRD: Well, then, I'll conclude.

MR. EBERSVILLER: Thank you.

MR. BAIRD: I think the worst case that I saw was the discussion of air quality, making reference to a formaldehyde plant and a gas sweetening plant. In essence, the approach taken was, well, it's already pretty bad. What's the matter -- what's wrong with trashing it a little bit more?

I have a shack up here myself. It's no beautiful cabin. I pay taxes up here, and those that I represent spend more than $50 a weekend, I'll guarantee you that. We oppose this project, and we also believe that the DEIS is so inadequate, as to preclude meaningful analysis. We believe a supplemental DEIS should be promulgated. Thank you.

(Applause)

MR. EBERSVILLER: Thank you.

Mr. Bill Huhtala?

MR. HUHTALA: Yes.

MR. EBERSVILLER: Thank you.

MR. HUHTALA: My name is Bill Huhtala, and originally I'm from down in the lower state. And I have to refer to the gentleman that was up talking about the need of the National Guard. We definitely need the National Guard, and I agree with that much. But the National Guard was operating when I purchased my property in 1972, and in '72, when I purchased it, there was an article in the paperwork that said, "From time to time, you will hear sounds like distant thunder." Well, that's all that I thought I was buying, but it's turned out to be a nightmare, really.

It's -- my property was shaken up. I turned in a claim to the government. They paid it. I had to go out and get quotations for the repair. They paid for it to the amount of that quotation. By the time I got my money, the contractor that had priced it could no longer do it for that price. So last summer I did take and rebuild my deck. I rebuilt my chimney. I had a man in to take and repair all the plaster cracks in my place, and all of those cracks are opened back up again, and my chimney is beginning to show signs of cracking.

Last fall I got an additional crack in my basement, and I called Major Foehl three different times, and I never did reach him, till finally he called me back. And I stated at that time that I had an additional crack in my basement and I would like another form to claim for repairing the basement wall. He said he would send me out a form. I've never seen it.

Now also, since that time, I had an additional crack that runs just opposite to the one in the front of my house, and this is a load-bearing structure for the center of the house. I don't know how much longer it's going to stand up. The house is built on a sand foundation, which is basically the best type of a foundation you can build on, but it's moving because of the heavy 500-pound bombs and the heavy artillery. This is continuing, and according to this paperwork I see, it will continue until 1992, that that's still going to be. Now as far as I'm concerned -- I'm speaking for myself, but I'm also speaking for all the people of Guthrie Lake. We all up there planned our retirement for this area way back when things were at a level that was no problem. But now that this has all come, we're all in a quandary.

They're tearing up our roads out there at Marlett Road. Last week ago Saturday, they came through with a big convoy of heavy equipment. They run off on the shoulder and tore up the shoulders. And then to top it all off, yesterday at 5:15, I hear a helicopter coming, so I stepped out on my deck and I look up, and he couldn't have been over 600 feet over my house, and he was carrying one of those orange buckets, and he was coming from the direction of I-75. Well, I called Major Foehl's office, but he wasn't there again. But then they referred me to the Aircraft Control, and in talking with them, they said, "Oh, we have a fire over there on range 40, just west of the tower, and we're working on that. And since this is an emergency, we're allowed to fly at that height over your property, over Guthrie Lake." So I don't know. And then I said, "Well, shouldn't there be some concern that we should get out of here, or, you know, is the fire that bad?" And that's only like a mile and a half from my house, if it's that far.

So they have to -- if they could roll -- the other gentleman said -- roll it back to 1978, I'd like it rolled back to 1972. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, sir. Walter Freyburger?

MR. FREYBURGER: I've not prepared any document for tonight, and maybe it'd be better off if I didn't say anything, because I'm somewhat repeating what people said before. But I am the immediate past president of the AuSable North Branch Area Association, and I'm speaking tonight as a person. We have not discussed this at the Area -- at the Association meeting.

First of all, I just don't understand the mentality of those who claim to protect this country by destroying a part of it, and that is what we're doing. The main thing, though, I'm concerned with, is this environmental consideration, environmental impact considerations. Where is the data? This has been brought up again and again tonight. How can anyone analyze the data as an Environmental Impact Statement if it isn't presented? For example, like was mentioned earlier, why do the chemical analyses of the impact area at the source of the east branch of Barnes Lake and so forth? What, for instance, is the evidence that the fish in the east branch, the

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60 trout in the east branch are safe to eat? Has anybody ever analyzed any of that? If they have, where is the data?

61 You're planning a new series of impact areas. Is it not cogent to know from experience of the present impact area what pollution has taken place in the past before generating a new toxic waste dump? When are you going to provide the data on the existing pollution at Lake Margrethe? It's been talked about tonight, but it has never been made generally public. It's a mess, and it needs to be cleaned up.

What is the philosophy that says we're going to save the 400 remaining Kirtland Warblers by just driving them out? Now admittedly, there are not 400 Kirtland Warblers nesting in -- on the grounds of the National Guard. There are only 400 in the country, and they're all in Michigan. And they're going to allow the trees to grow up and not replenish the area for the few birds that are nesting in that area, but there are darn few available anywhere.

62 Every time a shell explodes or a bomb, chemicals do not disappear. This has been mentioned earlier. But again, I reiterate, we need that data.

Their chemical natures change. The possibility of nitrosamines was brought up. There are many other nitrogen-containing compounds that could be generated on this, and certainly something is known about whether it's good, bad or indifferent, but there is no data in this document.

63 And what is the situation downwind from the area of impact? What sorts of materials are being drifted down on the people who live downwind from the impact area? No data, and I don't think there was any plans to release any.

I did have some other things to say. I'll leave one message which some may consider a non sequitur, but I do not. The National Guard in Michigan has been supported very largely by the two senators from the state. It is interesting that these two senators vote consistently to decrease the defense budget, but vote to maintain an increase in the budget for the Guard in Michigan. To me, that can spell only one thing: boondoggle. Thank you.

(Applause)

MR. EBERSVILLER: Thank you. Mr. Carl Lord, would you care to comment, please?

MR. LORD: No. I yield to AMAC.

MR. EBERSVILLER: Okay. Thank you, Mr. Lord. Mr. Richard Retenburgh?

MR. RETENBURGH: No.

MR. EBERSVILLER: Okay. Thank you, sir. Mr. John Campau?

LTC. WILKINS: Campau.

MR. EBERSVILLER: P-A-U. Forgive me.

MR. CAMPAU: I don't have no prepared speech, but I'm going to give you a few pointers what I know about. I hope you can all hear me. My name is John Campau. My folks have been in this country for a long, long time, and my forefathers. But the most important thing you want to realize, we heard about what the National Guard does to us as a whole. Well, the National Guard is headed for a lot of trouble. I'll tell you why. They're spending too much money, the taxpayers' money. We ain't got that kind of money to spend. They're throwing stuff in the dump that should be used up. They're bombing them big bombs over there that's obsolete. All that stuff they're using today is obsolete. The stuff you need today is stuff that they'll never get to use it unless we start saving some money.

The money lenders of Europe have taken

over this country. Because we're in debt so far, the compound interest is eating us up. And if we don't wake up pretty soon and start getting some people into office that'll save us some money, us taxpayers will not have a home to live in.

Not only that, I was telling a friend of mine about it, and he says, "I bought a home, $30,000 home after the war." He says, "My monthly payments was $100 a month on the mortgage." And another one of the friends there, he says, "That's nothing." He says, "I'm paying $200 a month taxes on my property that I bought for $30,000 after the war." Now where is that tax money going? You see it in the paper. You see it on television. The bombs, the tanks, the battleships, blowing them up and costing the taxpayers a lot of money. We're going to be broke so bad, that they'll come in and take your property and the National Guard will work for them. They'll turn the guns on you, the taxpayers.

(Applause)

MR. EBERSVILLER: Thank you. Ms. Jan Reynolds, would you care to comment this evening?

MS. REYNOLDS: No comment.

MR. EBERSVILLER: No comment. Thank you. Ms. Vickie Kimbrell?

MS. KIMBRELL: I would like to give my time to AMAC or the attorney for Trout Unlimited.

MR. EBERSVILLER: Okay. Let me put this aside and return to it as we complete the people who haven't spoken yet. Rusty Gates?

MR. GATES: Yes.

MR. EBERSVILLER: Thank you.

MR. GATES: Good evening. My name is Rusty Gates. I am President of the Anglers of the AuSable. We are a 700-member organization devoted to the protection of the AuSable-Manistee watersheds. We are affiliated with the Federation of Fly Fishermen, a nationwide community of over 25,000 anglers. Tonight I represent the Anglers. We also support AMAC, and have a very special relationship with Trout Unlimited with regard to this EIS. In the limited time available, I will confine my remarks to but one issue. This issue is the pollution of firing ranges from unexploded -- and I emphasize -- the residue from exploded ordnance.

In his testimony to the Camp Grayling

Management Advisory Committee, Major General Vernon Andrews admitted, and I quote, "If we were to establish a new military artillery range, we would be polluting another very large section of earth." He then added, "We have been firing artillery shells, mortar shells, et cetera into the range 40 complex area for many, many years. It is only fair and honest to say that this ground is contaminated," end of quote. We believe that General Andrews should include the range 30 complex and the air bombing range in the areas that he says are contaminated. In the special alert which we distributed to our members in December of 1987, we stated, "The AuSable watershed virtually surrounds the proposed site of the MPRC, and would continue to receive, as it does today, from the present ranges, an untold and possibly unknown amount of what are believed to be highly toxic residues of exploded ordnance."

The DMA promptly responded to our alert with an extensive review in which they stated, and I quote, "Exploded ordnance leaves no residue, since it is destroyed in the detonation." They then assured us that there is also no cause for concern, since test wells located in the range area show no

signs of contamination of any kind. In our reply to this review, we reminded the DMA that their thermodynamic conversions are never 100 percent efficient, and that considerable accumulation of what are believed to be toxic and potentially hazardous materials can take the place.

We added that we, and our client, the AuSable River, whose life we hope will extend far beyond ours and the Guards', take no comfort in the assurance from the DMA that the test wells presently show no contamination. We then asked for copies of these tests, and also a map showing the location of the wells. The Guard has yet to provide any test results or maps or anything related to this potentially serious issue that threatens the groundwater of the north camp area, which is the heart of three branches of the AuSable River system.

In the preliminary scoping document for the EIS, there was no mention of this pollution concern resulting from accumulated residue of exploded ordnance. In the final scoping document distributed in the fall of 1986, the following statement was inserted, and I quote: "Concerns expressed over water pollution from explosives residue and the ammunition dumped in waters within

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the camp will be investigated." In the Draft EIS, there is no mention of these concerns.

In a recent letter to the Anglers, General Andrews states, and I quote, "I believe we will have the test results back on the Barnes Lake Study of environmental effects of the impact areas early this summer." While General Andrews keeps giving us assurances that this issue will soon be addressed, we remain skeptical, to say the least, and question why it was omitted in the EIS. We now believe that the exploded shell or bomb is less than 80 percent efficient, and possibly as low as 50 to 60 percent. We also include propellant charge explosion as an area of serious concern.

This latter area was the subject of a study at the Illinois Institute of Technology with results reported in 1985. The subject of this study was the possibility that combustion of such a large amount of ammunition in the Vietnam War could lead to the production of significant amounts of toxic substance. In this study of both the M-16 and the 105 millimeter howitzer, they found a large number of trace gas species, inhalable heavy metals and a significant number of chemical species.

MR. EBERSVILLER: Sir, I need to remind

you of the time.

MR. GATES: I'm getting there in a minute.

MR. BROSKY: Excuse me. My card's going to be the one you're coming to, and I intend to give my time to Rusty.

MR. EBERSVILLER: Could you give me your name, please?

MR. BROSKY: John Brosky. So we can just expedite that.

MR. EBERSVILLER: Thank you, John. I'll give you (Mr. Gates) another three minutes.

MR. GATES: Thank you. They concluded that large amounts of potentially harmful materials were dispersed in the Vietnam War. Remember, they studied only the M-16 and the 105 howitzer, and confined their study to propellant charge. If they studied the exploded shell or bomb or rocket or grenade, et cetera, we believe that they would find similar products in a greater amount.

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There was a lot of ordnance expended in the Vietnam War; sometimes concentrated, sometimes dispersed over an extended period of slightly more than a decade. At Camp Grayling, there has been a lot of ordnance expended over a period of more than seven decades concentrated in a very small area.

the United States Government was concerned enough about how badly we polluted Vietnam from exploded ordnance, it seems reasonable to us that the Department of the Army, the National Guard and the DNR should also be concerned about the pollution resulting from exploded ordnance in firing ranges at Camp Grayling.

We have many questions about this serious environmental issue: Who initially expressed these concerns so forcefully that they were inserted in the final scoping document? Why has the Guard ignored our request for copies of the test and a map showing well locations after they said that the test wells showed no signs? Why has it taken almost three years to proceed from the original concerns to the recent statement of Andrews where he says results will be available this summer. Who is responsible for these test wells and their location for the analysis of the results? Why isn't the DNR involved in this analysis? Why apparently is the effort confined to the Barnes Lake area, ignoring the impact areas of the other ranges? And finally, why were these concerns, and presumably the almost completed Barnes Lake Study, ignored in the EIS? This was just one of our concerns. In our written

response, we will detail many others.

In the final analysis, this issue may not be most important; however, it illustrates a basic flaw that runs through the entire Draft EIS. It also demonstrates the irresponsible attitude of the DNR in the environmental issues at hand and the past relationship of the DNR to the military. The DNR should be the environmental custodian of our land, yet in this issue and others, has not lived up to its mandate.

Mike Lindel, an eminent Michigan poet, a teacher and an AuSable angler, has written, "Whatever they name the Guard and vote for their destruction, remember that they turn the ground to powder. Remember that what the Guard does, it does to the earth." We would add that whatever the Guard does to the earth, also is done to the water, and what is done to the water affects the AuSable and the Manistee Rivers.

(Applause)

MR. EBERSVILLER: Thank you. Phyllis Higman, would you care to speak this evening?

MS. HIGMAN: No comment at this time.

MR. EBERSVILLER: No comment. Thank you. Mr. Tom Mudd, would you care to comment?

MR. MUDD: I thank you all for the opportunity to speak. I was introduced to the AuSable River of the north branch when I was just a budding teenager and this old man took me out to the river and taught me how to fish, and that was in maybe the early 1950's. And since then, I've fallen in love with this area. And I vowed one day when I ever made the money, that I would buy a little cabin and come up here so I could be closer to a sport that I dearly love. So I own a very humble, rickety cabin in the woods, a mile into the woods near Lovells -- about three miles southeast of Lovells.

I come from a military family. I was in the Air Force. My father was a flight surgeon. My brother Richard was a fighter pilot in the Korean War, and my brother Joe was a helicopter pilot in Vietnam, so far be it for me to speak out against the Guard. I grew up in a military base at Duncan Field in Texas.

I realize, I think, what the Guard is trying to do. Our Guard has a great deal of pride. It has a tradition to follow. I think that it's true, from what I've read, that the Guard has a lot

to be proud of in the performance of its troops. Some Guard units have scored better on some of their tactical operations than regular Army units. Some of these Guardsmen were trained here. And for that, I can be proud, because I'm a Michigander.

But I wonder, has anybody considered whether or not this expansion is really necessary and realistic considering recent shifts in the geopolitical makeup of this planet? The riots in China. Their call for democratization. Riots in Soviet Georgia. Glasnost. Perestroika. The winding down of the war in Afghanistan. The end of the conflict mostly in Angola. And today in the paper, Gorbachev saying, "No more weapons for the Nicaraguans." I think the winds of change might well be coming on after this horrible age that we have lived in in this century. Has that been considered?

We have a 3-percent reduction in the amount of money that America has donated to NATO. There has been a call for a reassessment of our role in NATO, and what will happen when regular Army units relocate to this country? Will this change the role of the National Guard? Possibly.

Have we also considered the fact that if

indeed the cold war has ended, will it be necessary or will it be desirable or will it be acceptable that Americans -- as one gentleman said over here, are we going to support advanced Star Wars weaponry? Are we going to support -- which we have turned down really. I think the Star Wars has not, at least been funded as much as it wished it had. Are we going to support the kind of advanced technological warfare that is proposed here at Camp Grayling?

So I just have that one question. Has this been considered? Are we looking at what's going on in the world before we go on to make a base that reflects what the world used to be like? Thank you very much.

(Applause)

MR. EBERSVILLER: Thank you. Ms. Sally Alstott, would you care to comment this evening?

MS. ALSTOTT: Not at this time.

MR. EBERSVILLER: Marian Gregory, would you care to comment?

MS. GREGORY: Not at this time.

MR. EBERSVILLER: I believe I mentioned Vickie Kimbrell earlier. We have two people who

wish to relinquish their time to AMAC. If they have any more comments at this time, I'd be willing to open the floor. Otherwise, it's an opportunity for a break and for people to sign up who would like to speak again, or for people who haven't spoken to sign up to also speak.

(No response)

MR. EBERSVILLER: At this time, I'd like to take a ten-minute break for people to sign up if they'd like to speak again. We'll reconvene at 9:30.

(Break taken from 9:20 P.M. to 9:30 P.M.)

MR. EBERSVILLER: Ladies and gentlemen, we have at least one more person who would like to speak tonight. Is there anybody else who has completed a card who would like to speak again this evening who -- I've got three cards here. Okay. Why don't I go through these, and then I'll give another opportunity in case somebody has a card completed and they just haven't got that to me. Ms. Mary Coy, if you'd like to comment this evening,

I have an indication that you'd like to. Mary Coy?

MS. COY: When I first came tonight, I had no intention of making any comments, but the more I listened, the more I decided I was going to. I'm not representing any of the groups. I live in Maple Forest Township, and I would like to address the gentleman that said none of the townships nor counties have done anything. Our township found out accidentally that the military was trying to get more land in our township, and we are the smallest one in the area. We had a petition. My husband, at that time, was Maple Forest Supervisor, and at that time, he was also a full-time National Guard, as well as part time, so I had not got a lot of enmity with him, but I do have, because I think they are taking over too much.

We had many of our people sign the petitions. We took it down to the meeting with the DNR. They refused to even look at it. We called three township meetings, and had the former Camp Commander come out so the people could address him with the problems that was going on at that time. Actually, he did not have very many answers for us. Therefore, we had more meetings.

We asked our people in our township to

send letters to our senators, our governor, and anyone that we -- plus the military, and this is one of the things I think that helped, besides AMAC, to have the government -- the governor form this committee to hear the complaints of this county.

Also, we keep being told that the military are the only ones apparently who are putting a lot of money into this community. That is not so. What about the people that live up here? They put a great deal of it. We do have a very large tourist trade, so I don't believe that all of our money is coming from the military. I am not antimilitary in the least.

When we come up here, we knew they were here when we built our home, but not to the amount they have escalated at this time. We can sit and watch the flares go off. We can listen to the bombing. We live about five miles from range 40. We listen to this every day and every night. We have helicopters going over our house continuously. Up until two years ago, I had never heard a complaint, but when they had to raise to go above treetop level, then I think it was time to complain.

We were told by General Andrews they would have identifying numbers under the aircraft. They

did not. Last year I called, and they had to check down with Lansing, and said they would call me back. They have been very courteous about calling back, but I was told this was a gentleman's agreement, so they did not have to honor it. The other states that come in here, I think really it is time we have taken a stand. Not to get rid of them. Not even to not allow some of the others to come in here, but definitely I think we ought to be more aware of the damage they are doing to our area.

And I have a small business in town. I do get military trade, but I get an awful lot of tourist trade and local trade, and a lot of people that come up here are getting very concerned because they do come up here. It's a beautiful area. We have a beautiful state park, and they are getting an awful lot of the impact from this. And I do think that it's time that they thought about the people, not just the Kirtland Warbler, and not just the AuSable River, but what about the people that live here and pay taxes as well?

That's all I have to say at this point, other than one thing they do have in here about the fuel dispensing facility. And I'm concerned particularly with the alternative site, which would

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be a half mile northwest of the ammunition supply point adjacent to the south access road. What happens if anything ever goes in that ammunition supply? What about all that fuel stored there? It may be something to think about. Thank you.

(Applause)

MR. EBERSVILLER: Thank you, ma'am. Mr. Richard Mercier?

MR. MERCIER: George and Donna McMahon and my wife Sandra and I have a home that we built here, and it's been a home I think of as more than just a shack. To replace it for the appraisal that we had in excess of $113,000 -- the government or the state came in approximately a year ago, two years ago November and said they wanted to buy our place, and the appraiser was coming out. The only word I got was the appraiser called me. We have property on Jones -- off Jones Lake Road, and the front road that we come in off of is Kyle Lake Road, and we are on section 13 in the platt book, T 27, NR 3 W. And there was nine parcels of land there, and all but two have been purchased by the government or by the state. And they have come in and offered us a

rather ridiculous price in saying that it was a fair market value.

We went to the expense -- after him saying that we would not find anything at a greater value -- we went to the cost of $800 and had an appraiser come in and prove them wrong, and that told us at the end they would be good neighbors.

For this Environmental Impact, looking at it, our property is in the tank range management area. The new platted area on this particular map here, that's figure 2 of the tank range map that they show. We are concerned now, and we've come to the point, we've had it. We want out. We built. We've not complained. I'm a very patient man. In fact, I've been waiting here very long tonight. I still have 200 miles to drive and have to catch a plane in the morning at 6:00. So what I am saying to the comments of this, is the noise. It has increased. It has driven us out. We built very fine homes up there. We appreciate the area. I've been coming here since I've been 16 years old. My plans were to move here. My plans have changed. My wife no longer cares to come. My family no longer cares to come.

There is some comments in regards to this

particular report here that on 4-326, the reference is three private land sections that are within one mile of the new tank firing box, I believe is the way it's commented. And we're within that one mile, I understand. The noise has increased tremendously. Just as recently as today, looking down the road, there has been a tank coming within 100 yards of our property, just toward the area right straight out from out on the road. Tore the road up. Went back out on the tank trail. We're very close to the tank trail. He came up the trail, and ran down the trail and came back, and then ran into the woods. This we -- I can't say that I had seen it, but I can see the evidence. At least I can't say that I seen the tank, but I seen the evidence of the tank and the destruction it made just going through there. It's not my property, but I butt right up to it.

They bought all but these two pieces, and my approach is, I'm planning on, if we ever do sell it -- I can't sell it. We tried to sell it. Put it up for sale. We've had an ongoing problem with people coming up there saying -- on the property, saying, "Well, this has been sold to the state. It's no longer your property." And I say, "Mister, I haven't sold it to the state. You are infringing

on me. You're trespassing. Please leave." That part was just a mistake by his knowledge of thinking that all the property was purchased there.

So my comment here is the range safety fan impact area, with the type of night shooting is going on, the noise has increased. I've lived with it, but I've given up on it. I would like to move. I'd like to tell Colonel Becker, who come in and did it in his diplomatic way that we could not sell to anybody but him at the price that they said, I plan on writing Carl Levin and Blanchard and giving my remarks to this.

But noise is a problem. I'm not going to just give my land away, but I'm certainly going to make a deal and move. I've had it, along with my brother-in-law and my sister that is up there with us, and we feel that the increased harassment, in a sense -- we have Jones Lake Road that was to be paved, the last section last year. We lost it because the military was buying the land, and they said it'd be fruitless to go ahead and pave that section of land to be paid for. We were into the last year. We got back $16, is what we got back for our assessment. They would upgrade and keep the road up. They upgrade, but it's to the point where

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we feel that the increased noise with the range safety fan that we are now within -- they claim the 120 DP peak for the noise back when they tested it, that has increased. There's no doubt about it. The parcel that is noted is also on the 4-326 page on that statement that we got here.

Here again, we just feel that it has gotten increasingly bad. We feel that this is the time to say something. We've been patient. We're patient. Now we want to move. I've invested a lot of money, and we feel that the taxes that we've paid over the years -- we paid them. We have not been delinquent at any point. We just want the service and what we feel is our fair share of the area. I built out there knowing that it was there, but the increased noise now is terrible. It's just to the point where it is just extremely noisy. The ongoing road problem that we're having now, tearing it up -- getting the county to come in there to even maintain it -- they've missed us four times on plowing this year stating that -- they said they had a new man, and he didn't know the difference. We couldn't come in on a weekend that we were here.

It's just that we feel that the harassment has gone too far. But we feel very definite about

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the noise approach of this new multipurpose range that is coming in, will definitely increase and deter us from enjoying what we feel we had a very nice place out there. If they want to buy, please, I'm willing to negotiate. Colonel Becker, call me. Thank you.

(Applause)

MR. EBERSVILLER: Thank you very much for coming this evening, sir. Ms. Linda Caswell, I have a note here that says you'd like to comment.

MS. CASWELL: I first of all feel duty-bound to address Richard personally. (Indicating Mr. Mercier) I am a resident of Crawford County, and my heart goes out to you. I'm really sorry about your anguish. I wish that there was some easy answer. I'm sure when you come up here, on top of everything else, it is very painful for you to look out into an audience that dwindles; it is very painful for you to try to deal with officials who don't really seem to honor their qualifications. I apologize for that as another citizen, Richard.

I really didn't intend on speaking,

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because I felt that there were many qualified ladies and gentlemen here tonight who would do a much better job than I. I also felt that, upon looking through the Environmental Impact Statement, I just simply was not qualified to give any real input as to what I could see as just an average person. But I have ears. I've listened tonight. What I've heard concerning the Environmental Impact Statement is that there is a question of feasibility; there is a question of credibility; there is a question of deception; and there is a question of discrepancy. And believe you/me, one way or another, we are going to get the military and the DNR to finally answer those questions. It has to be.

(Applause)

MS. CASWELL: There may be a small number of us here, but that doesn't mean that out there, there aren't large numbers. I live in this area. I know exactly why my neighbors aren't here tonight, and my friends, and I will answer that question, which I am sure that a lot of the individuals that have put a lot of input into the study want to know. Frustration. True, honest to goodness frustration

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breeds two things: apathy and contempt. That's what you're seeing here, is apathy and contempt. These people feel that they cannot be heard. Most of my friends and neighbors have lived in this area for years, years beyond what I have lived, and they just simply feel total frustration.

Well, I guess to address that, I can only address the frustration and apathy via the Environmental Impact Statement. And that probably is another frustration, because it didn't say much as far as an impact study was concerned, and a lot of -- those of us who tried to read it, again, had to address the fact that the military is putting one over on us. And when I say the military, I think Tom Mudd qualified it very well. Especially being an ex-military man, I think I can refer back to him. Plus, I have military in my family also. I think what he was trying to touch on very delicately is that there is an issue here as to why the National Guard is trying to maintain this area. In other words, why they are entrenching in this area. Let's remember that phrase, "entrenchment." They have dug the ditches. They believe they're going to stay. Why is that? Did the Environmental Assessment Study address that? No, I don't think so.

I have my personal opinion. My personal opinion, and the opinion of several others that I have talked to -- many others, frankly -- is that, as Tom said, the world is changing globally. We now have countries that are going to have to reduce their military might. That is a big statement. We all know that the military in every country has been a large money-making machine. I am not saying something that is anti-American. I am making a statement of fact for the record.

The National Guard is trying to protect their interests. I suppose I might do the same thing if I were the National Guard. We might look at them in a different way. Don't look at them as the National Guard. Look at them as a business, a corporation. What do corporations do? They expand. They have to expand. They have to make money. They have to pay their stockholders. Well, in this case, they have to pay retirements. They have to pay for men and women that are already in the armed forces. Where are they going to go? They've got a quandary. But the problem is, we don't want to put up with their quandary here in this area. We can't afford it.

It has been mentioned time and again at

many meetings, aside from the Environmental Impact Studies, what is going to happen to our community economically if the Guard leaves? Well, I honestly believe that it would be a wonderful thing, because then I think it would force us into a healthier economy than we have now. That's something else that is a real blatant statement, and I realize that, and I realize I'm not popular with the Guard because of that, but we have to really begin to look at that. It's going to be hard. Three-quarters of Grayling isn't here. Three-quarters of Crawford County isn't here tonight. So it's going to be hard to reach these people, but it's not impossible. It's not impossible when we have organizations like the AuSable Manistee Action Council. It's not impossible when we have the Anglers of the AuSable. It's not impossible when we have Trout Unlimited. It's not impossible when we have our township boards and our County Board of Commissioners, and we have all kinds of people that are caring enough to involve themselves.

Our numbers may not seem great, but I think they're greater and growing all the time. And we have to send the message right now. Not just to our local officials, but to our state officials and

beyond. I personally am sending a message to the President of the United States -- of this country. I don't want my homeland to be a battleground anymore, and the military has made it a battleground.

(Applause)

MS. CASWELL: This is not a local issue, folks. This is a national issue. We are not the only ones that are suffering this type of situation. So we have to try to stand firm; to expect and demand credibility; to expect and demand feasibility; to absolutely refuse discrepancies; and perhaps then, one day, at least we can look at ourselves.

It's pretty strange. I look at this audience -- in closing I will have to say this. I guess maybe we've started a new trend. We're the middle-aged activists.

(Applause)

MR. EBERSVILLER: Thank you, ma'am. And if you have a chance, would you stop with me later

on and complete your card so we can keep in touch with you? Kevin Hinderleider?

MR. HINDERLEIDER: Hinderleider. My name is Kevin Hinderleider. I'm 18 years old. I go here to Grayling High School. This is nothing like my speech class. I've heard a lot of things tonight about the military. A lot of con or -- yeah, a lot of con. I have to give the military some credit. They are going to protect us some day. They're really going to stand up for us, but I do have a couple of things that I'm really worried about. One thing is the education here at the high school.

As you know, the airport is just a little ways down the road, and they have to circle around before they land. In our classroom, we'll be listening to lectures and trying to learn. When a helicopter comes around, they disrupt the classroom, and it takes us seven to ten minutes to get us back into our place and start learning again so that we can just get back in the same frame of mind.

The other thing I worry about is our streets with the Guards. One person said that -- I think it was that the Guards, with being in the field, are off the streets more. No. I have a girl friend up in Roscommon. Her parents do not want her

coming to Grayling because of the Guards. She's afraid of her daughter coming here and something happening to her. That hurts me dearly. I hate to put down the military. I really do, because I think you guys deserve a lot. I mean you're going to save me someday, but I also worry about what's going to happen with us, the younger generation. That's the only thing I have to worry about. Thank you.

(Applause)

MR. EBERSVILLER: Those are the comments that I have on record this evening. If there is anybody else at this time who would like to speak before we go to the closing, I would entertain one more opportunity here. Otherwise, I'll turn the meeting over to closing to Colonel Wilkens.

LTC. WILKINS: I want to thank everybody for coming. Also, I want to point out, there will be another opportunity for public comment in Kalkaska on June 13th, and I'm sure some of you at that point in time will -- may want to speak again. But we'll make, you know, every opportunity available for you to do that. Again, I want to thank you very much for your comments, and the

written ones are due July 1st. I guess that's the end of it, unless somebody else has something they'd like to say. Thank you very much.

(Hearing concluded at 10:00 P.M.)

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STATE OF MICHIGAN
COUNTY OF CRAWFORD

I, Bonnie J. Waterman, Certified Shorthand Reporter, do hereby certify that I reported in Stenograph the proceedings of the Public Hearing of the Michigan Department of Military Affairs and the National Guard Bureau at the time and place hereinbefore set forth; that the same was thereafter transcribed by me and the foregoing transcript is a full, true and correct transcription of my Stenographic notes.

Bonnie J. Waterman
BONNIE J. WATERMAN, CSR 3493
Registered Professional Reporter

TRANSCRIPT 2

PUBLIC MEETING

CAMP GRAYLING
DRAFT
ENVIRONMENTAL IMPACT
STATEMENT

Tuesday, June 13, 1989
Kalkaska High School Auditorium
Kalkaska, Michigan
7:00 P.M.

MR. WILKINS: This is the time for us to receive comments on the draft environmental impact statement which is entitled Michigan Multiple Construction Camp Grayling Army National Guard Camp Site in Michigan.

We did hold one of these earlier at Grayling on the 17th of May, there were a lot of good comments made there. And we also last night -- I want to thank the Kalkaska County Board of Commissioners for holding a public forum last night. There were a lot of good comments and a lot of one-on-one discussions last night about some of the issues which will be brought out here tonight.

The meeting will be run by Mr. Judd Ebersviller, our consultant, EA Hickok & Associates from Minnesota.

The format will be the same as we ran the Grayling meeting whereby we are here to receive public comment. I will turn this over to Judd now, and he will chair the meeting.

MR. EBERSVILLER: Thank you. Before we begin the public comment portion of the meeting tonight, I would like to take a few moments to review the National Environmental Policy Act and

the environmental impact statement as it applies to the project here at Camp Grayling.

My name is Judd Ebersviller, and I am a senior environmental professional with EA Hickok, and we are the contractor who is assisting the Department of Military Affairs in preparation of this EIS. The purpose of the hearing tonight, as you know, is to record verbal comments on the document. These responses will be incorporated or these comments, along with responses from the Department of Military Affairs, will be incorporated into the final EIS document.

We are also taking written comments through July 1st. The verbal comments here tonight have received the same weight and consideration as the written comments which can be delivered to the Department of Military Affairs at the address on the agenda, or if you wish we will take them here tonight, if you have written comments prepared.

My role here tonight is primarily to insure that everyone who wishes has the opportunity to speak. So for that purpose it may be necessary for us to use a three minute time period. Now, there are groups of people who will

speak first, and those people will arrange with me -- excuse me?

DR. FREYBURGER: Three minutes?

MR. EBERSVILLER: A three minute time limit, that's right, sir.

DR. FREYBURGER: I thought you were having a hearing.

MR. CAMPBELL: I drove up four hours to speak and three minutes seems short.

MR. EBERSVILLER: Sir, you will have a second opportunity to speak again after we pass through those who wish to speak a first time, but the problem is that we have a very large number of people who wish to speak tonight, and in order to get through everybody at least once we have to impose a three-minute limit. We will stay here as long as necessary so that everybody has their satisfaction in speaking, however.

So as I said, I will insure that everybody who wishes has the opportunity to speak this evening. First of all, I would like to just take a few minutes, with that in mind, for a quick review of the National Environmental Policy Act and the environmental impact statement document.

The National Environmental Policy Act was passed in 1969. It created the Council on Environmental Quality who created guidelines for preparation of information that would incorporate the environmental concerns into the federal agency decision making process.

The state of Michigan has adopted similar legislation so that the environmental impact statements here in Michigan provide information about environmental impacts of the proposed project as well as other alternatives to those responsible for making those decisions. The environmental impact statement is not a substitute for permits or approvals which would normally be required as part of these projects' performance.

At completion of the environmental impact statement process, permits and approvals that would normally be required will still be required. The environmental impact statement process for this document include a notice of intent to prepare an environmental impact statement July 22nd, 1986, it was published in the Federal Register.

Notice was provided in the Michigan

Status Report on August 15th, '86. The public meeting notice for the scoping meeting for this document was published in the Grayling, Kalkaska and Gaylord papers one week prior to the scoping meeting held September 4th, 1986. There was a 21-day comment period following the meeting, and the draft environmental impact statement was subsequently prepared and notice of availability provided April 21, 1989.

April 15th, 1989 the state status report noticed its availability and the document was also noticed availablility May 4th, Grayling, Kalkaska and Gaylord papers. Complete documents have been made available to those requesting them.

Notice of this meeting tonight was provided on May 11 in the papers from Kalkaska and Grayling and last week in the Crawford County Avalanche. Future environmental impact statement events include the close of the comment period on July 1st, 1989, preparation of a final environmental impact statement and notice of availability of the final environmental impact statement which will be followed by a 30-day comment period. Written comments only will be

received at that time.

The record of decision, which is the official record of which actions will be implemented by the Department of Military Affairs and the reasons for their decisions will be published in the record of decision after the close of comment period on the final EIS.

The draft EIS document follows the organization of the executive summary available at the door this evening, it includes a purpose and need section addressing the purposes of these projects including deterioration of existing facilities, development of new training techniques, environmental standards and regulations and the mission requiring cold weather training.

The plan includes proposed projects for the cantoment area, the training area and training operational activities. The alternatives considered portion of the document addresses the projects proposed for the cantoment area. 15 of the 18 proposed projects take place in the cantoment area, they include a waste water treatment plant, buildings, road improvements and a new fuel facility.

The training area projects include road and trail improvements, a multi-purpose ranch complex and assault landing strip. Locations of those are shown at the executive summary available at the door. Training operational procedures activities include cold weather training, assignment of new aviation units and lanes training.

The alternatives to the proposed actions include no action, relocation, and alternative siting, not all alternatives will retain for each project. The retained alternatives are discussed in the tables presented in your executive summary as well as in the text.

No action was retained in all cases and other reasonable alternatives which could meet the intended purpose of the proposed action were also retained. The text also includes a section addressing affected environment and environmental and socioeconomic consequences. This section was also summarized in the executive summary available at the door. It includes material printed in 11 different environmental attributes, and the results of these discussions are

presented in an environmental matrix which is also included in the executive summary.

At this time I would like to begin the public comment period. The folks from AMAC have arranged for a block of time, they have consolidated several people in order to fill that time, so I will turn this over to the AMAC people.

Mr. Alstott?

MR. ALSTOTT: Thank you, Mr. Ebersviller.

I am Dan Alstott, I am the unpaid executive director of the Au Sable Manistee Action Council. I am here to speak tonight in my own right and wish to note that the action council will be submitting separate comments by mail.

In the last paragraph on page 2 of the DEIS executive summary, it is stated, and I quote, "This document fulfills the purpose of an environmental impact statement by presenting a full and fair discussion of significant environmental impacts of proposed actions". This statement is untrue in view of the content of the DEIS, which essentially addresses only the

consequences of the proposed action during the construction phase.

It is imperative to present the whole truth in the DEIS, and to do this will require a massive revision and re-issue of the revised document. It is to that end that this letter speaks.

Further, the DEIS makes few, if any, commitments nor does it provide needed assurances. Instead it is filled with phrases such as, and I quote, "are not anticipated to, should be compatible, computer simulated, expected to, after mitigation", ad infinitum. This tactic simply does not suffice to assure that the proposed action is environmentally sound. It further lacks any binding commitment to insure that sound practices will be followed.

Instead the DEIS is, in Pentagon parlance, a tap dance, which is defined as, quote, "a slick briefing usually lacking in substance", end quote.

The DEIS does not address all concerns raised during the scoping process. For example, it is silent on, quote, "concerns expressed over water pollution from explosive's residue and

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ammunition dumped in waters within the camp", end quote, as listed towards the end of the final scoping document, dated October 13th, 1986. This is one of the most serious concerns regarding this facility. We are concerned about toxic poisoning.

1

Please tell the truth about what the millions of pounds of exploded and unexploded ordnance expended at Camp Grayling has done, is doing and will do to the land and water in and down gradient from the firing and bombing ranges. Please include the effect of both army and air guard operations over the historical life of the camp. We drink this water and are becoming afraid.

Please tell the truth about the effect of radioactive penetrators lying about the ranges. Are these required only at the tank ranges, or do the armor piercing rounds here shot by the air guard contain the same material? The DEIS is silent on the entire subject of radioactive penetrators.

2

Please tell the truth about noise, which is violating standards set for the human environment. According to the Camp Grayling

management analysis and plan, despite hundreds or thousands of complaints, your noise data is woefully incomplete and much more firing must take place before you can get a handle on this, other than to recognize it is a problem of unknown, but great magnitude and potential legal consequence.

Please tell the truth about your installation compatibility use zone program, the ICUZ. Tell how this intends to influence local governments to zone property lying in your way, so as to create it useless for habitation and thus lessen its worth. Tell how this will lessen

3

It is obvious from noise studies we have in our files that your methods of trying to extrapolate noise from 105 millimeter guns to generate equivalents for 8-inch cannons and 500 pound bombs will not suffice, regardless of the power of the computers used.

Admit that you simply do not know what noise your activity generates, and absolutely stop your expansion plans until you can accurately manage these impacts to a level that can be tolerated by the human residents of this region.

tax revenues causing the surviving lands to pick up the slack. Tell it like it is instead of trying to make the ICUZ proposition look like a cure-all.

Tell about the property taxes in Crawford County being the highest in the Continental 48 states, based on per capita income, due to the vast amount of public land the military occupies at Camp Grayling.

Tell the truth about the proposed multi-purpose range complex, MPRC, as it is called in the DEIS. You have omitted the H which stands for heavy. That is the way it is listed in the federal budget requests; multi-purpose range complex heavy, MPRC-H.

Tell the public that combined arms training at the MPRC-H means all weapons including artillery. General Andrews has said not so, but you have it obscurely listed as combined arms training in the DEIS. Tell it like it is, or like it will be. To quote earlier writings of General Andrews, who has honestly listed the proposal as an MPRC-heavy range, he states, quote, "We have also designed it so that field artillery can also fire into the impact

area to provide complete fire control and coordination for every element on the battlefield", end quote.

What this means is that artillery will fire from the MPRC-H, across County Road 612 and KP Lake into the impact area. The DEIS is absolutely silent on this. Tell the public how this will require buying out the 65 plus or minus homes at KP Lake and closing County Road 612, cutting Lewiston and Lovells from ready access to I-75, unless you actually intend to fire live wartime ordnance across these areas.

Please tell the people that figure 2-3.1 demonstrates and confirms that total troop training from 1980 through 1986 increased nearly 62 percent, and this means at present rates the training will double every seven years or less. Tell it like it is in terms we can all relate to instead of trying to obscure the facts.

Why, on 2-3.7, do you talk of tanks with 105 millimeter guns, when as early as January 1987 General Andrews wrote about the MPRC-H being designed to handle the new 120 millimeter tank gun that is upgunning the M1A tank, end quote.

How did you possibly contend there will be less noise at the MPRC-H when the tank guns will be larger and every element on the battlefield will be present? This is a totally non-realistic assumption. Your statement that the MPRC-H will have lazer target capabilities rings hollow. Why do you not instead give assurances that lazers will be used exclusively? The answer is simple. Lazers will not satisfy the basic urge in military training to make noise, to simulate combat, to blow things up to simulate combat, to destroy to simulate combat. These are the elements of war, and since you intend to simulate war in this place, why do you not come out and say so, instead of presenting your plans into the bland terms contained in the DEIS?

Project T3 assault landing strip appears on 3-2.6 to further involve combined arms training. Does this mean you will have artillery there also? What do you mean when you say, quote, "Further analysis will offer productive environmental insights?", end quote. Is this an environmental experiment like the multiple 500 pound bomb drops conducted for determining worst

case noise levels described on 4-3.15?

This assault strip obviously has a larger purpose than expressed in the DEIS. Colonel Downey has stated that, and I quote, "The Michigan National Guard has only one C-130, thus the strip will not be used very much", end of the quote. This being the case, the assault strip is either a monumental waste of money, or it represents the beginning of a conversion of the site into a new military airfield to replace what exists near Grayling. Please tell the whole truth about this project with its associated fueling facilities alongside the Manistee River. Please do this or provide legally binding guarantees of non-conversion into any other use.

You describe on 3-3.7 how the new waste water plant will allow you to service lake shore residents in Grayling Township. What is your underlying motive in this? It sounds like the olympic size swimming pool that was dangled before the Kalkaska community a few months ago. This treatment of private sewage will benefit a select few well-to-do citizens, most of whom favor guard expansion. You had best get a legal opinion from the US Attorney General or the

Comptroller General in Washington before continuing this unsavory practice of legalized bribery.

Your rail siding project C11 will no doubt serve as a stationing site when MX missiles are rail garrisoned in Oscoda. You should tell the citizens about this, or give irreversible assurances to the contrary.

Project C12 ASP/LSF Railroad will serve the siding, so the same applies. It is also very unclear in the DEIS how you propose to construct this railroad across I-75. The proposed new underpass construction will be a massive undertaking with serious consequences on tourist and commercial traffic trying to meet points north and west of that site. Tell how this will compromise places like the Traverse City area, Gaylord, the Upper Peninsula and elsewhere. Do this instead of trying to obscure things, as you have done, by using an ancient map in figure 3-3.3 which does not even show I-75.

On 3-3.15 you honestly admit that the MPRC-H will simulate a battlefield, right adjacent to the Au Sable River and a new emerging residential condominium and golf course

development. You forgot to indicate that in addition to every element on the battlefield, you will also have many jet aircraft present so as t attack the forces using the MPRC-H. This introduces a new noise element, previously confined to the air/ground range. How do you intend to mitigate this new attack on the human environment?

Please tell the truth about why covered bleachers are proposed at the MPRC-H. We know they are not for entertainment purposes such as rock concerts, and are convinced that they will serve as viewing places for politicians and military brass during such things as fire power demonstration which are designed to impress upon the viewer the full destructive force of weapons in use. Tell us why such an amphitheater, and all that goes with it, is proposed in such an environmentally sensitive area which, incidentally, is growing fastest in population of any place in the region.

The MPRC-H drawing on figure 3-3.5 shows a huge area to be involved. Certainly more public roads and snowmobile trails will be closed as a result of the construction and use of this

MPRC-H. No mention of these closings, which will further impair recreational use, is made in any detail in the DEIS. Please tell the truth about this. If there will be no such closing, then provide absolute legally binding assurances.

Please provide detail covering the wetlands shown on figure 3-3.6 lying north of the west half of the assault strip. How do you plan to protect or preserve these areas during combined arms training? Or have you already destroyed this asset? Please tell the people the truth.

Please also list the flight paths to be used at the assault strip. None are shown in the DEIS, but they are vital. Please also show the guaranteed traffic pattern and altitude restrictions that will apply. Please do not write up a bunch of FAA jargon, but instead tell this in a fashion understandable to non-aviators, who will suffer the brunt of noise and air pollution arising from this assault strip.

On 3-4.1 it becomes abundantly clear at the bottom of this page that Camp Grayling intends to grow through competition with other national guard camps. This has been verified by

this writer who monitored a radio interchange at the air/ground range on May 24th, 1989.

A two seater A-7 with a photographer in back came in to check out the area. His call letters were Tulsa-19. He was very thorough and made repeated passes while talking to the range control officer, who was promoting the attributes of Camp Grayling. At the end of this very friendly exchange, the Camp Grayling range officer offered to send promotional materials to Tulsa-19 who gave his zip code as 74115 which has been verified as Tulsa, Oklahoma.

The DEIS claims no growth, but the reality is that Camp Grayling is in the marketing business, trying to entice guard units from Oklahoma and elsewhere to come here and blow up our environment. The Italian bombing in June 1987, is another example of marketing by design.

This acts to totally invalidate any expressions of no growth in the DEIS, and calls for major revisions, if the document's legal process and its authors including the Pentagon, the Michigan DMA and the consultants are sincere about the truth being known.

On 3-5.7, the second paragraph dealing

with land use is incredible. It speaks as though the status quo will not be altered or increased. It also contends that the status quo is acceptable. Both are assumptions, totally lacking in substance. The noise discussion is so shallow it is a travesty, considering what is already happening. To continue along the expressed course will increase citizen outrage beyond current high levels and present day problems will be minor by comparison. Please take a realistic approach to your problems instead of trying to talk them away.

The last paragraph on access is also very wrong. Weekly newspaper notices, describing range usage, for all intents and purposes, totally close the majority of Camp Grayling land to the public, who is warned to stay out during training times. This multi-use public land is no longer available with any reliability except for two weeks each year during deer season. Please tell it the way it is, not as you want it to look.

In 4-3.1 you state the post has been in existence since 1913. This is at best only partially true and applies only to a very small

portion of the overall reservation. To use this as a premise to justify the proposed action is misleading. You state noise outside camp boundaries can annoy people. This is a gross understatement and, to be accurate, you should state that the noise does annoy people.

Noise from your operations is creating threats to the health and welfare of many private citizens outside your boundaries. Your refusal to reduce excessive noise levels in favor of trying to justify them, via computer extrapolation of nine-year-old data, has taken Camp Grayling into the worst period of controversy in its history.

You state in 4-3.3 that a noise level of 55 decibels will protect public health and welfare. Then you go on in an attempt to justify noise levels at my residence outside the camp boundary of more than 200 percent of the safe level. This simply will not wash, and you are in harms way legally if you do not change your approach. Tell the truth. You make noise outside the post, at Guthrie Lake, over 250 percent of the so-called safe level. People are suffering both physically and mentally from your

noise harassment.

You describe noise from airplane overflights in figure 4-3.1C as having zone 2 and 3 contained in a tadpole-shaped area near the air/ground range. This may represent ideal conditions, but it is far from the truth. Even as I write this letter in my residence, the jet noise is absolutely devastating. It is just like living at the end of the departure runway at Detroit Metro Airport as the fighter bombers roar overhead and conversation becomes impossible.

Years of complaints to your officers have changed this condition not one iota. Your planes do not follow your own rules and instead are more interested in blowing leaves or dusting civilians. Tell the truth. You cannot control what your people do and they will continue to create noise problems any time they wish until you establish better discipline.

Perhaps if you get away from your computers and get out into the field and talk to the people, and listen objectively to your own sounds, you will eventually realize the true problem your projects and operations are creating for not only the natural environment, but also

for the human environment, which is after all what you are here to protect.

You contend on 4-3.26 that the lands adjacent to the MPRC-H are, quote, "All owned by the military", end quote. This is not true. Those lands are owned by the people of Michigan, and are merely leased to you by the DNR for you to tear up. Why do you continue to lie? You say no growth, but on 4-3.28 you describe in the MPRC-H operating year-round, 16 hours per day. This overrules your no growth contention, your theory or supposition that winter training will offset summer usage is either false or stupid.

You state that Camp Grayling is the best training site in the nation, and to believe that the Pentagon will allow any investment such as the MPRC-H to lie idle is pure hogwash. Tell the truth, Camp Grayling will be fully booked winter and summer, especially with Washington's desire to consolidate and close outmoded military bases. You may not, quote, "anticipate" this, but common sense dictates that is the way it will be.

On 4-4.1 you tell of basing your entire soil section on data that is 62 years old. Soils

are the very earth we live upon. You have mixed inground the soils here for so many years with tanks, bombs, guns, etc. The least you can do in your attempt to legitimize your activities is to get a current soil survey before continuing. Please stop all new activities until this is completely and thoroughly analyzed.

21

You have completely ignored a major gas field in figure 4-5.1. Haven't you heard about the 15 or so gas wells on the Draper land in North Camp? Or did you omit this to avoid having to explain how much money the state will lose by not being able to lease North Camp out for oil/gas due to its conflicting military activities and ordnance pollution in its place? Don't keep trying to mislead the public. This is not a public relations document. It is supposed to be a DEIS, or is it really PR? Anyway, please show this big gas deposit as it relates to North Camp.

It is interesting on 4-5.13, the DNR has not surveyed the camp wetlands. How in the world can you go forward with all your rhetoric about protection when you do not even know where the wetlands are? Please stop everything until a

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survey is completed and analyzed.

Your bald eagle section on 4-5.43 may not be valid because the wildlife in Flora-Endangered map is inaccurate. You have omitted the eagle nest at firing point number 117, despite the fact that it has been in the same tree for 15 plus or minus years. This is the one you finally decided to protect after it was publically exposed that your operations were causing the nest to fail through parental abandonment of baby eagles every year. By the way, Colonel Downey's PR on the traditional nest tree blowing down last year is totally false.

23

On 4-5.45 you talk of no Ospreys. This was not always true, but seems to be now. This is particularly alarming, since the osprey is an indicator species, and will leave a polluted area long before man realizes what is happening. You had better take a very hard look at all aspects of your operation to determine what made this bird disappear about three years ago.

We agree with you on 4-5.51 about your creating noise which may scare animals. It scares people, too. What we really need to know is about the quiet, undisturbed areas available

in post. Where are these places? We want to go there, too, for some tranquilty. Please include a map of these in the final EIS for our personal use.

You have again erred on 4-6.3 as you talk about the Hanson Land Grant. Hanson left this land, restricting it to four distinct purposes: Forest preserve, game preserve, fresh air camp for government employees and as a permanent encampment and maneuvering ground for the militia of this state and for no other purposes whatsoever. Please so note in the DEIS to avoid further confusion on this subject.

In the discussion of Act 192 on 4-6.4, please elaborate on why the DMA has not maintained roads so as to make them passable. This law apparently removed these roads from local jurisdiction, and it is your duty to keep them in good condition for public use. You have not done so and are thus in violation of the law. Please explain this in the DEIS.

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Despite your attempt to explain it away on 4-5.5, there are 50,342 acres of private land zoned residential within the area considered in this section. This extends to a maximum of 3.5

kilometers outside the post. This is an area over 34 percent as large as the camp itself. Please explain how you intend to grow or stay as you are without severely impinging on these lands with your noise, dust, smoke, fumes, etc. Please do not try to take these lands through the ICUZ. That is confiscatory. Explain how you intend to modify your operation to resolve this situation.

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On 4-6.13 you again go on saying new troops are not anticipated, however. Elsewhere you have stated that ultimate winter training will involve brigade/division levels. Please explain what you really mean. Is it no new troops, or is it a division? You cannot continue to double talk this issue.

26

Please elaborate on the refueling aspects of the assault strip as noted on 4-8.26. State exactly what you intend to do here and guarantee not to exceed those limits. As this stands now, you give yourselves a blank check in practically every instance, to do anything you please, anywhere you wish, after completing this EIS process which, by this point in your book seems little more than a charade.

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Probably the most outrageous statement

in the DEIS is on 4-10.27, where you state, quote, "No significant adverse effects upon psychological, physiological or community needs or lifestyles or residents of the area are perceived as a result of full implementation of these actions", end quote.

You obviously have no perception of the absolute stress your noise and harassment has upon the civilian population. A professional noise expert employed by the Au Sable Manistee Action Council has very recently stated in a written report, and I quote again, "Some of the residential areas around Camp Grayling are probably receiving more noise impact than any other community in the United States located adjacent to an army base".

It is those people in those areas, wherever they are, and others having been hit, forced off roads, raped, groped, insulted, trespassed upon, etc. by visiting military personnel who have already been affected psychologically or physiologically. The expansion of Camp Grayling will serve only to worsen this very serious problem.

In closing, I reiterate that subject

DEIS is lacking in truth, fact and substance to the extent it does not present a full or fair evaluation of human or natural environmental consequences arising from the proposed action. For those reasons it must be either wholly discarded or given a major overhaul.

Sincerely, Dan L. Alstott.

MR. EBERSVILLER: Tom Baird? You have a total of six folks here who would like to combine for a total of 18 minutes.

MR. BAIRD: Thank you, Judd.

If I have any left over, I would like to donate it to this gentleman right here or maybe the guy who drove four hours to make this meeting.

My name is Tom Baird, I represent Trout Unlimited. Trout Unlimited's position on this entire issue is that it opposes the expansion projects slated for Camp Grayling, but supports the minor efforts mentioned in the DEIS to ameliorate current environmental problems.

Since the last hearing I have had an opportunity to review the statute and regulations and interview several experts in the areas of wildlife, hazardous waste, hydrogeology and

military operations. They have been unanimous in their findings that first Camp Grayling has simply outgrown itself in connection with these proposals, and second that the DEIS itself is insufficient on a number of grounds.

There are several general problems, many of which almost go unstated throughout the DEIS that I would like to mention. First of all, it confuses the purpose of Camp Grayling with the purposes of the United States military establishment. Training, of course, is important through our military, but I don't think anyone in his right mind would posit that all of the training and all of the types of training must necessarily occur at Camp Grayling.

Second, the DEIS ignores for the most part the multiple use concept applicable to all state lands including Camp Grayling in Michigan. Third, the DEIS assumes permanent ownership of all of the lands now associated with the camp. It is an erroneous assumption. Most of that land is leased, some of it is on short-term leases up to 20 years, other on what are purported to be perpetual leases but which can also be terminated for breach. As I think I mentioned at the last

hearing, the national guard is already in breach of its leases with the DNR.

Fifth, and I think very importantly, the DEIS fails or more properly refuses to admit that growth in use and types of use at Camp Grayling is in the offering. Now, that's denied, but when you read between the lines and look at the various entries in the DEIS and the statements that have been made, it is clear that growth can't be avoided if these expansion projects are permitted to go forward.

For example, in the economic section it is estimated that there will be a 16 percent increase in sales volume due to training, not the construction phase, but due to training, that money is typically supposedly spent by troops in the area. I think you could deduce from that that there will be a 16 percent increase in training.

Second, in connection with the marketing aspect of the matter mentioned by Dan, it is indicated in the DEIS that use of the camp will fall in terms of numbers if these improvements are not made. I think the other side of that coin, as was admitted by Colonel

Green, among others, is that if these improvements are made, this will be a very attractive base for troops from throughout the country to train at, it's as simple as that and the national guard markets itself at Camp Grayling for that purpose.

General Andrews indicated in his testimony that he couldn't see use exceeding 50,000 troops a year. That is in excess of any estimates in the DEIS. Colonel Downey, who addressed the Michigan Council of Trout Unlimited last year, was unwilling to guarantee, and as far as I know anyone in authority is unwilling to guarantee that there will not be an increase in use pursuant to the new master plan. No one from the military establishment, state or federal, has made that statement, and they know they can't make it because it wouldn't be true if they did.

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Finally, and I think key in terms of general problems with this statement, is that this statement is not predecisional. It has been drafted to justify a plan that was prepared and finalized almost before the notification of the EIS process was begun. That is contrary to law, and it is contrary to the CEQ regulations.

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The process is not to justify decisions already made, it is to consider whether a project or projects should go forward in view of the environmental consequences. The best proof of that now is that the national guard has a budget request pending in President Bush's budget requesting money for the MPRC.

The description of the affected environment is also defective in the DEIS. The social negatives of having Camp Grayling here, some of which Dan mentioned already, are nowhere to be found. On the economic description, only positive aspects of Camp Grayling are mentioned. None of the negative economic impacts are given any substantial or serious treatment at all.

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Esthetic factors are pretty much ignored. Regarding soil and geology and especially hydrogeology, my expert in that area kind of chuckled at the thing and he said, Tom, when you read this description of the soils that are around Camp Grayling, it basically boils down to the statement that this is sand and gravel, and we assume that ground water will run downhill through the sand and gravel into the rivers. That's about it.

As Dan mentioned, the only soil study mentioned is over 60 years old. It is simply insufficient for the purposes of an environmental impact statement of this scope and importance.

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Human health hazards are glossed over, and I think Dan mentioned them, too. In terms of the current environment, the EIS, DEIS, fails to mention the extremely high cancer rate in this county and therefore the remainder of the DEIS fails to indicate what effects expanded use might have on the cancer rates.

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Regarding endangered and threatened species the description of current environment is woefully insufficient, especially, vis-a-vis, endangered plant species. An inventory needs to be done and these plants species and other endangered species need to be identified and located within the boundaries. This has not been done to date.

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In general, the conservation aspect, the wilderness aspect of the Camp Grayling area has been ignored. In terms of identification of alternatives, these are described as the heart of an environmental impact statement by the regulations themselves.

Both NEPA and the Endangered Species Act require the proponent of these projects to go outside the scope of the proposal, outside the geographic boundaries and even outside its own jurisdiction to consider alternatives.

However, in this case the definition of alternatives is extremely narrow particularly with respect to other sites and relocations. They are narrowly defined, which affects the entire document as being other locations either inside or very close to Camp Grayling. Other areas in the state and other states are simply not considered, and they should be. This is now a multi-state training area, and other states should be asked to share in the burden as well as the benefits of military training.

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The option of reduced activities, for example, a reduction back to 1978 levels is not even mentioned so that it can be struck down. The discussion of environmental consequences is likewise insufficient. The regulations require anticipation of any, any foreseeable adverse impacts, direct or indirect, relative to either the proposal or the alternatives which should be considered.

If there is incomplete information, and there is a lot of incomplete economic and other information in the document, it is the obligation of the proponent to go out and get that information. It is not sufficient simply to say that it's hard to get or that it's not available. If it's not available, the obligation of the agency is to get that information. We are aware of no effort to do so except by making personal communications with national guard officials.

The EIS should tell both sides of the story and it does not. In particular with respect to the economic aspects, none of the negatives are mentioned, the aspect of increased growth of the camp is not mentioned. The flip side of that, the lost opportunity from having a huge military fort in the middle of a recreational area is not mentioned at all. That opportunity hasn't been realized yet, but it will never be realized if these projects are allowed to go forward as proposed.

Human health, as I mentioned before, has simply been skipped over. I think Dr. Cooper mentioned the problems with contaminants in the food chain, several elements of which wind up on

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our dinner tables including grouse and deer. This camp is covered with hydrocarbon waste, combustion, byproducts, heavy metals, explosives including unexploded ordnance, and hazardous wastes buried around the facility. These are given little or no discussion whatsoever relative to noise. The health hazards are simply shrugged off. If anything, noise is only considered an irritant, but noise, continued noise, loud noise can have an effect on sleep, on psychologically measurable stress levels and on hearing. These are simply glossed over.

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Finally, there is no mention of the possibility of accidents, negligence or intentional misconduct. This is a hazardous activity occurring at this camp, and I think the contractors have a duty to anticipate that things are going to go wrong. It's not like they haven't gone wrong in the past. There has been human error, using the PBB burial site for a roadway.

There have been intentional violations such as firing into Barns Lake, or continued refusal to put numbers on helicopters. There have been accidents such as the fuel spill.

There has been negligence such as the continued malfunction of the current sewage system. All of these are exacerbated by the problem of the guard's lack of authority and control over the users of this camp.

The Michigan National Guard has enough trouble and has failed in controlling its own troops. New troops from outside the state do not fall under their direct control, and the leaders of those troops may outrank camp personnel. There is no training agreement in place although that was one of the recommendations of the Governor's committee, there is no way to exercise control over these for foreign troops.

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All of the accidents and intentional misconduct are made worse by this inability to control the activities of troops on the ground. The discussion of the mitigation is again deficient, mostly it goes to construction projects. As I mentioned last week, there are no site specific plans whatsoever, and there is a very minimal discussion of monitoring.

Now, Hickok & Associates is going to be able to walk away from this project when it's built, we are still all going to be here. And

there is not any significant discussion of monitoring for environmental hazards either in terms of ground water or in other areas.

Just by way of example, in a recent DEIS that I read, great specificity was included regarding monitoring wells, their number, their depth, their location, and the sampling program. Nothing approaching that is contained in this DEIS.

The DEIS ignores the problem of short versus long term uses. This land is leased land and it belongs to the people of the State of Michigan. Sooner or later it will revert to them. Hopefully we won't have a Fort Custer like they have in Battle Creek, which is so damaged at this point in time that it is beyond repair, and it simply -- a fence has been put up around it. We can't let that happen to Camp Grayling.

Finally, ignored and in connection with that is the cost of cleanups. There have been a number of studies, very well respected studies, done in connection with the hazardous waste and pollution aspects of the explosion of ordnance. These are on military testing facilities. The military has access to these studies, and

probably more that I am not aware of.

These studies must be addressed, brought to light as references in the DEIS and exposed to the public for comment. This DEIS was not written by scientists, it was written by lawyers. I hate to say that being one myself, but maybe it takes one to know one. This document has been stroked and smoothed and turned into a big bowl of tapioca. You can't get a grip on it and that was done on purpose.

The document addresses individual projects, never considers the synergistic or additive effect of these projects in connection with one another. It is so inadequate in its description of the current environment, definition of alternatives and discussion of adverse environmental impacts, that it precludes meaningful review. And we join AMAC in requesting that a supplemental DEIS be produced and that it be submitted to the same public comment system that we are going through now, not squeezed into the final EIS rammed through, and construction begins this fall.

Don't kid yourself about this process, there is nothing in NEBA which requires anything

sociatively as a matter of environmental law. It only requires that the military, quote, unquote, consider environmental matters in making decisions. Once they are considered, that's it, there is no substantive guidance in the statute. Once that final EIS comes up, the military will be within its rights subject only to the permit process to go forward with these construction activities.

The solution to this problem is not in this process, it lies within with the Department of Natural Resources in Michigan and the politicians. It is imperative that you contact Blanchard, Riegal and Levin and let them know how you feel about this. That's the only way you are going to stop this, not in this process.

Let Director Hales know how you feel. Get up here tonight and speak, don't be shy, have your say because this is your last chance, but don't let it end there. Talk to the politicians, that is key and without it we will lose.

Thank you.

MR. EBERSVILLER: Mr. Gregory?

MR. GREGORY: My name is William Gregory, I am the chairman of the board of the Au

Sable Manistee Action Council, but tonight I am addressing you in my own right as a property owner in Lovells, an area that is greatly impacted by the document that we are here addressing tonight.

Ladies and gentlemen, the draft environmental impact statement is seriously flawed. It is flawed from concept to conclusion. The Michigan Department of Military Affairs in its zeal to achieve its committed goals of expansion and construction have engaged, with the assistance of its hired consultants, in a despicable conspiracy to confuse, mislead and deceive the people of the state of Michigan, and most importantly the people of Kalkaska, Crawford, Otsego, Roscommon and Missaukee Counties.

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The DEIS in its attempt to be benign is guilty of gross error both in commission and omission. It represents what is commonly called a whitewash job, tell them something but tell them nothing. The issues are far too important to the future of this area to be so patently glossed over or ignored.

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The DEIS speaks for itself in its

woefully inadequate responses to our previous charges and criticisms of the military. In the interest of time and brevity, I would like to offer just the following five issues, five out of more than 60 that have been identified in the DEIS as a typical example of the total and complete inadequacy of the DEIS.

First, it is a construction document and addresses only that phase of the proposed mission multiple construction project. All environmental concerns and impacts caused by the operations of Camp Grayling and its rangers are summarily dismissed by claiming a DNR permit to be required and that will make them acceptable. This is not only false and misleading, but utterly ridiculous. It defies logic, it is frankly insulting to intelligent people.

Secondly, the DEIS is shamefully inadequate and almost silent in addressing the concerns and fears regarding toxic contamination of the land, its water, aquatic creatures, wildlife, and most importantly we human creatures that have to inhabit the area. Over a half century of exploded and unexploded ordnance dumps munitions, liquid and solid waste disposal is

glossed over or totally ignored in the document.

The impact on the wetland chain from Barns Lake through the east branch to the main stream of the Au Sable River is totally absent from any mention. A complete and thorough analysis of all areas for toxic contamination must be made a part of any final draft EIS.

A part of this study must be a consideration of the impact of radioactive penetrators that are fired on the various ranges. Data must be made available to the public regarding the impact of toxic contaminants and the effect of heavy metal residues on the wildlife of the area. 40

Thirdly, the DEIS says the state has no noise standards or laws that would govern or control the camp, and yet it acknowledges that noise levels violate the acceptable standards for human existence. The DEIS falls horribly short in its content regarding a full and fair discussion of significant environmental impacts as it particularly pertains to noise. 41 Let's face it and be honest, you do not have adequate data. Your limited studies are sadly incomplete, you just don't know what the true impacts on humans

are.

Admit it, and don't deceive us with this document that would try to convince us noise levels may get better because of these proposed projects. That's what I call hogwash.

The DEIS completely fails to address the impacts of military air traffic over the range after construction. Will it increase with a new MPRC? You treat it like it doesn't exist and yet it has been a constant source of citizen complaint for years. 42

Fourth, the DEIS on page 41027, as Dan had previously mentioned, but it's worth saying again, says no significant adverse effects upon psychological, physiological or community needs and lifestyles of residents of the area are perceived as a result of full implementation of these actions. 43 How can this possibly be true when a committee appointed by the Governor of the state of Michigan, commissioned to investigate the conflicts over the use of Camp Grayling, heard hours of public testimony from residents in the area expressing great concerns for conflicts, controversy and confrontations with the military.

We already are experiencing the very effects this document would try to convince us will not occur. This statement pretty well sums it up, the DEIS is totally fraud and completely inadequate.

Fifth, I ask why is there no mention of Roscommon or Missaukee Counties in the DEIS? Can it be assumed there will be absolutely no impact on these two counties that contained land within the boundaries of Camp Grayling? Or do we choose to omit them so that those people are denied opportunity to add their cry of concern to that already voiced at other public hearings? Another example of the inadequacy of the DEIS in the omission of two valuable counties. 44

Finally in closing, I would like to quote from page 1 of the executive summary, draft DEIS, "The environmental impact statement document contains a full and fair discussion of the significant environmental impacts and informs the public and decision making bodies of reasonable alternatives that would minimize adverse impacts before decisions are made". In the case of the subject DEIS, this simply is not true due to all the errors and flaws found in the

document. It does not contain a full and fair discussion of significant environmental impacts.

Quoting from section 1502.9, the Council on Environmental Equality under the National Environmental Policy Act, I read, "If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portions".

This draft EIS is so seriously flawed, inaccurate, misleading and inadequate that it must, in all good conscience, be completely redrafted. In short, the Michigan Department of Military Affairs, return to the beginning and start over to develop something meaningful instead of this hogwash document we have under consideration.

Thank you.

MR. EBERSVILLER: Mr. John Cook?

MR. COOK: My name is John Cook, and I am a local resident of the Garfield Township, and I live right close to the assault landing strip.

I am going to kind of get down to grass roots, if there is any grass left in this operation. This is a letter that I submitted to

the Kalkaska County Board of Commissioners' meeting yesterday. It was entered into their minutes today, I understand, and I was requested to read it to this body this evening. I am going to leave out some of the non-important items.

But I would like to preface my remarks with a quote from the National Wildlife Federation Magazine June-July issue 1989 entitled Tragedy in Alaska.

The article starts: "It's a heck of a way to win an argument, stated Knute Johnson, a 62-year-old fisherman who was surveying the frenetic activity in and around his hometown, the fishing port of Valdez, in south central Alaska.

"On Good Friday, March 24, 1989, the oil tanker the Exxon Valdez ran aground on Bligh Reef spilling more than 10 million gallons of crude oil into the Prince William Sound.

"During the 1970's when congress was debating whether to allow building of the Trans Alaska Pipeline to Valdez, Johnson and some fellow fishermen made a trip to Washington to argue against it. We were concerned about what the biological damages could be, he recalled ruefully.

"We were concerned about tankers piling up on reefs. The oil companies dismissed Johnson's worries, all they said was that the latest technology would be used, they should not worry about a spill because it would never happen, now it has happened."

I don't intend to imply that what is proposed at Camp Grayling has the significance of the Valdez disaster, but I guess really it is all a matter of degree. I have always been a believer that if you truly believe in something you have the responsibility to stand up, take a stand and be counted and fight for what you think is right. This is the purpose of this letter.

In the portion of the executive summary of the EIS draft, in the section entitled noise, paragraph 5, it states, "The training area project T3-assault landing strip proposed will have insignificant impacts as neither zone 2 or zone 3 computer simulated noise contours extend off post." Computer simulated noise contours do not truly reflect the total scope of the problem. It is incomprehensible to anyone who has seen or knows that area, for them to believe that the traffic on King Road or Sunset Trail will not

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increase due to the use of the assault landing strip.

It is also interesting to note that the replacement of the CC bridge with a new 40 foot wide bridge, built to interstate highway bridge specifications, I've been told, is not designed to handle extra heavy vehicles. If you question this, I would encourage you to take a short trip down to that job site and view that construction.

Under section physical setting, paragraph 9 reads: "Training area T3-assault landing strip as proposed involves construction in a level non-forested area". I have enclosed with this report a copy of the Garfield Township Fire Department report on a fire and also a copy of the DNR report on this fire. I think you will find it most interesting. Prior to the fire the area was definitely not non-forested.

Under the section headed natural resources, the report states: "Natural resources of the post will not be significantly affected by the master plan actions. The training area actions generally are planned for existing range areas, and are well removed from potential habitat for protected species. Collectively the

training area project will not have a significant effect. Clearing will be minimal and mitigation will prevent impacts to threaten species".

You will notice that the term collectively is used as it relates to the full number of projects. I would take issue with the impact on the natural resources as it relates to the assault landing strip. The ALS center is exactly one mile from the Manistee River which lies to the north. The ALS will run essentially parallel with the Manistee River with the compass coordinates of 55 degrees NE, 230 degrees SW. The approach and takeoff patterns depending upon wind direction will cause the planes to fly close to and/or cross the Manistee River, which will essentially affect noise, air space, air disturbance from the aviation activity and essentially will cover an area northeast and southwest along the river encompassing approximately 25 square miles.

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This activity obviously will impact residents, tourists, campers, fishermen and serenity seekers in the river usage area. It is also hard for me to believe that any mitigation that the DMA might accomplish would stop impact

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on eagles. I enjoyed observing on fishing down the river near the North Sharon Bridge while I was flyfishing last Sunday evening, ospreys, ducks, swans and geese, etc.

Also in the section headed wildlife in the DMA report it states that they will take mitigation measures to protect any Kirtland warbler nesting areas. They state that project T3 assault landing strip as proposed will have an insignificant impact on wildlife, the nearest warbler nesting area is more than one mile to the west. I can't help but feel that one mile doesn't protect the warbler from being affected by this airstrip.

In paragraph 4 under the heading wildlife the report states: "The new aviation units could disturb noise sensitive animals, but the impact will be insignificant because of additional flight time will be minimal and the flights over deer wintering areas or warbler nesting areas will be restricted". I would like to point out that again that the airstrip parallels the Manistee River and that most of this area is the wintering area for the deer, low flying aircraft must have an impact.

Under the section headed vegetation in paragraph 3, the report states: "Project T3 assault landing strip as proposed will have an insignificant impact on vegetation since most of the area is recently cut jackpine". Again, I refer you to the attached Garfield Township Fire Department report and the DNR report.

In paragraph 5 under the same heading of vegetation the report states: "Cold weather training will ultimately mean significantly higher levels of field exercises during the cold weather period from October 1 to April 1". If this means that these exercises will occur in areas used by bird, deer and bear hunters, it will have a significant impact on one of the most valued recreation attractions of the tourist industry.

Under the section headed land use in paragraph 3, the report states: "Activities that could potentially change land use patterns outside the post are those activities which create excessive noise. The proposed projection will not significantly alter noise contours thus will not affect recreational uses and around the post". If the new bridge at the CC bridge

location will accomodate extra heavy vehicles, i.e., tanks, armored personnel carriers, field trucks, semi-trailer and tractor units, then it would follow that that type of traffic would certainly impact Sunset Trail, King Road, Riverview Road recreation areas and the state campgrounds at the old CC bridge site.

Under the section headed socioeconomics the report states in general that Camp Grayling is a notable socioeconomics effect on the primary social and economic environment. It is good for the town of Grayling. Camp Grayling is not good socioeconomically in general for the rest of the impacted area because it reduces, by the very nature of the necessary activity, the tourism that nourishes the other surrounding areas. Recently while reviewing the area around Cannon Creek off of Fletcher Road in the month of May, I met a turkey hunter who was complaiing about the fact that the troops were on manuevers between Naples Road and County Road 571 with arms fire all night long and in the early morning and frightening off the turkeys that he called in before he was able to take a shot. His statement to me, they are all over the place, appears to be

a good example of significant impact.

Under the section cumulative impact of master plan in paragraph 2, the report states: "The implementation of the Camp Grayling master plan can be performed without significant impacts to the environment. There are not unmitigatable effect that will be significant for individual actions or collectively". I take issue with this statement, and in addition to previous comments that I have made those of you who have been following reports in the Kalkaska newspaper and the Leader Kalkaskan have read about other folks who have had individual direct contact which has been unpleasant, distressing and possibly even traumatic.

My family has had personal exposure to low flying helicopters, that do not have buzz numbers on within the last month. In the Thursday, June 8th issue of the Leader Kalkaskan, General Vernon Andrews was a guest columnist and promised, as he did at the dedication of the armory, that changes would be made. The article was an excellent article and I sincerely believe that General Andrews means what he says. Unfortunately, in his column there was one very

notable omission, he mentioned nothing about the assault landing strip. I have been on the assault landing strip location as recently as two weeks ago and it is my recollection that the Governor, in response to the select committee's recommendation, asked that the assault landing strip be put on hold for one year. The road is finished from the cantonment area to the assault landing strip access road. The southwestern portion of the strip has been virtually cleared of all of the trees. They are in the process of surveying and placing engineering grade stakes for the layout of the project. So it appears that they are not following their commander-in-chief's directive and are progressing with the project.

In Traverse The Magazine, December issue 1988, Debra Wyatt, publisher and editor, relates in her editor's note: "The letters are a continual reminder of the commitment our readers have made to Northern Michigan, whether they live in Boyne City or Indonesia. Last month William Green, an attorney from Bethesda, Maryland, took the time to write us and hear his concerns that Northern Michigan will end up facing the same

pollution and overcrowding problems that plague Chesapeake Bay and the Atlantic Coast. He ended his letter by asking the question, "If your part of the country becomes as bad as ours, why would we ever want to return again?". It is a question worth asking, and I find it particularly poignant that it came from an unsolicited letter from a reader.

Hopefully we will never be confronted with the disaster or even the slow erosion which leads to an equivalent disaster as Knute Johnson the fisherman in Valdez, or the problems plaguing the eastern seaboard. But the only way that we will is to stand up and fight. The process by which solutions are found is often cumbersome and time consuming and outcomes are very likely to be compromises. Ultimately each one of us has to determine whether the process is worth it. And that really boils down to asking ourselves is our area worth it. I would hate to think that we can't come to some compromise and solution without resorting to litigation.

Sincerely, John B. Cook.

MR. EBERSVILLER: Bob Hartwig?

MR. HARTWIG: I speak in response to

the draft environmental statement. I am Bob Hartwig, president of the KP Lake Association.

KP Lake has been mentioned several times tonight. We are within the confines of the boundaries of the guard, and we hear from time to time that it would be necessary for the guard to buy out KP Lake as such. I have talked to no one who is a resident there who is in favor of that.

I read or scanned most of the statement and I have not seen sufficient reference to KP Lake. We have here more than 70 homes, the ownership of some of them date being back to the 20's. I believe the foremost environmental issue here relating to the military is noise and concussion, I have to add the word concussion. It's important to us.

We began questioning the Michigan National Guard about the use of high explosive ammunition in the 1950's. Their answer was that they must use up all the surplus World War II ammunition first. I questioned General Vernon Andrews in a letter, August 1988, about the need for high explosive ammunition in artillery practice. His answer was that it costs more to produce practice ammo, it's dangerous and does

not properly train the troops.

I am quite sure that the pilot that drops a 500 pounder, that's a live one, on range 40 does not see the target hit. I am sure that the crew that fires the artillery does not see the shell explode, some things are just difficult to understand.

In the last couple years the military here has been using more practice rounds, that's because of the action by people such as you, as long as they are going to practice in the near back yards of civilian population, why not use all practice routes, that would certainly help the folks at KP Lake. We don't feel at all comfortable with planes flying over the lake loaded with 3000 pounds of high explosive ammunition.

The impact statement 4-3.14 says, quote, "Flight paths are carefully designed", unquote, and so forth. Folks live around KP Lake all the year, the same is true with helicopters, they so often fly directly over our homes at tree top level, they do harass us, and it is often -- certainly the military needs to train, but in a country as large as ours, is it really necessary

to train in a residential back yard?

Let me just give you one prolific incident. It involves a 3000-pound accident, and I should say accident or experiment, I am not sure which, in June of 1987, soon after the explosion the footing under a house on KP Lake settled. The wall tipped out a bit, the door frame twisted and broke, the ground in front of the house settled a bit. At the same time the walls of the garage developed cracks, the garage is about 200 feet away from the house, both buildings had been there intact over 30 years. Mrs. Hidrix, a widow, contacted the military. She was directed to get an engineer's study on the house construction, the footing, the foundation and such. This she did to the tune of $400 or so. The report showed the house to be very well constructed. Lately she has received a letter from the military claiming no responsibility.

A question I didn't see addressed in the statement and has been mentioned several times, but I am going to remention it, could the continued use of high explosive ammo in the impact area, I am talking about range 40,

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particularly, affect the ground water? Have wells been sunk to check it? If the water was damaged, how far could that chemical carry it? Would that in any way damage the residential wells outside of range 40? I haven't seen any answers to that. This area, this land among the Au Sable and Manistee and a few small lakes is and has been for sometime recreation land. It's where since the lumbering days folks have come to fish and hunt and relax from the rigors of life elsewhere. Some have built camps, many have built retirement homes.

Years ago land was set aside for the Michigan National Guard, all these factors we have gotten along with. We have been compatible. We have been able to share the environment well. But to have troops from elsewhere move in to train, that's not what the problem seems to be -- that's what the problem presently seems to be all about. Here is not the place for such. This is not Fort Grayling. Around KP Lake, the place where folks live and have lived for years, there are army camps across the country for army training and the environmental impact statement needs to address this.

Thank you.

MR. CAMPBELL: My name is Harry Campbell. I would like to spend my three minutes talking about the warbler. I would like to know who in this room wrote on page 18 that the Kirtland warbler bird is a state threatened species. Did you write that?

MR. EBERSVILLER: I don't know.

MR. CAMPBELL: Do you know if it's a state threatened species? It's a federally designated endangered species. Do you know the difference? It's a ward of the Secretary of the Interior, it is a federal issue, and this document spends about four sentences talking about the Kirtland warbler, and one of the most interesting is on page 18, this area referring to some areas in the multi purpose range complex that are going to be cleared for jackpine, this area has been habitat for Kirtland warbler, a state threatened species, since 1976.

In my mind as a private citizen, that is either an indication of utter incompetence of the generation of this document or intentionally misleading to try to keep this under your hats because we are talking about an animal that

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ranges with the grisly bear, the Florida panther, the condor, the whooping crane, the woodpecker and the Kirtland warbler.

And it is our federal responsibility and our responsibility as a nation to protect this bird, not the DMA's responsibility to shuffle it off the camp so they can blow off bombs. And we as Michiganians will be subject to an international scandal if we do not protect this bird.

I believe that this should be sent back to the army and have competent people rewrite this section on the federally endangered species and have it submitted to the proper authority, who is the Secretary of the Interior of the United States for public comment.

If you would like me to, because I am neither a lawyer or a scientist, and this is really the only issue in this whole thing I can understand. I did get information, and there is interesting stuff in it, about threatening and harassing. There is interesting stuff in it about court cases in there. Large federal projects were stopped because it was the intent of Congress to protect these at all costs and

this is serious stuff and it -- I don't think it's the most important issue that faces the people up here, but it may be the most important environmental issue that will face Michigan in many years.

Thank you.

MR. EBERSVILLER: Howard Nanninga?

MR. NANNINGA: I am also here on a get-back statement. I am a resident of Garfield Township, I live fairly close to the new assault landing strip. So tonight I will talk to you on the landing strip. June 13th, 1989 Kalkaska High School hearing on the draft environmental impact statement.

The DEIS report has a lot of words like no action, as proposed, no impact or insignificant, no real depth and data on many of the proposed projects.

Tonight I will address the proposed project number T3 assault landing strip. This proposed landing strip is located south of the Manistee River in section 31 and 32 in Bear Lake Township. The airstrip is to be 3600 feet long, 60 feet wide, with a 10-foot shoulder and a 300-foot overrun on each end. It is unclear on

how many aircraft will use this strip. There is no data on what kind of usage, how many aircraft will use this strip, how many helicopters, how many troops will take part. You must have the answers to these questions to evaluate the noise problem. 56

The EIS says to take precaution during construction to insure sediment does not enter the one drainage way which enters the Manistee River. But in fact, there are three, not one, three natural drainage ways to the Manistee River. They say sediment and erosion are possible, but not likely. Then why are there two permanent drains across the road?

It talks of bales of straw are not a permanent filter, states bales of straw are a temporary construction type of filter. We would like to see something said in there of a permanent nature. We want a permanent filtering system. A gathering point with a filter system in it. Something that can be maintained, cleared periodically. 57

If this is to be built in this area, refueling activities on this type of soil in this area, the slope of the land and the ground water 58

that is so close to the surface could cause real problems with a major spill you would not have time to prevent the the fuel of entering the river or the ground water.

How is the fuel going to be transported to the pad? Is it to be in rubber blotters on C-130's? They will hold three of them. Tanker trucks? Maybe this is the reason for the rebuilding of the CC bridge. We also have a problem of toxic emission from the fuel, airplanes, helicopters and trucks will put in the area. How will this affect our rivers and our creeks? How will this affect our clean air? How will this affect our vegetation? 58 59

Through Soil Erosion and Sediment Control Act Number 347 of 1972, the DNR should look at this area very closely. The EIS data is delete in many areas on this issue. Maybe the DNR should make sure that Hickok & Associates conform with the rules and regulations of the division of land and water management. Maybe Hickok & Associates could go to the DNR and attend one of their seminars, divisions, soils and runoff, soil erosion and sediment, sediment base and vegetation, erosion control. I am sure

that the DNR would enroll you, and we would appreciate it very much.

You can see if you would just have looked at the map that there is three common drains to this area along with wetlands. I herein rest my case.

MR. EBERSVILLER: I have quite a stack of people here. Normally we take a break after a period of time, but I think in order that everybody will have the opportunity to speak here that we will just go right through.

Art Schwarm?

MR. SCHWARM: I represent to everybody that they get up here and talk because sitting in these hard chairs gets to be a long evening.

My name is Art Schwarm and I am here to speak on my own. I own and pay taxes on property located on the Manistee River located approximately within a mile or so of the proposed assault landing strip.

You have heard many comments tonight of the total inadequacy of the DEIS, and I certainly concur with that. In my opinion allowing the overall expansion of Camp Grayling and specifically the construction and operation of

the proposed assault strip would be a major and tragic mistake.

The Au Sable and Manistee River systems are absolute jewels in the recreational treasury in the state of Michigan. These areas have always offered outdoor minded citizens the opportunity to enjoy some of the finest fishing, hunting, camping and canoeing that can be found in the country and still be just two to three hours away from major metropolitan areas.

It is an area with significant current tourism impact and even greater potential, one that I might add that has already suffered mightily from proximity to Camp Grayling and the documented abuses that have occurred over the years.

But let's imagine that just for a moment that Camp Grayling had never been built, it did not exist today. Would anyone seriously think that in this enlightened environmental area that the construction of a major military training base right in the heart of this prime Manistee Au Sable recreational area would ever get a considerable or a credible consideration? No, I think not. I think it would be completely

incompatible with the most valuable use, and to even contemplate the taking of prime recreational lands that are located within easy reach of millions of our citizens and turn what only nature can give us into a wasteland of noise and mechanical disturbance would be judged as outrageous at its best.

Obviously if the citizens of Michigan would refuse to allow this degradation of blue ribbon recreational lands in this imaginary example, then they should refuse to allow any increase in the degradation of these areas in today's real world situation. What isn't imaginary, though, is if the expansion of Camp Grayling and the proposed assault landing strip and the support services are allowed, then you and I and all of the others that come after will see another severe reduction in the quality of one of the state's finest natural resources.

The facts are simplistic. One, the population of this country will continue to grow. Two, the prime recreational lands of this country will continue to be under ever increasing pressure. Three, the military training base activities are totally incompatible with the

maximum enjoyment of nature and her gifts. And four, unless we stand up and say no, the base will continue to ever expand its operations in the future.

This would lead then to the conclusion that the acceptance of incompatible uses, for example, the expanded activities of Camp Grayling, will come at the direct expense and abandonment of one of our most valuable resources at a time we can ill-afford that, and to me the trade-off is simply unacceptable.

MR. EBERSVILLER: R.E. Newman? Virginia Sorenson?

MS. SORENSON: I relinquish my time to Linda, so whenever she comes up this will give her additional time.

MR. EBERSVILLER: Why don't we do that now?

MS. CASWELL: This is a heavy responsibility speaking for people. This is a very heavy responsibility speaking for people that give me their time, and I want to thank them very much.

I stated at the last meeting on the impact study that I believed that this really

boiled down to a matter of credibility. I believe that more strongly now than I ever have at any time, after two conversations that I had this afternoon with two different individuals. I will deal with the DEIS, but I have to say something that is a little bit outside of that issue to prove my point of credibility or the lack of it as far as this situation is concerned.

I stated last night that I felt, and last night there was also a meeting here in Kalkaska at 6:30, we had a question and answer session with various individuals of the military and John MacGregor. I stated at that time that I believed that I had at some point in time somewhere read that there was an incident of a PCB spill, and I was told that that just wasn't true. And I went home, went back to my many stacks of papers, didn't sleep very well all night and still couldn't find it.

In the morning I went back again, I found it. When I found it, my first emotion was elation, my second emotion was anger. My third emotion was frustration because I didn't know exactly how to present this to you, it has to be done in a very credible way. I believe in

credibility. But it also has to be done in such a way that somehow it will set you all emotionally off so that this is not the last time that you will get together as a group. You must realize this is not the last time that we will have to address this issue. And every person in this room that cares about this issue is going to end up in Lansing as a group. Remember that.

This is a document, a very fine document, from the DNR. I felt it was very thorough. The gentleman that did it was very concise. I just will read a short portion of it. "Neither of the two General Electric transformers nor the area in which the transformers were stored or the drum of excavated soil were marked with the ML label --", and the ML label is a universal label for PCB contaminants. "The inspector observed an untested ~~foliage~~ voltage regulator to be leaking and observed that an untested mineral oil transformer had spilled." This happened or the inspection number is March 26 of 1987.

The location near the outdoor fenced storage area did not meet the requirements for long term PCB storage areas. The 18 transformers

were stored in this area for several months. In addition the 18 transformers including the two GE transformers were not stored with secondary containment provisions when observed in building 26 at the time of inspection. None of the transformers nor the drum of excavated soil stored in the building 26 were observed to be dated with the original date of storage for disposal.

While discussing the issue with Major Lawson, this gentleman stated or Major Lawson stated that he knew nothing about the PCBs or PCB disposal regulations. He also stated that all the Camp Grayling transformers are maintained by the military, and that the facility had no records of what transformers contained PCB, or what ones didn't. He stated that Camp Grayling, quote, "was kind of a dumping ground for other military facilities to send unwanted materials". The action was apparently taken without consideration, or possible PCB disposal regulations. The facility is not to deal with PCB transformers, but Major Lawson desired to put that in place. A 1920 acre lake, and improperly handled spill or improperly disposed PCBs could

easily result in a major environmental problem. Would you please consider scheduling this facility for a TSCA inspection as soon as possible? If you do schedule this facility and if I am available, I would like to accompany the inspector.

I have talked to the gentleman who wrote this report at length. It was a good conversation. I didn't like what he told me, but it was a good conversation. I have talked to several other individuals that verify what he has said. I will just go on one more minute about this and then back to the DEIS. It must never be forgotten that military bases contain some of the worst toxic waste possible in this country. Anyone that does an impact study should always keep that in mind. It isn't the military's fault necessarily, they deal in armaments, they deal in chemicals, they deal with fuels, it's something that is part of their business. This cannot be forgotten again by anyone.

I learned today that one military installation dropped numerous drums, I can hardly say the word I am so devastated by it, numerous drums of nerve gas into Lake Superior, this is a

recent development. I have also heard that there has been involvement with cyanides and mustard gas. These are things that we cannot ignore any longer.

Now I will address the DEIS. This statement, the DEIS's statement, does not create a program of compliance to environmental regulations. The DEIS does not build a convincing case for building the assault landing strip. The issue of fuel spillage and dumping is not dealt with at all, and there simply could not be any accidental spills at all in the Manistee River area, ever.

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The statement does not deal with long term monitoring wells. The statement does not deal with the seriousness of toxic chemical use and we must remember one thing, bombs are considered to be highly toxic. It does not consider the seriousness of toxic chemical use on state land, federal land, etc. Chemicals such as benzene, cyanide, hydrocarbons, PCBs and the like are involved in this. In other words, Camp Grayling is not in compliance, and the DEIS simply does not provide proper compliance with this. The DEIS does not provide much credibility

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and certainly does not bring Camp Grayling into the 20th century as far as credibility is concerned. It's a tragedy and a travesty that we have had to waste our time.

I have to point this out. The military seems to be thinking that they are doing us a favor by having these open meetings. I will tell you frankly, I am exhausted, I know Dan is exhausted, I know Howard is exhausted, our spouses are beginning to complain bitterly because this has become an obsession with us. The reason it's become an obsession is not because we are radical, but because we care obsessively for this area. There is nothing wrong with loving the environment.

What is wrong is when I get a report, a very official report, dealing with the exploratory analysis of the relationship between toxic waste and cancer mortality in Michigan. And in that report I am very sorry to say that Crawford County is listed as fifth highest in mortality rate due to cancers. That was not something that pleased me at all, and I am sure it doesn't please you. I am sure it shocks you and saddens you.

These are documents that cannot be denied. I am not saying this report is perfect, but it does set a big question mark before us. And the question mark is: We have a right, an absolute guaranteed right in this country, to question any activity that is going to affect our environment or our health. This is a free country, we are a democracy, we are going through a democratic process, it's long, it's arduous. We also have a right to demand perfection when it comes to our health and our environment. This study does not even come close to being perfect. We cannot allow it to stand as a representative of what they are trying to do.

I wrote something on the back of this, the assault landing strip is not going to be built. I wrote this to myself because I cannot see, after having another conversation with another individual today, I cannot see how there would be absolutely any scenario where there would be fuel dumping in the Manistee River area where they could clean it up. First of all, how would any of us really know? We are talking about a remote area. We are talking about an utterly remote area. I was told today that I

have to get my little feet back to Grayling, and I have to start beating on some doors to have well samples taken along the airstrip in Grayling because there is some real concern now that the benzene levels might be very high. Fuel contains benzene. Benzene is not going to be in large numbers, I can tell you right now, in the Manistee River. I don't think any of you are going to tolerate that.

As far as the MPRC range is concerned, I think that issue is so absolutely complex we don't really understand it. I know I was also told today that Camp Grayling is not in compliance as far as the bombing site, site 40, range 40. Range 40 is a mess. A gentleman here stood up before me, wondered if the ground water possibly was contaminated. I can tell you right now, the ground water is contaminated. What we have to do is just absolutely insist that the right agencies start testing. When you have a highly permeable soil such as we do, and we have the type of situation that we have had as far as bombs are concerned, it's a little ludicrous to think that it isn't. The water is compromised and the soil is compromised. That is a fact.

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There also was brought up to me today the issue that they are not in compliance as far as handling bombs that have not been detonated. They can't just blow them up, they can't. They are toxic. They have to be taken care of in another way. It is time that we absolutely demand from the military credence to the fact that they are going to help us protect our environment, and to do this we have to do a bit more than we have, and I have to ask all of you to do it.

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It isn't going to be enough to write letters, which you must do, we are simply going to have to appear down in Lansing as a group. We have to be eyeballed, as they say. So I am asking all of you to take that commitment upon yourself, somehow we will do it. And I am asking all of you to write a statement, and I don't care if it's on toilet paper, it doesn't matter, to the Governor's office stating that you're not happy with the DEIS. You cannot, absolutely cannot accept it as it stands.

Thank you.

MR. EBERSVILLER: Jack Sloat?

MR. SLOAT: Hi, I am Jack Sloat. I am

down on the clear bottom of the totem pole when it comes to local government because I am a township supervisor. Due to that fact, I deal with a grass roots problem. I deal with the people that live in Garfield Township, many times in the surrounding area.

Already this year I have been approached, I thought it was good to bring this up because someone before me mentioned Missaukee County. I have been approached by several persons from Missaukee County who are hearing the roar of Congress and are being affected by military traffic dust, noise and so on. As a matter of fact, I have a daughter who lives in Missaukee County near Moorestown, in the Moorestown area.

I do not have the technical expertise to go into the general state of affairs of Camp Grayling. I feel that has been done very aptly by Dan Alstott, AMAC Corporation, Trout Unlimited and many of the other people who have presented their cases here.

Consequently I would like to stick to reiterating what I said before, a grass roots problem, that's the people problem. I have had

citizens of Garfield Township come to the township office, people who have lived in Garfield Township, not only all their lives, but five and six generation families who live there. I have had people come into my office with tears in their eyes, pleading with me to do something to stop this noise and this confusion and the ruination of this beautiful area where they live.

In several cases there were people who were afflicted with illness which the dust problem greatly aggravated. I was witnessed to one lady who talked to Colonel Hanson about the area where she lives which happens to be one of our greatest concerns in Garfield Township, that is the 20,000 acre lease that has been leased to the military by the DNR. I was told last night or informed at last night's meeting of the board of commissioners with the DNR and the military, this was not really a lease, but for lack of something more appropriate I am still going to call it a lease.

20,000 acres of land in Garfield Township. I believe that was in the spring of 1987 when we were approached by the camp commander then who was Colonel Schmidt. This was

the first time that Garfield Township had heard of this, had any notification whatsoever that 20,000 acres of our beautiful back door property, of our surrounding area was going to be subjected to military training activities. The state forest land that we had trusted and entrusted to the DNR to protect and beautify and keep in good shape for us. We were told then that this contract was signed and agreed to in 1984, three years later we finally got a rumble that 20,000 acres of our land was going to the military.

So therefore in the DEIS statement, which I am sure all of you will agree with me on, says very, very little about leased land, touches on it very lightly. I can guarantee you that there are thousands of people who object to the DNR leasing state forest land to the military.

At the present time we have formed in Garfield Township a council, it is called the Garfield Township Environmental Council. This is not a citizens group, this is an extra arm of township government sanctioned fully by the township board.

They have given us the duty and members of this council to inspect, to personally inspect

what is going on in this 20,000 acre lease, which we have done many times. And each time that we make an inspection tour we become more concerned, more saddened, more distressed.

People who live in the area tell me that the things that go wrong that they report takes at least a week to get an answer. The military and the DNR don't even agree on who you should contact for your grievances.

At a meeting in Grayling we talked with John MacGregor and other leading officers of the DNR, and they told us to contact them personally, directly and immediately of any violations that we saw occurring in that 20 acre lease parcel.

At the same time shortly after at a meeting that I attended of the county board of commissioners when Colonel Hanson was there, I brought this up to him because before I spoke he said report anything to the military that goes wrong, we will take care of it. Well, I asked him then, I said who do we report to? I have been told that we should report to the DNR, who I would think is the boss of this land, it's the DNR, it's state forest land and the DNR is supposed to be managing it. He said -- Colonel

Hanson said, and I quote, and I am sure it's on tape at the county board of commissioners meeting, he said, "We do not answer to the DNR, they are not our boss". Okay. There seems to be a little conflict there.

I believe that we have been referred to a lot of times as part-time people, part-time residents around the camp area who are doing most of the complaining. I want you to know that I am complaining not only for the citizens of Garfield Township, probably 99 percent of them.

I also represent the Manistee River Association of Fife Lake, Michigan along with the Garfield Township Board and concurrence by the Kalkaska County Board of Commissioners. I have been in the tourist business all my life. It has been part of my substance, and I can tell you that in the last five years it has dwindled very rapidly. Many of the people don't care to fish, many of the younger people are Vietnam, Korean veterans and they said they saw all the helicopters they wanted to see over there. And now when they float down the Manistee River they are being buzzed by those vehicles in the air.

So it is a people problem. I am here

to represent the people. We have gone on further than that, we are circulating a petition that's going to be delivered to the Governor very soon stating the very words that I am telling you now. Stating in fact as the main subject of our petition that we would like to have this 20,000-acre lease rescinded entirely. Not only on the grounds of noise and incompatibility, but on the same things that many people here before me have said tonight.

And I can tell you this, and I don't have to lie about it, it is a wetlands area, a good share of it. Many streams heading and flowing into the Manistee River, many small springs that are covered by foliage that wouldn't even show up, many small streams that wouldn't show up and aerial photos and do not show up.

I worked in the township as an assessor as well as the township supervisor. I know as a matter of fact that aerial photos oftentimes miss small bodies of water and small streams. They are there. They are beautiful. They are part of our environment, and we don't want them endangered by the military. We don't want them endangered by anybody, and we want to lean very

heavily on the DNR for the protection that we need.

We feel this is their responsibility, the DNR, and we are going to move in that direction from our district officers who have already voiced opposition before this plan ever came into effect almost without exception. Every one of the DNR officials and these small district offices and sometimes the area offices voiced opposition to the leasing of these parcels of land, and yet it was done, over their heads it was done. We in Garfield Township are out to undo that. We mean to keep on until that contract is rescinded or at least a major portion of that contract for the wetlands are concerned.

The airstrip has been referred to here so many times tonight as not in Garfield Township, but it borders Garfield Township. Garfield Township residents often drive through that area to get to their friends and relatives that own cottages up along the Manistee River. The planes that take off from that landing strip will be flying over Garfield Township, but most of all I am interested in preventing any kind of a catastrophe to the Manistee River, both to

sportsmen as president of the Manistee River Association, as the chairman of the township environmental council and as Jack Sloat personally. I do not want to see the Manistee River become polluted in any way, shape or form by anybody.

We were told last night at the meeting at the county board of commissioners that the only thing that is going to be there on that landing strip once it was completed was sand and gravel. All right. So I see a 130 comes down and makes a crash landing, several thousand gallons of gasoline are spilled on that sandy, permeable soil that drains directly into the Manistee River. Where is our protection? Who is going to stop that from happening? We want that. We would like to see that, and I am talking about the people that I represent. We would like to see that airstrip moved further away from the Manistee River, south and east, there is plenty of room for it south and east.

Another thing about that landing strip, you talk about the Kirtland warbler, I made a personal inspection of that area about three weeks ago with two other members of the Garfield

Township Environmental Council. There is right at this time jackpine that is ideal for Kirtland warbler habitat and is probably not a mile away from some of the Kirtland warbler habitat at present. There are also thousands of little jackpine that are sprouting in that cleared area where they are surveying, where they staunchly maintained that no work was being done, there is big pines like this cut down, a wide sweep where it looks like we are getting ready to build a landing strip or a highway, but survey work and cutting of trees has occurred in defiance of the Governor's order to layoff on that project.

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I guess that I have taken up enough of your time on this. I just hope you all remember what I said, and if you can't remember it, call Jack Sloat or the Garfield Township Environmental Council in Kalkaska County, and I will help to refresh your memory.

MR. EBERSVILLER: Margret Custer?

MS. CUSTER: I am Margret Custer and I live in Garfield Township.

The DEIS does not address the 20/20 land agreement between the DNR and the DMA, that that's the Garfield Township area. The only

mention of this area is a map which shows some wetlands, but doesn't present the total picture of this sensitive area. The problems experienced in this area have been stated by the DNR or to the DNR many times through letters and meetings, yet this lease still stands. I know they don't call it a lease, to us it is.

There is a direct conflict between state forest lands belonging to us, the people of Michigan, and the DMA that is using it. I agree with all these statements made by previous speakers here tonight as to the shortcomings of the DEIS and the whitewashing, but we also need to focus on the happenings in the 20/20 agreement area. Some of the happenings are roads destroyed, trees cut, fugitive dust, this is addressed not in our area but in the EIS. Traffic from the convoys which is unbelievable, garbage left all over, fox holes, signs in prime recreational areas warning don't enter or do not enter, enter at your own risk, whatever.

People need to wake up and realize that while you may not be affected now, you could be shortly. There are a lot of people in Kalkaska County that don't realize that that corner in

Garfield Township is greatly affected.

I would like to charge the DNR, Mr. MacGregor as a manager and protector of our environment to start representing us. The 20/20 lease can experience the very same things that the folks in Bear Lake Township and other areas that are a part of the old camp are experiencing. So when you allow one of these leases to go out, you should also require a statement to be made, an impact statement. You entered into this agreement with the DMA without giving us the right of protest.

The first time I heard about it was when I read that there would be a meeting at the Garfield Township Hall, Lieutenant Colonel Schmidt would be there and we were told what would happen to us. And I know my 80-acre parcel becomes a real sore thing to the DMA and to the DNR, but I am going to keep on because that is in the Commercial Forestry Act, and I am going to fight for it. And you are destroying -- the guards are destroying our environment in Garfield Township. That's probably one of the most prime deer hunting and trout fishing areas that there are. And it's a very, very, very fragile

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wetlands area.

So I am asking the people of Kalkaska County stand up, get with Garfield, folks, or you are going to have the very same thing that people at Guthrie Lakes and all over are talking about.

Thank you.

MR. EBERSVILLER: Sally Alstott?

MS. ALSTOTT: I have reviewed the DEIS to some degree and I concur with those who have spoken before me.

One thing that wasn't mentioned too much was the traffic problem that has been caused by the guard in the area, especially where we are. We use 612 a good deal and Saturday we were going to come back from Grayling and as we got just before Lovells, a truck pulled out that we were passing and he didn't have a turning signal and he hit us and shoved us into a ditch. And it was very, very upsetting and I am still very upset. It turns out his signal was not working and as we were in the ditch waiting for help, some soldiers came out in the pickup truck and jeered at us and yelled at us. It is getting so we can't go anywhere, and I think something should be addressed in the EIS about that.

Thank you.

MR. EBERSVILLER: Carl Lord.

MR. LORD: If the comedy goes on too long it becomes a tragedy and that's where we are now. I am a representative of the Enchanted Forest Property Owner's Association, better known or commonly known as Guthrie Lakes.

The environmental impact study that was prepared for the Michigan Department of Military Affairs is certainly an impressive document, catalogs dated intended to prove that the master plan projects are not threatening to the stability of the area's environment. I guess it's difficult to argue that mere construction of facilities constitutes danger. Inherently buildings and facilities posed little or no threat. However, the anticipated utilization of the facilities would appear to be the real issue.

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I think the answers are obvious. We at Guthrie Lakes are really concerned about intensity of training that will damage an already fragile environment that we choose to be a part of.

The statement is ambiguous regarding the relationship between projects and their subsequent use. On the one hand the Department of Military Affairs states that it does not anticipate substantial increases in the number of people that were trained at Camp Grayling. Indeed at recent hearings I am talking about the Governor's blue ribbon committee where the department denied any increase in the intensity of training. However, the department admits in the EIS that over the period fiscal year '80 to fiscal year '86 that the average yearly increase in troop strength at Camp Grayling was 3500, that's a major increase in my book.

The EIS makes reference to a public scoping meeting conducted in September of 1986. Guthrie Lakes' concerns were enumerated and it included vibrations so intense as to cause damage to structures, military trespass on private property and overflights across Guthrie Lakes by low flying aircraft.

I might add we just had that today, a fighter aircraft over Guthrie Lakes. I don't know what they were loaded with, but they were flying over a very concentrated residential area, it's hard to get the numbers, though, it really is.

These conditions that we are talking about still exist, especially noise pollution, which is the direct cause of damage to structures located in and around Guthrie Lakes. For the folks residing at Guthrie Lakes, noise pollution is an ongoing problem. The EIS defines noise as sound unwanted, objectionable or misplaced. It's not misplaced, we have it, I can tell you that right now. We know where it is at. It is said to annoy people, but the statement fails to comment on damage to man-made structures such as the 173 homes located in Guthrie Lakes. The statement states that there are only 39 homes.

The Department of Military Affairs continues to ignore noise studies made by the Department of Army. Agencies such as the Construction Engineer Research Laboratory, they fail to honor the installation, compatibility use zones devised by DMA agencies. Use zones are

divided into three noise areas with a major portion of the Guthrie Lakes development falling into zone 3. Zone 3 classification by definition indicates that an area is clearly unacceptable for use if noise levels exceed 75 decibels in a residential area.

Citizens residing at Guthrie Lakes feel that there is clear and present danger regarding impulse noise levels which are far in excess of 75 decibels at given times. The area was recently subjected to several days of bombing related noise which measured approximately 130 decibels. By the Department of Military Affairs' own admission, 500 pound bomb drops in 1985 registered 125 decibels on the west side of Guthrie Lakes, that's the side away from range 40.

In 1985, 100, 500-pound bombs were used in the range 40 area adjacent to Guthrie Lakes. How is this obvious violation of citizens' health and rights justified? What data would deny in activity, the guard uses a device called mitigation to justify an action.

Examples follow, winter training will alleviate noise levels by spreading it over the

entire year. Neither the state of Michigan or the City of Grayling have enacted specific noise regulations, therefore there is no technical violation of training results in excessive levels. Federal agencies recognize 55 decibels as a goal for outdoor noise in and around residential areas. But this does not require conformity because it is a goal and not regulatory.

One must consider busy day conditions within the context of the 365-day period, thus average noise appears to be the criteria, and I will be doggone if the last couple of days were average. Averages I think are a lousy statistical tool to use. Energy averaging the 24, 1-hour values in a day is suggested. That's two hours of 137 decibels readings when energy average could be less than 12 decibels, well within safe and accepted limits. That is -- somebody mentioned it was hogwash, I guess is the term used a couple of times and that's about it there.

In summary, one might address the following questions: Can natural resources be managed in a sound environmental manner and yet

be harmonious with the mission of Camp Grayling as discussed in the EIS? We at Guthrie Lakes would answer negative to that question, I will leave that for you to answer.

Another statement or another point, is the statement is so prepared as to square the results in favor of the sponsoring organization? Next, had the Department of Military Affairs pre-determined its position, they reject categorically the option of relocation. Next, does the master plan suggest increased intensity of training? Next, is there an ethical obligation on the part of Camp Grayling to protect the health and property of citizens from noise pollution? Next, is the credibility of the Department of Military Affairs suspect considering the past performances and practices? At Guthrie Lakes the last questions would have been answered with a resounding yes, and I will thank you for allowing me to share the views of Guthrie Lakes' folks.

Thank you.

MR. EBERSVILLER: Diane McCullen?

MS. McCULLEN: I will relinquish my time to anyone who would like to have it.

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MR. EBERSVILLER: Mr. Duke?

MR. DUKE: I am George Duke, I am a property owner 3 1/2 miles south of M-72 on the west side of the Manistee River. I was going to relinquish my time, but everybody says I ought to get my two cents worth in.

20 years ago when I built a supposedly retirement home, it looked like a good thing. There was military people there for a few weeks during the summer, weekends in the fall and that was all. Now my wife and I have relocated our recreational time somewhere else because squadrons of helicopters, bombs going off at 2 o'clock in the morning, rifle ranges running 24 hours a day, I think seven days a week right across the river from us, it just wasn't the place I wanted to go up and relax in.

And awhile back when two military young men in a motor boat on the Manistee River, and I am trout fishing, run me off the river, I said this is time to leave. So we've since moved. I don't know whether to sell the property or not. I don't know whether I can sell the property or not. I don't think anybody really wants to live there under the current conditions. So with

that, I thank you.

MR. EBERSVILLER: Joyce Haan?

MS. HAAN: I'd relinquish my time.

MR. EBERSVILLER: Weldon Bumpus?

MR. BUMPUS: I'd transfer my time to that gentleman right there.

DR. FREYBURGER: I would like to say in preface, that the subject of forts and camps and so forth has come up. You might want to look up what is the difference between a camp and a post and a fort. There are magnitudes of difference. We are talking about Camp Grayling today, but in this document there is a lot of mention of the post. Think about it.

I am here representing the Au Sable North Branch Area Association, and I will limit my comments pretty much to things that we think specifically affect our area. In a section, in this same section that you have heard about before, I am also going to mention there is no significant adverse effects upon psychological or physiological or community needs of lifestyles of residents in the area are perceived as a result of a full implementation of these actions, quote, unquote. This I will use a little different

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language.

This is a baldfaced lie. At the hearing in Grayling on May 17th speaker after speaker gnarled this gnarl. The ambiance of North Branch residents, many of whom have been property owners for 15 to 25 years or more, has been profoundly affected in the past five years by the noise and concussion from your artillery rounds, bombs, jets and helicopters. When children visiting up the North Branch screamed in terror all night, is this not a significant psychological or physiological event? When frustrated property owners even think of picking up a gun and firing it at passing jets or helicopters, there is no question this is a significant psychological event.

In May of 1989 helicopters in groups of six to eight passed from east to west and back for several days just over north of twin bridges at such altitude that my wife said the noise was deafening. I have already lost most of my hearing, so I have to take her seriously. At no time when we saw them were they over guard leased property. In the past month jets have regularly left the bombing range and shrieked south just

east of the North Branch and directly over Lovells, so low that I could clearly see the pilots as they backed. When people in the area consider selling their properties because their prize ambiance has been shattered by military generated noise and concussion, how can you state there have been no significant adverse effects on community needs, our lifestyles, anything else? Major concussion effects from artillery bombs with pictures falling off the walls from the shaking houses, serve to amplify the concerns above.

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But I would like to get on to the subject of toxic chemicals, which we are most interested, including those which might be airborne, waterborne or animalborne. Since the prevailing winds float from west to east and since the upper North Branch appears to be in close enough proximity to the impact zone to potentially pick up toxins percolating into this drainage, this subject is of special interest. You state concerns over water pollution from explosive residues and ammunition dumped within the water of the camp will be investigated, and I have cited that place in the document where that

statement has been made.

We've heard that a report on toxic residues in Barns Lake and East Branch were issued last fall, we heard nothing about it. I spent my working career as a scientist in experimental medical research. I have been a member of several societies in that area, and I have reviewed manuscripts submitted for publications and journals.

In addition to a statement of purpose and a summary of results and conclusions which are presented mostly, the meat of a manuscript that is to be found in the methods employed, the justification of those methods on the detailed presentation and discussion of the results obtained absent the information cited in the previous sentence the reader or the reviewer is unable to judge the merits of this study. I submit that such detailed information is crucial to an environmental impact statement on the toxins questioned.

Have or will studies be made on the five or more heavy metals, mercury, lead, zinc, cadmium and chromium and their soluble forms? It's well-known that many of these are

concentrated. Many times in the food chain, if you get mercury concentrated a thousand times, what is in the water is in the fish that are swimming in that water.

What about possible carcinogens or otherwise compounds such as nitrosamines? These need to be studied in plants and animals as well as in the water because animals eat animals and plant animals eat plants and they can pick up and multiply the materials in them. We want convincing data on such substances which may affect our North Branch populous or any other populous that's interested. Through the air we breathe, the water we drink, the fish we eat and the game, deer, turkey, grouse, rabbits, squirrels, etc., that we hunt and eat. This is mandatory if there is something in there that endangers the eating of any of this material or our presence in the drinking water. To not fight it I think, is totally criminal.

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Now, much has been said about the Kirtland warbler. The person that read that should really get the total document and look through it because in there it states that about 1/3 of all the Kirtland warblers in the world

have been nesting on the tank range and they are now in the process, they haven't completed it, of destroying the area in which they have been nesting and expecting them to move to some other area that is being prepared. I think that piece of information may be useful. This is done under a cooperative study about the DNR and there is a compilation of that agreement in the document. I think this is another one of the concessions made by the DNR which should not have been made.

Finally, as I was putting this together, I was listening at the side to what was going on on the television. And it occurred to me, you know, we are in different worlds. Our world in no way resembles the world in China, and our laws in no way resemble their laws. And the national guard is not going to come in and round up people, or is not going to assault anybody or is not going to shoot them, but are there very significant fundamental philosophical similarities? It's a good question.

Between the leaders and the powers in China -- I shouldn't say the leaders. The document at hand addresses and needs a measure of overhaul. To me it is written not as a balanced

study, but as a document constructed to obtain the objectives of the national guard. It speaks of mushroom management. Mushroom management is keep them in the dark and feed them horse manure. There have been no significant adverse effects physiological or psychological, and no one was killed in Tianannen Square.

MR. EBERSVILLER: George Nice?

MR. NICE: I attended a meeting on August 29th of 1988. I was very surprised to hear some of the complaints. I feel that the quality of life doesn't include noise pollution, housing that is impossible to sell, shock waves, river areas being destroyed, trash, ground crushed to powder, earth that looks like the moon and many, many more things brought to my attention at that meeting.

I think that our natural resources must be used intelligently. I think we should have learned from the past about our management and protection that all people owe to the preservation of all forms of wildlife, trees and shrubs. The human being can learn to adjust to other population while our environment will only slowly become another endangered species on our

already growing list.

I feel the presence of the guard will only threaten and destroy the beauty that surrounds Northern Michigan. I oppose the 20,000-acre lease to the guard from the DNR. This was supposed to be public land used and enjoyed by all of us. I believe that good communication and quality leadership is essential. I know the guard is a necessity to live in a free world. People must be heard and the lines of communication must be unlimited.

I hope the county board of commissioners will give serious consideration to this situation. I believe the long term effect of the guard destroying our sensitive environment and lifestyle must be monitored by our elected officials.

Thank you.

MR. EBERSVILLER: Robert Parks?

MR. PARKS: I won't take up much of your time, but I would like to have you look around the room. How many members of the guard do you see and how many do you think they are concerned about you?

My name is Bob Parks, I am here to talk

on behalf of myself. I am the vice-president of my association, Guthrie Lakes, I am on the board of directors. It is my opinion, based on present fact, that the activities of the guard yet far outstripped the ability of that land to handle it without any expansion.

Now, let's talk about expansion. This study -- first of all, let me talk about the Kirtland warbler, we should be interested in this bird. But I, too, am interested in the needs of another bird, this bird (indicating self), you should be, too.

The study clearly indicates to me that there will be an increase in the activities of the national guard. To point this out I'll use as an example the multiple range complex. As I understand it, technically it will be far advanced over any range with the exception of one other in Idaho.

Now, with that in mind, do you think that other state and national guards will not come to Michigan to use this range? Do you think that these tanks will only use this range and not use this for maneuvers? Tank maneuvers take up a tremendous amount of territory, a tremendous

amount. If you haven't seen it, go on out and look at the land that has been used for tank maneuvers, it's desecrated.

Now, will these other troops come in? Last year I wrote a letter to Congressman Davis asking some questions on which I never got an answer, but I sent a list of these questions to General Andrews. I did get a reply from the assistant brigadier general, I will quote from this letter dated August 8th, 1988. The question that was asked was this -- it takes me a little time, my eyes have gone to pot in the last year, so do forgive me. The question that's asked is, "Other than Camp Grayling where are the other 15 ranges to be located?". They told us, there were 15 more, and he couldn't tell me. The next question, "What state and national guard units other than Michigan will continue to train at Camp Grayling?". His answer, "Camp Grayling is a regional training site and can be used by any state guard unit which needs the unique training areas this post has to offer".

During Camp Grayling's 75 years it has been used by units from Arkansas, Conneticut, Illinois, Indiana, Iowa, Kentucky, Louisiana,

Maine, Minnesota, Ohio, Puerto Rico, West Virginia, Wisconsin and of course Michigan. That doesn't mention Canada or Italy that has been here.

I would like to change at this point and talk about the fact that yesterday our whole area, one way or the other, was involved in school elections and school millage proposals. I don't know about Kalkaska or Crawford, but I do know in Otsego County it takes $2900 a year to educate one child. I think it's in the same area in both the other counties.

UNIDENTIFIED MAN: 2600 here.

MR. PARKS: Thank you. An average family of husband and wife and one child coming into our area will not pay the taxes to send that child to school. Who then pays these taxes? Well, those who have no children. And who are they? Well, the absentee landholder, recreational land people, and those people who came up here to retire.

UNIDENTIFIED MAN: What about single people?

MR. PARKS: Single people as well.

UNIDENTIFIED MAN: Thank you.

MR. PARKS: Do you think that these people will continue to come up to this country if this area is turned into one vast practice battlefield? I don't think so.

I would like to make one more comment on this study. A friend of mine who is a doctorate in some statistics, told me to always be wary of what he called pseudostatistics, and we may be involved in some here. And he used a rather unique example. He used an example of the fact that medically it is known that the older a woman becomes, the wider becomes her stance. It is therefore logical to assume that if she keeps her feet together, she will never grow old.

Thank you.

MR. EBERSVILLER: Mr. Bill Huhtala?

MR. HUHTALA: I was going to relinquish my time to Mr. Lord in case he wasn't given enough time for his.

MR. EBERSVILLER: Mary Lou Stuck?

MS. STUCK: I will relinquish my time to the next speaker.

MR. EBERSVILLER: Jesse L. Stuck?

MR. STUCK: I won't. I am Jesse Stuck, resident of Garfield Township, born and raised

there.

Mr. Jack Sloat pretty well represented the majority of the people out there in his summation of the attitude of the majority of the people, but I have got a few things here I want to maybe duplicate.

All right. In the articles I read in the paper state that weekends and holidays there will be a reduction in the activity to benefit the cabin owners and whatnot. How about the permanent people? We aren't all just resorters, we live here. We work shift work and sleep days, we get woke up by helicopters.

Another article in the paper speaks as if there was one eagle nesting in the whole area affected by this. I would like to know how many eagles live in a nest. There are too many sightings in the area for all those eagles to come from one nest.

I noticed that in your articles, which are probably accurate, you refer to a small number of people being affected by this, that's true, but in any other situation we refer to the percentage of people in an area affected. You ought to change that figure to a percentage

figure because I think you will find the percentage of people objecting to this expansion is damned high.

The warblers -- in past years the DNR established warbler protection habitat, they posted it, they built traps for cow birds that compete with the warblers for nesting area for the rearing of their young, and I haven't seen any of those traps big enough to include the capture of a helicopter.

We don't got any environmental problems to speak of as far as noise pollution, according to the paper. I was strolling around the back 40 the other day minding my own business, and all of a sudden a barn flew over, he wasn't quiet, he was cruising through at tree top level. What is it going to sound like when he is going the other direction and leaving the ground?

You know, I think this whole thing reminds me of the PBB deal years back. There was a lot of people in Garfield Township opposed to the burial pit that someone previously referred to, but because we are a small number of people, we couldn't get the Governor to listen, but a large percentage of the people were in opposition

to that burial pit.

Now, that's got to be some explanation for the Crawford County statistics on the cancer mortality rate in this area. I think there is a whole hell of a bunch more studying that needs to be done prior to this expansion.

Thank you.

MR. EBERSVILLER: Irene Nanninga?

MS. NANNINGA: Due to the late hour, and most everyone has expressed my same thing, I will relinquish my time to the next speaker.

MR. EBERSVILLER: Ray Warner? Beverly Hicks?

MS. HICKS: I'd relinquish my time.

MR. EBERSVILLER: Rick Hicks?

MR. HICKS: I am Romain Hicks. My wife and I live in Grayling Township, we support Dan Alstott and AMAC 110 percent. I commend Bill, you and Dan and the rest of that board for your efforts, and I would commend the rest of you to give AMAC your support because heaven knows they need it, they are out on point, they are doing a tremendous job for all of us. Let's get behind them and stay behind them.

You know, I hate to say it, but this

draft EIS statement is mute testimony to the fact that the difference between genius and stupidity is that genius has its limits. I have seen a lot of environmental impact statements, so I don't make that statement ill-advisedly. I am sorry to have that make a statement that strong. I don't usually come on that hard, but I have been on the periphery of this battle for a long time, and in a supporting role and decided that my wife and I and a lot of other good people in this community, in this overall community, have got to get involved.

I think Tom Baird from Trout Unlimited hit the nail on the head when he said, Camp Grayling has simply outgrown itself. I'll testify that the Grayling High School from an article in the Arizona Daily Star that said that Camp Irwin was the only base in the United States that was adequate for full scale military training. Ladies and gentlemen, if you didn't hear that comment, that base is 640,000 acres, and it's too small and they are going to buy 220,000 acres more to add to it, that's been approved by Congress because those are the growing needs of the military.

Now, with all due respect for these gentlemen from the military, they have a mandate, but we have to have a mandate. They have a job to do, and we have got a job to do, and we have got a good DNR in this state, they are honorable people. What we have got to do is take the politics out of this thing and give honorable people a chance to do their job and do it with honor and dignity and protect this great environment that we have. We have to find the courage to do that.

So all I want to say to you tonight, I want to make it very quick, I think we have come pretty close to concluding how many angels can dance on the head of a pin, and now we need to get on with the job at hand and that means solicit your friends and neighbors, and if we have to let's get the kids involved.

This is our land. This is our America, it's their future and it's their land, let's get out and fight if we have to. Get them to join us and our own grandkids and our children, for heaven's sake, let's leave here with a resolve that we are going to get other people to participate and win this battle.

MR. EBERSVILLER: Ernest Nold?

MR. NOLD: I'd give my time to the next people.

MR. EBERSVILLER: Dorothy Nold?

MS. NOLD: I'll do the same.

MR. EBERSVILLER: M.R. Robinson? Pat Feeman?

MR. FEEMAN: I will pass.

MR. EVERSVILLER: Elaine McGlinn?

MS. McGLINN: I am a big bag of wind, so I am going to talk. I am going to ask you to be patient a little bit more. I am going to repeat some of the stuff that's been said, and I feel it's all with my heart.

I wrote it down, I worked on this a little bit. I really think we have to hang together as a group, first of all, just like the gentleman said, and I think it might mean a march on Lansing. If that's the thing that gets the Governer's attention, and gets the media's attention, maybe that's what we got to do, we're there.

First of all, my name is Elaine McGlinn. I am a mother of eight. I am a registered nurse, not currently working, but I am

a registered nurse. I am a board member of the Anglers of the Au Sable, believe it or not I am very proud to be so. We have a second residence, I don't live up here year-round like a lot of you do, and I really feel for you, I would like to.

We purchased this place a couple years ago on the main stream of the Au Sable. We have been coming up here for 30 some years with my family, two tents, everything, a dog, everything in the van that we used to have. We had a great time, learned to love the place a lot.

Throughout this environmental impact statement is a simple recurrent phrase, insignificant upon mitigation, or yes votes we could definitely have a problem here but the national guard will handle it perfectly. The EIS document is a complete whitewash, and you have heard that term before, of the environmental degradation that has been and will take place because of Camp Grayling's plans for expansion and use with the MPRC and the assault landing strip.

All possible errors will be mitigated, but we know differently, don't we? The past of Camp Grayling's environmental destruction speaks

for itself. What is going on here is that during a review process that was preceded by an environmental inquiry important enough to call the Governer's committee hearings, the Governor in the first part of May wipes out the environmental review board, that's too significant. That's too close. Something is amiss. It wipes out the environmental review board of this state replacing it with a unit we know nothing about.

The governmental unit that governed these meetings was wiped out. Therefore there is really no basis for the formal review process. This is illegal. Who does this Governor think he is? Napoleon?

I say to you, ladies and gentlemen, this state is now afloat rudderless in an environmental storm. Has the political scene in this state become so fouled that the Governor must resort to such tactics to achieve his purpose?

And what of justice? I tell you the people will not be silenced, we won't be, will we?

PEOPLE: No.

MS. McGLINN: The Au Sable and Manistee areas are too precious to allow them to be ruined. It does remind me of the way the DMA has handled the Kirtland warbler problems and how dare these little creatures, be they endangered species or not, nest where the MPRC is to be. So then if habitat is destroyed purposely as it was by the military, they won't get in the way. And then the military can attend symposiums and say how much they care for the little birds and the environment. How absurd.

The MPRC is alluded to as causing no significant increase in troops which is also utter nonsense. All these dollars to build it and no more troops, that's been said before, too. Interesting to note is that the Hartwick Pines State Park, according to the EIS document, is within a mile of the northwestern ridge of the proposed firing range. Perhaps the DMA will acquire some of these precious acres, too.

Why are the maps in the addition as zoned to noise contour ever so carefully just missing the main branch of the Au Sable? Well, we live on the main branch of the Au Sable, and I can tell you that is zoned to noise, no matter

what they say, no matter how their map paints the contour. And it does affect fishermen, it does affect campers, it does affect canoers, it does affect tourism.

This aghast body of words says nothing of how the noise affects tourism and what a detrimental effect this has on the economy, and you, yourself, have said that. And the assault landing strip here in Kalkaska, well, whoever heard of C130's disturbing campers or hikers? And erosion, they are going to solve it by bales of hay? I am sorry.

I am going to address the military now. Are you military? We are not giving up. We won't believe your words. I don't believe your words. We remember the past. Your interest is not for the rivers, the tourist, the campers and the like, your interest is to fulfill your mission regardless of the cost to others. But, you see, we love the rivers, we love the land, we want it for our children, we want it for their children. We will not be diminished, and we will not be daunted. We owe it to the generations that follow to save these rivers, and we are going to do everything in our power to do so.

MR. EBERSVILLER: Norma Wheeker?

MS. WHEEKER: I'd relinquish my time to the next speaker.

MR. EBERSVILLER: Bill Lippert?

MR. LIPPERT: I attended the meetings in Grayling and this one tonight, and if 10 percent of what these people are saying is true, I am shocked that the Governor, the DNR and the military has the guts to go through with this expansion.

Thank you.

MR. EBERSVILLER: Ronald Schwarz?

MR. SCHWARZ: Hi, I am Ron Schwarz. I am a six-year veteran of the Michigan National Guard, I hope that doesn't discount my credibility.

In the essence of the -- in light of the late hour, I am going to keep this pretty brief, these hard seats I am sure are affecting your posterior like they are mine. South of my home in the northern part of Crawford County is Barns Lake. You have heard the lake brought up before in this meeting. Well, I want to explain to you the simplicity of it and its grandeur.

Barns Lake is about 30 acres in size,

but it has such a tremendous spring feeding it that it feeds the East Branch of the Au Sable River. It forms East Branch. East Branch flows south out of that and gains momentum and joins the main stream. So you have to imagine the depth and the magnitude of this spring that feeds Barns Lake, crystal, clear, cold water, trout habitat water.

Slightly 500 yards to the east of Barns Lake is a hill that is a favored target by artillery gunners because in the geographical center of the artillery range they go for center of sector, this way if they miss left, right, up, down, they are still within their range. Sometimes they land in Barns Lake.

Last year 4000 some odd 8-inch artillery shells were dropped on this spot. Can you imagine the quaking and the grinding of the ground from 37 pounds of explosive in each shell times 4000, 5000 over the years? What it's doing to this underground stream? What is it doing to this river?

I will tell you what I have experienced in the last 15 years of living close to it, the trout are gone. For three miles of that river

that goes through range 40, they are gone. They have been replaced with perch, suckers and red horse, chubs. The trout water is gone, that's why the perch are there. The water has warmed, it has become contaminated, the trout can't live there. Trout favor nice places, the artillery range is not a nice place. Yet we allow this to go on on the headwaters of the East Branch of the Au Sable River which feeds the main stream.

Let's consult the horse manure manual and see what it says about the East Branch. Water quality for the main stream and the East Branch of the Au Sable as shown in table 4A, both rivers contain waters of excellent quality as evidenced by high quality trout fishery data presented. Ironically the data presented here that I have highlighted in green all says NT, NT. The amount of calcium, NT, the amount of magnesium, NT, sodium, potasium, chloride, sulfate, residue, nitrate, NT, NT, NT, 8 minerals, NT, and a footnote says, not tested. Does that mean not tested or won't tell? Can't tell? Are they afraid to tell us?

Another thing that I have witnessed on the East Branch in this same area is the building

of an army engineer corps bridge. There is a bridge to nowhere, it was a practice exercise, it went to the other side of the river and stopped deadend in a swamp. That was 12 years ago that they built that bridge, it has since collapsed because it was built out of pine and poplar. Beavers have taken over the natural obstruction to the river and added to it, it has caused the East Branch to back up.

The upstream side of the East Branch has now become a mill pond, it has 3 to 4 feet of sediment on it. The day will come when the mill pond builds up enough strength behind it to wash away the bridge that the army has built there, probably without a permit, and that 3 to 4 feet of sediment that's built up is going to cause the effect to the trout that are left down stream the same thing that happened up in Vanderbilt, they all suffocated.

Last night I went out to the East Branch to compose my thoughts for this. I went to a spot that used to be a culvert, but the Briggs Road is running over top of it. When this mill pond backed up the East Branch, it washed this culvert out, it's now a 40-foot wide

rushing, gaping hole in the road. Normal vehicles cannot cross it.

Last night when I was there three vehicles, which are a high mobility go anywhere vehicle, of the army came crashing through there. You've got to imagine a 5-foot diameter culvert half coming out of the ground with an 8-foot bank. These vehicles just went through there, tore up the bank and were gone. But the military will tell you that they do not allow vehicles to cross the river.

You know, to be brief, I am proud to be an American, and living in Crawford County. I recognize and support the need for well-regulated militia, but there is a time and place for everything. Now is the time to keep the national guard in their place.

Thank you.

MR. EBERSVILLER: Steve Kyle?

MR. KYLE: That was my time.

MR. EBERSVILLER: Richard Good?

That concludes the first round here. If there are other people who would like to speak, I would be willing to let them have another crack at it, or if they haven't spoke to

speak for the first time.

Okay. That concludes this session.

(Public Meeting concluded at 10:20 P.M.)

--ooOoo--

STATE OF MICHIGAN
COUNTY OF GRAND TRAVERSE

I, Janet K. Lombard, Shorthand Reporter, do hereby certify that I reported in Stenograph the proceedings had in a public meeting on the Camp Grayling Draft Environmental Impact Statement, at the time and place hereinbefore set forth; that the same was thereafter transcribed by me and the foregoing transcript is a full, true and correct transcription of my Stenographic notes.

Janet K. Lombard

Janet K. Lombard, CSR 3361
Notary Public, Grand Traverse Co.
My Commission Expires 9/3/89

TRANSCRIPT 3

MICHIGAN DEPARTMENT OF MILITARY AFFAIRS
NATIONAL GUARD BUREAU

PUBLIC HEARING

Grayling High School
Grayling, Michigan
July 22, 1989 at 10:00 A.M.

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CLOSING BY LTC. EDGAR WILKINS. 1

LTC. WILKINS: I'm Lieutenant Colonel Ed Wilkins. I'm the Chief of Construction Facilities Engineering Branch for the Department of Military Affairs. I want to welcome you here today on behalf of the Adjutant General and Base General Vernon Andrews, and Colonel David Hanson, Commander of Camp Grayling, to this third public comment period on the Camp Grayling EIS.

This public comment period has a special -- it was set up for a very special reason, and that was to give those people who have not had an opportunity to speak, that opportunity. Like it said in the announcement in the paper, those people that have spoken in the past or have given up their time to other speakers, we request that you, you know, do not request to speak today. We are going to, like I say, limit this to those people that have not spoken in the past. This was a special request from the Governor, and we want to fulfill this. As it is, we have over 45 cards to go through, and we want to limit the time you have to about three minutes. Between the setup time, we're here for three hours or more even at three minutes apiece.

This will be monitored or moderated by Mr. Greg Huntington, the Environmental Coordinator

of the Department of Military Affairs, and I'll turn this over to Greg here real quick, and then we'll get started. Done with the camera, Greg?

If we're still going around noon, we'll take a small break right at 12 o'clock for everybody. I'm very pleased to see this turnout of people. At the three meetings, we've had approximately this many people at each one of them, and there has been a lot of valid comments made, plus the written ones.

It was pointed out at the other two that the written comments have the same weight as the -- any comments given at this comment period. So if you have something else you'd like to say, we will still accept comments until the 31st of July in writing. Greg.

MR. HUNTINGTON: We'll run this pretty much as we have the past meetings. I will call your name. If you can come up and speak into the microphone, state your name and where you're from so the Recorder can get that down, and we'll try to proceed through these in a similar time and manner.

The first speaker is Pamela Lewis.

MS. LEWIS: I would like to relinquish my time to the Manistee River Council, please.

MR. HUNTINGTON: Okay. Elizabeth Bingham.

MS. BINGHAM: I relinquish my time to the Manistee River Council.

MR. HUNTINGTON: Okay. I think that's this first group of cards, then. Ann Snyder.

MS. SNYDER: I relinquish my time to the Manistee group.

MR. HUNTINGTON: And Roger McQueen.

MR. McQUEEN: My name is Roger McQueen. I live in Warren, Michigan, but I spend my summers at Guthrie Lake. Saturday, the 15th of July, at 7:06 p.m., helicopter number 045 flew over my house so low that one of our guests said to me, "Wow, that made the whole house shake." It was at treetop level. I called Wainwright -- I wish I weren't first. I thought that might have some effect. On Sunday, the next night, at 9:18, two helicopters flew low. Neither of them went over my house. One was quite clearly on state land. The other one was so close, that I looked into the cockpit of the helicopter.

I am very concerned about my family, and I'm concerned about the environment, because all they have to do is hit the top of one tree and they all go up in flames.

Thank you.

(Applause)

MR. HUNTINGTON: Otto Renz.

MR. RENZ: I'm Otto Renz from Blue Lake Township in Kalkaska County. Good morning, ladies and gentlemen. We are now seven months into the year that Governor Blanchard gave to solve the land use of the DNR -- DMA, DNR, tourists, landowners and permanent residents of this area. The AMAC study of the EIS by experts in many fields just confirmed our concerns. From the February 23rd, 1984 files of the DNR, I quote, "I will try to concern myself with the impacts on wildlife and wildlife user groups."

Firstly, those people who enjoy wildlife and Michigan forests in general will be severely restricted in their access to these lands. Presently, the military bars access to several thousand acres while they are on maneuvers from May through September. They are now planning to increase their training. Year-round training is in the offing, especially in the winter. This could prevent use for more time than the five months they now experience. In addition, winter training could

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have an adverse effect -- adverse impact on deer population, especially in Kalkaska County. Hunters could find themselves without access to lands they acquired with license money.

The lands requested in Kalkaska County are some of the most productive lands as far as wildlife is concerned. The southwest one-fourth of Kalkaska County contains close to two-thirds of the deer in the county, as well as some of the best grouse, woodcock and hare hunting available. Loss of access and management prerogatives in this area would have a negative impact on all of these species. No mention of this in the EIS.

Under "Land Use," the EIS states -- and this is a quotation -- "The proposed projects will not significantly alter existing noise contours, and thus will not affect recreational use in and around the post. The trout fishery of the AuSable and Manistee Rivers should not be affected by the proposed projects, and existing access to this resource will continue."

Quote: "Project T3, assault landing strip, as proposed, may increase JP4 fuel use, depending on amount of training at the strip. These additional storage needs will be addressed by

existing facilities and sources of supply. No data on existing facilities and sources of supply is available."

Quote: "Assault landing strip, as proposed, will have insignificant impact to soil after mitigation."

Now the quote from the Century Dictionary: "Mitigate. To make mild or more gentle, soften or mollify anything distressing."

"As I prayed to the Lord to mitigate a calamity which seemed to be past the capacity of man to remedy."

Quote: "Cold weather training will ultimately mean significantly heavier levels of field exercises during the cold weather period from October to April 1." End of quotation -- unquote. What form of mitigation are we going to use to inform the wildlife of the increased activities of troops and planes? No data in the EIS.

Quote: "Since the area proposed for the landing strip was defined as a wetland on the 1950 USDS topographic quad, the DNR has field checked the area to insure that no wetland areas are affected. The remaining wetland area is north of the proposed location and is considered a marginal wetland area

resource." And that's from Hunting, March 27, '87. We quote: "At one time, there were more wetlands. Maybe before it was clear under a state timber sal contract."

President Bush has said, "A new breeze is blowing. If world peace becomes a reality, do we need bigger and better?" Alternatives were not even considered in the EIS. Jefferson Proving Grounds in Indiana, to make environmentally safe, would take all of the 1990 Super Fund. How can we, in all conscience, expand and build project T3, air assault strip?

Thank you.

(Applause)

MR. HUNTINGTON: James Gilsdorf.

MR. GILSDORF: James Gilsdorf, Ann Arbor. I'm here representing myself predominantly, but also a large number of recreational users who don't live here and don't have property in the area, but frequent the area.

I and many of my friends come up here approximately 20 times a year to fish or canoe or hike in this area. It's most beautiful and most

pleasant, and closest to the urban southeast. Therefore, it's of prime importance to us. We come here to unjangle our nerves from modern urban living. I have stood knee deep in the south branch of the AuSable and in the middle fork of the AuSable and had a flock of helicopters come over me at treetop height. It puts a real pall in my mood, but more importantly, from an environmental standpoint, it puts every bird I'm listening to down for at least an hour, and probably often more. I've seen the effects of deer I've been watching as the helicopters come over, and they actually scrunch down and are markedly startled.

Now I grew up in an agricultural area where raising livestock was important, and I know that the weight gain on a cow in a feedlot is markedly less when a road goes by and simple construction noise. What can happen to the environmental animals, the wild species we all enjoy, under the effects of the helicopters that you physically feel the down draft? Trying to sleep at night with the physical feeling "boom." Last time when I was up here, there was night maneuvers going on, and the incendiary torches, or whatever they are that light the sky for visibility, were certainly

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enough to disturb sleep at the Canoe Landing Campsite some distance from the Guard activity.

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None of these issues are at all addressed anywhere in the EIS. It is as though flying overland is totally ignored by the military. Not all of us love the smell of napalm in the morning. Some of us don't even like the thought of having to deal with military activities, and having this most pristine area so assaulted really is a travesty.

Thank you.

(Applause)

MR. HUNTINGTON: Charles Mott.

MR. MOTT: Charles Mott, Midland, Michigan. Myself and my family have been coming up in this area for 15 years, and enjoy it from a recreation standpoint. We primarily spend our time in the Lovells/Shupac Lake area.

I trust you've all read this document. It takes some time. Each time I read it, I become emotionally disturbed at the elements that are in this document. I must tell you that I believe that although the data presented in some cases is valuable, each time the conclusions are drawn, it

appears as though the whitewash came out. And the conclusions do not represent the data, in my opinion, and I've cited and marked several pieces of examples of that which I will write of -- I do not have time to tell you about today. My recommendation is that this project be denied totally, based on the data in here, but not the conclusions. It does not represent a fair assessment of the situation -- the conclusions, that is.

Regarding noise, I'd like to tell you that the noise data in here is very interesting to me. There are maps of the areas which show decibel levels that are anywhere from 2 to 16 times the recommended levels from a scientific standpoint, and yet the conclusions are there will be no significant impact. I can cite those for you. For example, the table on 4.3.3 lists the noise level minimum in this area from 15 to 39 percent in the decibel area of 62 DB. And it is essentially in the noise level of people above 39 percent in the decibel area of 70. And those are the two sections which we now reside in. The document goes on to tell you that the increase in spending of $14 million and the additional 4,000 troops and X number of rounds in

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ammunition and railroad ties that will be put in will have no significant impact on that.

There's an interesting section here. Just an example of the lack of objectivity. There's a section in here that's called Appendix A. It has to do with the Kirtland Warblers, and it has to do with turning over or essentially closing off some land to the Kirtland Warblers. The .5 in there says that this agreed-to-document, once we've signed it, the DNR and the military -- there's one catch in there, and that is it's okay for the military to go in the area once we sign it off and close it off. Well, I'd like to have the Kirtland Warblers vote on that and perhaps vote on this document.

5

Thank you.

(Applause)

MR. HUNTINGTON: Dennis Potter.

MR. POTTER: My name is Dennis Potter. My primary residence is in Grand Rapids, Michigan. My family is fortunate enough to have a summer home on the main stream of the AuSable in the Pine Road area. What I'd like to do here, is read a letter that AuSable Manistee Action Council will be sending

to the DMA in Lansing, dated 7-22 -- today, regarding missile site, Camp Grayling.

"Dear Sirs, the following appears to be taking place at or being planned for Camp Grayling. It also appears to be structured in a fashion so as to circumvent the current EIS process. This is what we know at present. A surface to air missile site is proposed in the vicinity of Hardgrove Lake in section 25, T28 north, R3 west. This is in the same section as the ghost town of Hard Grove, according to the plat book. Thus, cultural and archeological significance may present a conflict.

The project is proposed by the U.S. Army, not the National Guard, but it is said that the Army will turn it over to the Guard after its completion. GTE is planning major capital work costs over $100,000 to service the SAM site. Phone linkage for control of the site will terminate somewhere in Texas. Colonel Hanson states that the site will be initially used for research and development of aiming and guidance systems, and that no live missiles or rockets will be fired at this time. He cannot or will not predict when this change -- when this will change to live firing. The site may or may not be on state land, as Military Board land is

also close by. No further information is available to the public on this SAM site.

The public is entitled to be made aware of the operating characteristics of the SAM site concerning the direction of fire, ground impact zone of spent rockets, ground impact zone of target aircraft destroyed, and et cetera. This is needed to provide warning to persons down range so they can take protective measures to ensure their personal safety. The military is being quite secretive about this, and we insist that you tell us here and now why this missile site was excluded from the DEIS. We also insist that you explain at this hearing how the site will be ultimately operated when completed.

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If the Guard officers present at this hearing are unable to answer these questions, then it is imperative that a complete revelation be made in writing immediately. Please direct this to the undersigned at the above address.

This is one more example of the deficiency of the DEIS, and one more reason to require a completely new draft of this document before proceeding any further with the implementation of the Camp Grayling master plan projects.

Sincerely, AuSable Manistee Action

Council, Dennis Potter."

And I would like some response from anybody available from the DMA to give us some more information at this time on the missile site.

Thank you.

(Applause)

LTC. WILKINS: I'm sorry, but this is a public comment period. We're not here to debate issues. The issue -- there is an E.A. been issued by the Army on that site, and you will have ample opportunity -- it will be going public. You will have ample opportunity to respond to the Army when the E.A. gets distributed.

So, Greg Huntington.

MR. HUNTINGTON: Gabriel Lewis, Jr.

MR. LEWIS: I have already given the Guard representatives a copy of what I'm going to say today. Good morning. My name is Gabriel N. Lewis, Jr. I and my family reside on the AuSable north branch, downstream of the Twin Bridge. It's identifiable to some as the tan house, roof and barn two "klicks" south of the gray barn, and on a line of site with firing point 124. That is, if you're

flying upriver. It's also identifiable by the two maize and blue marked driveways, and you can get to them if you miss the left turn on Friday's Corners Road going into the range 40 complex, which is don quite often too, if you don't know your right from your left.

I appreciate the opportunity to speak to the DEIS of March 1989. My copy, if you don't remember who I was from the public hearings, is number 147, and that'll tell you where I'm coming from. I am not a biologist. I am not a scientist, nor do I possess the academic qualifications to speak as an ecologist, hydrologist, et cetera. I am also not a nonpatriot, nor a self-serving critical and very vocal minority.

What I do possess is the education, the training and experience as a public servant for 26 years and more, which comes from being USN(SS) retired, social work, behavioral psychology professor and therapist, a veterans administrator and counselor, a former FAA -- Federal Aviation Administration -- technician and technical supervisor, a public safety officer, university training in both police and fire science. Also, a former gunnery officer, forward observer and

spotter. To some of you, that doesn't mean anything. To the Army, it does mean something.

I have also been a weapons system chief analyst and instructor and a technical editor, senior writer of numerous DOD documents, including the mark 80 tank recovery vehicle DEMWAR, the 300 amp field generator, the mark 37 gun and fire control system, the 106, 46, 48, and mark 37 fire control systems, just to list a few.

I've written DEIS type books before, and that's where I want to come from. I guess I'll talk to that little camera, because they're not listening to me over here. The preparers of the DEIS are unknown to me as a professional writer. Of or on their qualifications, I decline to comment. I do comment, however, on the DEIS, which, after several rereads, severely lacks the depth of research into -- a most narrow approach to the issues, and therefore, a resultant assessment which in no valid way shows the problems and/or the resolutions.

The document (DEIS) prays for additional expert research in many areas, such as the biological, ecological, social, psychosocial, socioeconomic, transitional, transportational, "future shock" of the cumulative and residuals of

this project, and the necessitation for the proposed projects. If the proposed projects are of national significance, then pray tell, why have we, the people of Michigan, heard only from the Department of Military Affairs, the Michigan National Guard and the National Guard Bureau?

As a United States Armed Forces retiree in receipt of retired retainer pay, and just a plain citizen, I, for one, want to hear it from the top: the Joint Chiefs of Staff, the General of the Army, the General of the Air Force, the Secretary of Defense. Will the leaders of the Armed Forces of the United States of America, those directly responsible for our military, tell us that this National Guard proposal is of such national significance to our national defense that there are no other options available to what can only be described as the termination of future use of those identified lands belonging to the people of the great state of Michigan?

The man before me quoted mitigation from the Century Dictionary. Mitigation, as defined in Webster's, is: "A soothing; a calming. An alleviation, abatement or diminution as of anything painful, harsh, severe, afflictive or calamitous.

As the mitigation of pain, grief, rigor, punishment or penalty." How appropriate.

Let me give you a few quotes from the DEIS. "Impacts are anticipated to be insignificant after mitigation." "None of the proposed training operational activities will impact." "Hide the site from the road...to minimize public concern...using planted trees, shrubs and beach grass." To say the least, such statements do not further the public trust. Today's society cannot and must not function in the gray area. People are not mushrooms, and must not be treated as such. We all know how you treat a mushroom and what you give it to eat. That's not in the letter. I didn't say that.

The truth, the black and white, best information available, researched in depth by the best authority available, results in informed decisions, respect and that public trust.

Testimony and comment, both written and oral, have and continue to be given by laypersons and experts in the applicable fields. An exampling few of my own, here they are. One, there are present lease restrictions that preclude the Michigan Department of Military Affairs the proposed actions in the DEIS. The Michigan Department of

Natural Resources must take a stand to make the MDMA adhere to them. That's one.

7 The Draft Environmental Impact Statement does not address the cumulative impact of the proposed actions.

Three, the regulatory provisions regarding the 50,000 acres in Act 154, Public Acts 1941, given 8 to them on May the 3rd, 1948, are they not applicable to the lease agreement, L-1479 of '78, and yet today? What controls are there for tomorrow, when the Michigan National Guard is not just addressing 50,000 acres, but, in fact, 150,955 acres? Since when did the military or paramilitary bases compete -- compete for the business of training for war? We're not talking supermarkets and price limits.

Five, the DOD is closing facility after facility. Two of my sons, one in the first response unit of the Military Intelligence Unit of the 82nd, and one with the CID in Germany, do not have the equipment, nor the funds, for training. The guy in Fort Bragg doesn't have the funds to jump out of airplanes. They can't get the funds for the fuel 9 for the airplanes. Is the C12, the T1 -- the C12 being the ASP/LSF Railroad; the T1, road and tank

9 trails -- the T2, multipurpose range complex-heavy; and the T3, assault landing strip, economically valid when compared to the possible use of an existing facility and/or facilities?

What of the undetermined and unidentified wetlands? Do we just ignore them and their 10 existence and all the life within them? Just forget them, because nobody identified them? Let's just forget them.

I feel myself -- and I only reservedly apologize. I feel myself getting worked up again. Dr. Preyburger and I go through this day after day after day. You know, I shrunk heads for a living, and I'm supposed to be easygoing. Sorry about that. Just bear with me. I could go on and on regarding the issues pertaining to this so-called right versus might concern. It's a dilemma, and the apparently double standards that are involved.

Suffice to say, when I compare five truckloads of 105's on July 10th, 1989 traveling northbound on I-75 toward my home in Lovells with no markings of either "hazardous" or "explosive cargo" on any of those five trucks, nor was there any escort of any kind, forward or aft, just five truckloads of shells running down the highway.

Okay. You try it. You try towing a gas tank behind your car out there in the open and see how far you can get it before someone pulls you over. I compare that to the MD -- Michigan Department of Natural Resources' requirement of me to pay them $25 and obtain prior site approval to move, add or remove one tree or one log out of the north branch of the AuSable. I've got to pay them, and they've got to come look at it, but somebody else can do that, you know. I come up short. I don't know how you look at it, but I come up short.

I'll close with these thoughts. I and many of the persons assembled here willingly destroyed and perpetuated the destruction of both life and property all over this earth in the cause of war. War is -- whether we are or we were professional warriors, or in for only one hitch -- man's most odious, empirical act against world society and its environs. Because of our human imperfections, we deem necessary a strong regular military reserve, and now a National Guard force and forces, to protect us from other imperfect humans. But at what cost? We have destroyed so much, made so very many places uninhabitable forever, must we now open yet new and additional resources and add

them to the list?

I thank you for the opportunity to speak.

(Applause)

MR. HUNTINGTON: I'm going to have to remind you, we've got to try to get down a little more closer to our time limit. We've got 40 some people to go through here. In fact, after the end of that time when we've gotten through everyone, we still have additional comments we can take at that time, so let's try to adhere a little closer to the time limit.

Mr. Paul Stoffa.

MR. STOFFA: I'm Paul Stoffa from Guthrie Lake. It's really great to see a lot of people here today and at these other meetings. Back in 1981 when I was president of the association and I traveled to Lansing, met Greg here and the generals and everybody else, Colonel Wilkins -- and they all have jobs to do, and I think we have to understand that. My biggest disappointment, though, basically is in the Governor of Michigan.

(Applause)

MR. STOFFA: I don't disagree with Colonel Wilkins' plan here to improve the facilities and wastewater and roads and stuff, because we certainly need the facility. They should be ready to go. Unfortunately in the past, the military, when something happens, we're really rushing and struggling, and as a result, we sacrifice a lot of lives to buy time. And we've done this in the last war, the Korean War, Vietnam. But we have the privilege, supposedly, that Governor Blanchard says we're going to have a blue ribbon committee headed by a fellow who will try to do a good job. And the committee is put together. I don't know what their credentials were, or whether they were sincere in their efforts. Even though they did come up with a proposal, it was totally disregarded by General Andrews, and the Governor looked the other way and watered it down as though it didn't even happen, and it's the (undiscernible word) who are sort of keeping this thing going.

I think the problem, gentlemen -- Greg and Colonel -- is the fact that the public has certain rights. We're hearing a lot about that in Washington, the Constitution and everything else. But I think the important thing is, Governor, if you

really want to serve the National Guard Bureau of the United States and do proper training -- we're not against proper training, but don't take us for granted. Don't ignore the complaints, and direct and assess your responsibilities to answering the complaints and taking corrective action. Don't deliberately mislead, or do not demonstrate lack of discipline of the military.

That's pointed out by transporting explosive shells. There's rules how they're supposed to be transported with vehicles in between, lights flashing and proper identification. It's not done. It's not done on the ground; it's not done in the air. It's not done anywhere. If you want to call Camp Grayling or call Alpena, you can't even get an 800 number. It's too expensive, isn't it? You don't want complaints. Until the Guard starts to demonstrate responsibility and discipline with the people they are supposed to manage -- and they haven't done so -- how do you expect the people to say okay, let's go ahead with it? We trust you. We don't trust you. You've demonstrated, you've failed to command the trust of the people.

(Applause)

MR. HUNTINGTON: Minnie Kenel.

MS. KENEL: I relinquish my time.

MR. HUNTINGTON: Jean Warner.

MS. WARNER: I relinquish my time to KP Lake.

MR. HUNTINGTON: Ray Warner.

MR. WARNER: Same comment.

MR. HUNTINGTON: Sharon Graham.

MS. GRAHAM: I relinquish my time.

MR. HUNTINGTON: Edith Pelon.

MS. PELON: I will relinquish my time to Chris Polaczyk.

MR. HUNTINGTON: Deborah Barry.

MS. BARRY: Ladies and gentlemen, my face is new to you because I've only been here for a month, but I see this is an issue that I'm going to have to deal with for a long time. My name is Deb Barry, and I'm the Executive Director for the Grayling Regional Chamber of Commerce. My presence at this public hearing is in an effort to be better informed. The Chamber's role is as a professional organization. It is greatly concerned about the current level of animosity and dissension among the community in Crawford County. In essence, we are greatly concerned about this dissension and how it's

affected tourism, business and industry, as I know all of you are.

In essence, the Chamber's concerned about the economic impact this issue is having on Crawford County, and essentially on all of you. The Chamber seeks necessary and meaningful communication -- and I do stress meaningful communication -- at all levels in regards to the National Guard's presence in Crawford County, and the Chamber does welcome any involvement or efforts to achieve this communication goal.

Thank you very much.

(Applause)

MR. HUNTINGTON: John Novak.

MR. NOVAK: I relinquish my time to AMAC.

MR. HUNTINGTON: Ted Swoszowski.

MR. SWOSZOWSKI: My name is Ted Swoszowski, and I live in the Higgins Lake area. I've just got one question. What's the proper height for these troop transport planes to be flying over? Recently they've been flying over Higgins Lake at treetop level, and looked like they were about ready to crash.

Thank you.

(Applause)

MR. HUNTINGTON: Rama Stimpson.

MS. STIMPSON: I relinquish my time to Tracy Ogletree.

MR. HUNTINGTON: I see that on the bottom. W. T. Ogletree.

MR. OGLETREE: Thank you. I am W. T. Ogletree. I live on KP Lake. I would like to give you first just a little bit of background about myself and the area in which I live. I bought that property in 1951 to become a summer haven, if you will. I built a cabin in 1952. My family spent their summers there for a long time, and enjoyed every minute of it. We knew the National Guard was here when we bought the property. We knew the Michigan National Guard was here. We got along well with them.

However, in 1971, I was transferred to England, in which I was not around the property. In 1985, I retired to come home. I did not sell this property. We kept it for our retirement. We were absolutely appalled at the actions of the Guard and

the noise pollution, helicopters, guns, bombs, dust storms, what have you. We were pleased when the Governor said that he would have a committee to see if he couldn't get the people together on this.

Now in this period of time, we, of course, have contributed greatly to the economy of Crawford County. All the people on KP Lake have done the same thing. We have 60 some homes there, and I would venture that 30 of them are permanent residents. So, therefore, you know that they have to do their shopping in Grayling, et cetera.

We do not like the noise and things when they rattle our homes. In the Impact Statement, it's stated that there is going to be no adverse effects on the expansion of the Guard. We believe that the facilities, yes, should be improved, but for Michigan National Guard. Not for the rest of the country to come in and tear apart our lands, our rivers.

Incidentally, the Manistee and the AuSable River are beautiful rivers, and I heard about them many times when I was overseas. Even our friends in various countries that I traveled in all knew about the AuSable. What a shame it would be to tear that up and not have that great facility for the

sportsmen and for the nature lovers. Since this year, however, I will say that there has been a slight improvement in the noise levels and et cetera. However, we still have the problems that exist.

The Impact Statement stated that decibels of 130, 140 from three miles away have been measured on bomb drops and on guns. 85 is considered a high level in a factory. After that, they're supposed to use protective ear covers. So when that big bomb drops or that big gun goes off and rattles our homes, there's that 130 decibels. We wait for the other shoe to drop, and sometimes it does, sometimes it doesn't. But we do have that uncertainty of the thing going to come off at any time.

Now this -- I state all these things because it only can get worse if we keep on going the way we are. I agree with the people that have spoken before. Let's get this Impact Statement brought up to date with proper figures, and let's get the thing rolling. We welcome the National Guard, Michigan National Guard, but I'm not so sure about the rest of the states.

Thank you very much.

(Applause)

MR. HUNTINGTON: Harold Hickman.

MR. HICKMAN: Thank you. Ladies and gentlemen, my name is Harold Hickman. We reside in the Twin Bridge area. We have been there for many, many years, and it is -- our location is not used primarily for summer living. We live there a good portion of our time, both winter and summer. I am a civil engineer. I have spent my whole -- a good portion of my life, my professional life, with the Corps of Engineers. I'm a hydrologist. Most of my work has been in conservation work for the Army, both as a civilian engineer and as an officer.

Many of these Impact Statements and reports, I have done, but it has all been on conservation. It hasn't been on what I consider -- let's don't even discuss it. I'm particularly interested in, and what I want to talk about today is the health and welfare of this area. This is what I would like to talk about. I can't see where anything has been talked about or brought out in this impact report.

These days, I feel it is easier to find someone who is upset, put out, disgusted or

otherwise angry, than someone who is patient. I am not patient. I am angry. Angry with the National Guard for attempting to impose an expansion program on the AuSable-Manistee areas without considering the health and welfare of the area and its people.

The citizens of Michigan have spent millions of hard-earned tax dollars and years of time to acquire and preserve these areas as a national monument for the propagation of its forests, wildlife, and for the development of recreational activities. The people, along with various state of Michigan departments and private agencies, have worked together to preserve the environment and to respect the limits -- respect the limits to which the ecology could be extended. The ecology of this area cannot survive under the impact of an expansion program as planned and presented by the Guard. Do we want this lovely area desecrated?

When the guard was granted lands for their use as a training center, and when they leased lands from the state for expanded operations, the Guard should have recognized their obligation to preserve the health and welfare of the area they were using. I'm quite sure they did, but who could hold them to their obligation? I'm angry. I'm angry with their

past performance, and I see no reason to believe the Guard will perform differently in the future.

I would like to diverge for just a moment. There is an old Michigan law, Public Law 197, which recognizes the legitimacy of the easement as a tool to preserve the natural and historic character of property. The people of Michigan ought to look -- they should investigate some of these laws. Maybe -- maybe the state of Michigan should seriously consider cancelling all National Guard leases.

(Applause)

MR. HICKMAN: I am not an attorney, but I do know something about contracts. Now a lease is a contract. If there is not a meeting of the minds -- I don't care what is on the contract in writing -- there is no contract. In reviewing the Michigan Department of Military Affairs' Draft Environmental Impact Statement, I find over 300 pages of, in my opinion, drivel.

(Applause)

MR. HICKMAN: I am amazed in this report

of the words that are used. I am amazed at how many times the word "not significant" is used. Not significant. It may not be to the Guard, but it sure is to us. I am amazed at the word "insignificant." It is used constantly. Insignificant. Is this insignificant, the things that they are listing? I don't think so. Included in this maze of drivel, I found over 40 outright lies or false statements. Does the Guard think the people of Michigan are stupid? What consideration does the Guard have for facts?

Just last week, the great powers of this -- of the world met in Paris for a conference. One of the main topics of the discussion was environment. They all concluded that drastic action was needed to protect the environment of the world. President Bush later stated that this country was going to take drastic action against pollution, and that this action would be a part of everyone's life: government, business, industry, and right down to the individual.

I don't know about this report. One thing is concern, and I'm very certain of this: The people of Michigan are going to live -- they are going to live with themselves. The people of

Michigan are not going to live with the Guard. The Guard is going to live with the people.

(Applause)

MR. HICKMAN: And both will comply -- both will comply with safeguarding the health and welfare of the area. Now this is going to happen.

Apropos of the subject we were discussing, but in no way assimilating organizations or persons, I ask you to dwell on one last thought. A European dictator told the church that he intended to rule the world. The church replied that this was impossible; that they had millions of people behind them, and that they had world public opinion behind them. The dictator hesitated and asked, "How many army divisions do you have? We have 200." Well, time has passed. Where is the dictator today? And where is the church?

Thank you very much.

(Applause)

MR. HUNTINGTON: David Long.

DR. LONG: My name is David Long. I

represent myself, my family. We're residing in East Lansing, Michigan, and I also represent AMAC. I was in the Army Reserve for six years, where I was in artillery for three years and military intelligence for three years, so I did not shirk my duty.

We own three trees and a stump along the north branch near Lovells. We've been there for the past five years, our little God's acre, so to speak. There's a few pieces of grass there too. I have -- in this area, we've experienced all the things that all you have experienced: helicopters coming downstream; troops coming down the stream in rafts; bombings at night. I've never had to use my night pocket light to fish with, because there's always been flares in the air. Luckily, my new son has not experienced any of this. This is his first trip up here. There's been an uneerie quiet that's settled over the Lovells area for the weekend, for some reason.

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I have four comments. My first comment is, I strongly support the document that AMAC has put together, and in particular, I call note to the writings of Bill Cooper, who critiqued the EIS, and I helped him -- I reviewed it for him. I find that to be an excellent document, and those issues must

be addressed, and they cannot be ignored or overlooked, and that's very important.

My second comment, I teach at Michigan State University, and I was just commenting that I teach, you know, many students, and this always gives me sweaty palms, where lecturing students doesn't, for some reason. I'm a full professor in the Department of Geology. My specialty is water chemistry and environmental chemistry, and for the past couple of years I've been doing a lot of work on groundwater and interaction between groundwater and surface water.

Because we were pregnant last year, we couldn't come up last year. My goodness, what a difference a year has made. Coming to Lovells, I noticed more tank trails and more staging areas. From in my profession, I can tell you this is not good. The result, I think, is going to be as follows: Increasing the tank trails and opening up timberlands is going to increase the groundwater table to open to the atmosphere. This will do a couple things. First of all, it's going to warm the groundwater, which will warm our stream, which will prevent good fishing, I'm sure. The second thing, by clearing these areas, we're going to increase th

amount of siltation in the rivers, which I think has already been happening.

And the third thing that's going to happen by opening up these areas and maintaining these areas, is that the groundwater table is going to be lower, and so is the stream. And you may say well, it's been hot, and that's what's causing all this, but doing all these opening the tank trails and having these staging areas just makes the matters worse.

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In other words, the Army must realize that they must deal with the climate. And I can tell you from my geologic training, this area, not only is it beautiful and is it a fun place to be at and enjoy, but it's also environmentally sensitive, whether we like it or not. There's a direct link between whatever we do on the surface and the groundwater supply, and this must be maintained. And I don't see in the document myself adequate -- I don't feel adequate in saying it's going to be maintained, particularly after what I've seen over a year. Now you may have been coming up here and not seeing any major change, but I can tell you, things are different, and I'm very concerned about the health of our stream.

My second comment, although I have not reviewed it completely, one of my specialties is toxic substances in the system, in the environment, and, of course, there's a report on the toxic nature of our soils and streams, groundwater supplies. In revieving that report, I find initially two fundamental flaws that must be addressed. First of all, the samples weren't even taken from the proper area to really gauge how important the pollution has been. For example, they should be inside the gunnery range, not outside it.

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The second thing I see as a potential flaw, that the water samples weren't taken properly, and this must be addressed, and I will, through AMAC, prepare a statement on that. But this report, as I see it, is insufficient in addressing the problems of toxicity in the environment in the area.

My final comment, which is interesting -- a couple months ago I had an opportunity to be talking with a former Governor of Wisconsin, Anthony Earl. And we were sitting in the back of a taxi, and I happened to mention our problem here, and he says, "Well, I can see the problem." He says, "We had a similar problem here at Camp McCoy. What I did, I worked with the DNR, and we made the lands

around Camp McCoy unavailable for expansion." Where has our Governor and our DNR been? Why can they do it in Wisconsin, and we can't do it here? I don't understand.

But then he says, "You know, you have a little bit different case." He says, "Camp McCoy isn't in a pristine recreational area. We don't have trout streams and fine hunting in this area, but you do. How can they expand them?" Then he went on to say, "They don't really need to expand them. There is many other places that they can go. You can maintain the Michigan National Guard, but there's no reason to expand to the rest of the world."

(Applause)

DR. LONG: So I've dealt with these problems before. I was on the Michigan Environmental Review Board, and I saw some of the early problems of Guthrie Lake and how the Army handled those, things such as the seismic tests that they did. I can tell you, I do not come away with dealing with the Army with pleasant thoughts. And we have some problems, but I still would like to

know and go on record on asking, where is our Governor in this issue, and why is he not supporting us? And where is the DNR in this issue, and why are they not supporting us?

Thank you.

(Applause)

MR. HUNTINGTON: Albert Lilly.

MR. LILLY: Nobody this short up here before me, I guess. (Adjusting microphone) Colonel Wilkins, Mr. Huntington, ladies and gentlemen, I am Albert J. Lilly, Jr. Although I am presently the President of the AuSable River North Branch Area Association, I am here basically in my individual capacity. I reside on the north branch. Have a home there. We occupy it weekends at this time. It's increasing all the time.

In the few minutes that have been allotted to me, I'm going to limit my remarks to the subject of the authority under which the Department of Military Affairs occupies over 50,000 acres of this state's lands. Namely, the May 3rd, 1948 lease and its 1978 extension. It must be remembered that the vast majority of what the DMA claims and occupies is

not owned by the DMA. It's owned by the state of Michigan. It's under the care of the state of Michigan, the Department of Natural Resources, and the use and occupancy of that land is solely limited by the terms of the lease under which they occupy it.

In the Environmental Impact Statement that brings us here today, it is stated, and I will quote, "Approximately 50,000 acres of land were leased in perpetuity from the Department of Conservation, which is now the Department of Natural Resources, by the Military Board under the authority of Act 154 of the Public Acts of 1941, and executed May 3rd, 1948. The in perpetuity lease allows the land to be used for military purposes by the Military Board, but the MDNR -- that's the Natural Resources division -- retains control for hunting, fishing, timber and mineral extraction purposes. The MDNR must first obtain permission of the Military Board before developing any conservation, recreational or other project in order to assure that there will be no interference with military activities." End of quote.

I take exception -- I take exception to the characterization of the lease and of its

amendment as constituting a perpetual lease. As a practicing attorney, and in particular, in the field of real property law, I find absolutely no basis for that statement. To say that because these leases have no stated termination date, that, as a direct result, they are perpetual, is simply untrue. It is a specious statement, but even that shortcoming pales in comparison to the fact that the DEIS that brings us here today conveniently forgets to mention the most important words in the leases: their granting clause.

Let's see what those granting clauses say just briefly. I quote: "They grant to the DMA," quote, "authority to use said lands for military purposes in the same manner and to the same extent as is now exercised on and over the Hanson State Military Reservation." One must remember that this was as of 1948, as extended by the 1978 extension agreement. For the reasons of the very wording of the lease, it is my opinion that this omission is a fatal defect in the DEIS. I think no one will question that the use of these 50,000 acres is not today to the same extent and in the same manner as in either 1948 or 1978. If you think about the words, "in the same manner, to the same extent as is

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now exercised on and over the Hanson State Military Reservation," it is patently obvious that as of March 1989 -- the date of issue of the DEIS -- the manner and extent of the DMA's use, the use by the Department of Military Affairs of these 50,000 plus acres, have been exceeded both quantitatively and qualitatively tenfold when compared to the 1948 lease, and manyfold since its 1978 extension.

Now as if that were not enough, there is an accompanying document -- I say accompanying the lease of 1948. It is entitled, quote, "Map Index Background Information - Department of Natural Resources and Department of Military Affairs Ownerships and Agreements: Crawford, Otsego and Kalkaska Counties." That was also dated May 3rd, 1948, the date of the original lease. And that document goes on to state, quote, "This long-term lease provides for usage by the military during their encampment, with no permanent buildings or improvements erected," end of quote.

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(Applause)

MR. LILLY: We're here today to discuss the 1989 environmental impact of yet another -- an

additional construction project, and all the while, millions of dollars in construction, construction that was -- that occurred, was built since 1948 on those 50,000 acres, stands in violation of what? First, of the lease documents. Secondly, in violation of the Federal Solid Waste Disposal Act, and thirdly, all without benefit of an Environmental Impact Statement, either before or after the fact of that construction.

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The Draft Environmental Impact Statement is fatally flawed. It should be redrafted to include reference to the items that I've just cited, and it should be resubmitted for our review.

I thank you.

(Applause)

MR. HUNTINGTON: Shirley Bumpus.

MS. BUMPUS: I'm not a public speaker, and I'm very, very nervous, but I feel that I must say something today.

We live down in the South Camp area on South Sharon Road, the 20,000 acres leased to the military in 1984. There has been no impact study done on this area, and we would like to know why.

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Why are certain areas important in this state, and other areas are not important? We feel that we have wetlands in the area. We have written to David Hales, Director of DNR, Lansing. He did not answer our letters. He had John McGregor write us. We had already met with John McGregor, and we would have liked to have had a response from David Hales.

There were bald eagles sighted in our area right in the training area last November by John McGregor and another DNR man, but the military was right back in this spring. Again, why are certain areas, certain wildlife protected, but not in our area?

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We've had such a dust problem. We are unable to get any help from our County Road Commission. I called the Camp and requested that they take care of it, because this Statement says that it is their duty to do so, and I was informed, quote -- quote, "If we do your road, we would be obligated to do others."

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The assault strip, we feel that, People, if we don't do something now, we will never have a chance to save the Manistee River. We are scared to death that there could be an accident or a gas spill, and if this river is contaminated, we could

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lose it forever. There are many, many other points that I could cover at this time, but I'm too nervous to do so, and I do thank the military and I thank you for listening.

(Applause)

MR. HUNTINGTON: Warren Hoehn.

MR. HOEHN: I'm Warren Hoehn. I live in Plymouth, Michigan, and have a place at KP Lake. Before I start my brief comments, I want to say I too am very angry at the Governor.

(Applause)

MR. HOEHN: I have only several short statements. If a multipurpose range goes in, will they fire over KP Lake? If so, will the EIS specifically address the health and safety issues of firing over KP Lake or the surrounding area? If so, what will the land values be at KP Lake, and what does the government have in mind on declaring right of eminent domain?

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The land that we're talking about was purchased by the state of Michigan for all the

people for multi-recreational uses: camping, hunting, fishing, snowmobiling, cross-country, and most importantly, the enjoyment of the natural beauty of the outdoors that you've heard so many statements about the area this morning. What natural beauty will be left when the military expansion is complete in this area? Does the EIS really address that area? I don't think so. The EIS should address what the purpose of the military expansion -- how it will affect the quality of life in the Grayling and the greater area in terms of crime, property values, tax base. I think it ought to carefully review the effects that this military installation is going to have on the whole area.

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Thank you.

(Applause)

MR. HUNTINGTON: Lynn Hoehn.

MS. HOEHN: My name is Lynn Hoehn. I live in Plymouth, Michigan. We own property on KP Lake. That was my husband you just heard speak. I have a few comments here based on a personal experience. When I was a child, my family vacationed at property in Browns Mills, New Jersey in the pine barrens, the

cedar lakes and streams adjoining what was in the 1930's a CCC Camp. During World War II, that area became Camp Dix, then Fort Dix. More land was acquired, and then McGuire Air Force Base was established.

The area changed. Unplanned, unmanaged growth occurred. The population became transient. Crime increased, both property and personal. We, as young girls, were not allowed to go alone to town or to walk alone in the woods. The family eventually regretfully sold this property. Now Fort Dix is scheduled to be closed. What is left for the citizens of New Jersey in this formerly lovely spot? I see shabby houses, poor neighborhoods, unemployment, and an area that can never be brought back to its prior state of beauty.

Are we, as a state, willing to give up a large, massive chunk of our recreation land permanently for military training? The proposed uses are not compatible with recreation and wildlife uses. This land is the closest forest wildlife area of any size to our major population centers. What is being proposed to replace these lands with? What other areas are going to become available to the citizens? This is a crossroads decision for the

people of the state of Michigan, as well as for the local community.

This land, once the use is changed, will most likely be lost for generations for the purposes it was held in trust: recreation of the residents of the state of Michigan. This land was not purchased as part of a land bank for the National Guard, or for the economic development of the immediate area. The land and the natural features therein were held to be a value to the residents of this state for wildlife, forest and recreation purposes. The state and the Governor must consider this trust when allowing changed usage of this land.

The state, I hope, will also consider the premise that nothing remains static. Everything grows or shrinks. If these changes are approved, then what next? How long before we will be here again for another study, another land use change, other projects to be considered, more land needed, fences to be installed, missile sites to be considered, roads to be closed, streams to be diverted, more landing strips, more ranges, more tanks -- national security's problems.

This is the beginning of major change. The state government and the Governor has the power

to demand these changes at least be addressed. Please do so.

Thank you.

(Applause)

MR. HUNTINGTON: Edward Wickes.

MR. WICKES: My name is Edward Wickes. I'm here on behalf of my family and a group of friends who live on the north shore of Higgins Lake. I'm intending to settle here permanently as a year-round resident, and I'm deeply concerned about everything that's been said, because I'm going to spend the rest of my life in this area. I'm speaking specifically on the Camp Grayling DEIS's endorsement of increased winter training. What considerations have been missed in this report?

Most important is impact on the national environment. Have essential advance studies been made on the effects of winter military activities on soils, vegetation and wildlife? If so, why have these not been reported? The DNR and other agencies have expressed prior concerns on negative effects of snowmobiles and other motorized vehicles on soils and vegetation in winter. Then what might be the

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effects of these heavy-weight tanks and other military motorized vehicles on soils and vegetation?

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Has consideration been given to possible effects on wildlife already stressed by winter? The report does give some cursory mention of deer -- only that. We need a detailed DNR evaluation of impact on wildlife. This issue has got to be faced in much more pointed fashion.

Finally, we're concerned over the impact on Michigan's economy. People come north to enjoy Michigan's winter wonderland. How much will our peace and tranquility of this treasured outdoor recreation be threatened by winter military activity? We believe the DEIS is gravely deficient in addressing these concerns. As one of my friends said, "The DEIS is an insult to our intelligence."

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(Applause)

MR. HUNTINGTON: Nancy Hanaford.

MS. HANAFORD: My name is Nancy Hanaford. I reside in Kentucky, but my husband's family has been coming to Higgins Lake for four generations, and we are concerned with what's going on here. I would like to address the problem of the railroad

and the wetlands. It is my understanding that a railroad spur 5 1/2 miles long is to be built through the middle of the wetlands, and I would like to know if a study has been made to assess the environmental impact to the wetlands that -- you know, what this railroad will -- how it will impact the wetlands? And if there has been a study made, is this available to us to review?

I know that there are federal laws that govern the use of wetlands, and I would like to know if this railroad is in violation of these laws, and has this question even been investigated? I would also like to know why the wetlands as a topic was not put into the EIS report; why it was omitted.

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And lastly, I would like to know what would be transported in this railroad -- by this railroad. Will it be chemicals? Will it be explosives? Will there be hazardous waste that will be going over these wetlands, and who can tell us, and will they tell us, and what happens to these wetlands and surface water and the groundwater when there is a chemical spill? And there will be a chemical spill. There always is, no matter how hard -- what happens to the hazardous waste? Is there any provision for containing this waste; for

cleaning them up? And has this issue been addressed, and how long will it take before we can restore our wetlands to their original health?

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Thank you very much.

(Applause)

MR. HUNTINGTON: Allan Smith.

MR. SMITH: My name is Allan Smith, and I'm a property owner at KP Lake. I reside in Milford. 50 years or so ago, I used to spend a week each summer at my aunt's cottage on KP Lake, and out on the back porch, we had a Victrola. This was before Top-O-Michigan got here, and one of my favorite records was "Home on the Range." Well, today I have my own home on the range.

(Applause)

MR. SMITH: I'd like to relate a few incidents in the last -- they're very modern. They're bothering me right now. A couple weeks ago -- this was two weeks ago Sunday, I had my family visiting me from Massachusetts, and at 2:00 in the morning, I was out walking our trails. I couldn't

sleep because of the rat-a-tat-tat going in my ears. Last Saturday night at 5 minutes to 9 o'clock, we arrived home from the restaurant. I looked up in the sky, and it was covered with smoke. This was caused by the National Guard, and it's a common occurrence resulting from military operations.

Last summer I drove my jeep over the East-West Truck Trail. This is a small trail running east and west just a couple miles south of KP Lake. Alongside both sides of this trail, it was posted signs, "No Trespassing. Kirtland Warbler Protected Area." Interspersed between the postings were tank tracks, and at the intersection of Stephan Bridge Road with East-West Truck Trail is an 8 foot high fence with signs warning of unexploded shells. Today, there is no military trespassing. That's because the signs have been removed. Now the area is off limit to the Kirtland Warbler, and the Environmental Impact Statement says, "no adverse effect."

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Just west of Stephan Bridge Road are a series of small lakes called the Frog Lakes. They're pretty lakes with clean and clear sand bottoms. The banks down to the lakes are despoiled with tank tracks, and the surrounding hills are

suffering from erosion. "No environmental impact." What has happened to the beaver we used to have along the east branch, north along Kinney Road? "No environmental impact."

Please be reminded, we are talking about an area designated as recreation land and a game preserve. Henry Ford vacationed here. Today, property values are stagnant. Taxes are among the highest in the nation. Taxes on my 20 by 26 foot cabin are costing me just about $100 for every weekend I'm here.

I reject the Environmental Impact Statement as insensitive and self-serving to the military. We cannot allow further environmental deterioration. I also wonder what our military is going to do with the comments that we are making here today. So far, everyone that I've listened to has been strongly against the Environmental Impact Statement. I'm wondering if this is all going to be whitewashed after we're all done, and what we're all doing.

Thank you very much.

(Applause)

MR. HUNTINGTON: Duane Peterson.

MR. PETERSON: Thank you. I am Duane Peterson. I live in Ann Arbor, Michigan, and vacation with my family on the north branch of the AuSable River. We have acreage, and have been paying taxes on this property since 1951. I'd like to make a few comments on the proposed expansion of Camp Grayling. First of all, I find the 1989 DEIS Statement inadequate. There is no adequate reason for Camp Grayling's expansion. Indeed, it needs to be reduced to the original intent and stated purpose of the Hanson grant. That is, for training --

(Applause)

MR. PETERSON: That is, for training -- for a training camp for the Michigan Militia, and only the Michigan Militia. Other states should train their own troops. However, if specialized modern facilities are needed, sites should be selected that are remote from areas of human habitation, and where there is enough room for the required training and equipment. Camp Grayling's expansion, as proposed, is an encroachment on the wildlife, the natural environment and the people

that live and recreate in the area.

Regarding the master plan at Camp Grayling, the DEIS admits on page 3 to 4 of the study that, quote, "Taking no action to expand the facility would eventually become less competitive in relation to other National Guard camps; thus, over time, the post will lose many of the troops who currently train there." Unquote.

(Applause)

MR. PETERSON: This master planning issue raises a major public concern. On one hand, DEIS makes the case that it is urgent that the expansion take place, so urgent that no alternatives should be considered. On the other hand, DEIS argues that if the actions -- if the actions are not taken; that is to say, expansion, other National Guard camps will outcompete Camp Grayling for such training. If there is such competition for Guard clientele, then the need to expand Camp Grayling cannot be so urgent a need as suggested.

I raise the question, if there is competition for Guard training, why not diversify the specialized training to other camps and other

states? This will preserve the quality of life in our northern environment, and help this and other states economically. To resolve this issue, a quantitative assessment of the off-site alternatives is recommended. 34

Regarding land use development, approximately 50,000 acres of land were leased in perpetuity from the Department of Conservation, now the DNR, by the Military Board under authority of Act 154, Public Acts 1941, and executed May 3rd, 1948. The in perpetuity lease allows the Military Board to use the land for military purposes, but the DNR retains control for hunting and fishing and timbering and mineral extraction. The DEIS distorts the intent of this lease. The plan to use the entire 50,000 acres for year-round training activities for deployment of new high technology weaponry training for doubling and redoubling of activity levels and so on is a gross misuse of the lease intentions.

Please know that the lease of 1948, and renewed in 1978, is very restrictive. It authorizes only extremely limited rights for low military levels, such as conventional weaponry training, and it states, "no permanent buildings and improvements 35

are to be erected." I ask the question, with these lease restrictions, why is Camp Grayling even being considered for expansion? Surely expansion of the nature being considered is in violation of the lease agreement, to say nothing of the law. 35

Regarding noise, this important and much complained about subject has been sidestepped by the DEIS. This area of much complaint must be addressed in detail as to the physiological and health impact it has on the Camp Grayling area residents. No other military camp has noise levels like Camp Grayling relative to area residents. There should be an assessment of the noise effects on populations and animal behavior. 36

The DEIS points out that the state has no noise standards as a regulatory tool, and implies that this is outside state control. However, noise and odor have been regulated by litigation in Michigan since 1910, so there is noise guideline and precedent and control within the state's jurisdiction. Further, the Department of Transportation set 70 decibels as the standard. This standard is constantly being violated by Camp Grayling's guns, tanks, bombs and military aircraft. An expansion of the Camp can only make the noise

problem impossible to tolerate.

So I repeat my opening comments. I find the 1989 DEIS inadequate. There is no adequate reason for Camp Grayling's expansion. Indeed, it needs to be reduced to the original intent and stated purpose of the Hanson Grant; that is, for a training camp for the Michigan militia, and only the Michigan militia. Other states should train their own troops. However, if specialized modern facilities are needed, sites should be selected that are remote from areas of human habitation, and where there is enough room for the required training and equipment. Camp Grayling's expansion, as proposed, is an encroachment on the wildlife, the natural environment and the people that live and recreate in the area.

Thank you.

(Applause)

MR. HUNTINGTON: Robert Krause.

(No response)

MR. HUNTINGTON: Is there a Robert Krause?

(No response)

MR. HUNTINGTON: James Stallings.

MR. STALLINGS: Thank you. I am Jim Stallings. I live in Flushing, Michigan, and we have a place on KP Lake. I am not a professional speaker, or will I deliver anything nearly as eloquent as what we've heard by trained professionals in the area, but I feel I must speak also.

We've been on KP Lake for about 30 years now, and I, by profession, am a businessperson. I am involved with an automobile company. And when I had the opportunity to pick up this Environmental Statement, I took the Executive Summary. Executive Summaries are something that I work with on a daily basis. I write them and I read them. And to me, an Executive Summary, the buzzword is, it gets you quick to the bottom line. What are they really trying to say? What are the numbers? What are the dollars? Well, I read this, and I don't see a bottom line. I see a lot of mumbo jumbo. A lot of statements made in it, but where is the bottom line? What are they really trying to tell us?

The air concerns -- a lot of people have

covered what I wanted to talk about, and I'm a little concerned about where I'm going with this, but bear with me. The air quality -- I wonder what happens when munitions are exploded; when they're put into the air? What kind of chemicals come out of that and settle back to the earth? How much of this get into the groundwater? We know quite a bit about what happens to automobiles with hydrocarbon emissions, and you pay a great penalty on each of your cars that you buy to take care of this. What happens when this sort of thing happens?

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Other contaminants are released into the air from the military. I wonder what the environment -- how much of the environment will be able to absorb that, and what really is going into the air. I'd like to hear it from a toxicologist.

The Statement, at least in the Executive Summary, states some studies that were made from the Army Environmental Hygiene Agency, 1982 to 1984, the Army Engineering Research Lab, 1985, and measurements by the State of Michigan Department of Military Affairs. What are the results of these studies? It sure didn't show up in that Executive Summary. That's the bottom line I was looking for. I guess it came out in the several hundred page

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summary that came out, but what does that really mean to me and to you? Is it something that's going to be a negative effect, or is it something that's neutral, or something positive?

Well, I'll tell you, we live up at KP Lake, and I don't need a study to tell me what the noise is up there. I come up here for a little rest, a little relaxation, get away from the stress that so many of us have, and I don't get it at 2:30 in the morning with the bombardment going on.

It talked a little bit about the cold weather camp. Another point that we bring up in this, if you're going to construct a facility, as I read it, to house another 4,000 people -- also you say you're not adding -- you're not going to add significantly to the amount of people that use the camp on a year-round basis. Well, my thought would be, if you're going to add that kind of capacity to it, and with the current thought in the government and the military of utilizing your bases to better use, why wouldn't you want to use that year-round and increase the amount of people that's coming into it? Your Statement says one thing, but your actions are saying something else.

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I too support the Michigan National Guard.

I feel that we need a strong Guard in the state of Michigan, but I am also concerned about why do we need to support that of several other states? If they had this pristine wilderness, this ecosystem that we have with the Manistee and AuSable River in any of the states that come up here, do you suppose they would allow their own National Guard to go into it and destroy it? I think not. I think not. Why should we allow them to come here and do it in our state?

Thank you very much.

(Applause)

MR. HUNTINGTON: We've got about ten people left. If you want, we can take a break.

LTC. WILKINS: About 10, 15 minutes.

MR. HUNTINGTON: About 10 or 15 minute break.

(Break taken.)

MR. HUNTINGTON: Mr. Jim Williams.

MR. WILLIAMS: My name is Jim Williams. My wife Virginia and I live on the north branch of

the AuSable just a bit south of Kellogg Bridge. Before commenting on the EIS, I would like to offer some reasons for why I feel qualified to express my views on the impact that military operations have had in the past and could have in the future on the environment of the AuSable and the Manistee River systems.

From a personal point of view, I've fished ardently on both rivers for nearly 50 years. My two sons learned to fly fish on both rivers, and I now have a grandson who has been introduced to fishing both of these rivers, so there is no doubt that the AuSable and Manistee systems are an integral part of our family character. I will, therefore, admit some prejudice favoring the environment in my remarks. However, this prejudice is very much tempered by the fact that most of my professional life has been involved with resource management. In particular, how natural resources are managed as a function of economic development.

In the minds of economic developers, there has always been a conflict between the need to expand the economic base of the community, and at the same time, retain the natural characteristics of the community. Most economic developers recognize

that in the political rush toward economic progress, if you destroy the quality of life, you also destroy the integrity of the economic system. Usually it's replaced with some form of either rural or urban decay.

In 1969 while I was Director of the Northeast Michigan Council of Governments, our commission officially recognized the AuSable River watershed as a natural resource vital to the economic well-being of northeast Michigan. We allocated staff and funds to assist with a user conflict study, and the development of a management plan helped reduce the conflicting uses on the river system. This was back in 1971. The study indicated that the highest and best use of the river system was for tourism and recreation, and that in 1971, tourism expenditures in the counties encompassing the AuSable River watershed were approximately $11,900,000. Crawford County alone benefited to the extent of approximately $3.4 million, based upon a factor of retail sales for that fiscal year.

I have worked for nearly 25 years on economic development problems throughout northeastern Michigan, and there is no doubt that tourism is a major industry in the region. It's

also a major industry to Crawford County. I also believe that the presence of the National Guard is significant to the economy of Crawford County. In fact, we are now conducting, through the Northeast Study Commission, a 15-county economic impact study and economic strategy that will develop specific strategies for each of the counties, including Crawford.

I have in the past invited your predecessor, Deborah. I will invite you -- she never participated. I will invite you to be a part of the advisory committee. One of the best ways, in fact, to alleviate deteriorating economic structure is by diversifying the base economy, and that's what this is designed to do.

We would probably all agree that the AuSable and Manistee Rivers represent a limited, and for the most part, nonrenewable natural resource. And if these conflicting uses became -- expansion of military operations and the preservation of the national environment are to be properly managed in the future, then we need to have a forum that provides for civilian responsibility in the gathering and assessment of information. And the recommending of policy in regard to military

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expansion, in whatever form, by Camp Grayling. There presently is no such authority, although it has been recommended by the Camp Grayling Management Advisory Committee.

In addition to the lack of a formal organization for resolving problems -- and that's the root cause, I believe, of the problems we're having now -- there is one overriding behavioral issue that has exacerbated the situation beyond reason. That is the arrogance of purpose displayed by the military and their disrespect for and lack of understanding about civil process. Even this meeting today is contrary to an agreement with the Camp Grayling Management Advisory Committee that hearings on the Environmental Impact Statement would be a joint effort between the Civilian Oversight Committee, once appointed by the Governor, and the National Guard.

For all practical purposes, the military is functioning as a self-regulating government agency in regard to environmental policy. The EIS is prepared by the military. The public hearings are conducted by the military. The assessments are reviewed by the military. The program is implemented by the military and policed by the

military.

I serve as a member of the Camp Grayling Management Advisory Committee. I heard some comments about the quality of that organization. I think they did a very good job, frankly. The members of that committee were appointed by executive order of the Governor. They were given a specific charge that depended heavily upon information from the National Guard. I speak here for myself. I can't speak for the committee. That information was given reluctantly. It was given partially. It was given late, and in some cases, not at all. The members of the committee served in good faith without remuneration, and arrived at a consensus of opinion in submitting their final recommendations to the Governor.

The military, however, did not apparently agree with some of these recommendations, and so they drafted a dissenting report for signature by some of the committee members, and that report has been filed as a matter of record.

Regardless of whether you are pro-military or pro-environment, this action cannot be viewed as anything less than a disregard for civil process by a constitutional agency of state government. I'm

not antimilitary. Everyone seems to want to emphasize that fact. I don't think any of us are. In fact, I've always been pro-defense, certainly far more of a hawk than a dove. I am, however, anti-self-regulating for any public agency or person that functions in a society that governs by checks and balances.

During the public hearings last August, I told Colonel Downey that I felt badly for the beating that the military seemed to be taking at that time, and I meant it sincerely. I also told him, however, that I felt it was deserved, and I mean it today as well, even more so. I think the National Guard has begun to feel even more so today, or realize today that they must be participants in the civil process, and not manipulators of it. And if so, maybe the process of resolving conflicts can begin.

I think the Governor did act responsibly in appointing a committee. I think it was a good committee. There was dissension; not within the committee ranks itself, but between some of the independent members. I think that the recommendations were good recommendations. The Governor responded relatively quickly in endorsing

41 those recommendations. Where the failure has come is in implementing those recommendations. And I think that if it was your letters before that stimulated action by the Governor, perhaps it's time to stimulate more action by encouraging the Governor to personally initiate the process of implementation, and by starting with the appointment of the Camp Grayling Oversight Committee as the first and most critical step in the process, and not allow that good faith effort to slip into apathy or be preempted by other actions. The military has been a potential deterrent in this process, and I would ask them also to cooperate.

Thank you.

(Applause)

MR. HUNTINGTON: Sherry Schairor.

MS. SCHAIROR: My name is Sherry Schairor, and I'm from Fox River Grove, Illinois, and we came up this weekend because of this public hearing. My husband and I are weekend residents owning 80 acres east of Grayling, a cottage and two small rental cottages for fly fishermen on the main stream AuSable River in Shaw Park. We are not newcomers to

the area. My husband and I have been landowners for 20 years, and I have been coming to Grayling for 40 years.

I have four concerns I'll share out of many. One, I'm concerned about preserving the area's environment. What will be the future of the

42 area wildlife, particularly the Kirtland Warbler and the bald eagle?

Two, I'm concerned about preserving the AuSable River. What will be the future of the

43 fishing in the area? Both the Kirtland Warbler and AuSable River are recognized throughout the United States as being important assets to the natural environment.

Three, I'm concerned about the noise factor in the operations of Camp Grayling. Illinois has many TV commercials wanting Illinoians to say yes to Michigan. What kind of rest, relaxation and recreation will families coming 400 miles find while listening to military maneuvers?

Four, I'm concerned about the proposed expansion of Camp Grayling. Now I'm not opposed to military training, but why does an expansion of training have to be in the Grayling area? Mr. Hanson gave the Michigan National Guard an inch.

They have taken a mile. We want to retire here in a couple of years. Our daughter, now 27, wants to build a cabin on the acreage. Is there a future for us in Michigan? And we're not corporate executives or a disgruntled vocal minority. We are average citizens interested in preserving the environment for our children and future generations. I'm saying yes to Michigan, but a loud, resounding no to an expanded Camp Grayling.

Thank you.

(Applause)

MR. HUNTINGTON: Ruth Haynes.

MS. HAYNES: I'm Ruth Haynes, and I live at Guthrie Lakes, and I don't have a prepared statement. I was tempted to relinquish my time, but I just wanted to express my appreciation to these knowledgeable and qualified people who have prepared statements today and voiced my concerns and my needs. And just in case the Governor is interested in numbers of speakers, I decided to come on up and say something.

We bought our property on Guthrie Lakes nearly 20 years ago, and we drove into this

beautiful area -- both my husband and I were impressed with the big, beautiful white pines and oaks and the crystal clear spring-fed Guthrie Lake, and we decided we wanted property here. It was quiet that day, and so we bought a nice lot. Well, we didn't decide to build until some years later. My husband retired in '80, and we decided to build a retirement home in Guthrie Lakes, and large enough so that our family could come and visit us and enjoy the outdoor facilities that we enjoy.

And at that time, we were then aware of the military activities and decided they weren't that bad, they wouldn't bother us, and we could live with that. So we built a fairly large home there and enjoyed it. But I would like the Governor to imagine, if he can, two years ago we were awakened at 7:30 in the morning with not 3 or 4, but 12, 500-pound bombs dropped in rapid succession. And I mean our house shook. Or being on a walk with your dog and having a 500-pound bomb dropped, and that poor dog ready to take off home. And now for a long time, just spends her summer in the basement down where she can get away a little bit from the vibration and noise.

Now admittedly, it's been fairly quiet

this year, not that bad, but we were told two years ago that every three years, this escalation of military people there would happen. So next year, we'd better be prepared for more of these 500-pound bombs and -- we're victims of noise pollution, and I just would like to see something done about this.

I thank all the other people. This is a good representation, and I thank you all for meeting here.

(Applause)

MR. HUNTINGTON: Lynn Vernon.

MR. VERNON: Good morning. Thank you, Lieutenant Colonel Wilkins and Mr. Huntington, for the opportunity to speak with you today. The first speaker up here mentioned that he had had several friends up last weekend. I guess he indeed is lucky to have friends and relatives that like to come up to this area anymore.

I had some prepared remarks, and I'm going to dispense with those, because I think this is really a charged issue. And though I, like many of those that have spoken here today, have no interest in abolishing the military here in this area or Camp

Grayling, I am very, very concerned about one big thing from my standpoint, and that is environmental health. And I think that most of the people up here this morning have touched a little bit on everything that I would say to you, but I too am concerned about air pollution. I too am concerned about the plundering of the land. I too am concerned about the wildlife, the wildlife habitat and the loss thereof, and I, quite frankly, think that it is time that all of us, whether we be on the military side or the environmental side, start to do something about this.

The EIS is totally inadequate. I think every one of you that have taken the time to read it and study it realize that. I think the military realizes that. I think it's time that the military do something about it. I think it's time that the Department of Natural Resources do something with it. I think it's time that our Governor start doing something about it instead of worrying about his upcoming marriage this fall.

(Applause)

MR. VERNON: I think that it's time that

everybody in this room, everybody that has just one little piece of interest in this problem, start to write letters, start to support economically and express all of our concerns. Whether you've done it before or not, that is not the point. We must continually do it again.

I too am connected with the automotive industry. I'm very involved in the advertising and PR and communication efforts of one of the big three. And we have a little saying: In order to get things done right, you have to tell them once, and you have to tell them again and again and again. Sometimes we speak to brick walls. We must continue to fight for what is right, and mutually find a way to coexist with the military. We are not going to abolish the military. That is not in our best interests, quite frankly, from my personal standpoint, but we must find a way to live with them.

Thank you very much, gentlemen.

(Applause)

MR. HUNTINGTON: Chris Polaczyk.

(No response)

MR. HUNTINGTON: There are several people that said they were relinquishing their time to KP Lake. Did they have a speaker for them? Minnie Kenel, Edith Pelon, Jean Warner, was there someone that was going to speak for you?

UNIDENTIFIED MEMBER OF AUDIENCE: Mr. Warner was supposed to speak for me.

MR. HUNTINGTON: Okay.

ANOTHER UNIDENTIFIED MEMBER OF AUDIENCE: I think Jon Hart was going to speak, and Nancy, I think it was, back here.

MR. HUNTINGTON: Okay. It must -- I haven't gotten to them yet. Gary Gilbert.

(No respone)

MR. HUNTINGTON: Ernest Dawson.

(No response)

MR. HUNTINGTON: Chuck Haynes.

MR. HAYNES: Ladies and gentlemen, I don't have a prepared statement either. Normally I don't

get up like this, but I felt like I should get up and make my voice heard. My wife has given you most of the details of where I live and everything, but the thing I would like to impress, is when they shoot off these 800-pound -- 500-pound bombs and shoot these 8-inchers, my house shakes, and I'm concerned about the construction of my house. And I call Camp Grayling just every time I feel it, and I was wondering, what do they do with those calls. Do they keep them on record? Because at one time earlier in this dispute, they said, "Well, we don't have any complaints from Guthrie Lakes," because people weren't calling.

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So I think each one of us, when we have this condition, we should call and let them know. That is, provided they actually do anything with these names. Now they're supposed to keep them on record in Lansing so that the Governor could review them, but I don't know if they do or not.

But what I'd like to say finally is that I'd like the Governor and the military to know that there is a lot of people like me. We don't talk a lot, but we're out there, and we're very unhappy with what is happening, and we hope that something can be resolved.

Thank you.

(Applause)

MR. RUNTINGTON: James McLennan.

MR. MCLENNAN: Thank you. My name is Jim McLennan. My wife and I are residents of Saginaw, and are taxpayers without representation in South Branch Township, Crawford County. That property has been in my wife's family since 1948.

The following are my comments relative to the Draft Environmental Impact Statement prepared by Eugene A. Hickok & Associates dated March 1989. In Executive Summary paragraphs 4 and 5, quote, "Since the early 1900's, Camp Grayling has been meeting the operational needs and training needs of an increasing and variety of military units. However, many of the post's existing facilities are no longer adequate to support current operations and training requirements, due to age and condition. The master plan actions addressed in this Environmental Impact Statement are intended to alleviate these deficiencies and upgrade these facilities to meet U.S. Department of Defense standards.

This document fulfills the purpose of an

Environmental Impact Statement by presenting a full and fair discussion of significant environmental impacts of proposed actions. This document also explains the purpose and need for these actions, examines their alternatives and offers conclusions about potential impacts." Unquote.

In my opinion, this document does not present either full or fair discussion of not only, quote, "significant environmental impacts of proposed actions," but -- unquote, but of any impacts of proposed actions. In paragraph 4, it's fully acknowledged that there is an escalation of activity, noting, quote, "The existing facilities are no longer adequate to support current operations and training requirements, due to age and condition."

I'm deeply concerned about the increase in activity, and I'm pleased to find that the document does acknowledge an increase in yearly training levels from 34,000 in fiscal year '80 to 55,000 in fiscal year '86. This means doubling about every seven years, which will mean 110,000 in fiscal year '93, and 220,000 in fiscal year 2000. And I do believe that this is a conservative number, considering the period between fiscal year '80 and

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'86 did not have the multipurpose range complex-heavy, as proposed, nor did it have an assault landing strip, as proposed. Both of these facilities will demand full use of the facilities 12 months a year.

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By the way, this may even require the closing down of deer season those two weeks in November because it's too much of a bother to interrupt Camp Grayling's training schedule.

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As a sidelight at this point, I cannot buy any of the socioeconomic projections of the document. There's no factual documentation of any of these projections. I personally could say that the tourist industry increase in Crawford County could amount to $100 million annually without Camp Grayling, and be just as accurate as to what has been presented in the DEIS. Don't get me wrong. I have no desire to either close down or shut down Camp Grayling.

On page 3 of the Executive Summary, alternatives were discussed. However, there was no consideration for, quote, "relocation," unquote, to a distance greater than a half mile from the proposed site. I feel it is necessary an Environmental Impact Statement should consider

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alternatives, be they within the confines of the original Hanson Grant of 1913, or 1000 miles or more away.

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On page 4-3.5 and Table 4-3.2, "Potential of Complaints and Damage Claims at Linear Peak Levels, Decibel Peaks of Greater Than 140," makes reference to, quote, "Possible cracks in poorly mounted window panes." Unquote. I believe that if the drafters of this report would have gone to the bother of checking, they might have found the claims for cracked concrete block walls, chimneys and other structurally sound objects were acknowledged and paid because of activities in range 40.

On 4-3.28, the contention is that all but, quote, "three particles of private land -- parcels of private land," unquote, are owned by the military. The fact is, out of approximately 146,000 acres of land used by the DMA, only about 44,000 are owned by the Military Board. The rest of the lands are under lease or management agreements with the Department of Natural Resources. These lands are intended to be used by the military and the citizens of the state of Michigan. It just seems to me that the DMA has decided that the private citizens put too much of a monkey wrench in their plans, and they

intend to use the lands for military purposes only.

I do have to fault the DNR, who have not policed the lease with the DMA as they should.

Throughout the entire DEIS, there is reference to the fact that everything will be hunky-dory after mitigation. The definition of mitigation is, "To make less in force or degree." That is, harshness, severity, et cetera. Nowhere in the DEIS did the drafters define any specific plans for the mitigation process. This reminds me of a concerned mother whose child has just skinned his or her knee. The mother assures the child that she will kiss it and make it all better. I think that the people of this area deserve more than to be kissed to make it all better.

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In closing, this Draft Environmental Impact Statement needs to be taken back to the drawing board and completely redone with subsequent public comment and review.

Thank you.

(Applause)

MR. HUNTINGTON: Barbara McLennan.

MS. MCLENNAN: I don't care to add

anything more. My husband spoke.

MR. HUNTINGTON: John Hart.

MR. HART: My name is Jack Hart. I live on Shupac Lake just outside the village of Lovells. I started coming up here trout fishing in the north branch back in 1942, and we bought our property in 1948, so I've been a property owner here for some 41 years. We're very concerned with the noise level, as everybody speaking so far has mentioned, but I want to point out one other aspect of this which has not been considered at all by any of the speakers, and I'm going to read this. It's a word of caution to the residents and the businesspeople who make up corporate Grayling.

The town's future may not lie with the expanding Guard. Assume that the Guard prevails, and General Temple, who is the head of the National Guard in Washington, D.C., stated they have a desire for an increase up to 100 fold in the activities, in the size of Camp Grayling. If this happens, Camp Grayling will then become either a post or a fort, with a large commissary and PX for shopping for members of the military personnel. The prices will be 20 to 25 percent lower than prevailing in any of the stores in the Grayling/Crawford County area. In

this case, having alienated what would be left of the surrounding populace -- we people -- and having reduced recreational visitors, what will happen to the economic well-being of Grayling? Have they hitched their wagon to a star which will explode in their faces?

The bottom line, they're going to suffer a loss of business, rather than having increased business as the National Guard expands to the size of a post or a fort.

Now I have a prepared presentation here, and I'm going to skip over most of it, because it's been said by several other speakers. There is one part of this that, to me, is very pertinent. A previous speaker mentioned it, and I'm going to repeat it for emphasis. In conclusion, I quote again from the consultant review with a most important question. Quote, "Are the leaders involved here really in the service of Guard training, or are they in the business of a specialized commercial camp? That is, the selling of the north central part of Michigan competitively for the Guard encampments of other states. The motive behind this does not appear to be to train the Michigan Guard and simultaneously preserve the

quality of life and the environment in the area. The alternatives posed for the facility expansion and for new military training and technology address neither the need, nor the site uniqueness, to say that north central Michigan looks like Russia in the wintertime."

I think that adequately covers the points that I wish to make, and I thank you.

(Applause)

MR. HUNTINGTON: R. C. Rieder.

(No response)

MR. HUNTINGTON: R-I-E-D-E-R.

UNIDENTIFIED MEMBER OF AUDIENCE: He's not here.

MR. HUNTINGTON: Chet Olsen.

(No response)

MR. HUNTINGTON: Chuck Wheeker.

MR. WHEEKER: Thank you. My name is Chuck Wheeker. We are complainers. Maybe he recognized

our name, and that's why he pulled my card out. I'm not sure. Our family has owned property in the Grayling and supported the Grayling area since as early as 1920, and I would like to read you a letter that my mother wrote to the Department of Military Affairs in Lansing, Michigan.

"My name is Norma Wheeker, and I'm representing the Pochelon family. Our family owns Fighting Deers on a bluff above the AuSable North Branch, upstream from the Kellogg Bridge in Lovells Township. We are continually harassed by low-flying military aircraft which seem to zero in on our flagpole and American Flag we fly with pride and patriotism. Many times we have gone for cover on the ground from sheer terror when we are startled by your aviators buzzing us at 400 miles per hour, 200 or so feet above our heads. This is much more frequent than ever in the 60 plus years we have been coming up here.

When we call and report these trespasses, we are told by Major Foehl that Camp Grayling has no control over the Air National Guard. We are here to tell you that you had better get control, and get it soon.

(Applause)

MR. WHEEKER: In your EIS, Figure 4-3.1C shows zone II aircraft noise totally contained within your property. This is an outright lie. When your planes go over our place, try blowing our flag off its pole, they subject us to zone III noise, and it is affecting our health, both physically and psychologically, and we will fight it to the end and win. 50

(Applause)

MR. WHEEKER: Your big sign at Camp Grayling says "Army and Air National Guard Training Site." That being the case, how can you possibly state you have no control? It is your duty to maintain control. You are derelict in this duty, because you have chosen to cop out or otherwise shrug this off. Or are the pilots simply lacking discipline, and they do not follow your orders? 51

(Applause)

MR. WHEEKER: It is for this reason we

must tell you that your EIS is, in our opinion, a pack of lies, and it must be completely redone. Sincerely, the Pochelon and Wheeker family, all children, grandchildren and relatives included."

I also brought a copy, just to sensationalize a little bit, a copy of The First 100 Years, which is an introduction to the history of Grayling, and my family enjoys reading this. My kids read it every weekend. Will the second 100 years show how Grayling was devastated by the National Guard? I hope not.

(Applause)

MR. HUNTINGTON: E. P. Stansbury.

MR. STANSBURY: Good afternoon. My name is E. P. Stansbury, and I live in Saginaw, and I've been a property owner in the Grayling area for a long time. We have two pieces of property. One on the main stream in the Still Waters area, and one on the north branch in the Lovells area. I am not anti-Guard per se. I think that Camp Grayling belongs to the Michigan Militia or the Michigan National Guard, and the Michigan National Guard only, and I think that all of us are going to have

to take a stand and fight for that stand if we're going to prevail.

Now like so many of you, I put in my stint in the service from '42 to '46, and I was a Captain in the Army of the United States, detailed in field artillery, so I have a little knowledge of what field artillery is all about. And in examining the EIS, I concluded that it is, as stated by several other speakers, an insult -- a blatant insult to the intelligence of the people of Michigan, and particularly, those of us who are associated with this area and understand some of the facts. That EIS is a mockery, and it more resembles something that would have been written by Art Buchwald with tongue in cheek.

(Applause)

MR. STANSBURY: As a literary piece, it's a disaster. Now one of the things that it doesn't address, and I think that is forefront in all of us, is the fact that the AuSable River and the Manistee are Michigan treasures, and they are national treasures, and they must be preserved as such, and they must be regarded as such, and not written off

as insignificant or not significant by a phony EIS.

(Applause)

MR. STANSBURY: If any of you have had any experience with a historic district, you'll understand that once an item gets in a historic district, the government goes to great lengths to preserve it. And I'd like to see the same thing and the same kind of vigilance exercised for our AuSable and Manistee Rivers. In the years that I've been here, the degradation that has occurred on both the AuSable and the Manistee are very evident, and not all of this is attributable, of course, to the military, but some of it is.

I'd like to speak on another point for just a moment. Not much has been said about that multi-range complex that's a part of this plan, but the multi-range complex points right at Lovells, and I had some experience in the artillery with what's called longs and shorts. Now I wouldn't worry about shorts too much, except if I was, you know, around KP Lake maybe. But longs, being around Lovells, I worry a lot about. And I watch those long toms, those 155 rifles fire a lot, and I watch the 8-inch

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howitzers fire a lot, and they hurl huge missiles 16 miles, 22 miles. So from the multipurpose range, Lovells is well within their capability, and I shudder to think what could happen. And there's no mention in an environmental impact study of an impact like that.

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Back in the 1850's, a political slogan sprang up. It was "Fifty-Four Forty or Fight," and it was very instrumental in an election. Well, friends, this is sort of an election, because we are arrayed against the military in a political battle, and I say to you, our slogan ought to be, "the Michigan National Guard and no further. This is as far as we go."

(Applause)

MR. STANSBURY: We've gone from 13,000 acres to over 145,000 acres, and that's officially. Unofficially, a lot more. Private property even, you know, becomes the pathway for the military when the fellows decide that this kind of a shortcut would be convenient, or to dump the garbage. So we are going to have to become activists. I submit to you, and you've heard the speakers say this: There

is no reason, no real compelling reason to expand Camp Grayling in the kind of things that have been envisioned and stated in this EIS. I also submit to you that this is an adventure in military imperialism, and is for the satisfaction of an eagle. Someone is empire building here for his own benefit. I don't know who it is, but I am not going to stand for it.

(Applause)

MR. STANSBURY: And I urge each and every one of you the same thing. Join AMAC. Join somebody else, but let us take care of our area.

Thank you very much.

(Applause)

MR. HUNTINGTON: Dick Daane.

MR. DAANE: Thank you. Good afternoon. I have a place on the north branch of the AuSable downstream from Kellogg Bridge, and I live and I practice law in Ann Arbor. And I had thought to display my erudition this afternoon by describing the EIS as a paragon of audacity, but I like

Mr. Bickman's characterization better: it's drivel. Four points illustrate that.

The treatment by the EIS of the assault landing strip. You will find in the Executive Summary portion on page Roman XIV the following statements: "Computer simulated noise contours don't extend off-post." Well, the airplanes will, and the noise on post will pollute the Manistee River Valley, because the Manistee River Valley has the bad luck to be on post. Air noise is addressed also at page 4-3.17, which devotes itself to bomb drops, and concludes that excessive noise for 10 or 12 days per year is okay. Well, even if that were acceptable, a fighter plane doesn't have to be dropping a bomb to make an unacceptably high level of noise, as we all here know.

And at page 4-3.15, the EIS essentially dismisses this concern, because it says that kind of low-level noise occurs on post. Well, on post is huge. But even if that statement were true, it would be unacceptable. And the fact is, ladies and gentlemen, that statement is not true. I have personally experienced off-post noise assaults by low-level fighter planes while bird hunting in the area north of F-38, which even the expansive -- most

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expansive characterization of the limits of the post does not include.

I share the concerns also of the geologist who spoke eloquently earlier about contamination of the groundwater. He can speak to the point with far more sophistication than I, but it does jump right out at you, doesn't it, that if you want to find out whether there are toxic wastes caused by exploded or unexploded ordnance in the firing range area, you ought to take your tests from places where the ordnance lands, instead of someplace else.

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Finally -- and this is the last point I intend to address -- is the socioeconomic point to which the EIS devotes attention. That page is 3-5.11 and 4-10.29, among other places. There is absolutely no consideration in this document of the long-term effects on the local economy of continued economic buildup. The document is an apology for the current state of affairs, in my view. We all know the jobs in Grayling are important. I want Grayling to prosper just as much as anybody else. But a fair study, an objective study, a study that was intended to really analyze, would have included at least some consideration of the opposite side of the coin, and it is lamentably unaddressed by the

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Statement we are here to discuss this morning.

My personal view is that the long-term economic interests of our community, Grayling and its environs, will be far better served by preserving and cherishing the environment represented by these watersheds, than by driving tanks through them.

(Applause)

MR. HUNTINGTON: Sylvia Ghainer.

MS. GHAINER: Good afternoon. I'm Sylvia Ghainer from East Lansing, Michigan. Since the late 40's, our family has lived on the north shore of East Twin Lake in Lewiston, Montmorency County. My parents built a Perma-Log home on a very sturdy cement basement foundation in the early 50's, and at that time, it was the only large home on that shore of the lake. And it seems like the military had taken their ground pictures, and that was a great spot for their path of military. Our house has been traveled over by their planes at extremely low levels, treetop levels, television aerial levels, since the propellor planes on -- I mean I've seen the propellor planes come over, and I've seen the

jets come over.

Last year or the year before, one plane came over extremely low, and we spent an afternoon trying to track it down, and we finally did, and they apologized for the -- for the problem that it created with the family and all the neighbors.

In the early 50's, as a child, we had the artillery, and since then, the noise level has increased and increased. And last summer, one night I jumped right out of bed. It shook the house. The pictures were all askew, and I couldn't believe that I was living right here in Lewiston and listening to something that was dropped about 30 miles away.

I'm extremely against the expansion of this base or this project to a year-round facility.

Thank you.

(Applause)

MR. HUNTINGTON: Deborah Golden.

MS. GOLDEN: I didn't come to this meeting expecting to speak, so this is kind of disjointed. My name is Debbie Golden, and I represent my family in 42 very silent acres on Holy Water. They are 42 of the most beautiful acres in the United States.

We looked for two and-a-half years and drove 22,000 miles looking for the perfect retirement place. We thought we were moving to Grayling. We didn't know we were moving to a lulu, locally undecidable land use. That is, high unemployment, low education level, and lots of land.

We would like to know why the Federal Government is so adamant about expanding in a magnificent natural resource area. Why is the DNR fighting this? We moved here from Chicago, so I have to ask the question: who paid off who?

(Applause)

MS. GOLDEN: We thought moving out of Chicago, we would not have this so much. I want to know why the government is wanting to spend millions of dollars at Camp Grayling when they're closing military bases across the United States.

(Applause)

MS. GOLDEN: I have an article from the Battle Creek paper that says, quote, "'When there is a probability that the curtailment of ground forces

used at Grayling Training Center might upgrade the importance of the Fort Custer site,' according to Mr. Russell, 'some ground troops could be pushed here if Grayling is shut off to them,' he said. He anticipates that Fort Custer could be used to greater advantage by infantry and engineering units from the Midwest.

There is an effort by residents near the Grayling military base to curtail the use of heavy weapons. This also would affect the ANG, which uses the base to fire missiles and mini guns at ground targets.

Last year, Fort Custer was also used by National Guard units from several Midwest states. The Marine Corps -- excuse me -- Reservists from Oregon and Arizona, the FBI, the U.S. Secret Service, SWAT teams from Michigan State Police and other communities, and police departments tracking and drug detecting dog training. Russell said that Fort Custer has a permanent party of 50 officers, enlisted personnel," et cetera, et cetera, "and he said that the urbanized terrain training area, military assault course also will be built to train soldiers and police in street fighting tactics, and they would like to have Camp Grayling."

(Applause)

MS. GOLDEN: If the military -- I mean a foreign government had come in and caused the destruction that the National Guard has, our government would have declared war on them. The noise level from the helicopters that go over our house on the Holy Water where the no kill law was passed to protect the fish will surely do more damage than any fisherman who kept his fish.

My question is, what good are all these comments that were made here today? Will the Governor get a chance to hear them? Will the DNR and the federal decision-makers hear our comments? Are our comments today -- will they only go as far as our calls to the Grayling -- Camp Grayling hot line? Was today's meeting a voice exercised in these very, very knowledgeable speakers? Is this meeting just another PR exercise for the National Guard; and what's the next step? Do we have any chance of stopping this desecration? Is there anyone in a real authority who will hear us? Maybe we should just get in buses and go down and call on our dear Governor.

(Applause)

MR. HUNTINGTON: Jim Szabo.

MR. SZABO: Good afternoon. I'm Jim Szabo from Cold Springs Township, Kalkaska. There is insufficient environmental facts in the EIS report to go ahead with these projects. There is a House Concurrent Resolution Bill Number 338 in the State House at this time. This resolution is sponsored by 17 representatives, and reads as follows: "A concurrent resolution calling for a moratorium on a proposed construction of military airstrip and multipurpose range complex at Camp Grayling until all environmental issues are addressed and resolved. Whereas, a conflict between recreational use and National Guard training activities continues adjacent to Camp Grayling.

Public concerns about noise and significant negative impact on the environment, wildlife and the quality of life of residents resulting from Guard activities continue to mount. And whereas Governor Blanchard appointed a temporary Camp Grayling Management Advisory Committee which submitted recommendations on 47 issues and recommended deferral of construction of the air

assault strip and MPRC; and whereas, full evaluation of environmental impacts and resolutions of public concerns about these impacts must be resolved by the House of Representatives.

The state concurring that we call for a moratorium on proposed construction of a military airstrip and MPRC at Camp Grayling until all environmental issues are publicly addressed and resolved. And be it further resolved that a copy of this resolution be transmitted to the Director of the Department of Military Affairs. The concurrent resolution was referred to the Committee on House Oversight." I'm nervous.

I don't think the military needs either one of these facilities. As we read through the EIS, there is no real information in this report. The flaunting of millions of federal dollars is no justification for any type of pollution. The pollution of our land in long-term use is not addressed in the EIS. How long before someone will say, you can't eat the fish from the rivers or eat the wild game such as deer, grouse, rabbit and turkey? Now we have come to a time and place where the environment is becoming a number one value in our country. The military is no longer exempt from

environmental law. We must find a way to train our military hard and still save our environment for the future.

There is a bill in our Federal Government now, number HR 1056, that will make all federal agencies comply with the environmental laws of our land.

Throughout the EIS, the bottom line reads, the impact of this project will be insignificant. Boy, there has been times when I wish that that were, but in real life, you must face the real thing. This EIS report doesn't face the complete and real problems of Camp Grayling. Therefore, the EIS must be redone and give a fair evaluation of human and natural environment consequences.

Thank you.

(Applause)

MR. HUNTINGTON: Rick Hickel, I believe it is.

MR. HICKS: It's Hicks. I wish it was Hickel, because I'd like to be associated with Wally Hickel. I'm here on behalf of several neighbors of mine who live on the south branch along with my wif

and I. Three or four families who couldn't come today, but wanted those of you from KP Lake and the rest of the concerned area to know that those of us who are on the fringe on the east side of this are with you 100 percent, and will be with you 100 percent.

I have commented at other hearings on environmental and economic questions; those that have been addressed beautifully today by some very competent people. But I want to -- and I've written my letters, incidentally, to Congress, to the Armed Services Committee, to the Governor, to General Andrews, and to the President of the United States suggesting that if this was his fishing hole, our problems probably wouldn't be before us.

(Applause)

MR. HICKS: Some of you are probably aware of a group in Michigan called PIRG, Public Interest Research Group, in Michigan, and I'd like to quote just briefly from a note from the Director in the last issue of that. It says, "In the minds of an increasing number of Americans, being an environmentalist no longer simply means enjoying the

outdoors or being fond of animals. It means protecting ourselves and our children against an array of problems that threaten our health, our quality of life and our economy in very serious ways." And I think that that sort of sums up why we're here today. All of the other testimony addresses those particular issues.

In that same issue of the PIRG bulletin, there is a graph that shows toxic waste and cancer mortality rates in Michigan, the link between those two. The thing that jumps out at you, ladies and gentlemen, on that map, is that we live in an area that is one of the highest toxic waste and cancer mortality regions in our state. Now I thought that all of that pollution and contamination was in the Detroit area, and that all the bad things that went into the water happened down there. But there's evidence in this bulletin that we need be concerned, even beyond the resolution of this issue with the Michigan National Guard.

And that's the only reason, frankly, that I wanted to get up here today to say that when we have prevailed over the Michigan National Guard -- and we will prevail. I'm convinced of that. I wasn't when I first got involved, but we have a

legitimate cause, and we own America. It's our country, and this is our land, and we are going to prevail in this issue. But beyond that, we need to be concerned about some things that were brought out in a meeting at the Holiday Inn a couple of weeks ago by the AuSable Conservation Trust; that we are the target in this area for toxic waste dumps, and we need to be aware of that.

And I want to leave you with that thought today, that we not go away from here when this issue with the military is resolved. And I fervently hope that we can resolve this on the moral issues, because they're legitimate, and I would hope that Governor Blanchard will listen to those. But if we have to prevail on the legal issues, they're substantive, as have been quoted today. There's been some good research done, very impressive research, and I think we will prevail. It would be nice if we didn't have to do it on that basis, but beyond that, let's remember that we must continue to have eternal vigilance if we're going to be free to enjoy this beautiful environment.

I thank you.

(Applause)

MR. HUNTINGTON: William Colburn.

MR. COLBURN: My name is William Colburn. I live in Lansing, Michigan. I appear here in my status as a Michigan resident interested in and concerned about its Natural Resources, its economy, and its general welfare. It happens I am also the proud owner of 50 feet of frontage with a modest 60-plus year old cabin on the AuSable mainstream.

This week I went down to the DNR office in Lansing two afternoons to spend some time with the MDMA Draft Environmental Impact Statement, and more particularly, with the Review, Evaluation and Critique prepared by the AMAC consultants. I soon concluded that the latter is of very high quality prepared by highly competent people, and I, therefore, did not have to spend a great deal of time with the DEIS report. The consultants had already done that for me.

I was amazed and disturbed and alarmed at what the consultants had to say about the DEIS. It was overwhelming. Taken as a whole, their report is a resounding condemnation of the Department of Military Affairs' Statement. Even more important, it raises grave concern about the whole project as it is planned.

I have lifted just a few quotes to give here some of the flavor of the report. For instance, on page 2-10, it is said -- forgive the repeat, but I've got to go through it. "In many places throughout the document, the DEIS concludes, quote, 'There will be no significant adverse impacts of the proposed activity, and so forth,'" end of quote. I conclude that this assertion is made again and again in the DEIS without buttressing by statement of relative facts or supporting reasons.

Again on page 2-10 -- that light isn't helping any -- the consultants say, "The DEIS states over and over, quote, 'The impacts are anticipated to be insignificant after mitigation.'" It appears that what the impacts might be are not customarily presented, and the mitigation measures are not described. The consultant concluded with, quote, "The assumption that a mitigation plan acceptable to the regulatory authority can be developed in the face of such superficiality is blatant." To complete the end of quote -- to complete this thought, I add a couple of words so that it reads, "It is a blatant absurdity."

Again on page 6-1-1, The consultants say, quote, "The EIS considers only the impacts during

construction phase. The environmental impacts of the operational phase are dismissed, since most environmentally sensitive operations will require DNR permit," end of quote. This sets up an impossible situation. For instance, supposing that the construction of a waste generating disposal system designed to serve several hundred people can be carried out without harming the environment, could the DNR or any other agency refuse a permit to use such a sanitary facility once it is constructed on the basis that the use would cause environmental damage? This is highly unlikely. Once the facility is there, probably no one can stop its use by using the permit system.

It appears that the military is like the camel who gets its nose under the tent again and again and again, claiming that one little old nose isn't going to hurt anyone. The problem is, of course, that the camel follows the camel's nose. But, of course, the camel could then claim that there are already so many camels there, that one more won't hurt anybody. The consultants' report seems to say that the plans of the military call for incremental increase in the number of camels in Crawford County.

I was deeply concerned that the military appears to have gotten the upper hand in this affair, and that the Department of Natural Resources, identified by the consultants as the regulatory agency, is going to be severely outgunned in a battle to contain and control the proposed enormous expansion of activity and facilities in the National Guard area.

The consultants' report includes in the Appendix a letter prepared by AMAC Executive Director Dan Alstott, in which he says, quote, "Since you intend to simulate war in this place, why do you not come out and say so?" End of quote. It is clear that the military had no intention to discuss in any full manner the activities which it is its intent to carry on. This failure must be remedied.

The Department of Natural Resources sent to the DMA its comments on the DEIS with a letter of transmittal dated June 13. These comments express grave concern about many aspects of the report and project. We must call on the DNR to pursue this matter with intensity and vigor and vision. Beyond that, we must secure the additional participation of Governor James Blanchard, Attorney General Frank J.

Kelley, the Michigan Legislature and the entire Michigan Congressional Delegation.

This is an issue of great moment, reaching to all corners of the state, and to all the people of the state. The activists appearing at this hearing have a very special concern, but the issues speak to the state as a whole, and indeed, to the nation as a whole. The military will rightly claim that there is a national interest here. I heartily agree.

Thank you.

(Applause)

MR. HUNTINGTON: Mike Caswell.

MR. CASWELL: Colonel Wilkins, Hanson, Governor Blanchard, Director Hales of the DNR, I'm hungry and I'm tired, but I'm here representing a group, and I'm going to speak very briefly about my comments on the EIS Statement. I'm a member of the AuSable Conservation Trust, a new organization that is dedicated not only to protecting the environment against military hazardous waste, but all hazardous waste in Crawford County. We're very concerned, number one, about the issues of the military landing

strip going in on the Manistee River. The effects that they're stating in the EIS Statement, the statements that they're making saying that effects should be minimal, I take issue with this. Simple issues like placing stacked hay bales across the drainage leading to the intermittent stream can mitigate the impact, that's totally ridiculous. I do not like the statement, "should be minimal."

If this was a detailed report, it would address the number of aircraft, gallons of fuel, and size of fuel storage tanks. All of these important facts are left to the imagination. No longer as citizens and stewards of this county and surrounding counties can we leave -- it's our responsibility to take the First Amendment, which has been criticized for doing and speaking out against the military, and I'm not totally against the Michigan National Guard. I'm for freedom of speech. Some of the people that were -- that have spoken before -- and I address this to you, Governor -- have not been allowed to speak at this meeting, and I don't like that. I don't think it's right that we don't have a word in this.

I commend the Governor for getting a committee together. This committee has to research

more. We have to be advised of what's happening. Building a bridge that costs over half a million dollars on the Manistee River that's just massive, that will probably support 25 to 30 cars a day, this is totally uncalled for. Obviously they have plans to move -- maybe even land C-130's on the bridge. I cannot believe this.

Director Hales and the Governor of the State of Michigan, as a member of the AuSable Conservation Trust, I am going to continue to speak out as long as I have a citizenship in the state of Michigan, and my dear wife and I will continue to fight for the rights of the people of Crawford County. We love this area. We moved here for a purpose: to enjoy the surrounding areas. We will allow the military -- or we do not condemn the military for being here. We respect their right to have the Second Amendment, the right for the militia to be in existence. We respect that. We fly the flag at our house, and we stand for America, but we need to get together, and we need to be stewards of the land.

Thank you.

(Applause)

MR. HUNTINGTON: I have three groups of cards, people indicated that they wanted someone to speak for them -- KP Lake. KP Lake group, Ann Snyder, Elizabeth Bingham or Pamela Lewis, wish to speak or have someone speak for them?

LTC. WILKINS: That's Manistee River.

MR. HUNTINGTON: Is that the Manistee River? I'm sorry. Any of those individuals care to --

(No response)

MR. HUNTINGTON: There was another group, KP Lake group. Do any of these individuals now wish to speak? Edith Pelon, Sharon Graham?

UNIDENTIFIED MEMBER OF AUDIENCE: You asked for Chris Polaczyk before us.

MR. HUNTINGTON: I don't have a card for -- for who?

UNIDENTIFIED MEMBER OF AUDIENCE: Chris Polaczyk.

MR. HUNTINGTON: Okay. Could that person speak now, Chris Polaczyk?

UNIDENTIFIED MEMBER OF AUDIENCE: Excuse me. I have a sign-up sheet for buses to go to

Lansing sometime in the near future, and anybody who's interested in being on this, will you please sign your name and phone number, and we'll get in touch with you on the date?

MR. HUNTINGTON: Chris Polaczyk, would you like to speak for this group?

(No response)

MR. HUNTINGTON: I'll go through this group one more time, if anyone would like to speak. I have one more group. Okay. Sharon Graham, Edith Pelon, Minnie Kenel, Jean Warner or Ray Warner.

(No response)

MR. HUNTINGTON: John Novak said he wanted to have someone from AMAC.

MR. NOVAK: Yes. I would like to relinquish my time to Dan Alstott, if he'd like to speak.

MR. HUNTINGTON: I believe Dan Alstott has already said he would not like to speak.

MR. ALSTOTT: Yes, we've spoken at two prior hearings, and so thank you for the offer.

MR. HUNTINGTON: Would you care to speak for yourself, Mr. Novak?

MR. NOVAK: Sure. My name is John Novak. I'm from Ypsilanti, Michigan, and my wife and I have a vacation home on the south side of Higgins Lake. That's where the sound of the bombs sound like distant thunder. I can't speak about water pollution, because I don't know anything about that, and I can't speak about a lot of these things, but I can speak about noise. Noise is something that I'm very familiar with. I work in a factory. In that factory, I've experienced less noise than I've experienced on the north branch of the AuSable River during the famous Sakorski hatch.

(Applause)

MR. NOVAK: I know. I've given the pilots my opinion from the ground of what I think their I.Q. is, and, you know, maybe I can't -- maybe it's cause I can't match the hatch, but I can't catch fish after they come over. The water just turns to froth.

We considered buying property on the AuSable River, and we have discounted the north

branch completely because of the noise on the north branch. We've been out there driving around and checking out property when they've been dropping their bombs, and who wants to live next to that?

In conclusion, I'd just like to say that, if nothing else, the National Guard has been very guilty of being a very poor neighbor.

Thank you.

(Applause)

MR. HUNTINGTON: Nancy Atwood.

MS. ATWOOD: Thank you. I'm a resident of Midland, but for the past 35 years, this area has been my part-time summer home, and I hope to be able to continue to use it as such. But in the past few years, this area has turned into a war zone. I can no longer use the forests without being attacked by helicopters, running into tanks or encountering armed men. The serenity of waking up to the call of the loon is now interspersed with the roar of cannons and the rattle of windows. The paths that I've walked are now littered with C rations and constant reminders that there is another battle to be fought here. That battle is to fight to preserve

this area for our children in the hopes that they someday may be able to walk the same paths that we've walked. I deeply resent the fact that my state Michigan -- Michigan state land has become a battleground, not only for the military, but for myself and my family too.

The military's plans to increase troop activity in this area, as stated in the Draft Environmental Impact Statement, have raised some serious questions for me. But because my time is limited, I'll concentrate only on a portion of the Draft covering the socioeconomic resource. This portion is Section 4, Part 10.26 through 10.29, and one of these resources is recreation. Throughout this text, it's made clear that the state forests and waters of the Kalkaska, Roscommon and Crawford areas are widely used for recreational purposes. The value of this resource can be found in the dollars spent in retail goods to revenues collected on summer cottages.

And the Draft states that, and I quote, "The post will still be open to public recreation activities and the use of nearby parks and recreation areas, like Hartwick Pines State Park or the trout streams in the Camp, and will not be

affected." There's a problem with this statement. These areas have already been affected. I know from experience that the chance of using the state land around the KP Lake area is next to impossible because of the present level of troop activities, yet the DEIS states that increased troop activities, and I quote, "will have no potential to impact recreation."

A portion of the designated trout stream, Portage Creek, is part of a firing range called AFF and ARF. I'm sure this range has had an effect on recreational fishing of this river, and I question the right of the military to restrict public access because of this range. Precedence has been set in the past State Supreme Court cases on the right to public access on waterways. Cases in fact are Taggert versus the State of Michigan, Kne-Bo-Shone and Pine River.

Other areas are also off limits, such as Barnes and Timber Lakes, due to deadly materials laying in the area. And in speaking with individuals from the DNR, even the Lonesome Lake area is an area one should not wander into. I've been told that even when inactive, the whole range 40 complex is an area that should be avoided. And

we're to believe that recreation will not be affected by increased troop activity? I wonder if the persons who drafted this Statement have seriously looked into what troop activity is?

At present, even when an area is not closed off due to military activities, an individual runs the potential risk of bodily harm due to interaction with the military. Last July, I was assaulted by a pilot wielding a Cobra helicopter. I had just finished taking photographs in an inactive area, and was trying to return to my car when a helicopter approached, hovered, and then lowered to approximately 12 feet over my head, and he intentionally sandblasted me, not once, but twice. Not only was this experience painful, and it was, but it was expensive. It was expensive in emotional and monetary costs. It cost me almost a year of frustration, phone calls and letters to get reimbursed for less than $100 worth of camera equipment that was damaged due to this assault.

But the Environmental Draft Statement would have us believe that troop activity would have no impact on recreation, and that the cost of peace of mind is intangible. It cost me, not only in frustration and phone bills, but it cost the

military too, and it cost them in terms of paperwork and restitution. I honestly believe that if someone was to sit down and compile the costs from the complaint files, they'd find a price tag attached to peace of mind and military/civilian interaction. The cost would be in the form of property damage, personal assault, police intervention, and some of these things might have a direct price tag in the form of dollars and cents, but they carry a very high cost in terms of respect, trust and public acceptance.

Multiply these things, plus the loss of recreational dollars due to the loss of recreational land, and then add to that the cost of increased complaints because of civilian/military interaction due to increased competition for the land, and I'm sure you'll find that increased troop activities will have a significant impact on recreation in this area, and that impact won't be positive.

(Applause)

MR. HUNTINGTON: I have three other cards that have not indicated they want to speak. R. E. Hinschfield, Hirschfield.

(No response)

MR. HUNTINGTON: John Hartwig.

(No response)

MR. HUNTINGTON: Marion Wright.

MR. WRIGHT: Right here.

MR. HUNTINGTON: Would you care to speak, sir?

MR. WRIGHT: Mr. Chairman, I yield to any person from the Guthrie Lake area, or if not available, to AMAC. And I would like to have permission to state a reason for that, and that is due to physical impairment, I would be too emotional to explain what I've gone through the last two weeks. I'd be more emotional than (undiscernible name) was, and that was quite a bit. Thank you.

MR. HUNTINGTON: Okay. At this time, is there anyone who has not had the opportunity to speak?

MR. PELON: What happened to my card? Pelon. P-E-L-O-N.

MR. HUNTINGTON: I read off a Pelon, and you indicated --

MR. PELON: I've been here ever since --

MS. PELON: You read off my card. I'm Edith Pelon. This is my husband.

UNIDENTIFIED MEMBER OF AUDIENCE: You missed mine too.

MR. HUNTINGTON: Okay. Mr. Pelon, would you like to speak now?

MR. PELON: Sure would. Hi folks. I'm a senior citizen. One of those that are sweet and under the carpet, and I see I have a lot of friends out here going the same direction. Now my name is Duke Pelon, and I've been coming up to Sharon since 1933, and we have a cabin there, and we retired there 12 years ago. And I have seen the coming of the National Guard, and thank heavens I don't see them too often. We're at the mouth of Clear Creek on private property, and the only people who don't know we are there is the National Guard, and they come quite often to make sure we haven't left.

Now I do not know much about this report. Just what I've heard. That's been covered, but I will tell you the amount of people and the kind of people we have ran into many times over the years along the river. Now along there, I have met 10 to 12 half-tracks, jeeps with the wheel in front wit

map, lost and waiting for us to get out of the way. I refuse to move. I have a station wagon would have handled it. I set there, and pretty soon I waited long enough, and I got out and I jumped the head wheel, and right away, "We are lost. You move, and we'll find the next road to the left." Well, I said, "All I want is some numbers," so my wife gave me a card and I started making numbers. Needless to say, he moved his equipment, and as I went by, I got the senior citizens' salute from the National Guard with one finger. You know how that goes. So I returned with a senior citizens' salute of five fingers.

Needless to say, that sort of turned me off. So shortly after that, in came the whirlybirds. I was on the roof with Chester Sutton from the Upper Manistee Association, and they flew so low -- now when I say low, I could have knocked them down with a hammer. I'd have had to throw it, but I could have done it. We reported it. Well, it's just unfortunate we happened to be where they were moving through. They was lucky enough to give us all those cattle they didn't want out back. Now one mile away, we are going to get an airport. How lucky can we get? They accidently come around one

night and said, "There's a fire out here. You've got five minutes to leave, and five minutes is it," and the sheriff department pushed us out the door in five minutes. That was 20 after 4:00, and at half past 10:00, they let us come back, but it only burned within about three blocks of the cabin.

There's 19 of us in the road. It only burned that close. We were lucky. So needless to say, when we have company anywheres up to 2:30 in the morning, we have had a knock on the door, and with some of the people we've had, I walk out there, and I have a 25 Red Automatic in my hand just in case, and here they come down with an experimental boat. 2:30 in the morning, someone's supposed to have been upstream for a maneuver, and they was two hours late, and they were lost. They were on the river, but they were lost, so we hauled them to Camp Grayling. Now all I can say is, from the amount of people they had in there -- I was a Scout Master, and I had kids that could outread them with a map any time of day, and I've gone down that river from all the way from 72 down to Dutch John, and I know every snag in that river by name, and some of the names, you wouldn't want to hear.

Now all I can say is, I've seen it from

'33 till now, and it has never improved, and I've been going there 56 years, and I can say it's absolutely going downhill, and I'll sure as the devil remember when November comes around again.

Thank you.

(Applause)

MR. HUNTINGTON: William Meagher.

MR. MEAGHER: My name is Bill Meagher. I live in Essexville, Michigan, and I have a residence on the mainstream of the AuSable -- summer home.

The Draft Environmental Impact Statement is deficient in so many areas, it's impossible to adequately cover them in this limited amount of time allocated to individuals in these hearings. I therefore choose to address a glaring omission in the DEIS: the subject of toxic contamination of the air, water and ground located in, around, through and above the three firing ranges: 13, 30 and 40.

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The DMA will, no doubt, answer this critique by stating that the Department of Army Environmental Hygiene Agency has completed the Barnes Lake Study and found no indications of toxic materials migrating from the range 40 site to

surrounding water and lands.

The Barnes Lake Study, while providing background data, is otherwise virtually meaningless. This is due to the fact that the AEHA did not examine water, soil, sediments or fish tissue from inside of the range 40 fence, which encloses a huge area known as the artillery and bombing impact area. Instead, the Army opted to stay outside of the fence, and to test water wells as far as seven miles away from the point of impact of ordnance.

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They might just as well have gone out in the middle of Lake Michigan. The impact area inside the fence is the area of concern, because that is the place containing Bull Frog, Barnes and Timber Lakes, plus the wetlands system creating the AuSable River East Branch. This is the area where shells and bombs fall and explode and become unexploded duds. This is the area of certain contamination. This is the area the military covers in their Environmental Management Analysis and Plan by stating, "Some of the post lands, such as range 13 and 14, have irreversible land commitments due to dud contamination. While these areas still provide wildlife habitat and forestry resources, the area cannot be managed as an environmental resource."

They've already destroyed it.

This is the area which must be tested to get a handle on the problem. This testing should be done by a reliable, independent company and institution outside the military structure so that as to avoid a repeat of the issue dodging contained in this report. The absence of apparent contamination in the data set generated by the Army Hygiene Agency for samples taken at only two times during the year from stations up to several miles from these points of likely contamination is not surprising.

It is hard to believe that the study author emphasizes that, "The conclusions drawn in this study are for broad overview purposes, and should be interpreted as a detailed and comprehensive environmental assessment -- should not be interpreted" -- and also reaches the conclusion -- which we consider unwarranted and completely disagree with -- "that although this study represents a preliminary assessment, the data indicates that a follow-up study of a more comprehensive and detailed nature is not warranted." It is likely -- in light of the fact that no samples were taken from areas most likely to be

contaminated, this conclusion begs for rational justification.

I would further quote from the study to point out another major inconsistency, erroneous and misleading conclusions, and I quote: "It was found that current munitions burning practices on the ground surface may create highly localized elevated concentrations of metal, such as lead and zinc." The conclusions contained continues: "In order to alleviate possible future environmental problems and concerns, open burning and open detonation of munitions compounds should not be conducted on the ground surface."

62 In complete disregard for air pollution, which is not included in any way in this study, it continues: "All munitions compounds should be placed in burn pans prior to burning. The contaminants should be designed -- the containers should be designed to trap the residue and prevent it from getting onto the soil surface. After having been burned, the container should be removed from the site and the residue disposed on an environmentally accepted manner -- or in an environmentally accepted manner."

All this concern for open burning and open

detonation of a few pounds of waste disposal is very admirable, but when you stop to give thought, one wonders where their concern is regarding explosion of tons and tons of high explosive warheads from cannons, missiles, mortars, bombs and all other forms of ordnance. Is it possible the Army doesn't

63 consider the explosion of this ordnance as burning or detonation? This logic is incredible, and yet here we are left with this conclusion from the Army Agency concerned and experienced in environmental hygiene matters. Another Army Agency tap dance.

I seriously question the study's fish tissue analysis conclusion. It is my understanding the fish taken from the test area lakes and streams were cleaned, filleted, and then frozen and sent for laboratory analysis. I'm told by a noted toxicologist that the procedure is faulty and improper for the type of testing that should have

64 been done. The Agency threw out the most important part of the fish -- as we fishermen would call it, the guts: the liver, the spleen, the intestines, central nervous system, et cetera.

(Discussion off the record.)

MR. MEAGHER: It would appear, if this fact is substantiated, that the Army Hygiene Agency is either grossly incompetent, or is trying to hoodwink and deceive a concerned public with erroneous and fictitious information and conclusions.

I repeat, this test must be redone by proper, independent consultants under the watchful eye of public scrutiny. The area tested must include the active areas of the range 13, 30 and 40, including Barnes Lake and the wetland chains in the impact area.

Thank you.

(Applause)

MR. HUNTINGTON: I have three other people that have spoken before. Is there anyone that has not spoken -- that has not spoken at any of the hearings yet?

MS. CASWELL: I would like to be able to address Marion Wright's. He needs to be represented. It's only fair to represent the man, and I believe with Marion's permission -- is it all right, Marion, if I talk for you?

MR. WRIGHT: Oh, I'd be happy.

MR. HUNTINGTON: Okay. Could we get through these few people that had already indicated -- that have filled out cards?

MS. CASWELL: That's fine.

MR. HUNTINGTON: George Custer, would you care to speak?

MR. CUSTER: I'm George Custer, Garfield Township, Kalkaska County. From what I've read in this EIS Statement, it's not worth a whole lot. It doesn't cover anything over here, and it doesn't even mention the 20/20 lease. I don't know a lot of these facts, like some people do here, but I've been out in the woods. I've hunted and trapped the woods in the 20/20 lease for half my life now, and I know what a fragile area it is.

You've got this map. There's a picture, I guess, put out by the DNR on the wetlands. I've looked at the Cannon Creek. That could be a snapshot of it. There's a lot of small feeder streams and creeks going in this area. The ground is soft. You can stand right on the tree roots and bounce up and down and shake the whole tree.

We have oil companies coming through. They test for oil with dynamite, their thumpers.

You've got springs break out and flowing wells. It's just a real sensitive area. You've got the Dead Stream Swamp over at Houghton/Higgins Lake area. That drains clear into the Big Cannon, and then on into the Manistee, and on down.

On the back of this from the DNR, it says, "Remember, wetlands -- wetland habitat is fragile and easily damaged by human activity. It's best to visit them in small groups and avoid wading through areas of soft moss soils and shallows where sensitive plants may occur." I don't see how the same DNR that's supposed to watch over the land and the animals living there can lease this land out for military maneuvers. It just doesn't make any sense.

We have a lot of oak ridges on the edge of the swamps where the Guards were camped. The old -- the DNR rye fields, they had camps up in those. That ground is still bare. The soil has been beat right down and the sod beat right out of it.

We really -- we haven't had the use of a lot of areas now, and if it's continued to be used, we're going to end up with some of the areas like the Portage Creek area -- just sank.

All this 20,000 acres that the Guard -- they just had to have it, and I don't know why they

have to play their war games outside of this area, and why they have to play inside the Kirtland Warbler area. It must still be okay for bird use, as there are fresh signs, and there's corn put in the cage this spring -- in the bird trap.

We have the Garfield Township Environmental Council, and that was John McGregor, Bob Borak and Don Edmonds, and John McGregor and Bob Borak came out. We took them around to see what was left in the summer of '88. We saw an eagle the DNR and the Guards had chose to ignore, because it's leased land. When the Guards were in in the spring of '89, I called the DNR. Gave them a chance, three weeks while the Guards were training in there, and after they had moved out, I talked to two different guys. I talked to John; I talked to Bob. Nobody could come out and look at it. They waited. After everything was all fixed, the fox holes -- we had fox holes chest deep out there. There was garbage. They waited for months. They finally come out. They had four-wheelers, loggers, and it rained and it washed a lot of the tracks away. Then they couldn't see what the problem was.

I've got this little comment book here. The Guards are supposed to have them, the soldiers

are. They either don't read them or they can't. What it says in here, basically they're supposed to leave the woods how they found it. Used cans, boxes, C rations, are supposed to be -- all right. "Everything you carry in, should be carried out." Well, that doesn't happen either. We have garbage from as long as three years ago. There are trees 6, 8 inches through that have been cut down. They've cut pine -- red pine the state planted, by limbing them out, they used for camouflage this spring. I called the Camp, the DNR on it, the National Guard. They tried to blame campers. There hadn't been no campers in there.

Then they come out in the paper -- the newspaper got ahold of it. The Guards came out and said an infraction, once it was cleaned up and fixed, it was no longer an infraction. So if I went out and robbed a bank and got caught and gave the money back, it must be fixed. Well, I'm sorry to have to tell the Guards and the DNR, but it just don't work like that. Things -- they don't work.

I guess that's all I've got to say.

(Applause)

MR. HUNTINGTON: Tom Mastes.

MR. MASTES: I don't believe I can speak. I spoke once before, although I've got a lot to say, if I could.

MR. HUNTINGTON: Okay. Don Welser.

UNIDENTIFIED MEMBER OF AUDIENCE: Not here.

MR. HUNTINGTON: Is there anyone that has not had the opportunity to speak that would like to?

(No response)

MR. HUNTINGTON: I guess that's -- at this point, if there is one person that wants to speak for the other individual, now would be the time.

MS. CASWELL: I apologize to the Governor and to the Military Affairs for impinging upon their rules for this meeting, but I felt that it was very important that Marion Wright be represented, and I understand that it is very difficult for Marion to speak at this time. One of the reasons that I believe that Marion wanted to speak was that he, along with several other residents of this area, are very concerned about groundwater contamination. The issue of toxic waste contamination has been brought

up several times in this meeting today. It's just been touched on a small, tiny bit.

What Marion is trying to say by giving me -- he gave me this document here, the Great Lakes Water Quality Ban. There are a number of people that have made decisions to have their water tested very comprehensively. That's a very expensive proposition, and we are going to have to possibly ask the Governor and the military, and perhaps several industries in the area, to help us with this. We are requesting a hydrogeological study be done for this area. We feel that the DEIS did not address this issue at all. It is probably one of the most important issues of all, because it has to do with our health. I stand to prove this concern, and I again apologize, because this first issue is not exactly addressed in the DEIS, but I am using this example, because apparently there never was an environmental study done with this particular rifle range that was completed last year.

It is a million dollar rifle range off from Arrowhead Road -- M16 rifle range. It is located between the Manistee River and Portage Creek. It is a wetland area. It is my understanding -- and perhaps I'm completely wrong on

this, because I don't hunt -- but in this area, the gentlemen hunters are not allowed to use lead shot in wetland areas. It is against the law. Well, in this rifle range that is sitting between Portage Creek and the Manistee River, it is a floodplain area. It is a wetland area.

(Ms. Caswell showing photographs.)

MS. CASWELL: If I'm not mistaken, the center core of shells is lead, covered with a steel coating. We have been told that that is not enough protection for impact. In other words, the shells on impact can shatter or they can have a dent, and that eventually would seep out through a number of years. 66

Now at this point, this area is not contaminated, but we have been assured within a five- to ten-year -- possibly a bit longer time, this area will be contaminated with lead. That is wrong, and there never was an environmental study done, a proper study of this area, and the DEIS is an example of what we are trying to tell you people. If this study was not done properly -- and look what happened -- what will happen if all this is allowed

66 to be just on its own merit: the MPRC range, the assault landing strip, the railroad spur, on and on? In other words, this has to be addressed. They are not in compliance.

Now that means a lot of work and effort for a lot of people. Needless work and effort. Someone has to be accountable for this, and I can assure you right now that the taxpayers are probably going to bear a big burden of this. Marion is upset about that. I'm upset about that.

I know for certain of another well that has been contaminated. Not possibly -- been contaminated. We are trying to find the source. It doesn't look good, especially for this organization. I plead -- I plead with the Governor, and I plead with the military, and I plead with our state and local officials to somehow supply us with the data and the experts that we need. We can no longer tolerate this just on a logical level. We can no longer tolerate the toxic waste that is being generated in this community.

This report was brought up today. I brought it up again not too long ago, "The Cancer Connection." PIRG is a very, very accountable group. They didn't do this to stir up things or be

controversial. They did this because they have a genuine concern for the people in Michigan. We have to absolutely, categorically state that we are not going to allow ourselves to be put in jeopardy as far as our health is concerned. I believe that's what Marion, in part, wanted to say. He's concerned, and I must give you a little history about Marion.

He's been a lifelong resident here. He's not someone that just comes and goes like you and I sometimes do. He's committed. He's been committed. And as my dear husband said, it's not easy to be committed when it's 2 o'clock and you're tired and you're hungry, and we've had how many of these meetings. And it's as Deb Golden said, we have to somehow make some sort of impact beyond this meeting.

And as Sally Alstott asked me, she wants to know, and I do too, how many papers was this announcement in? How many state papers, not just local? I believe we have a right to know that. 67

We also are going to have to ask that the DEIS address in minutia the economic impact. We've talked about it here and there, and some people have been extremely credible in their discussions. But I

am telling you something from personal experience. The reason that the economic impact has to be addressed, is because that is the only way that you are going to make the businessmen of Grayling listen to you. They don't listen to anything else. Believe me. Trust me on this. I've worked long and hard to try to get them to listen to health issues and environmental issues. They are interested in one thing, and that is dollars and cents. The DEIS does not address that properly. I believe we should demand that it do so.

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Thank you.

(Applause)

MR. BUMPUS: I would like to speak.

MR. HUNTINGTON: Who are you, sir?

MR. BUMPUS: Weldon Bumpus.

MR. HUNTINGTON: Okay, Mr. Bumpus. Why don't you come up.

MR. BUMPUS: I've just got a few things here. I live in Garfield Township in Kalkaska County down where the military leased a 20 year, 20,000 acres. There's no environmental impact study done on that 20,000 acres, and why they didn't have

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to do that, that's something I don't know. The DNR told us it wasn't necessary, but I still think it was. And they used to have, on that area down in there, they used to have a one-year lease on it or a land permit, use permit, but the DNR said that was too much work to do it every year, so they gave them a 20-year lease on it.

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And also, I would like to know what they consider a wetland. They've got certain areas that they forbid people to -- well, like over to Traverse City, they made them quit making a golf course because it was affecting the wetland. Yet most of our area down in that 20,000 acres, the biggest share of it is wetlands. And why they have a right to be in there and do the way they do, is something that I don't understand.

And we've got a petition going, and we're asking that the DNR rescind this lease for the 20,000 acres.

The people have been saying here, talking about 50,000 acres for the military. The Governor said the military has 173,000 acres in Camp Grayling. Well, where he got that, I don't know, but that's what he says. We do know that before that 20,000 acres was leased in our territory, that

Camp Grayling was supposed to be 146,000 acres, and this 20,000 acres on top of that, so we know that there's more than 50,000 acres in Camp Grayling.

And ever since they've been training across the road, there's been violations. The DNR says if the military does enough violations, they can rescind the lease. How many violations do they have to have?

Thank you.

(Applause)

LTC. WILKINS: Thank you, Mr. Bumpus. That's going to conclude this hearing. This is the third public hearing. We will be accepting written comments until the 31st of July, the close of business on the 31st. So if you think of something else, put it in writing and fire it off to us, and we'll include it in the report.

I want to thank everybody for coming out. My count was about 170 people. That makes a pretty good turnout, so thank you very much. Be careful going back home.

(Public hearing concluded at 2:05 P.M.)

STATE OF MICHIGAN
COUNTY OF CRAWFORD

I, Bonnie J. Waterman, Certified Shorthand Reporter, do hereby certify that I reported in Stenograph the proceedings of the Public Hearing of the Michigan Department of Military Affairs and the National Guard Bureau at the time and place hereinbefore set forth; that the same was thereafter transcribed by me and the foregoing transcript is a full, true and correct transcription of my Stenographic notes.

Bonnie J. Waterman

BONNIE J. WATERMAN, CSR 3493
Registered Professional Reporter

APPENDIX O

Comments and Responses - Mar 89 DEIS Review

Note:
Reproduction of original written comments, as received,
are found in Appendix M.

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TABLE 2-2

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Federal and State Agencies/Officials		
U.S. Environmental Protection Agency (Mr. William D. Franz, Chief, Region 5) (Chicago, IL)	1	0-7
U.S. Dept. of the Interior (Sheila Minor Huff) (Chicago, IL)	2	O-17
Centers for Disease Control (David E. Clapp, Ph.D, P.E., CIH) (Atlanta, GA)	3	0-17
Department of Natural Resources (David F. Hales, Director) (Lansing, MI)	4	0-18
Michigan Loon Registry Program (Arlene A. Westhoven) (Mt. Pleasant, MI)	5	O-27
Local Agencies/Officials		
Excelsior Twp. Supervisor, Kalkaska County (Bethel Larabee) (Kalkaska, MI)	6	O-28
Organizations		
White, Beekman, Przybylowicz, Schneider & Baird, P.C. (Thomas A. Baird) (Okemos, MI)	7	O-28
Trout Unlimited (Robert L. Herbst) (Vienna, VA)	8	O-39

TABLE 2-2 (Continued)

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Organizations (Continued)		
Michigan United Conservation Clubs (Thomas L. Washington) (Lansing, MI)	9	O-42
Sierra Club Mackinaw Chapter (Matthew S. Urdan) (Lansing, MI)	10	O-46
Anglers of the AuSable (Bruce Johnson) (Grayling, MI)	11	O-47
AuSable North Branch Area Association (Walter A. Freyburger, Ph.D.) (Grayling, MI)	12	O-56
Former Servicewomen of America, Mich. Chapt. #1 (Reatha Dubay) (Bay City, MI)	13	*
E.F.P.O.A. (Carl W. Lord) (Waters, MI)	14	O-57
The KP Lake Association (Bob Hartwig) (Grayling, MI)	15	O-59
AuSable-Manistee Action Council (AMAC) (Review, Evaluation, and Critique of Mission/Multiple Construction: Camp Grayling Army National Guard Training Site) (Lansing, MI)	16	O-60

TABLE 2-2 (Continued)

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Individuals		
Susan Seifert (Grayling, MI)	17	O-86
Chris B. Polaczyk and Gerald Hemming (Inkster, MI)	18	O-86
Gerald Kimball (Chesaning, MI)	19	*
Michelle J. Schwarz (Frederic, MI)	20	O-87
Richard B. McGlinn (Plymouth, MI)	21	O-87
Donald Welser (Grayling, MI)	22	O-88
Richard Davis (Gaylord, MI)	23	O-88
Susan E. Cooper (Bloomfield Hills, MI)	24	*
Art Schwarm (Traverse City, MI)	25	O-89
Harvey Burkholder (Mt. Clemens, MI)	26	O-89
Joseph A. Cercone (Rogers City, MI)	27	O-90
Peter L. Gustafson (Grand Rapids, MI)	28	O-90
Leonard S. Gell, M.D. (Grand Rapids, MI)	29	O-90
David F. Oeming, Jr. (Saginaw, MI)	30	O-90
Mr. and Mrs. Karl Leppien (Waters, MI)	31	O-91
Bruce Johnson (Rochester, MI)	32	O-92
Ralph T. Rucinski, D.D.S. (Crown Point, IN)	33	O-92
Edward J. McGlinn (Farmington Hills, MI)	34	O-94

TABLE 2-2 (Continued)

LIST OF RESPONDENTS SUBMITTING WRITTEN COMMENTS

Respondent	Document	Page
Judith McGlinn (Farmington Hills, MI)	35	*
Frank W. Crawford (Kalamazoo, MI)	36	*
Anne V. Fuller (Kalamazoo, MI)	37	*
Rama L. Stimpson (Grayling, MI)	38	O-94
Dan L. Alstott (Grayling, MI)	39	O-94
William D. Gregory (Bay City, MI)	40	O-99
George A. Bentley (Grayling, MI)	41	O-100
Elaine P. McGlinn (Plymouth, MI)	42	O-100
Joe Stanek Stone (Grayling, MI)	43	*

* No Response Required

Document No. 1 **Comment No. 1**

ISSUE: The population within the Zone II Noise Area for the proposed MPRC (off-post and on-post) is not estimated.

RESPONSE: The Zone II contour for the MPRC-H-R is presented in Figure 4-5 of the Final EIS. A field review found that there are two private residences located within this Zone II area. Residences occur along the outside northwest and south edges of the Zone II contour. The physical characteristics associated with the movement of the firing points after the construction of the MPRC-H-R will reduce the sound energy the most in the private lands immediately to the southwest of the existing Range 30 tank firing points. These reductions move the existing contours slightly to the north and east into less populated areas.

Document No. 1 **Comment No. 2**

ISSUE: Commitments made by the Army National Guard to provide noise relief to those persons adversely impacted by the MPRC project are not described.

RESPONSE: The DMA has attempted to mitigate the effects of Range 30 noise impacts by offering to buy lands nearby. Over the last several years, the Department of Military Affairs has acquired approximately 400 acres of land within the existing Zone II noise contour. Also, refer to Section 4.1.3.1 which discusses noise mitigation procedures.

Document No. 1 **Comment No. 3**

ISSUE: The commentor states that if a significant number of aircraft operations are planned for the Assault Landing Strip that a single event analysis should be conducted to evaluate nighttime wakeups and abatement/mitigations should be provided to affected residences.

RESPONSE: The Department of Military Affairs has cancelled this project.

Document No. 1 **Comment No. 4**

ISSUE: The Draft EIS discusses the increase of low-level, nap-of-the-earth flights and their potential noise impacts on wildlife. The proposal to assign additional helicopter units to Camp Grayling involves an increase of only one to two helicopter flights per week and states that flight restrictions over deer wintering areas and Kirtland's warbler nesting area habitat will be observed. The meaning of the word "observed" and measures taken to minimize disturbances of Kirtland's warbler, bald eagle, other federal and state-listed species and wildlife are not stated in clear terms.

RESPONSE: The proposal to assign new helicopter units has been cancelled. However, the term "observed" means that flight restrictions established in the Camp Grayling

Regulations will be followed by troops training at that installation. The standard operating procedures for the Grayling Army Airfield (Pamphlet 95-1, 1 October 1982) outlines restricted flying areas for protection of threatened or endangered species as shown below:

(a) Each aviator will become familiar with the location of posted bald eagle nests and will not fly within one-quarter mile of these areas.

(b) Overflights of the Kirtland's warbler occupied nesting areas below 500 (1990 revision) feet above ground level are prohibited.

Bald eagle nesting information is provided by the Michigan Department of Natural Resources and the U.S. Fish and Wildlife Service. The Department of Military Affairs follows all guidelines including maintaining a 1/4 mile radius buffer area for nest trees, as prescribed by the U.S. Fish and Wildlife Service Eagle Management Guidelines. Human entry and low-level aircraft operations are prohibited in these areas. The DNR and USFWS both ensure compliance. In June 1989, the Department of Military Affairs began subsidizing bald eagle research at a nest within Range 40 and contracted a nest watcher to document disturbance in the buffer areas surrounding the bald eagle nesting area. Complete nest watcher reports are available from DMA. In summary, the report indicates that existing protection efforts appear to be adequate and offspring are being successfully produced each year (Bowerman and Rogers, 1992).

The biological opinion formulated by the U.S. Fish and Wildlife Service (7 June 1990) comments on the threatened species Houghton's goldenrod and bald eagle, as well as the endangered Kirtland's warbler in relation to the construction and operation of the proposed Multi-Purpose Range Complex, as well as on-going training activities (U.S. Fish and Wildlife Service, 7 June 1990). Based on their review of the DMA biological evaluation, the informal consultation meeting on 8 December 1989, the Draft EIS of March 1989, the Cooperative Agreement of 22 May 1986, and the Kirtland's Warbler Recovery Plan of 30 September 1985, the biological opinion of the U.S. Fish and Wildlife Service is that the proposed projects are not likely to jeopardize the continued existence of Kirtland's warblers or result in the adverse modification of critical habitat. The U.S. Fish and Wildlife Service found that the protection provisions outlined in the Order of the Director of the Michigan Department of Natural Resources and the provisions of the DMA/DNR management agreement would prevent all activities, including DNR activities, from affecting these species. An integral provision was the agreement of the DMA's offering of over 4,000 acres of military lease land, much of which is currently prime habitat, to be designated a permanent warbler management unit. This provision includes severe restrictions upon future military use.

The standard operating procedures for the Grayling Army Airfield also act to protect the breeding pair of common loons known to exist off-post at Wakely Lake as well as the common loons which frequent KP and Shupac Lakes within the installation boundary. In accordance with the standard operating procedures for the Grayling Army Airfield (Pamphlet 95-1, 1 October 1982), Army aircraft are not permitted off-post at elevations

below 500 feet above ground level except in officially designated low-level flight corridors. According to DMA Terrain Flying Regulations, dated 1 October 1982, nap-of-the-earth flights over private property are not permitted. In accordance with this policy, National Guard aircraft are required to maintain elevations of 500 feet above ground level when flying over private property adjacent to KP Lake. Though these restrictions were made primarily with the intention of alleviating noise and impacts to private property owners in the vicinity of Camp Grayling, they also provide restrictions on aircraft activities which could potentially affect common loons on Wakely or KP Lakes. Further, Camp Grayling, in cooperation with the DNR, has established a no-fly area over Wakely Lake where common loons traditionally nest.

Document No. 1 **Comment No. 5**

ISSUE: What actions has the DMA taken to work with the city of Grayling to implement a plan to mitigate the adverse noise impact caused by Camp activities at the Grayling Army Airfield?

RESPONSE: Refer to Section 4.1.3.1 Mitigation.

The DMA has committed to increase enforcement efforts to keep military helicopters above 500 feet above ground level (which is 450 feet higher than the minimum set for civilian helicopters flying over the same area). Air space over Camp Grayling and the few low altitude corridors in the state are the only places in Michigan that pilots can practice low altitude flight skills. Minimum altitudes will not be raised in the training areas since to do so would make it impossible to provide this required training.

Document No. 1 **Comment No. 6**

ISSUE: Steps taken by the DMA to reduce construction noise are not documented in the Draft EIS.

RESPONSE: Construction noise is normally short-term in duration and limited to normal business hours. Unless the primary purpose of construction is to provide military training which requires around-the-clock activity, construction will be limited to daytime hours to minimize disturbance of nearby residents.

Document No. 1 **Comment No. 7**

ISSUE: Steps taken to reduce noise related to "cycling" vehicles (idling machinery periodically to prevent freezing), are not explicitly outlined in the Draft EIS.

RESPONSE: As required by regulations, diesel equipment is started periodically and idled for a short period of time. The noise from idling vehicles will occur periodically and will be spread throughout the approximately 148,000 acre installation. No diesel equipment is left idling all night. Bivouac sites are required to be located far enough from residences to ensure that noise from vehicles or generators is not of concern.

Document No. 1 **Comment No. 8**

ISSUE: Developments at Camp Grayling which include renovation or demolition of buildings which may contain asbestos must follow federal and state regulations. What steps have been taken to ensure compliance with these regulations?

RESPONSE: The Department of Military Affairs follows Michigan Acts 135 and 147 as well as federal regulations (40 CFR Part 61) to prevent asbestos from becoming airborne at all stages of renovation, loading, transportation and unloading. No existing structures will be affected and no asbestos concerns exist in relation to the proposed Master Plan projects.

Document No. 1 **Comment No. 9**

ISSUE: The Fugitive Dust Control Plan in Appendix 4-2 of the Draft EIS states that calcium chloride mixtures could be used to control dust over unpaved roads. The document does not describe whether this chemical will be used near waterbodies or provide commitments to prevent related adverse impacts to water resources.

RESPONSE: Approximately 60,000 gallons of a water-calcium chloride ($CaCl_2$) dust-suppressant mixture is currently utilized at Camp Grayling in a typical year. The equivalent of approximately 40 miles of two-lane road is treated. This includes a 6-mile portion of Howe Road which runs from the cantonment area west across Portage Creek and north to the Automated Field Fire and Automated Record Fire Ranges (Section 12, T28N, R5W). Dust suppressants are also used in the cantonment area road shoulders away from Lake Margrethe.

A typical application schedule of four applications of dust suppressant per year over 40 miles of two-lane road places the Camp Grayling application rate below the typical application rates cited in the U.S. Bureau of Mines study (Singer et al., 1982) of 2 tons/mile/year. (By comparison, the study cites application rates of chloride deicing compounds of up to 40 tons/road-mile/year).

The chloride ion (Cl^-) is capable of widespread movement in the environment, eventually resting in a water system. Studies of sensitive fish species including rainbow trout (reported in the 1982 Bureau of Mines Study) indicate some harmful effects of chloride concentrations as low as 400 parts per million (ppm). Chloride concentrations in Grayling area surface and ground waters are generally low (less than 20 ppm). Cases of chloride contamination occur primarily in urban areas and are related to road salt deicing runoff to adjacent still waters. Some species of vegetation, including white pine and Canadian hemlock, are intolerant of low calcium chloride concentrations.

The U.S. Bureau of Mines study found that calcium chloride posed little internal hazard to man and animals, but noted that toxicity to vegetation in and around the area of application should be expected and the effects of calcium chloride as a dust suppressant should be considerably less than its use as a road deicer. However, chlorides will

predominantly locate in water systems and applications by the DMA will be minimized especially near Portage Creek. No applications will be made within 100 feet of Portage Creek or another surface water. The Michigan DOT is currently conducting its own study of the environmental effects of calcium chloride. The Michigan Department of Military Affairs will track this study and re-evaluate its use of calcium chloride if the study's findings warrant it.

Tracked vehicle speeds creating fugitive dust were a concern along portions of the tank trail; in response, a five mile per hour speed limit was established near residential/commercial areas. The construction of the new MATES facility (completed in 1987) has provided for the storage of tracked vehicles within the Range 30 complex and has now greatly reduced traffic on the tank trail near the residential/commercial areas, again requiring less treatment.

Construction at the MPRC s well within the installation away from residential areas. The typical rainfall pattern should assist in suppressing fugitive dust potential at the construction site itself. The Camp Grayling Fugitive Dust Control Plan presents guidelines for addressing these concerns.

Document No. 1 **Comment No. 10**

ISSUE: What steps are being taken to reduce the amount of time equipment must idle during winter training and/or the amount of equipment which must remain idling? Idling equipment for extended periods produces hydrocarbon emissions that could otherwise be avoided.

RESPONSE: The Army National Guard is currently investigating retrofitting its vehicles with equipment which will allow it to shut down diesel equipment for longer periods during cold weather. Also, refer to Comment No. 7 of Document No. 1.

Document No. 1 **Comment No. 11**

ISSUE: The alternative site for construction of Action C15 - Fuel Dispensing Facility appears preferable to the proposed site because it is located further from water resources, thus providing additional safety factor in the event of a leak or spill. The commentor recommends that the alternative site be chosen for development of this facility.

RESPONSE: The DMA concurs that the construction of the Bulk Fuel Facility at an alternate site wil provide an additional margin of safety against groundwater and surface water contamination. The alternate site approximately three-quarters mile west of the Ammunition Supply Point adjacent to South Access Road is now the preferred site of the DMA.

Document No. 1 **Comment No. 12**

ISSUE: The installation and replacement of underground storage tanks or piping and abandonment or removal of existing underground tanks must be performed in accordance with EPA and State regulations.

RESPONSE: The New Fuel Dispensing Facility will not use any underground tanks or piping. Therefore, no abandonment or removal of any existing underground tanks will occur. The facility will store diesel and gasoline in aboveground tanks only. The facility will have adequate secondary containments and comply with all Federal and State regulations.

Regarding underground storage tanks, the DMA has notified the State of Michigan of its underground storage tanks already in existence and complies with all requirements for existing underground storage tanks, their removal, or installation of new tanks as mandated. It has been the DMA's policy since 1987 to utilize only double-wall tank and piping systems in either new or replacement facilities.

Document No. 1 **Comments No. 13 through 16**

ISSUE: The details of the Camp Grayling Spill Prevention, Control and Countermeasure Plan (SPCCP) and Installation Spill Contingency Plan (ISCP) should contain plans for the Assault Landing Strip, the New Fuel Dispensing Facility, the MATES, and the winter bivouac areas, including contingency plans for spills in snow and under ice.

RESPONSE: Both the Assault Landing Strip and increased winter training proposals have been cancelled.

Please refer to Section 4.1.6 (B) for a discussion of mitigation.

For a discussion of past leaks/spills see Section 3.9.1 of the EIS.

Document No. 1 **Comment No. 17**

ISSUE: The Final EIS should indicate whether any fire training activities would be undertaken in conjunction with the development of the Assault Landing Strip. If such activities are contemplated, control measures to be employed to protect the soils and groundwater should be described.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 1 **Comment No. 18**

ISSUE: The Final EIS should discuss the control measures which would be taken in the event of an accidental spill or leak of refueling equipment at the Assault Landing Strip particularly during winter conditions.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 1 **Comment No. 19**

ISSUE: The Final EIS should discuss the impacts that the increased use of explosives during winter training to prepare excavations may have on the soils.

RESPONSE: Though it is important that units have training in the use of explosives to prepare excavations, these activities will not be a training practice conducted by troops in the field during winter training conditions at Camp Grayling. Winter/snow training involves using the small arms ranges, bivouacking 3-6 kilometers from the cantonment area (soldiers reach the site via skiing or snowshoeing), and instructional sessions in heated buildings. However, the proposal to increase winter training has been cancelled.

Document No. 1 **Comment No. 20**

ISSUE: The Final EIS should indicate what measures will be taken to prevent the contamination of the two lakes located within the proposed Multi-Purpose Range Complex fan due to spent ammunition and explosives.

RESPONSE: The firing fan of the MPRC-H-R is contained within the larger Range 30 complex that includes Kyle Lake and Duck Lake. However, neither of these lakes are in the firing box of the proposed MPRC-H-R thereby precluding incidental entry of inert rounds into them. Add itionally, only inert rounds will be fired on the MPRC-H-R. Furthermore, no waterways exist in the firing fan of the MPRC-H-R thereby eliminating direct transport of sediment and other pollutants off-site. These lakes are further protected from training activities by the prohibition of training activities within 200 feet of the lake shore (Please refer to Camp Grayling Reg. 200-1, Appendix H).

Document No. 1 **Comment No. 21**

ISSUE: The commentor recommends that all areas requiring fill activities be field-checked to determine the presence of wetland areas. The Final EIS should clarify whether all areas have been field verified for wetlands and whether any fill activities would occur within wetlands. If fill activities will take place, a map showing the locations and types of wetlands which would be filled and alternatives to these activities should be described.

RESPONSE: No wetlands occur at any of the proposed construction activities sites. This determination was made following a comprehensive wetland assessment conducted by National Wetlands Inventory (NWI) (U.S. Fish and Wildlife Service), Michigan National Features Inventory (MNFI), U.S. Department of Agriculture (U.S.D.A) Soil Conservation Service Modern Soil Survey, and Camp Grayling Environmental Office personnel. Identification of all wetlands was first obtained from the NWI maps and then "ground-truthed" (on-site field investigations) by MNFI and Camp Grayling Environmental Office staff. The NWI maps, as a result of this extensive ground-truthing, are now published as

finalized. Follow-up determinations have since been made verifying that no wetlands exist at the proposed construction activities locations.

Document No. 1 **Comment No. 22**

ISSUE: The EPA recommends that the wording in the camp regulations clearly state that wetlands will be "off-limits" during cold weather training. Additionally, the EPA states that the details of the Vegetation Monitoring Plan utilized to monitor heavily used cold weather training areas be provided.

RESPONSE: The term "off-limits" is reserved in military regulations for areas characterized by extreme safety considerations such as impact areas and range firing fans. Therefore, the term "restricted" is used and applies to areas which are off-limits to certain types of training activities. The restrictions apply to wetlands, lakes, and riparian areas throughout the installation. Current restrictions regarding wetlands include those established by DMA (see Appendix H; Camp Grayling Reg. 200-1) and other state and federal regulations. Also see Section 3.5.1 for a description of ITAM.

Document No. 1 **Comment No. 23**

ISSUE: The EPA states that it is unclear exactly what activities will take place within the area designated Range/Safety Fans/Impact Areas which overlie the area south of Bear Swamp. The commentor states that any activities should be discouraged from taking place within Bear Swamp.

RESPONSE: The area south of Bear Swamp area is approximately 4,500 acres and comprises safety fans from 13 small arms ranges (see Figure 3-13 and Table 3-6). The area contains range safety fans that represent the maximum extent that projectiles fired on these ranges could travel. Protective berms have been installed behind Ranges 18 and 19 to prevent bullets from entering Bear Swamp and to provide increased safety. Protective berms are planned to be installed behind Ranges 7, 8, and 9 during 1994. Due to the frequent use of these ranges the safety fan is generally off-limits to all training. Vehicular training is prohibited in any wetland at Camp Grayling as outlined in Camp Grayling Reg. 200-1 (see Appendix H).

Document No. 1 **Comment No. 24 and 25**

ISSUE: The EPA states that specific measures to be incorporated into the design of the wastewater treatment plant lagoon construction project to minimize contamination of the swamp from leaching of the wastewater lagoon.

RESPONSE: The wastewater treatment facility was constructed and in full operation in 1991 as ordered by the Michigan Water Resources Commission under a final order of abatement. The treatment facility consists of three, 2.33 acre lagoons. The lagoons are lined with a layer of 60 mm high density polyethylene over 1 foot of compacted clay preventing leaching to adjacent wetlands. The wastewater treatment facility is sized to

hold 6 months of wastewater during the winter non-application period. All activities have been approved and permitted by the Michigan Department of Natural Resources (see Sections 3.3.2.3.3 and 3.7.2.4).

Document No. 1 **Comment No. 26**

ISSUE: Since Action C6 - Field Grade Bachelor's Officers Quarters is located in a portion of the cantonment area which has slopes of 10 percent, the EPA recommends that the project be relocated to an area of lesser slope to reduce erosion potential.

RESPONSE: The proposed Bachelor's Officers Quarters Buildings is no longer being considered.

Document No. 1 **Comment No. 27**

ISSUE: The EPA states that the Draft EIS does not provide sufficient details of Lanes Training to allow the determination of impacts on vegetation, wetlands, and other sensitive areas due to effects of increased erosion. The EPA states that the types of terrain to be utilized within lanes should be evaluated and minimized.

RESPONSE: Lanes Training is no longer being considered in the Master Plan. The action is a training strategy and in this document will be discussed as an on-going (current) training activity.

Document No. 1 **Comment No. 28**

ISSUE: The EPA states that additional precautions taken to protect the AuSable and Manistee Rivers to prevent degradation of the water quality due to erosion and possible contamination should be stated.

RESPONSE: Protection and management of water resources including the Manistee and Au Sable Rivers is covered in Sections 4.1.4 and 4.1.5. Other installation programs LRAM (see Section 3.5.1; Mitigation - Utilization of LRAM) and policies (Camp Grayling Reg. 200-1, see Appendix H) also protect water resources. The DMA is also involved in research and restoration projects (see Section 3.5.6.1.2 - (2) Land Management and Water Resources and (3) Water Resources Research).

Document No. 1 **Comment No. 29**

ISSUE: The EPA states that it is unclear in the Draft EIS whether off-road maneuvering is allowed.

RESPONSE: Off-road vehicle maneuvers are only authorized during tactical training exercises on orders of the Unit Commanders. Tactical training exercises for tracked vehicles take place primarily in the North Post Range 30 complex and tank tactical maneuvers are focused on the Tank Range Area. All vehicles conducting normal field

training movements from one training area to the other must move on established roads and trails.

Document No. 1 **Comment No. 30**

ISSUE: The EPA states that the Erosion Control Plan in Section 4.1.4 of the Draft EIS should be modified to state that erosion control measures should be described as "will" be taken rather than "should" be taken and a commitment should be taken to implement the plan.

RESPONSE: The DMA agreed and the wording has been strengthened (see Section 3.5.5.3 in the FEIS).

Document No. 1 **Comment No. 31**

ISSUE: The EPA states that straw bales or sediment fences are preferential than hay bales and that the DMA should stipulate that these preferred methods would be used.

RESPONSE: Comment noted.

Document No. 1 **Comment No. 32**

ISSUE: The EPA states that the use of de-icing chemicals in relation to activities at the airfield, assault landing strip, and on roads should be described, along with measures taken to prevent contamination of nearby waterbodies by these chemicals.

RESPONSE: No chemical de-icing materials are used at Camp Grayling. No de-icing activities place at the Airfield. The roads within the Camp that are maintained by the DMA are treated with sand as needed during the winter months. The Assault Landing Strip project has been cancelled.

Document No. 1 **Comment No. 33**

ISSUE: The EPA states that the DMA should describe enforcement procedures to prevent the cutting of live conifers for camouflage during winter training and describe the details of the vegetation monitoring plan to be implemented to prevent destruction of vegetation during training activities.

RESPONSE: Refer to Appendix H, Camp Grayling Regulation 200-1 Environmental Protection (Chapter 2-12) and Sections 3.5.1 and 4.2.1.

Document No. 1 **Comment No. 34**

ISSUE: The EPA recommends that commitments to replace Kirtland's warbler habitat within the Range 30 complex, the new site of the MPRC, be described.

RESPONSE: The DMA commitments to replace warbler habitat are discussed in detail in the Kirtland's Warbler Management Plan, and in the current U.S. Fish and Wildlife biological opinion (see response to Comment No. 4 of Document No. 1).

Document No. 1 **Comment No. 35**

ISSUE: The EPA states that the DMA should discuss and commit to measures to protect the bald eagle from training activities at the Assault Landing Strip and the MPRC.

RESPONSE: The issue of bald eagle management in relation to the MPRC is addressed in response to Comment No. 4 of Document No. 1. The Assault Landing Strip project has been cancelled.

Document No. 2 **Comment No 1**

ISSUE: It should be noted that Houghton's goldenrod (Solidago houghtonii) is now listed as a Federally-Listed Threatened Species (Federal Register 27134, July 18, 1988).

RESPONSE: The change in federally-listed status of Houghton's goldenrod is noted.

Document No. 2 **Comment No. 2**

ISSUE: Although construction activities proposed in the statement will not affect the bald eagle, a commitment from the DMA to follow the bald eagle management guidelines in foraging or nesting areas which may be affected by future military operations should be provided.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1 and also in Section 4.2.6 under Mitigation.

Document No. 2 **Comment No. 3**

ISSUE: Further clarification should be provided concerning the impact of the Multi-Purpose Range Complex (MPRC) upon "developing habitat" for the Kirtland's warbler.

RESPONSE: The U.S. Fish and Wildlife Service Biological Opinion resulting from formal consultation is summarized in response to Comment No. 4 of Document No. 1.

Document No. 3 **Comment No. 1**

ISSUE: The U.S. Department of Health and Human Services states that from a public health and safety standpoint, the proposed construction and renovation of facilities should result in a net reduction of potential health and safety risks.

RESPONSE: The opinion of the U.S. Department of Health and Human Services (Centers for Disease Control) is noted.

Document No. 4 **Comment No. 1**

ISSUE: It is not clear what additional volume of wastewater will be generated as a result of the construction of winterized housing at the Grayling Army Airfield or how and where the additional volumes of wastewater will be treated.

RESPONSE: The Grayling Army Airfield Housing facility has been cancelled.

Document No. 4 **Comment No. 2**

ISSUE: The Draft EIS fails to detail winter sludge management plans for the proposed Camp Grayling wastewater treatment system.

RESPONSE: Please refer to Comment No. 24 and 25 of Document No. 1.

Document No. 4 **Comment No. 3**

ISSUE: The Draft EIS does not adequately address the surface and groundwater impacts from aircraft refueling and deicing activities conducted at the Assault Landing Strip including effects upon the Manistee River.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 4 **Comment No. 4**

ISSUE: The Draft EIS does not address the impact on wintering and vulnerable wildlife from construction and operation of the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 4 **Comment No. 5**

ISSUE: The Draft EIS document does not adequately address the impact from operation and construction of the Assault Landing Strip upon the endangered Kirtland's warbler habitat.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 4 **Comment No. 7**

ISSUE: No analysis has been done to determine the impact of heavy troop activity during winter months (cold weather training). Analyses should address the impact of year-round

training on wildlife, vegetation, the human population, and winter recreation activities, especially cross-country skiing and snowmobiling.

RESPONSE: The proposal to increase winter training has been cancelled. Refer to Section 3.4.1 for a discussion of cold weather training activities. Military units are essentially required to conduct the same training tasks during warm or cold weather. However, due to the more severe conditions commonly associated with cold weather training, it takes significantly longer to perform the same activities under these conditions. Therefore, less activities can be accomplished during cold weather training relative to other times of the year.

Cold Weather Training Noise Description: The cold weather training activities with the greatest potential to generate noise concerns include impulse noise from artillery firing at Range 40, tank firing at Range 30, and non-impulse noise associated with the use of Army helicopters.

Noise levels generated by cold weather annual training periods are lower than those associated with annual training conducted during the summer months. Because of the more severe weather conditions associated with cold weather training, significantly greater amounts of a unit's 15 day annual training period must be spent maintaining, moving and setting up related equipment. Additionally, the focus of cold weather training is field exercises and personal winter survival skills. Therefore, qualification firing by tank units or evaluation firing by artillery units is not conducted during cold weather annual training periods. Due to the limitations of daily firing to the hours between sunrise and three hours after sunset, approximately 40 percent less time is available for firing during cold weather training. For example, only 13 hours per day is available for firing on February 1 versus approximately 20.5 hours on July 1.

Daily firing levels are considerably less than those related to summer annual training by the same units. For example, establishing artillery firing points during winter conditions could require the use of engineering equipment to clear snow, winching trucks and artillery through snow cover into firing positions, and extended time to dig through frozen soil to stabilize the artillery pieces prior to firing. All tasks must be accomplished by personnel who are also required to pay detailed attention to winter survival skills and more training must be conducted under dark conditions due to the loss of daylight.

Peak sound pressure levels from individual blasts related to artillery and tank firing at Range 40 and Range 30 respectively, is sometimes larger in winter because winter atmospheric inversions (when they occur) are more severe. (Differences in sound energy attenuation due to air densities and vegetation from summer to winter would not likely be statistically significant in relation to the inherent variability characteristic of blast noise measured outside of the laboratory (Luz, September 25, 1989). However, the inversion occurrence at Camp Grayling is less frequent during winter and is low compared to the remainder of the continental United States.

Cold Weather Training Effects on Residents: The Guthrie Lake area identified in the Final EIS (Figure 3.8) is the area most affected by cold weather firing. The Guthrie lakes area includes residences and is the area of concern in relation to artillery firing at Range 40. Although the number of artillery rounds and the number of hours per day during which artillery can be fired is reduced relative to summer annual training, when firing occurs, the same peak sound level distribution can be experienced. This distribution, described in the Draft EIS, based on the 1984 study, is as follows: 17 percent less than 105 dB peak, 73 percent between 105 and 120 dB peak, and 10 percent greater than 120 dB peak. As shown in the DEIS (Table 4-3.2) peak sound pressure levels are below the threshold of physiological ear damage (140 dB), but those between 120 and 140 dB are associated with a high risk of noise complaints and the possibility of damage claims.

The bulk of the rotary-wing aircraft in the Michigan Army National Guard are assigned to four company-size aviation units stationed at Grand Ledge. These units are estimated to account for about 60 percent of the approximately 1,000 hours of annual training flight time logged by aviation units at Camp Grayling, Michigan. Helicopters with the Division assigned to Indiana, an armored cavalry regiment in Ohio, and various Army Reserve units also frequently perform annual training at Camp Grayling and account for the remaining usage. Because there are no winter aviation storage facilities at Camp Grayling, each unit's winter training flight time would only approach 40 to 50 percent of their historic summer levels.

Average sound level exposures are also reduced during cold weather because residents spend more time indoors with windows and doors closed than in the summer. Annoyance effects on health and welfare would be reduced by the factors previously outlined in relation to cold weather constraints on training activities.

Cold Weather Training Noise Impacts on Winter Recreation: The DMA recognizes that recreational use of lands leased for the purposes of military training should be accommodated to the extent that this recreational use does not interfere with the DMA's goal of providing effective military training.

Sound which is in conflict with the expectations/motivations of recreationists can be considered as a potential intrusion into a recreation experience. Noise in this sense could cause an increase in annoyance or a decrease in recreation satisfaction. To evaluate these effects in a meaningful way, the complex interaction between acoustics, psychoacoustics, and recreation sociology must be examined (Harrison et al., 12-13 September 1989).

At Camp Grayling, the issue is the potential impact of cold weather training activities at the MPRC and Range 40 as well as related helicopter activities upon recreational activities. The recreational activities of primary concern are those which would take place during the prime winter training period from late December through early March in the areas within these zones of influence previously described for Range 40 and the MPRC. It should be noted that these activities are currently subject to some cold weather tank and artillery firing.

Cross-country skiing is anticipated to be the recreational activity most heavily impacted. By January 1st, deer, bear and grouse hunting have concluded for the year and snowmobiles generate a significant level of noise which is likely to mask any effects of range activity to the operator during the time the snowmobiles are being operated. Currently, Range 30 is closed to the public whenever a unit is required to fire during cold weather training. Refer to Section 3.7.4 for additional information pertaining to recreation.

Cold Weather Training Noise Impacts on Wildlife: The noise impacts of winter training on wildlife primarily concern the effects of Range 30 and Range 40 firing and helicopters on deer. Kirtland's warblers do not winter at Camp Grayling. Winter deer range and deer yards are shown on the deer habitat map (Figure 3-25). These areas are located primarily in the river valleys adjacent to the Au Sable and Manistee Rivers.

As discussed in Section 3.6.2.1, the deer population in the deer yard areas during the winter is likely to exceed 30 deer per square mile along the Manistee and Au Sable Rivers, as well as their larger tributaries. Deer populations within the deer range surrounding the deer yard area is estimated to range from 10 to 29 deer per mile. Deer populations in the general area are believed to be increasing. Refer to Section 4.1.3.1.6 for an in-depth view of the effects of noise on wildlife.

Cold Weather Training Impacts on Vegetation: During cold weather, Camp Grayling receives an average of between 90 and 110 inches of snowfall based on average annual records. This amount of snowfall creates snow depths of six inches or more, 80 days per year; 11 inches or more, 50 days per year; 21 inches or more, 18 days per year; and 26 inches or more, on less than 10 days per year. This can severely limit the mobility of soldiers and military vehicles. Even tanks and tracked personnel carriers get stuck quite easily in deeper snow. Therefore, vehicle movements are almost entirely confined to the roads plowed for military use, with the exception of tanks. Because vehicle traffic in off-road areas clearly reveal military positions, it is also desirable from a tactical point of view to generally confine vehicle movements to established roads. Winter cross-country vehicle movements tend to be confined to limited tactical situations for tanks.

There will be few impacts to vegetation since the primary winter/snow training activity is the Cold Weather Operations School, held in late January and/or early February each year. Typically, 200-300 units bivouac in the field for only 4-6 days. They generally arrive at the bivouac site by either skiing or snowshoeing the 3-6 kilometers to the site.

Cold Weather Training Effects on Winter Recreation Land Uses: The DMA considers military training to be the priority use on Hanson Military Reserve and on State lands conveyed to the DMA for the purposes of military training. Multiple uses, including recreation, are acceptable by the DMA to the extent that they do not unduly interfere with the priority use. The DMA has taken actions to minimize training/recreation conflicts by resisting and rescheduling firing and tactical training activities, and will continue to do so whenever it is feasible.

Year-Round Training Effects on Recreation and Tourism: The effects of year-round training on the economic aspects of recreation and tourism are not evaluated in quantitative terms in the EIS. An on-going noise/recreation study by the U.S. Forest Service and a qualitative evaluation of tourism in the Camp Grayling area are discussed in response to comment No. 18 of Document No. 7. No previous studies have been identified which quantitatively address similar relationships between noise and recreation and the corresponding economic effects. The effects of noise on recreation was previously discussed in relation to noise impacts of cold weather training.

Document No. 4 **Comment No. 8**

ISSUE: Noise reduction/mitigation proposals are needed with respect to the impact of year-round noise (cold weather training) on wildlife, the human population, and tourism.

RESPONSE: The proposal to increase winter training has been cancelled. Mitigation procedures now in place to alleviate noise impacts are shown in Section 3.5.4 of the EIS.

Document No. 4 **Comment No. 9**

ISSUE: The environmental impacts of the railroad spur project (Action C12 - ASP/LSF Railroad), including wetlands destruction, wildlife habitat destruction, drainage and surface water effects, public use of the right-of-way, and questions of health and human safety relative to train contents are not addressed.

RESPONSE: The ASP/LSF Railroad project has been cancelled.

Document No. 4 **Comment No. 10**

ISSUE: It is the opinion of the DNR that the impacts of toxics and heavy metals in soils and surface waters have not been adequately addressed.

RESPONSE: Several major investigations regarding heavy metals and other toxics, including ordnance residuals, have been carried out at Camp Grayling and are summarized in Section 3.9.2.

Document No. 4 **Comment No. 11**

ISSUE: It is the opinion of the DNR that the EIS must address the method of disposal used for unserviceable ordnance and demonstrate compliance with state and federal regulations.

RESPONSE: EPA and DNR concur that the unexploded ordnance (duds) left on impact areas or dud rounds occurring at firing points that are unsafe to transport and are detonated at the firing point, are not subject to hazardous waste treatment and disposal regulations of either Resource Conservation and Recovery Act (RCRA) or Michigan State Act 64. Activities which could pertain to RCRA and/or Act 64 regulations include:

1. Closing the Camp and demilitarization.

2. Unexploded or old munitions/ordnance which are buried with the intent of disposal. This material would be considered a waste and if the ordnance was reactive, it would be considered to be a hazardous waste and therefore subject to all disposal and permitting regulations of both State and Federal hazardous waste regulations.

3. If unexploded ordnance or old/outdated explosives/munitions (unserviceable) are brought in from off-site locations to be detonated or open burned with the specific purpose of treatment and disposal. These activities are regulated under both Michigan and Federal hazardous waste regulations.

In response to circumstance 1 outlined above, the U.S. Department of Defense has implemented the Installation Restoration Program which is funded under the Defense Environmental Restoration Act. This program addresses concerns related to closure of the ranges and impact areas at the time of closure should it occur.

In response to circumstance 2 above, it is not military policy to bury live munitions as a means of disposal. In the past, two sites were utilized at the air-to-ground range portion of Range 40 to bury casings from expended practice bombs which contained discharged 10-gauge shotgun shell-like spotting charges. The iron alloy casings were collected, placed in pits and burned along with wood and fuel to ensure the spotting charges were detonated. This practice was permanently halted in early 1989. All practice bombs are now recovered and those with unexpended spotting charges are detonated on the surface. The expended practice bombs are then placed in containers and recycled under contract as scrap metal. A study of one of the pits was conducted in 1993 and no contaminants were found.

In response to circumstance 3 above, unserviceable ordnance is not brought to Camp Grayling from other military installations off-site for treatment or disposal. In the past, Camp Grayling has, in rare instances, accommodated law enforcement agency needs for explosive ordnance disposal under emergency conditions. However, at times, certain unserviceable ordnance is returned to the Camp ammunition supply point by units training at the installation. To determine the status of this activity, the DMA held a hazardous waste consultation with the DNR and U.S. EPA Region V on November 1, 1989. The DMA and the DNR have since worked very closely in developing a consent order agreement which outlines certain provisions the DMA must and will follow to ensure compliance regarding open burn and open detonation activities at the post. The DMA does not allow the burning of excess propellant and returns all excess propellant to an Army depot for renovation, re-issue, or recycling.

Any unserviceable ordnance which is not blown up in place and needs to be moved to the ammunition supply point for temporary storage prior to disposal will be handled, stored, and disposed of in accordance with the consent agreement. The consent order also specifies an air monitoring program to identify components emitted during this

operation to ensure compliance with air quality regulations. In 1993, the Army Environmental Hygiene Agency (AEHA) conducted a study (modeling) to determine pollutant-specific ambient air concentrations resulting from open burning operations. The results of this study indicated that ambient air ground-level pollutant-specific concentrations from open burning operations at Camp Grayling did not exceed applicable health based standards. DMA discontinued the burning of excess propellant in early 1993.

Document No. 4 **Comment No. 12**

ISSUE: It is the opinion of the DNR that the Draft EIS does not adequately address the requirements of the State Solid Waste Management Plan, particularly with regard to recycling.

RESPONSE: Camp Grayling has implemented recycling and currently recycles its office papers, wood pallets, iron alloy practice bomb casings, and cardboard packaging materials, as well as many metal products. Aluminum cans are covered by the State Container Deposit Law and are returned to stores. The post does not generate a significant volume of white goods (old appliances). The Crawford County Solid Waste Management Plan has no specific requirements regarding the volumes or specific materials which are to be recycled. The solid waste generated at Camp Grayling is handled in accordance with the State Solid Waste Regulations and the Crawford County Solid Waste Management Plan.

The DMA has implemented a Training Site Agreement which is signed by all units training at Camp Grayling (see Appendix K). This agreement emphasizes strict adherence to Camp environmental regulations including provisions for proper disposal of solid waste generated during training activities.

Document No. 4 **Comment No. 13**

ISSUE: Permits will be required for the activities involving stream crossings or extension of existing stream crossings under the Inland Lakes and Streams Act, the Flood Hazardous Regulatory Authority Act, and the Wetlands Protection Act.

RESPONSE: Open stream crossings are prohibited by units training at Camp Grayling. Please refer to Section 4.1.5.1.

Document No. 4 **Comment No. 14**

ISSUE: The proposed railroad spur (Action C12 - ASP/LSF Railroad) will pass through wetlands.

RESPONSE: The ASP/LSF Railroad project has been cancelled.

Document No. 4 **Comment No. 15**

ISSUE: The AuSable River is a Designated Natural River, however, the Draft EIS does not address whether expansion of facilities is proposed within 400 feet of this river.

RESPONSE: Camp Grayling regulations specifically restrict training activities within 400 feet of the Au Sable River and designated tributaries. Please refer to Section 4.1.5.1.

Document No. 4 **Comment No. 16**

ISSUE: No assessment has been made in the Draft EIS regarding wetland impacts.

RESPONSE: No wetlands are located on or near sites of proposed activities requiring construction. Please refer to responses to Comments No. 21-25 of Document No. 1.

Document No. 4 **Comment No. 17**

ISSUE: It is the opinion of the DNR that the EIS does not adequately address the socioeconomic impact of the proposed activities, including increased traffic, year-round noise, potential shipping of toxic or hazardous materials by rail through resort communities, and light pollution during night-time exercises (also fire control, fire prevention, and local law enforcement requirements).

RESPONSE: None of the proposed projects, neither separately nor in combination, will increase military traffic. However, the DMA will continue to coordinate with appropriate state, county, and local officials to minimize the impact of military traffic on the surrounding communities. The DMA has currently provided directions to using units to ensure convoys arriving at the Post do not pass thru the City of Grayling but instead use the military road entrance to the Post. Road maintenance and improvement projects are routinely conducted on public roads used by the military. Many interior Post roads are also maintained on a regular basis and are normally available for public use. Whenever necessary, military road guards are used to help direct traffic to avoid dangerous situations.

Noise issues are addressed in Comments No. 7 and 8 of Document No. 4.

Light pollution related to the firing of phosphorus flares will be reduced as an indirect effect of the reduction in night artillery training. As a result of the DMA commitment to not fire artillery past three hours after sunset, light pollution will decrease. The amount of night artillery fire will decrease as well as the amount of phosphorus flares fired in support of artillery fire. The DMA has also acted to reduce the effects of light from helicopter spotlights by locating helicopter forward refueling/rearming points away from populated areas and will emphasize the sensitive nature of using spotlights near populated areas in Army Aircraft Unit orientation meetings.

The Crawford County Sheriffs Department has reported that a relatively small percentage of their time has been committed to Camp Grayling-related incidents. The Grayling Chief of Police has noted the effectiveness of the cooperative effort between the military police personnel and county, city, and state police agencies. A detailed record of time committed by the Grayling Police Department to Camp Grayling-related incidents was maintained for the period between June 18 and August 29, 1988. Out of a total departmental schedule of 1,800 man-hours, approximately 37 hours, or 2 percent, of staff time was related to Camp Grayling-related incidents (Peter W. Stefan, Grayling Chief of Police, September 2, 1988). Grayling Police Department staff time committed to Camp Grayling-related incidents has remained consistent over the years.

Document No. 4 **Comment No. 18**

ISSUE: The commentor states that expanded winter training in the state's primary winter recreation area could have a negative economic effect and increase pressure on local roads, hospitals, police, and fire personnel.

RESPONSE: The proposal to increase winter training has been cancelled.

Document No. 4 **Comment No. 19**

ISSUE: The commentor states that he is concerned that the proposed activities at Camp Grayling may damage the natural resources within the post which would ultimately decrease the development demand in the Grayling vicinity and reduce property values.

RESPONSE: The DMA has initiated a proven, standardized system for the inventory and monitoring of natural resources, the Army Land Condition Trend Analysis Program (see Section 3.5.1), at Camp Grayling for the purposes of establishing an ecological baseline. The proposed projects will not increase the training utilization of the installation on an annual basis. Additionally, the DMA has committed to an on-going restoration program for seriously impacted areas and is currently contracting for the necessary services.

The training utilization of the installation with full implementation of the Master Plan projects will not vary significantly from historic utilization of the installation or with the "No Action" alternative. These programs demonstrate the emphasis the DMA is placing on protecting the natural resources within Camp Grayling.

The economic impacts of the Camp Grayling Master Plan actions are compared to the conditions within the economic effects area which includes Kalkaska, Otsego, and Crawford Counties, as discussed in Section 4.4 of the Final EIS. Burdens on local services are addressed in a qualitative manner and further information on this issue is provided in response to Comments No. 17 through 19 of Document No. 4. A detailed quantitative economic evaluation of property value effects, recreational opportunities, and tourism in relation to on-going activities at Camp Grayling is beyond the scope of this EIS.

In 1989, the Governor's Camp Grayling Management Advisory Committee conducted a qualitative economic evaluation of Camp Grayling and the surrounding eight counties, including the economic aspects of tourism. The study concludes that though the number of tourism jobs vary considerably throughout the nine counties that the trends are basically the same and indicates that Crawford County had comparable tourism growth during 1979 to 1984 relative to the other counties in the region. The Governor's Management Advisory Committee report notes that the Michigan Travel Bureau was unable to provide relevant information to isolate tourism expenditures.

The Camp Grayling Management Advisory Committee reviewed the State Equalized Valuation as the primary indicator of property values in a simplified analysis of potential property value impacts upon Crawford County. They found that the average annual increase in equalized value for Crawford County (16.3 percent) was greater than the value for all nine counties (14.9 percent) and comparable to the average annual increase for the I-75 corridor counties of 16.5 percent. There was some concern that Guthrie Lake property in Otsego County had been devalued due to military activity in that area, but written testimony by a representative from the Northeast Michigan Council of Governments was not found to support the allegation.

The EIS does estimate the acreage of timber affected and describe the size, quantity, and type of commercial materials generated relative to large clearing projects (Action C12 - ASP/LSF Railroad) and MPRC. However, Action C12 has been cancelled. Troops are not permitted to cut timber during training activities. Only the DNR can contract for timber sales. These sales are accommodated by the DMA to the fullest extent possible.

The overall evaluation of Camp Grayling's contribution to the three-county economic effects area economy relative to construction, operation and maintenance, and training is discussed in Section 4.4 of the Final EIS.

Document No. 5 **Comment No. 1**

ISSUE: The commentor states that no mention is made of the impacts to the common loon relative to plans for range expansion in terms of guaranteed protection from overhead disturbances.

RESPONSE: The actions taken by the DMA to reduce potential impacts to wildlife, including the common loon, are presented in response to Comment No. 4 of Document No. 1.

Document No. 5a **Comment No. 1**

ISSUE: The commentor states that bald eagles, Virginia rails, and American bitterns in the Wakely Lake area are also being affected by Air Force fighters flying at low altitudes.

RESPONSE: Wakely Lake is designated as a "no-fly" area. As infractions of this restriction are brought to the attention of the DMA appropriate action will be taken.

Document No. 6 **Comment No. 1**

ISSUE: The Assault Landing Strip's location next to the Manistee River will lower recreational use of the river and produce adverse economic effects by lowering recreation and tourism.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 6 **Comment No. 2**

ISSUE: The commentor states that a major fuel spill or plane crash could cause long-lasting damage on the river and adjacent area.

RESPONSE: The Assault Landing Strip is no longer being considered at this time.

Document No. 6 **Comment No. 3**

ISSUE: Has the area about 4 miles southwest of the cantonment area been evaluated as an alternative location for the Assault Landing Strip?

RESPONSE: The DMA did investigate the alternative location southwest of the cantonment area. However, the Assault Landing has been cancelled.

Document No. 7 **Comment No. 1**

ISSUE: The commentor states that growth in the camp to date has outstripped the carrying capacity of the region.

RESPONSE: The implementation of the remaining proposed Master Plan projects will not increase the utilization of the installation on an annual basis. However, the DMA has implemented the ITAM program to establish an ecological baseline for the installation from which future management decisions will be made (see Section 3.5.1).

Document No. 7 **Comment No. 2**

ISSUE: The commentor feels that Camp Grayling is a state-owned multiple-use area, not "dedicated" to military purposes, and that the mission of the military can be met without implementing the proposed projects which will further detract from the recreational use of the area.

RESPONSE: It is the DMA's position that the primary use of the lands controlled by the DMA are for military training and that recreation will be accommodated as possible. Further, the DMA has determined that the on-going training and proposed projects are necessary to fulfill the mission of the Camp Grayling training site. The mission is to provide support and facilities to ensure that troops receive the best training possible should they be placed in a fighting scenario. Until notified by the Attorney General's

office, the DMA assumes that its interpretation of the lease language and its use of the lease land is adequate and acceptable.

Document No. 7 **Comment No. 3**

ISSUE: The commentor states that the leases to the DMA include other obligations and contingencies for renewal which could result in the lands being withdrawn from military control, resulting in the waste of enormous sums of public money.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Document No. 7 **Comment No. 4**

ISSUE: The commentor states that there is no legally enforceable restriction which places limits on the growth and expansion or the utilization of Camp Grayling. The commentor states that Camp Grayling use has almost doubled in the last ten years. Master Plan projects will be over-built to accommodate growth.

RESPONSE: Since the Total Force Concept was initiated, the majority of utilization of the installation has consistently been by Michigan, Indiana, and Ohio, although numbers have varied somewhat from year to year. The DMA has no reason to believe this pattern will change.

An analysis of the total yearly Camp Grayling man-day utilization data in Tables A-2 and A-3 shows a mean of 443,952 man-days over the last ten years. If the last ten years of data are assumed to typify future training levels, the 95 percent confidence limit would indicate that 95 percent of all future yearly man-day utilization levels would be less than or equal to 587,666 (assuming the data are normally distributed). Approximately 68 percent of all future training mean, man-day utilization totals can be expected to fall within one standard deviation of the man, 443,952 $\pm$ 78,404 or 365,448 to 522,356.

Document No. 7 **Comment No. 5**

ISSUE: The DMA will not follow "good practices" and "sound techniques" in the implementation of its EIS actions.

RESPONSE: The Army National Guard is mandated to follow applicable Federal, State, and Local regulations. It is subject to the legal penalties for non-compliance. This includes binding commitments made as part of the permitting process and Memoranda of Understanding and other official agreements signed by the DMA.

Document No. 7 **Comment No. 6**

ISSUE: The commentor states the DMA lacks authority and control sufficient to enforce its own environmental regulations, particularly over units from outside Michigan.

RESPONSE: The Michigan Adjutant General is the ultimate authority (other than the Governor) regarding military utilization of Camp Grayling. This authority is transmitted to the Camp Commander to enforce camp regulations and guidelines for all troops (active and inactive) from any state or country when they are utilizing the installation. Additionally, since 1990, all troops utilizing Camp Grayling are required to sign a Training Site Agreement stating they will adhere to all training site regulations and will replace, repair, or pay for any damage caused.

In 1989, the DMA (in cooperation with the Governors Advisory Committee) conducted a review and revision of rules, associated sanctions, and improvements needed in enforcement procedures for the use of military vehicles, and reporting and claim procedures regarding trespassing and accidental incursions onto private property. The Training Site Agreement and revised regulations/policies reflect the results of this review.

Document No. 7 **Comment No. 7**

ISSUE: The commentor states that the Draft EIS makes the incorrect assumption that the current environmental, social, and economic status in and around Camp Grayling is acceptable and thus the marginal effects of the implementation of the Master Plan will not, by comparison, be detrimental.

RESPONSE: Governor Blanchard appointed the Camp Grayling Advisory Committee in June 1987 to evaluate citizen concerns regarding the existing and on-going operation and training activities at Camp Grayling. In January 1990, the Camp Grayling Advisory Committee released its findings which identified 43 actions to be implemented to address related citizen concerns. Subsequently, a second committee was appointed to ensure implementation of all 43 items. The DMA has complied with these recommendations and has addressed the existing conflict issues.

Document No. 7 **Comment No. 8**

ISSUE: The issue of chemical contamination of soils, groundwater, and surface water at Camp Grayling which was identified as a scoping issue was not addressed.

RESPONSE: Contamination of soils, groundwater, and surface waters are discussed in Section 3.9.2.

Document No. 7 **Comment No. 9**

ISSUE: The commentor states the CEQ regulations encourage interagency cooperation in assessing the environmental impacts of government proposals and require any federal or state agency with jurisdiction or special expertise to be notified of promulgation of the Draft EIS and encouraged to participate.

RESPONSE: The Notice of Intent to Prepare the Camp Grayling EIS was published in the Federal Register, July 22, 1986 and in the Michigan Environmental Review Board

"Status Report." A scoping meeting was held September 4, 1986 and comments were taken through September 21. A notice announcing the scoping meeting was published in the Kalkaska, Otsego, and Crawford County papers. Correspondence with agencies regarding the scoping process is included in Appendix L.

Document No. 7 **Comment No. 10**

ISSUE: The commentor states the Draft EIS must contain a current and accurate assessment of soil conditions.

RESPONSE: A soil survey for Camp Grayling was conducted by the USDA Soil Conservation Service and completed in 1989. This document was used in preparing the EIS. See Section 3.5.5.3 for a description of current soil conditions.

Document No. 7 **Comment No. 11**

ISSUE: The commentor stated that the Draft EIS does not adequately characterize the groundwater conditions at Camp Grayling.

RESPONSE: Groundwater monitoring stipulations are normally proposed as part of a permit process or remedial action, or as necessary in order to answer specific questions regarding a special facility or action. At the time the Draft EIS was prepared, the available groundwater information for the site was essentially limited to monitoring wells at the Camp landfill, the wastewater treatment plant, and a limited number of well logs as stated in the Draft EIS. Since then, the Range 40 Water Quality Study, the MATES Hydrogeologic Study, the bulk fuel and airfield cleanup studies, and additional wastewater treatment site studies have been conducted. This process is an on-going effort which will take several years to address. Refer to Sections 3.5.6.2 and 4.1.6. In addition, these studies are available upon request.

Document No. 7 **Comment No. 12**

ISSUE: The commentor states that the Draft EIS does not adequately describe wetlands within Camp Grayling lands.

RESPONSE: Wetlands are currently described in Section 3.5.6.3. See Response to Document 1, Comment 21 for a complete discussion of the finalized National Wetlands Inventory maps.

Document No. 7 **Comment No. 13**

ISSUE: Endangered plant and animal species should be completely inventoried at Camp Grayling.

RESPONSE: The Michigan Natural Features Inventory (MNFI), in conjunction with the Land Condition-Trend Analysis Program initiated at Camp Grayling in FY91, includes a

complete endangered plant and animal species survey of the installation. All proposed construction sites have been surveyed for endangered plant and animal species. Refer to Sections 4.2.3 and 4.2.6 for information pertaining to the impacts associated with Threatened and Endangered species for each of the alternatives and Section 3.6.1.4 for a complete discussion of the MNFI floristic and Threatened and Endangered species survey.

Document No. 7 **Comment No. 14**

ISSUE: The commentor states that all hazardous wastes, waste sites, and disposal practices should be inventoried prior to expansion and described in the Draft EIS.

RESPONSE: Refer to Section 3.7.2.2 for a discussion of hazardous waste.

Document No. 7 **Comment No. 15**

ISSUE: The commentor states that the Draft EIS completely ignores the Barnes Lake study (AEHA Range 40 Water Quality Study, August 1988) which is completely inadequate.

RESPONSE: Issues related to potential contamination in and around Range 40 have been addressed in Sections 3.9.2.

Document No. 7 **Comment No. 16**

ISSUE: The commentor states that the Draft EIS does not properly address the Scenic River designation of the AuSable Watershed.

RESPONSE: This issue is addressed in response to Comment No. 28 of Document No. 1. For a description of the Au Sable River refer to Section 3.5.6.1.1(2) Au Sable River Basin.

Document No. 7 **Comment No. 17**

ISSUE: The commentor states that no serious attempt appears to have been made to assess the current health effects of noise at Camp Grayling.

RESPONSE: The Draft EIS noise analysis utilizes noise contours based on C-weighted day-night noise levels applied according to procedures and standards outlined by the National Research Council in 1981. Section 4.1.3 of the EIS provides information which relates day-night noise levels to annoyance, which is the accepted index of measurement of human effects for this measurement scale. Information regarding peak noise impulses is also provided. Information relative to noise effects is also provided in response to Comment No. 7 of Document No. 4.

Document No. 7 **Comment No. 18**

ISSUE: The commentor states that the economic analysis in the Draft EIS is inadequate because it fails to address the negative impact of the post in terms of property devaluation, burdens on local services, and reduction of the tax base. The commentor states that it also fails to measure foregone benefits in the areas of recreation and tourism that would be accrued if Camp Grayling did not exist.

RESPONSE: Refer to Comment No. 19 of Document No. 4.

No previous studies have been identified which address the relationship between noise and recreation and the corresponding economic effects. The U.S. Forest Service and the National Park Service are currently conducting a study to derive a methodology for evaluating the effects of noise upon various recreational land use classifications. A Zone III Noise Classification is indicative of clearly unacceptable areas for noise-sensitive land uses including residential housing. Zone II is a transitional area that is classified as normally unacceptable for noise-sensitive uses including residential use. The DMA has recently implemented numerous measures to reduce the extent of these noise contours (see response to Comment No. 5 of Document No. 1).

A survey is being conducted to quantify the recreational use of post lands. This study will be completed in August 1994. The DNR was contacted and they were unable to identify any high recreational use areas on post other than established snowmobile trails in the MPRC vicinity. The existing designated snowmobile trails that fall within the MPRC safety fan already fell within the existing Range 30 safety fans and no significant conflicts have been noted. The DMA has committed to assist in relocating these snowmobile trails should winter training interfere with their use. Other effects upon recreational activities are addressed in response to Comment No. 7 of Document No. 4.

Document No. 7 **Comment No. 19**

ISSUE: The commentor states the Draft EIS unreasonably limits alternatives, particularly that the alternate site and relocation alternatives are defined as involving only Camp Grayling or the Grayling area. Other locations throughout the region or country are not considered. The commentor states that the Draft EIS does not evaluate the alternative of reducing activities at Camp Grayling.

RESPONSE: The cantonment area actions serve to supplement and maintain existing facilities currently in-place at Camp Grayling. (Alternative sites within the cantonment area are considered.) It would be unrealistic to consider the location of these activities at other sites in Michigan or in other states. The alternative location for the MPRC is discussed in the following text.

MPRC-H-R

The Multi-Purpose Range Complex-Heavy-Reduced (MPRC-H-R) must be located at a training site that offers the supporting facilities in terms of maintenance, equipment, and appropriately sized range areas. There is no other location within the State of Michigan other than Camp Grayling which offers this combination of services. The MPRC-H-R proposed for Camp Grayling is a component of a national program which provides MPRC training in each region of the United States for ARNG troops. Camp Grayling is the designated MPRC site for the region of the United States which includes Michigan, Indiana, and Ohio. Indiana and Ohio have no training site capable of supporting an MPRC. In the future, all ARNG units will be expected to demonstrate proficiency on this type of range and will require sufficient training time to develop the necessary skills in order to meet National Training Guidelines. However, training at an out-of-state MPRC facility has been added as an alternative (see Section 2.4.3).

Reducing training activities or closing the post is not considered consistent with guidance from the Governor's office. In 1987, the Governor appointed a Blue Ribbon Committee to review citizen concerns regarding conflicts at the post. The Committee made several recommendations, which in turn, were reviewed by the Governor's office. The DMA was then advised to implement 43 recommendations which the Governor's office felt would reduce citizen concerns. Reduction in training and post closure were alternatives investigated but were not recommendations by the Governor.

Document No. 7 **Comment No. 20**

ISSUE: The commentor states the Draft EIS does not include a cost-benefit analysis and does not address the eventual costs of cleanup associated with demilitarization of Camp Grayling.

RESPONSE: The Department of Defense has established and directed programs which address closure of military installations. Evaluating the costs of closure of Camp Graying will be done when/if the decision to demilitarize the facility is made.

Document No. 7 **Comment No. 21**

ISSUE: The commentor states that the timing of construction and implementation of the operational aspects of the Master Plan is not revealed.

RESPONSE: Current status of the originally proposed actions (Draft EIS, March 1989) is shown in Table 1-1. Several of the originally proposed actions have been completed while others are no longer being considered at this time. All other actions could be implemented in the next five years depending upon funding constraints.

Document No. 7 **Comment No. 23**

ISSUE: The commentor states that no discussion is provided regarding the maintenance required for the Assault Landing Strip and airplane operations which will take place such as deicing and fuel dumping.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 24**

ISSUE: The commentor states that wetlands impacts related to the Assault Landing Strip are not described.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 25**

ISSUE: The commentor states that deer wintering area effects are not addressed relative to activities of the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 26**

ISSUE: The commentor states that stream crossings are not addressed in the Draft EIS.

RESPONSE: Steam crossings are prohibited by units training at Camp Grayling. Please refer to Section 4.1.5.1.

Document No. 7 **Comment No. 27**

ISSUE: The commentor states that contamination from spills and dumps, propellants and explosives, unexploded ordnance, and other chemicals is not satisfactorily addressed.

RESPONSE: Spill planning and contingency actions are addressed in Sections 4.1.6 and 3.9.2.

Document No. 7 **Comment No. 28**

ISSUE: The commentor states that the problem of spills, dumping and accidents associated with the Assault Landing Strip were not addressed.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 29**

ISSUE: The commentor states that sewage treatment at the Camp Grayling wastewater treatment plant is not described.

RESPONSE: The operation of the Camp Grayling wastewater treatment facility is described in Sections 3.3.2.3.3 and 3.7.2.4.

Document No. 7 **Comment No. 30**

ISSUE: Runoff from paved areas at the Assault Landing Strip is not discussed.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 31**

ISSUE: The commentor states the Draft EIS gives insufficient consideration to the effects of noise and contamination on eagles, raptors, loons, Kirtland's warbler, and other species relative to construction and operation (of the MPRC and Assault Landing Strip and implementation of winter training).

RESPONSE: The impacts of cold weather training and noise on wildlife are addressed in responses to Comment No. 4 of Document No. 1 and Comment No. 7 and 8 of Document No. 4. However, the Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 32**

ISSUE: The biomagnification potential of contaminants in the soil and water through the food chain is not considered.

RESPONSE: As previously noted, further study is being conducted to provide more definitive information relative to on-going activities at the installation. Refer to Section 3.9.2.

Document No. 7 **Comment No. 33**

ISSUE: The commentor states that the effects of construction and operation (of the Assault Landing Strip and MPRC) upon habitat for wildlife and fish is not addressed, especially regarding problems of wildfires related to Kirtland's warbler habitat.

RESPONSE: The biological opinion of the U.S. Fish and Wildlife Service relative to threatened and endangered species management at Camp Grayling is discussed in response to Comment No. 4 of Document No. 1. The issue of wildfires at Camp Grayling is addressed in Sections 3.6.1.3 and 4.2.2. However, the Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 34**

ISSUE: The problems of gases and blast residue in the air is, for the most part, ignored.

RESPONSE: None of the Master Plan projects will have effects on existing levels of firing at Range 40. Only inert ammunition will be utilized at the MPRC-H-R. The issue of air quality relative to opening burning propellants, although not directly related to activities proposed as part of the Camp Grayling Master Plan, was investigated as part of the

consent order developed with the DNR. A study conducted by AEHA in 1993 indicated the ambient air groundlevel pollutant-specific concentrations from open burning did not exceed applicable health board standards. DMA discontinued opening burning of propellents in 1993. Refer to Section 4.1.2 and response to Document 4, Comment 11.

Document No. 7 **Comment No. 36**

ISSUE: The problem of winter closing of cross-country ski trails, snowmobile trails, and hunting during all open seasons has nowhere been addressed.

RESPONSE: The issues relative to cross-country skiing and snowmobiling and other recreational activities in relation to cold weather training and noise are addressed in response to Comment No. 7 of Document No. 4.

Document No. 7 **Comment No. 37**

ISSUE: The following sources of spills are not considered: plane crash and/or spill at the Assault Landing Strip, fuel storage tank rupture at the bulk fuel storage facility, and other fuel spills.

RESPONSE: The issues of leaks/spill is discussed in Section 4.1.6.1. However, the Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 38**

ISSUE: Accidents, including transportation involving wheeled and tracked vehicles, air crashes, and train accidents are not addressed.

RESPONSE: The Installation Spill Contingency Plan addresses releases of substances or fires associated with accidents, crashes, or other incidents. The Installation Spill Response Team is supported by military police and staff trained in dealing with these sorts of contingencies. In the past, the installation has had experience with a variety of incidents within the military and civilian community. The military staff is also supported by the local agencies including the sheriffs department, fire departments of local communities, and DNR staff, or supports state agencies in an off-post location. See Section 4.1.6.

Document No. 7 **Comment No. 39**

ISSUE: The commentor states that wildfires do not seem to be considered in the Draft EIS. Fires and contingency plans for dealing with them are not considered.

RESPONSE: A Memorandum of Agreement between the DNR and the DMA regarding wildfire contingency plans was implemented in 1988 to increase the effectiveness of wildfire prevention and the firefighting capabilities. Camp Grayling has established an automated phone system that improves public access to the camp staff. When training is

being conducted at Camp Grayling, outside callers will be able to reach a staff member 24 hours a day. Refer to Sections 3.6.1.3 and 4.2.2 for a more in-depth discussion of fire.

Document No. 7 **Comment No. 40**

ISSUE: The problems of habitat destruction, soil and water contamination, and noise problems relative to the MPRC have not been addressed.

RESPONSE: The potential impacts associated with the MPRC-H-R are discussed in Chapter 4 of the EIS under each of the environmental attributes and for all of the alternatives.

Document No. 7 **Comment No. 41**

ISSUE: The problems of habitat destruction, wetlands destruction, and operational problems with the Assault Landing Strip have not been addressed.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 7 **Comment No. 43**

ISSUE: The evaluation of proposed cold weather training operations does not evaluate problems due to year-round operations, including destruction of deer wintering grounds, closure of recreational areas, potential soil and water quality issues related to sewage disposal at the wastewater treatment facility.

RESPONSE: The impacts associated with year-round training is addressed in response to Comment No. 7 of Document No. 4. Recreational issues associated with cold weather training are addressed in response to Comments No. 7 and 8 of Document No. 4. Water quality issues associated with operation of the Camp Grayling wastewater treatment facility are addressed in response to Comments No. 24, and 25 of Document No. 1.

Document No. 7 **Comment No. 44**

ISSUE: Insufficient detail has been provided relative to the transportation and storage of dangerous materials and hazardous wastes in relation to the vehicle maintenance and fueling facilities, the Assault Landing Strip, and the disposal of ordnance.

RESPONSE: Refer to Sections 3.7.2 and 4.1.6. The proposed facilities will be incorporated into the Installation Spill Control Plans and will be covered by the hazardous waste management plan. The disposal of unexploded ordnance is discussed in response to Comment No. 11 of Document No. 4. The ALS project has been cancelled.

Document No. 7 **Comment No. 45**

ISSUE: Site-specific information must be provided relative to groundwater monitoring and a soil and hydrogeological study must be done prior to constructing the proposed Master Plan facilities.

RESPONSE: Ground water monitoring is addressed in response to Comment No. 11 of Document No. 7. Analysis of soil and water quality is addressed in Section 3.9.2 in response to Comment 10 of Document No. 4.

Document No. 7 **Comment No. 46**

ISSUE: The commentor states that the EIS does not address who will pay the costs associated with decommissioning Camp Grayling.

RESPONSE: The Army established the Installation Restoration Program within the Toxics and Hazardous Materials Agency (now the Army Environmental Center) under the Defense Environmental Restoration Act. Provisions of this act would provide for proper decommission in the event this should occur.

Document No. 7 **Comment No. 47**

ISSUE: The Draft EIS fails to adequately take into account the multiple use nature of the Camp Grayling lands.

RESPONSE: This issue has been previously addressed in response to Comment No. 2 of this Document No. 7.

NOTE: Document No. 8 is a letter submitted by the National Trout Unlimited group and mentions many of the same issues addressed in Document No. 7 which was submitted by the Michigan Council of Trout Unlimited.

Document No. 8 **Comment No. 1**

ISSUE: The Draft EIS fails to deal with several issues identified in the scoping process including the problem of contamination from exploded and unexploded ordnance.

RESPONSE: This issue is address in response to Comment No. 10 of Document No. 4 and Section 3.9.2 concerning the Range 40 Study.

Document No. 8 **Comment No. 2**

ISSUE: The proposed timing of construction and plans for further development are not disclosed.

RESPONSE: This issue is addressed in response to Comment No. 21 of Document No. 7.

Document No. 8 **Comment No. 3**

ISSUE: The Draft EIS fails to recognize the multiple use nature of Camp Grayling lands.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Document No. 8 **Comment No. 4**

ISSUE: The Draft EIS makes the insupportable assumption that growth in intensity, use, and number of users at the camp will cease.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Document No. 8 **Comment No. 5**

ISSUE: The Draft EIS description of the current environment does not contain an adequate inventory of wetlands, feeder streams, plants, wildlife, endangered species, or on-going environmental problems.

RESPONSE: Several programs are currently in place at Camp Grayling that inventory and monitor natural resources at the installation. Separate, yet coordinated and complementary efforts continue to collect information and update existing databases that are used in the many resource management activities conducted by the staff of the Environmental Office. This information is vital for monitoring the effects of training activities on biological and nonbiological resources. Please refer to responses to Document 1, Comments 21 and 22, Document 7, Comment 12 and Section 3.5.1.

Document No. 8 **Comment No. 6**

ISSUE: The Draft EIS fails to recognize the economic value of the Camp Grayling area for recreation, tourism, and recreational uses.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7.

Document No. 8 **Comment No. 7**

ISSUE: The commentor states that the human health hazards to the surrounding population from the activities conducted at Camp Grayling is not evaluated.

RESPONSE: This issue, relative to noise, is addressed in response to Comment No. 7 of Document No. 4 and water quality issues are addressed in response to Comment No. 10 of Document No. 4.

Document No. 8 **Comment No. 8**

ISSUE: The commentor states that the discussions of monitoring and mitigation in the Draft EIS are completely insufficient.

RESPONSE: Monitoring and mitigation activities and programs are discussed throughout the text in general and often provide detailed treatment for a particular activity or area of concern (i.e., noise, water resources, soil erosion, threatened and endangered species). Special attention was given to the recently completed Range 40 study which is discussed in Section 3.9.2 and responses to Comment No. 20 and 22 of Document No. 1, Comment No. 10 of Document No. 4, and Comment No. 5 of Document No. 8.

Document No. 8 **Comment No. 9**

ISSUE: The commentor states that the Draft EIS ignores foreseeable consequences of the operations at the Assault Landing Strip including fuel spills and airplane crashes, as well as potential spills at stream crossings, streambed and streambank degradation, and establishing control over troops in training.

RESPONSE: The Assault Landing Strip project has been cancelled. See Sections 4.1.4, 4.1.6, and 4.1.5.1.

Document No. 8 **Comment No. 10**

ISSUE: The cost of decommissioning Camp Grayling is, not addressed in the Draft EIS.

RESPONSE: The Department of Defense has funded and established programs for addressing the decommissioning of military installations in the event this should occur (see Comment No. 46 of Document No. 7.)

Document No. 8 **Comment No. 11**

ISSUE: The soil and geological study on which the Draft EIS is based is 60 years old.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 7.

Document No. 8 **Comment No. 12**

ISSUE: The commentor states that the adverse economic impacts of the implementation of the Master Plan upon the area are completely ignored.

RESPONSE: Refer to Comment No. 19 of Document No. 4.

Document No. 8 **Comment No. 13**

ISSUE: The commentor states that no consideration has been given to the possibility of reduced activity or utilization of other training areas.

RESPONSE: This issue is addressed in the second part of the response to Comment No. 19 of Document No. 7.

Document No. 9 **Comment No. 1**

ISSUE: The commentor states that fire problems relative to ordnance (from explosions in impact areas) are not adequately discussed in the Draft EIS.

RESPONSE: This issue is addressed in Section 3.6.1.3 and 4.2.2 of the EIS.

Document No. 9 **Comment No. 2**

ISSUE: The commentor states that other reasonable alternatives (relocation of Master Plan projects) are not adequately addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7.

Document No. 9 **Comment No. 3**

ISSUE: The commentor states the Draft EIS contains a slanted economic cost-benefit analysis.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7. A specific cost-benefit analysis was not prepared as part of the evaluation of the Master Plan actions at Camp Grayling for the Draft EIS. However, an economic profile and regional economy has been evaluated for each of the alternatives in the Final EIS.

Document No. 9 **Comment No. 4**

ISSUE: The commentor states that historical increases in utilization of Camp facilities and the implementation of new projects, including the MPRC and the Assault Landing Strip, make it difficult to believe the installation will not continue to have increasing utilization and that the consequences of the increased utilization should be addressed in the EIS.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7. However, the Assault Landing Strip project has been cancelled.

Document No. 9 **Comment No. 5**

ISSUE: The commentor states that on-going training problems including dumping and disposal of waste materials (hazardous materials) are not addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 14 of Document No. 7 and Comment No. 11 of Document No. 4.

Document No. 9 **Comment No. 6**

ISSUE: The commentor states that on-going problems related to fuel spills are not addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 13 through 16 of Document No. 1 and Section 4.1.6.

Document No. 9 **Comment No. 8**

ISSUE: The commentor states that landfills at Camp Grayling are not in a legal status.

RESPONSE: The Camp Grayling landfill was closed in accordance with a closure plan reviewed and approved by the Michigan DNR in November 1987.

Document No. 9 **Comment No. 9**

ISSUE: The commentor states that activities, including stream crossings, have affected the Manistee and AuSable Rivers.

RESPONSE: Please refer to Sections 4.1.4 and 4.1.5.1.

Document No. 9 **Comment No. 10**

ISSUE: The commentor states that some of the issues raised in the scoping process have not been addressed in the Draft EIS, specifically, potential accidents related to spills or chemicals which could leach from the impact area and cause contamination of soils or surface and ground waters.

RESPONSE: Issues related to potential contamination in and around Range 40 have been addressed in Section 3.9.2. and in response to Comment No. 10 of Document No. 4. Section 4.1.6 discusses potential impacts related to spills. In addition, procedures for effectively dealing with spills are also covered in Section 4.1.6.

Document No. 9 **Comment No. 11**

ISSUE: The commentor states that alternatives for relocation of the proposed Master Plan projects should be considered throughout Michigan and other areas of the country.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7.

Document No. 9 **Comment No. 12**

ISSUE: The commentor states the cost for cleanup of potential contamination (impact areas) caused by the DMA must be addressed.

RESPONSE: This issue is addressed in response to Comment No. 46 of Document No. 7.

Document No. 9 **Comment No. 13**

ISSUE: The commentor states the Draft EIS fails to mention other alternatives (relocation) and screens alternatives on an arbitrary basis.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7 and in Section 2.2.

Document No. 9 **Comment No. 14**

ISSUE: The commentor states that spills, dumping, and accidents associated with the Assault Landing Strip need to be addressed.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 9 **Comment No. 15**

ISSUE: The commentor states that the winter operation of the wastewater treatment plant will produce spring runoff high in nutrients which will cause contamination of adjacent surface waters.

RESPONSE: This issue is addressed in response to Comment No. 24 and 25 of Document No. 1.

Document No. 9 **Comment No. 16**

ISSUE: The commentor states that aesthetic issues are not addressed in the Draft EIS.

RESPONSE: In 1987-8 the Governor's Camp Grayling Management Advisory Committee reviewed commentary and testimony from local citizens regarding many issues related to aesthetics of the Camp Grayling environment. They formulated a list of 43 items which are being addressed by the DMA on an established schedule. Many of these items address the aesthetic issues outlined above.

Document No. 9 **Comment No. 17**

ISSUE: The commentor states the Draft EIS does not address potentially foreseeable accidents, including a plane crash or accident at the Assault Landing Strip that would lead to contamination of the Manistee River, an explosion at the ammunition supply point, or wildfires. He also states that these situations are more likely to occur because of the lack of authority and control of the installation commander over troops during training.

RESPONSE: The issue of potentially foreseeable catastrophic accidents is addressed in response to Comment No. 20 of Document No. 11. The Assault Landing Strip project has been cancelled. Training related fires are addressed in response to Comment No. 17 of Document No. 4 and Section 3.6.1.3 of the EIS.

The ammunition supply point is more than one mile from the nearest privately owned land. The ammunition supply point is designed in accordance with Army quantity/distance design parameters. These parameters minimize the risk for potential explosions by placing limited quantities of explosives in protective structures separated by distances which ensure that a potential explosion in one structure would not affect adjacent storage facilities.

Document No. 9 **Comment No. 18**

ISSUE: The commentor states that the issue of wetlands impacts has not been adequately addressed in the Draft EIS.

RESPONSE: Please refer to Comments No. 21, 24, and 25 of Document No. 1.

Document No. 9 **Comment No. 19**

ISSUE: The commentor states that mitigations need to be described in detail, including groundwater monitoring programs, soil and hydrogeological studies regarding contamination, contingency plans for spills, accidents, and evacuations, and cooperation with local officials running Section 3.3 of the Community Right-to-Know and Emergency Response Act (SARA).

RESPONSE: Current spill prevention measures and groundwater monitoring sites are described in response to Comments No. 13 through 16 of Document No. 1, Comment 11 of Document 7 and Section 4.1.6. Monitoring requirements relative to future permits required for proposed Master Plan actions are addressed in response to Comment No. 5 of Document No. 16. Soil and hydrogeological studies are addressed in response to Comment No. 10 of Document No. 4. Contingency plans for spills or accidents are addressed in response to Comments No. 13 through 16 of Document No. 1 and Section 4.1.6. The DMA has a designated representative on the local Emergency Planning Committee and is currently in consultation with the DNR to ensure that concerns related to SARA are adequately addressed.

Document No. 10 **Comments No. 1, 2, and 3**

ISSUE: The commentor states that the Draft EIS does not provide adequate justification for the selection of alternatives to the proposed actions and should have examined the possibility of a facility being constructed at other states or the limitation of training only Michigan troops at Camp Grayling.

RESPONSE: The issue of relocation alternatives or reducing training levels at Camp Grayling is addressed in response to Comment No. 19 of Document No. 7.

Document No. 10 **Comment No. 4**

ISSUE: The commentor states that an alternative for partial implementation of the proposed Master Plan actions should be considered whereby proposed actions intended solely to address environmental problems at the camp could be considered for implementation separately from other actions.

RESPONSE: The DMA will prepare a Record of Decision document which will describe the specific actions it will implement, including a description of these actions, identification of related impacts and the mitigations it will provide. This Record of Decision will consider actions on a project-by-project basis.

Document No. 10 **Comment No. 5**

ISSUE: The commentor states that a complete inventory of potential environmental contamination sites on the facility, including information regarding related investigations, would help the public in understanding the current situation at the camp.

RESPONSE: Information regarding historic spills at Camp Grayling is provided in response to Comments No. 13 through 16 of Document No. 1 and Section 4.1.6.1. Information regarding potential contamination related to the Firing Range 40 impact area investigation is provided in response to Comment No. 10 of Document No. 4 and Section 3.9.2. Actions taken to address potential regulatory concerns related to impact areas are addressed in response to Comment No. 11 of Document No. 4.

Document No. 10 **Comments No. 6 and 7**

ISSUE: The commentor states that the Draft EIS analysis of threatened or endangered species and wetlands is inadequate because information regarding the existence and location of these natural resources is inadequate.

RESPONSE: Site-specific investigations and consultations with the U.S. Fish and Wildlife Service regarding threatened or endangered species are discussed in response to Comment No. 4 of Document No. 1. Site-specific investigations regarding the impacts of proposed Master Plan projects on wetlands are discussed in response to Comments No. 21 and 23 through 25 of Document No. 1. These responses include a description of the

LCTA Program which was implemented to provide a thorough inventory of wetlands and threatened or endangered species at Camp Grayling. The DMA has consistently coordinated any and all endangered species concerns brought to the Department by either the DNR or the EPA.
For a treatment of wetland issues concerning available information please refer to Section 3.5.6.3 and responses to Comment No. 21 and 22 of Document No. 1 and Comment No. 16 of Document No. 4.

Document No. 10 **Comment No. 8**

ISSUE: The commentor states the DMA should provide a complete examination of potential accidents and remedial actions which would be performed to prevent accidents from contaminating the AuSable or Manistee River relative to training activities at Camp Grayling.

RESPONSE: Remedial actions in relation to spills and accidents are described in Section 4.1.6. Contamination issues concerning the Range 40 complex are addressed in Section 3.9.2. Preventive measures to reduce the possibility of spills near streams are contained in DMA regulations restricting activities to areas away from water resources. Please refer to response to Comment No. 28 of Document No. 28, and Camp Grayling Reg. 200-1.

Document No. 11 **Comment No. 1**

ISSUE: The commentor is concerned that the Michigan Environmental Review Board has been rescinded and proper State Guidelines are not available for EIS preparation.

RESPONSE: The Camp Grayling EIS was prepared as a joint state-federal document in accordance with 40 CFR Part 1500 and Army Regulation 200-2, in order that the document could receive required federal and state reviews. Up through the time of the Governor's dissolution of the Michigan Environmental Review Board, all Camp Grayling pre-Final EIS state reviews were completed. Although no state review is now required, the EIS meets all federal, National Guard Bureau, and Army requirements.

Document No. 11 **Comment No. 2**

ISSUE: The commentor questions the EIS statement that the implementation of the Master Plan actions will not change the existing utilization of the installation.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Document No. 11 **Comment No. 3**

ISSUE: The commentor questions the effort that the DMA has, or will, place environmental compliance.

RESPONSE: This issue is addressed in response to Comments No. 5 and 6 of Document No. 7. The DMA is required to comply with environmental rules and regulations in the same manner as other state agencies. The establishment and enforcement of its recent environmental regulations at Camp Grayling include provisions of the Hazardous Waste Management Plan, Spill Prevention Control and Countermeasure Plan, Installation Spill Contingency Plan, and other new standard operating procedures designed to improve environmental compliance. The DMA has agreed to implement measures in response to 43 items outlined by the Governor's Camp Grayling Advisory Committee in 1988 according to an established schedule. One measure is a training site agreement which each commander of troops utilizing the post must sign. The agreement stipulates that if damage is caused by their units, they will repair or pay for the damage.

Document No. 11 **Comment No. 4**

ISSUE: The commentor questions the effectiveness of DNR's efforts to ensure DMA compliance at Camp Grayling with Michigan environmental regulations.

RESPONSE: The DMA must comply with existing environmental regulations in the same manner as other governmental agencies (see response to Comment No. 3 above).

Document No. 11 **Comment No. 5**

ISSUE: The commentor questions the compatibility of Guard activities and recreational pursuits.

RESPONSE: This issue is addressed in response to Comments No. 7 and 18 of Document No. 4 and Comment No. 2 of Document No. 7.

Document No. 11 **Comment No. 6**

ISSUE: The Draft EIS has not assessed all alternatives or depth of assessment is lacking.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7.

Document No. 11 **Comment No. 7**

ISSUE: The commentor is concerned about the effects upon water quality and public health in relation to residues from explosive ordnance.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 11 **Comment No. 8**

ISSUE: The Draft EIS should have considered the result of high intensity aircraft noise and high intensity impulsive noise on the human environment.

RESPONSE: This issue is addressed in response to Comments No. 7 and 8 of Document No. 4. Also refer to Section 4.1.3.

Document No. 11 **Comment No. 9**

ISSUE: The Draft EIS does not consider the effects of noise on wildlife and other animals.

RESPONSE: This issue is addressed in response to Comments No. 7 and 8 of Document No. 4.

Document No. 11 **Comment No. 10**

ISSUE: The commentor states that the DMA should have included information regarding the economic effects of base closure.

RESPONSE: The evaluation of the economic effects of closure of Camp Grayling is not being considered.

Document No. 11 **Comment No. 11**

ISSUE: The commentor states that EPA procedures must ensure that environmental information is made available to public officials and citizens before decisions are made and actions taken.

RESPONSE: In some situations where there are questions of primacy, it is the policy of DMA to solicit legal opinions regarding the permission to release information. Approximately 350 copies of the Draft EIS were provided to those requesting them. At least ten public meetings have been hosted by the DMA to inform local citizens of the operational and training activities associated with the proposed Master Plan actions over a period of several months. Three formal public meetings were conducted specifically to address the Draft EIS. These measures have been taken to ensure that information is available to the public. In its preparation of the Record of Decision regarding the Master Plan actions, the DMA will consider the comments received during public review of the Final EIS.

Document No. 11 **Comment No. 12**

ISSUE: The commentor states that the information included in the EIS must be of high quality, the NEPA process should be integrated into early planning, and interagency cooperation must be sought before the EIS is prepared.

RESPONSE: The information presented in the EIS reflects scientific analysis, agency comments, and public scrutiny. It utilizes the scoping process to focus on issues that are truly significant to the action in question. The DMA Environmental Coordinator ensures that the initial step in the DMA planning of proposed projects includes an environmental checklist which includes consideration of multi-disciplinary environmental issues. As a result of the Environmental Checklist prepared for the Master Plan actions, the DMA determined to pursue an environmental impact statement.

A notice of intent to prepare this federal/state EIS was published in the Federal Register on July 22, 1986 and the Michigan Environmental Review Board "Status Report." The Environmental Coordinator is responsible for overall review of agency NEPA compliance. In response to the assistance solicited in the Federal Register notice, correspondence was received from the U.S. Department of the Interior (Fish and Wildlife Service), the Bureau of Land Management, the State Historic Preservation Office, and the Michigan Department of Natural Resources.

The Michigan National Guard also prepared a press release dated 17 July 1986 announcing its intent to prepare an environmental impact statement. A public meeting announcement was prepared announcing the September 4, 1986 scoping meeting in advance of the September 4, 1986 public scoping meeting held at the Grayling Armory, Camp Grayling, Michigan. The scoping meeting was announced in the papers in Crawford County, Kalkaska County, and Otsego County. Written comments were accepted through September 21. These efforts were provided to ensure agency coordination and definition of the real issues. Duplication with state and federal procedures was minimized by preparing a joint state/federal document. The joint DMA and National Guard Bureau leadership in preparing the Camp Grayling EIS to eliminate duplication of state and local procedures is done in accordance with Part 156.2 of the Council on Environmental Quality Regulations for Implementing NEPA.

The Notice of Intent to Prepare the Camp Grayling EIS in the Federal Register and the State Status Report, the Michigan Department of Military Affairs news release, announcements of the public scoping meetings in the local papers, and the correspondence with agencies responding to these materials all act as invitations for participation and coordination of concerned agencies.

Document No. 11 **Comment No. 13**

ISSUE: The commentor states that the EIS shall provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.

RESPONSE: The EIS, including the Draft and Final EIS, defines significant environmental impacts and includes input from the public and agencies for means of avoiding or minimizing adverse environmental impacts. In fact, several proposed projects are no

longer being considered and other alternatives are being considered in response to public and agency comment.

Document No. 11 **Comment No. 14**

ISSUE: The commentor states that the EIS is encyclopedic rather than analytic.

RESPONSE: The EIS for Camp Grayling utilizes available environmental information regarding Camp Grayling and presents analyses and identifies pertinent mitigations.

Document No. 11 **Comment No. 15**

ISSUE: The commentor states that agencies shall not commit resources prejudicing selection of alternatives before making a final decision. Accordingly, EISs shall serve as the means of assessing the environmental impact of proposed agency actions rather than justifying decisions already made.

RESPONSE: The DMA has pursued the planning necessary to evaluate the environmental effects of the proposed Master Plan actions. Funding for construction of these projects will not be committed until the environmental documentation is completed and impacts have been identified and mitigated where possible (see response to Comment No. 12 of Document No. 11).

Document No. 11 **Comment No. 16**

ISSUE: The commentor states that the appendix material is not pertinent to the body of the EIS.

RESPONSE: The Draft EIS appendix included the EIS scoping document which provided firsthand information relative to issues identified for the study. Quantitative analysis presented in the Draft EIS addressed scoping issues regarding noise, waste disposal, water quality, and certain economic aspects of collective implementation of the cumulative Master Plan actions. Appendices in the FEIS provide information which supports the further analysis of these scoping issues.

Document No. 11 **Comment No. 17**

ISSUE: The commentor states that the Draft EIS was not furnished to all agencies or individuals requesting a copy.

RESPONSE: The DMA distributed over 350 copies of the Draft EIS and has maintained records of all requests, written or oral, of those individuals requesting copies of the document. Copies of the document were also provided to libraries in the cities of Grayling, Kalkaska, Gaylord, and Lansing, and were available at Camp Grayling and DMA Headquarters in Lansing for public viewing (see response to Comment No. 12 of Document No. 11).

Document No. 11 **Comment No. 18**

ISSUE: The commentor states that material incorporated by reference into the Draft EIS was not reasonably available for inspection.

RESPONSE: All references are available upon written request to the DMA. The DMA provided a period for public comment which extended from April 21, 1989 through July 31, effectively doubling the minimum 45-day requirement for comments on the Draft EIS, and conducted three public hearings within the study area and numerous public information meetings at different locations in order to reach the maximum number of concerned residents. The DMA furnished several parties with information for their inspection during this time period (see response to Comment No. 12 of Document No. 11).

Document No. 11 **Comment No. 19**

ISSUE: The commentor states that the DMA did not make it clear in the Draft EIS when information regarding foreseeable adverse effects (i.e., Range 40 water quality) was unavailable or incomplete.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 11 **Comment No. 20**

ISSUE: The commentor states that the EIS should include impacts which have catastrophic consequences even if their probability of occurrence is low, provided that the analysis of impact is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

RESPONSE: The term "catastrophic" is unclear and at best very subjective. In 75 years of operations at Camp Grayling, there have been very few incidents which could potentially be termed "catastrophic", i.e., death, serious injury, significant loss of property, and/or significant damage to natural resources. The DMA has implemented contingency plans to address known concerns. These actions include spill management planning (see response to Comments No. 13 through 16 of Document No. 1), fire response (see response to Comment No. 17 of Document No. 4), and concerns regarding trespassing into the impact areas on-post. In response to the impact area trespassing concerns, these areas have been fenced and posted, and are now protected under DNR Director's Closure Orders. Other incidents during the last 10 years are currently being investigated as part of the DMA's efforts to be responsive to residents' concerns and provide the best available information.

Document No. 11 **Comment No. 21**

ISSUE: The commentor states that the EIS does not reference by footnote the scientific sources relied upon for conclusions.

RESPONSE: The format of the EIS provides complete bibliographic references for methodologies, literature, and other sources relied upon for conclusions in environmental analyses.

Document No. 11 **Comment No. 22**

ISSUE: The commentor states there are no references supporting the value of the National Guard in a national emergency. He states there is no supporting evidence for the thesis that part-time troops can be trained to the level of full-time regulars and therefore ensure successful and prompt integration of the National Guard/Reserve and Active Armed Forces in the event of a national emergency.

RESPONSE: Operation Desert Shield provides a prominent example which supports the value of the National Guard in a national emergency. During Operation Desert Shield, tens of thousands of Reserve and National Guard soldiers were activated on short notice and integrated with active forces. While these Guardsmen remained in the United States for a few weeks before deploying to Saudi Arabia, their equipment was immediately shipped on ahead. This meant that while they could participate in some classroom sessions and work on physical fitness and marksmanship, they generally could not train on the equipment they needed to accomplish their mission. To put it another way, these units entered Saudi Arabia at approximately the same level of training they left Annual Training with the summer before. Other examples of Guard readiness include both Grenada and Panama military operations where Reserve and Guard troops joined active forces, literally on hours' notice.

The Army Guard and Reserve trains to the same standards as active Army units. These standards are written by the active Army and are evaluated by active Army officers and NCOs who train each summer with the Guard and Reserve at Camp Grayling. Just during the time period this EIS was being developed, the Michigan Army National Guard won the competition as the best machine gun team in the world (including active duty teams from British S.A.S., West German commandos, U.S. Special Forces, Rangers, Navy Seals, etc.). Michigan National Guard bridging units regularly win the All-NATO engineer competition in Germany. Michigan Air National Guard units likewise place high in their fighter aircraft competitions.

General Carl E. Vuono, Chief of Staff of the Army (senior uniformed officer in the active Army) said in his annual status report on the Army: "In some cases, or course, forward deployed or contingency forces will be insufficient to meet our force requirements, particularly on a protracted basis. So we must also maintain the capability for both rapid and sustained reinforcement of our forward deployed forces and those we deploy for

contingencies with additional active and reserve units. This critical responsibility will be of singular importance as we shape the reserve components in the future."

Document No. 11 **Comment No. 23**

ISSUE: The commentor states that the environmental impact of "no action" is ignored in the Draft EIS.

RESPONSE: The Draft EIS offers an evaluation of the "no action" alternative in association with each proposed project as it relates to the proposed Master Plan projects. Responses in this Final EIS reflect environmental impacts of on-going activities at the post at the beginning of each environmental attribute in Chapter 4.

Document No. 11 **Comment No. 24**

ISSUE: The commentor states that the effects of toxic residues form exploded ordnance on all ranges are not discussed.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 11 **Comment No. 25**

ISSUE: The commentor states that stream crossings are not identified.

RESPONSE: Open water stream crossings are prohibited at Camp Grayling.

Document No. 11 **Comment No. 26**

ISSUE: The commentor states that the whole issue of transportation, storage, security, and disposal of ammunition and ordnance is not addressed.

RESPONSE: Transportation, storage, security, and disposal of ammunition actions are completed in strict compliance with all applicable federal, state, local and army regulations.

Document No. 11 **Comment No. 27**

ISSUE: The commentor states that affected wetlands and forest vegetation are not adequately described.

RESPONSE: Detailed site inspections of the locations of the proposed actions were conducted for wetlands and threatened and endangered species. Further discussion of this issue is provided in response to Comments No. 21 through 23 of Document No. 1 and Comments No. 13 through 16 of Document No. 4.

Document No. 11 **Comment No. 28**

ISSUE: The commentor states that conflicts with migratory bird routes and the (aircraft) utilizing the Assault Landing Strip are ignored.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 11 **Comment No. 29**

ISSUE: The commentor states if there are no state or local noise regulations permit or approvals for noise, that common law cases should be examined to establish noise criteria.

RESPONSE: Refer to Section 3.5.4.1. It is beyond the scope of this EIS to review case law in the State of Michigan and establish site-specific noise criteria for Camp Grayling. The EIS noise analysis utilizes A-weighted and C-weighted noise contours reflecting day-night noise levels, applied in accordance with procedures outlined by the National Research Council (1981) based on criteria established by the federal agencies.

Document No. 11 **Comment No. 30**

ISSUE: The Draft EIS does not delineate or substantiate the "minor beneficial noise benefits related to the construction of the Multi-Purpose Range Complex."

RESPONSE: Figures 4-1 and 4-5 display the predicted Zone II and Zone III contours for the MPRC-H-R and the existing tank range complex. The Zone II contour area is reduced 30.25 acres, from 6922.36 to 6892.11 acres. The Zone III contour area is reduced 427.48 acres, from 2842.93 to 2415.45 acres. The MPRC-H-R contour occurs to the north and east of the existing contour. This shift results in decreasing the Zone II contour off-post from 1367.35 to 201.63 acres, a reduction of 1165.72 acres. Another benefit is the capacity of the MPRC to be readily used for laser firing instead of live rounds for portions of training.

Document No. 11 **Comment No. 31**

ISSUE: The Camp Grayling wastewater treatment facility will pollute Bear Swamp.

RESPONSE: This issue is addressed in response to Comment No. 24 and 25 of Document No. 1.

Document No. 11 **Comment No. 32**

ISSUE: The construction of the MPRC will affect important warbler habitat.

RESPONSE: This issue is addressed in detail in response to Comment No. 4 of Document No. 1.

Document No. 11 **Comment No. 33**

ISSUE: The commentor questions if it is legal for the DMA to close any part of the proposed MPRC range during the small game hunting season.

RESPONSE: This issues is addressed in response to Comment No. 2 of Document No. 7.

Document No. 11 **Comment No. 34**

ISSUE: How will the National Guard provide sewage treatment related to its increase in housing at the Grayling Army Airfield?

RESPONSE: The proposal to increase housing at the Grayling Army Airfield has been cancelled.

Document No. 11 **Comment No. 35**

ISSUE: The Draft EIS does not address the impacts of noise and other intrusions of training exercises on wildlife.

RESPONSE: This issue is addressed in response to Comment No. 7 of Document No. 4 and Comment No. 2 of Document No. 7.

Document No. 12 **Comment No. 1**

ISSUE: The commentor states that concerns expressed over water pollution from explosive residue and ammunition dumped in waters within the camp are not investigated in the Draft EIS.

RESPONSE: No explosive residues or ammunition is deliberately "dumped" in surface waters at Camp Grayling. Incidental ordnance entry at several locations has occurred but is not common. Ordnance related residuals as related to water resources at Camp Grayling are discussed in Section 3.9.2.

Document No. 12 **Comment No. 2**

ISSUE: The commentor questions whether studies of heavy metals (mercury, lead, zinc, cadmium, chromium, and other soluble forms), carcinogens, and toxic nitrogenous chemicals will be conducted to determine whether effects of contamination and bio-accumulation are occurring at Camp Grayling.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 12 **Comments No. 3 and 4**

ISSUE: The commentor states concern that the existing Kirtland's warbler agreement and the provisions taken to protect bald eagles at the installation are inadequate, and that military activities have caused bald eagles to repeatedly abandon young in their nest.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Document No. 14 **Comment No. 1**

ISSUE: The commentor states that the Draft EIS is a pre-decisional document designed to support plans which are already a matter of accomplished fact.

RESPONSE: The DMA has pursued the planning necessary to evaluate the environmental effects of the proposed Master Plan actions. The final decision of whether to fund these actions, the specific terms by which each action will be implemented and the determination of which mitigations will be applied will not be made until the environmental documentation is completed in a Record of Decision.

Document No. 14 **Comment No. 2**

ISSUE: The commentor states that the size of the wastewater treatment facility at Camp Grayling implies increased activities at the installation.

RESPONSE: Action C1 - Repair/Replace Wastewater Treatment. A discussion of facility program evaluation is included in Sections 3.3.2.3.3 and 3.7.2.4. The wastewater facility is designed based on existing troop training levels.

Document No. 14 **Comment No. 3**

ISSUE: The commentor questions whether the barracks, BOQ Complex at the airfield suggests increased activities at the installation.

RESPONSE: Housing at the Grayling Army Airfield is no longer being considered at this time.

Document No. 14 **Comment No. 4**

ISSUE: The commentor questions whether the construction of two new buildings at the MATES suggest increased levels of activity.

RESPONSE: The two proposed MATES vehicle storage buildings are designed to provide protection from the elements for existing military equipment when it is not in use. These buildings are storage buildings for the purpose of housing equipment existing at the installation.

Document No. 14 **Comment No. 5**

ISSUE: The commentor questions whether the training intensity at Camp Grayling will increase in light of the increasing troop strength from 1980 to 1986.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Document No. 14 **Comment No. 6**

ISSUE: The commentor states that vibrations related to activities at the Range 40 complex, military trespass on private property, and (annoyance from) overflights across Guthrie Lake by low-flying aircraft identified during the public scoping process for the EIS still exist and inquires about what the DMA is doing to mitigate these on-going situations.

RESPONSE: Information regarding the effects of noise from training activities at the Range 40 complex are discussed in response to Comment No. 7 of Document No. 4. Noise mitigations are outlined in response to Comment No. 8 of Document No. 4. Traffic issues are discussed in response to Comment No. 17 of Document No. 4.

Document No. 14 **Comment No. 7**

ISSUE: The commentor states that the DMA has failed to honor their Installation Compatible Use Zone responsibilities by mitigating unacceptable noise levels in the Guthrie Lakes area, i.e., reducing effects from 500-pound bomb drops and evaluating the effects of winter training noise in more detail. The commentor also states that the DMA must establish acceptable noise standards and utilize acceptable methodologies to evaluate existing noise conditions.

RESPONSE: Refer to Section 4.1.3.1.6, Mitigation and Section 3.5.4. Mitigations have been implemented so that Zone III contours no longer occur off-post. An evaluation of winter training noise effects and peak noise effects are addressed in response to Comment No. 7 of Document No. 4.

Document No. 14 **Comment No. 8**

ISSUE: The commentor states that the current training intensity is already damaging the areas natural resources and that the mission of Camp Grayling to train troops precludes sound environmental management of the installation.

RESPONSE: The establishment of an ecological baseline to evaluate existing natural resource conditions in a quantitative manner is addressed in response to Comment No. 22 of Document No. 1. As discussed, the ITAM Program will inventory existing resources, identify sites requiring additional management, and implement a monitoring program to ensure management sites are effectively treated.

Document No. 15 **Comment No. 1**

ISSUE: The commentor questions why planes and helicopters so often fly over KP Lake at low levels when, as stated on page 4-3.14 of the Draft EIS, "flight paths are carefully designed for the air-to-ground range."

RESPONSE: Camp Grayling regulations specifically state that no aircraft should overfly KP Lake at elevations below 500 feet above ground level. Violations need to be reported for disciplinary action. Buzz numbers are installed on all helicopters to facilitate reports of violations.

Document No. 15 **Comment No. 2**

ISSUE: The commentor questions the need for the use of high explosive artillery, ammunition, and live bomb drops, and suggests that inert ammunition be used more frequently.

RESPONSE: Inert bombs are used regularly. Army training requirements specifically state the need for experience in handling and firing high explosive ammunition. However, inert artillery rounds are used whenever supplies can be obtained. Inert artillery rounds are only available in limited quantities for 155 mm artillery. Only inert tank rounds are used.

Document No. 15 **Comment No. 3**

ISSUE: The commentor questions why groundwater monitoring wells have not been placed in the impact area of Range 40.

RESPONSE: Ground water monitoring wells were an integral component of the hydrogeologic assessment of Range 40 by ESE (1993). This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 15 **Comment No. 4**

ISSUE: The commentor states that an expansion of the use of Camp Grayling would adversely affect recreation and hundreds of homes in the Camp Grayling area.

RESPONSE: The effects of noise on Grayling area residents are addressed in response to Comment No. 7 of Document No. 4. The effects of noise on recreation are also addressed in response to Comment No. 18 of Document No. 7. None of the proposed Master Plan actions will require the acquisition of additional lands or will significantly increase the number or types of troops training at Camp Grayling.

Document No. 16 **Comment No. 1**

ISSUE: The commentor states that the Draft EIS contains no assessment of cumulative impacts.

RESPONSE: Cumulative effects are addressed for each of the environmental attributes discussed in Chapter 4 of the EIS.

Document No. 16 **Comment No. 2**

ISSUE: Neither the Camp Grayling Master Plan nor the Master Planning process is included in the Draft EIS.

RESPONSE: The Camp Grayling Master Plan and regulations describing the Army National Guard (ARNG) Master Planning process are available for public review, as are the other materials referenced in the Draft EIS. The facilities and activities being assessed in this document were taken from the Master Plan.

The Master Plan process begins with the evaluation of a project based on need, but also utilizes an environmental checklist to prepare a Record of Environmental Consideration. Adequate evaluation of environmental concerns requires plans which include a certain amount of design work to be-conducted for a proposed project.

Funding for construction of the proposed Master Plan projects is not granted until a Record of Decision has been prepared by the DMA and National Guard Bureau.

Document No. 16 **Comment No. 3**

ISSUE: Off-site alternatives for Actions T1 - Road and Tank Trails, Action T2 - Multi-Purpose Range Complex, and Action T3 - Assault Landing Strip, as well as cold weather training and the assignment of new aviation units are not considered.

RESPONSE: None of these projects are now proposed except for the MPRC. A new alternative for the MPRC-H-R has been added due to public comment.

Document No. 16 **Comment No. 4**

ISSUE: The mitigations discussed in the Draft EIS do not adequately consider the mitigations likely to be required by regulatory agencies.

RESPONSE: Mitigations likely to be required by regulatory agencies that have been included in the comments submitted by agencies on the Draft EIS are included in this document. The DMA will implement all mitigations required by permits or outlined in its Record of Decision which will be issued following release of the Final EIS. This issue is addressed in more detail in response to Comment No. 5 of Document No. 7 and response to Comment No. 8 of Document No. 8.

Document No. 16 **Comment No. 5**

ISSUE: The DMA should include copies of all draft permits in an appendix to the EIS.

RESPONSE: The Michigan DNR has determined that the permits outlined below apply to the proposed actions addressed in the Draft EIS. Permits under the Water Resources Commission Act, 1929 PA 245 include the discharge to groundwater of treated sewage effluent via irrigation from the Proposed Action C1 - Repair/Replacement of Camp Grayling wastewater treatment facility. A groundwater discharge permit stipulating effluent limitations and monitoring was obtained from the DNR to operate the wastewater treatment plant. This and all other permits to operate at Camp Grayling are available for review from the Camp Grayling Enivronmental Office or the DNR.

Permits under the Inland Lakes and Streams Act, 1972 PA 346, include permits to construct and reconstruct crossings of rivers and streams. No crossings of rivers or streams are required for the implementation of the proposed actions described in the Draft EIS or on-going training actions. However, the DMA has contracted for services or provided troop projects falling under this act. In all instances, approval from the DNR and/or appropriate permits were obtained.

No permits are required under the Federal Resource Conservation and Recovery Act (RCRA) relative to the Camp Grayling Master Plan actions. The DMA has entered into a consent order with the DNR to ensure compliance regarding the handling of excess propellent and unserviceable or unexploded ordnance (see response to Comment No. 11 of Document No. 4).

All existing underground storage tanks have been documented and all new tanks have been installed in accordance with regulations of the Michigan Fire Marshal, Department of State Police, and DNR as have all removals of existing underground tanks.

The Michigan policy is to prepare and complete permits prior to project implementation. There is no CEQ requirement to complete permit applications simultaneously with an EIS.

Document No. 16 **Comment No. 6**

ISSUE: The Draft EIS does not consider accidental, worst-case, or abnormal events relative to the proposed actions.

RESPONSE: SPCCPs and ISCPs have been prepared to address accidents related to operation of the proposed Master Plan actions. This concern is addressed in response to Comments No. 12 through 18 of Document No. 1 and Comment No. 20 of Document No. 11 and Section 4.1.6.

Document No. 16 **Comment No. 7**

ISSUE: The DMA should work with the DNR and the Camp Grayling Advisory Committee to draft a Consent Agreement which augments the regulatory permits and lease conditions.

RESPONSE: This concern is addressed in response to Comment No. 2 of Document No. 7.

Document No. 16 **Comment No. 8**

ISSUE: The on-going decision-making process (at Camp Grayling) is insufficiently regulated.

RESPONSE: The DMA complies with the terms of all applicable permits as required by law. Almost all of the Camp Grayling Advisory Committee recommendations have been implemented under supervision of a committee appointed by the past Governor. All opportunities for public input as required under the National Environmental Policy Act or explicit permit requirements are being observed by the DMA

The Camp Grayling Master Plan is reviewed annually and revised as needed with the approval of the Chief, National Guard Bureau. Further revisions of the Camp Grayling Master Plan will be addressed in future environmental documentation if required in accordance with the requirements of State and Federal law. .

Document No. 16 **Comment No. 9**

ISSUE: Public attitudes were not addressed in the Draft EIS.

RESPONSE: The opinions of the public and state and federal agencies regarding the proposed Master Plan actions are considered through the EIS scoping process and the collection of public comments regarding the Draft EIS. Comments on the Draft EIS are presented in their entirety in this document. Issues which relate to the specific Master Plan actions, as well as issues related to on-going training actions, are discussed in the Camp Grayling Final EIS. In addition, the Governor's Advisory Committee spent many hours listening to public comment. After review of conflicts between citizens and the post, 43 recommendations specified by the Governor's office are being implemented.

Document No. 16 **Comment No. 10**

ISSUE: The carrying capacity of the Camp Grayling lands is exceeded by existing military and non-military activity levels. A systematic, quantitative assessment should be made of the carrying capacity of these lands for multiple uses.

RESPONSE: The DMA has initiated the Army's Land Condition Trend Analysis Program at Camp Grayling. This concern is discussed in more detail in response to Comment No. 22 of Document No. 1.

Document No. 16 **Comment No. 11**

ISSUE: The DMA should develop and implement a more substantial training program for creating environmental awareness among individuals training at Camp Grayling.

RESPONSE: The DMA conducts pre-camp briefings of commanding officers and staff. These briefings include a discussion of environmental concerns at Camp Grayling as well as pertinent Camp Grayling environmental regulations. The post also publishes an environmental pamphlet ("The Soldier and Camp Grayling Resources") which is furnished to every soldier training at the post starting this training season, all unit commanders are given an environmental briefing the first day of training and are then required to brief their units. A program is now being developed which requires environmental training classes to be given during weekend drills at the armory locations before going to the field.

Document No. 16 **Comment No. 12**

ISSUE: The alterative of conducting National Guard training at another site outside of the Grayling area has not been adequately evaluated.

RESPONSE: Training on an MPRC out-of-state has been added as an alternative.

Document No. 16 **Comment No. 13**

ISSUE: The DMA should assess the impact of proposed activities on microclimate and the consequential effects on vegetation, animals, soils, etc.

RESPONSE: The DMA has initiated the Land Condition Trend Analysis (LCTA) Program at Camp Grayling to establish an ecological baseline and evaluate the effects of training on the ecology of the installation. This issue is addressed in more detail in response to Comment No. 22 of Document No. 1.

Document No. 16 **Comment No. 14**

ISSUE: Specific climatic criteria defining adverse weather conditions for firing need to be identified and a method for determining when current weather conditions violate these criteria needs to be established, along with a contingency plan to control firing during these times.

RESPONSE: To better resolve noise impacts, the DMA has installed a noise early warning detection system (NEWDS) at its range areas as part of the ICUZ program. This system consists of a series of listening posts (sound level meters) around the ranges near sensitive locations (residences). The listening posts are tied in through telephone

lines to a central receiving computer on post which records all data and indicates trouble areas. The system also includes weather stations which will allow for the analysis of how various weather conditions affect noise levels.

Document No. 16 **Comment No. 15**

ISSUE: Training should be limited during thaw conditions to minimize effects upon vegetation and terrain.

RESPONSE: The existing utilization pattern for Camp Grayling includes periods of annual training primarily during summer months, with limited annual training during prime winter training conditions (January and February). The monthly average temperature begins to exceed 32 degrees Fahrenheit in March, with a thaw period continuing in April. Late March and April have historically been low utilization months in the military's training activities at Camp Grayling. This pattern of usage is anticipated to continue.

Document No. 16 **Comment No. 16**

ISSUE: Existing air quality at Camp Grayling is not documented by site-specific data.

RESPONSE: Refer to Section 3.5.3. The Michigan DNR has not established monitoring stations in Crawford, Kalkaska, or Otsego Counties. The DNR has focused its sampling on areas where emission sources exist and attainment criteria are likely to be exceeded.

Document No. 16 **Comment No. 17**

ISSUE: The DMA should develop a comprehensive toxic and hazardous waste monitoring program (for emissions from open burning of propellants and explosive detonations), including baseline characterization of concentration levels in soils, vegetation, animal tissue, etc., and model fate and transport of movement of these materials through various media. The DMA should conduct on-site tests and consider current scientific literature in conducting this study. The DMA should stop open detonation and open burning of waste explosives.

RESPONSE: The opening burning of excess propellant was discontinued at Camp Grayling in early 1993. All excess propellant generated as a result of training in now returned to an Army depot for renovation, re-issue, or recycling.

A comprehensive study to assess the possible effects of military activities at the Range 40 complex is currently in progress. Refer to 3.9.2 for a discussion of this study.

Document No. 16 **Comment No. 18**

ISSUE: An assessment of the site psychological and health impacts of noise, and a more comprehensive detailed assessment of the effects of noise on animal behavior of population should be included.

RESPONSE: Information from current literature describing the effects on animal behavior and populations, and noise impacts on residents is included in response to Comment No. 17 of Document No. 7 and Sections 3.5.4 and 4.1.3.

Document No. 16 **Comment No. 19**

ISSUE: All required permit applications (involving soil erosion concerns), including supporting data and mitigation plans, should be provided in the Draft EIS.

RESPONSE: The DMA will require all proposed construction plans to include an erosion/sedimentation control plan. Currently, construction sites are visited by DMA personnel to ensure compliance. This issue is discussed in more detail in response to Comment No. 5 of Document No. 16.

Document No. 16 **Comment No. 20**

ISSUE: Reclamation plans should use native plant species, specifically not beach grass (Ammophila breviligula).

RESPONSE: In April 1987 and again in September 1990, Camp Grayling lands were inspected by representatives of the Soil Conservation Service (SCS) and the DMA. The first inspection and subsequent consultations with the SCS representatives are summarized in the Camp Grayling Soil Erosion Control Plan (Section 3.5.5.3 in the EIS). The use of beach grass was specifically recommended by representatives of the SCS for certain areas, although on large areas of restoration topsoil will be required to be hauled to the site and hydro-seeding of appropriate grass mixes will be utilized. If possible, native plant species will be used at all reclamation sites. The Camp has established a plot planted with native species. This plot was designed to be harvested as a source of seed for reclamation projects.

Document No. 16 **Comment No. 21**

ISSUE: The Draft EIS does not describe how conclusions regarding the availability and recovery of mineral resources were determined or address the issue of ownership and profit, and whether the retrieval of oil, gas, and sand are being conducted in an environmentally sound manner and at acceptable rates.

RESPONSE: The information presented in the Draft EIS was based on information furnished by the DNR which is responsible for permitting mineral and oil extraction operations. The locations of identified operations were compared with those of the proposed projects. The locations of the proposed Master Plan actions did not conflict with identified oil and mineral extraction sites. Ownership and profit of mineral resources is the management responsibility of the DNR.

The DMA does not have the responsibility or expertise to speculate whether or not unidentified mineral resources within the installation will be identified or to evaluate the

environmental compliance of existing extraction operations. Pertinent natural resources management programs are conducted by the DNR, not the DMA.

Document No. 16 **Comment No. 22**

ISSUE: The Draft EIS does not address the potential adverse health effects upon wildlife and plants as a result of uptake of toxic materials as residuals of various ammunition types utilized by troops at Camp Grayling.

RESPONSE: The DMA has initiated a water quality study at Range 40 and has agreed to investigate additional items through more detailed follow-up studies as described in response to Comment No. 10 of Document No. 4. These additional studies will answer the above concerns.

Document No. 16 **Comment No. 23**

ISSUE: A detailed wetland survey of Camp Grayling lands should be performed and the impacts on wetlands should be evaluated on a site-specific basis with drafts of all necessary permits included in an appendix to the EIS.

RESPONSE: Refer to Section 3.5.6.3.

Document No. 16 **Comment No. 24**

ISSUE: The commentor states that existing vegetation data is inadequate and that immediate threatened or endangered species searches should be conducted for all proposed construction and training areas. The site-specific mitigation plans should be included (as necessary) in the EIS. It is further proposed that a comprehensive assessment and monitoring plan be developed and implemented for the entire installation.

RESPONSE: The DMA has conducted a comprehensive floristic and threatened and endangered species survey of the entire installation for threatened and endangered species as discussed in response to Comment No. 13 of Document No. 7. The LCTA Program established transects, collected quantitative ecologic information, and identified areas requiring restoration or rotation of land use as discussed in response to Comment No. 22 of Document No. 1.

Document No. 16 **Comment No. 25**

ISSUE: The Draft EIS does not define the term "critical wildlife habitat" or discuss the type or extent of disturbance associated with Action C12 - ASP/LSF Railroad.

RESPONSE: The term "critical wildlife habitat" refers to habitat officially designated by a State or Federal agency to be required for the existence of a species. However, the ASP/LSF Railroad project has been cancelled.

Document No. 16 **Comment No. 26**

ISSUE: There are areas of concern with respect to Kirtland's warblers and bald eagles which are not adequately addressed by the existing management plan and the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Document No. 16 **Comment No. 27**

ISSUE: The breeding bird data for Camp Grayling contains serious omissions (regarding "common species") because breeding bird surveyors were prevented from getting access to areas within Camp Grayling.

RESPONSE: The impact areas of Ranges 13 and 40 within Camp Grayling are off-limits to civilians and most military personnel for reasons of safety. These areas contain unexploded ammunition which can be detonated by activities in these areas. It is to prevent bodily harm to individuals that these areas are fenced and posted off-limits. Any other area within the installation is open for the public or bird surveyors except during specific limited times when training is occurring. Refer to Appendix D in the EIS for a comprehensive list of the bird species documented via LCTA and others that are likely to occur.

The development of a detailed data base for the 147,000 acre Camp Grayling Military Reservation is a major effort which will be conducted over a period of years. The information within the Michigan Bird Atlas will be utilized to assist LCTA staff in establishing a thorough inventory of bird species. The LCTA program is described in Document No. 1 Comment No. 22.

Document No. 16 **Comment No. 28**

ISSUE: The Draft EIS is deficient because it does not consider the major restrictions on manner and extent of use incorporated in the terms of the 1978 Supplemental Lease Agreement.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Document No. 16 **Comment No. 29**

ISSUE: The Draft EIS does not provide detailed discussions of off-site and on-site traffic impacts.

RESPONSE: Refer to Section 4.3.1. Also refer to response to Comment No. 17 of Document No. 4.

The DMA has agreed to review and strengthen (if needed) and publicize definitive rules, associated sanctions, and enforcement procedures for the use of military vehicles. In

addition, reporting and claim procedures regarding trespassing and accidental incursions onto private property and associated damage (if any) will be reviewed.

Document No. 16 **Comment No. 30**

ISSUE: A study should be conducted to quantify the amount of land closure related to training at Camp Grayling including a tabulation of days closed (by area). The commentor also suggests that a study be conducted to determine recreational user densities in the affected areas and that multiple use schedules be developed and incorporated into a legal document.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

It is the policy of the DMA that military training is the primary use of lands controlled by the DMA and that other uses will be accommodated as possible. A study to assess dispersed recreation use of Camp Grayling was initiated in July 1993. This study is being conducted by Michigan State University's Department of Resource Devlopment. This 1 year study is scheduled to be completed in August 1994 and will identify the type and magnitude of outdoor recreation use of the area, especially such uses as hunting, fishing, and hiking. Section 3.7.4 contains preliminary results of the study to date.

Document No. 16 **Comment No. 31**

ISSUE: The construction of security fences around Range 40 and Range 30 were not subject to public scrutiny and these actions should be reviewed as part of the EIS.

RESPONSE: It is the policy of the DMA to establish security fences around selected areas for the purposes of ensuring public safety, especially in the case of impact areas. These areas were closed under a DNR Director's Order and the fence was installed to ensure that the public was completely aware of the danger area within.

Document No. 16 **Comment No. 32**

ISSUE: The concern is expressed that improvements to the Camp Grayling wastewater treatment plant and increased activities at Camp Grayling will greatly increase the amount of effluent released to Bear Swamp and result in application of effluent under winter conditions.

RESPONSE: This issue is addressed in response to Comment No. 24 and 25 of Document No. 1, and Comment No. 43 of Document No. 7.

Document No. 16 **Comment No. 33**

ISSUE: The commentor states that the Draft EIS does not consider alternative (recycling) technologies aside from recycling of spent oil.

RESPONSE: This issue is addressed in more detail in response to Comment No. 12 of Document No. 4.

Document No. 16 **Comment No. 34**

ISSUE: The commentor states that a task force should be appointed by the DNR to specify the scope design, schedule, and parameters to be included in a baseline and monitoring program dealing with contamination in the areas likely to be polluted. The recommended monitoring program plan should be part of a legal agreement.

RESPONSE: DMA has entered into a Consent Order with the DNR to address this concern.

Document No. 16 **Comment No. 35**

ISSUE: The commentor states that the DMA should be required to comply with state and federal regulations in handling of toxic and hazardous materials. No open burning, open detonation, or burial of hazardous wastes should be allowed. The classification of areas containing unexploded explosives as RCRA waste storage or disposal facilities should be investigated.

RESPONSE: The issue of the classification of the range areas as RCRA facilities is addressed in response to Comment No. 11 of Document No. 4.

The DMA has prepared a detailed hazardous waste management plan, Spill Prevention Control and Countermeasure Plans and an Installation Spill Contingency Plan. These plans address the handling, storage, and disposal of hazardous materials and wastes. Camp Grayling has been inspected annually by the EPA and/or DNR and has been found to be in compliance with pertinent federal and state regulations regarding the handling, storage, and disposal of hazardous materials and wastes. Refer to Document 4, Comment 11 for a discussion of open burning of excess propellant.

Document No. 16 **Comment No. 36**

ISSUE: The commentor expresses the concern that establishment of the MPRC will lead to new contamination by explosive materials and residues.

RESPONSE: The MPRC-H-R will utilize only inert projectiles. No exploding projectiles will be used on this range. No new lands will be exposed to potential contamination from unexploded ordnance or explosive residues relative to MPRC activities.

Document No. 16 **Comment No. 37**

ISSUE: The Draft EIS analysis of the wastewater treatment plant effluent discharge effects is totally flawed.

RESPONSE: This issue is addressed in detail in response to Comments No. 24 and 25 of Document No. 1.

Document No. 16 **Comment No. 38**

ISSUE: The Draft EIS should address the impact of bridge and barge training at Camp Grayling.

RESPONSE: There are no new locations for bridge and barge training being proposed. These activities only take place at five locations approved by the Michigan Department of Natural Resources. Also refer to Section 4.1.5.2.

Document No. 16 **Comment No. 39**

ISSUE: The Draft EIS does not provide an assessment of the potential adverse effects of accidental impacts to water resources or present a comprehensive picture of ground and surface water hydrology as a spatial assessment of potential impacts.

RESPONSE: The potential adverse effects related to accidental spills or leaks are addressed in response to Comments No. 13 through 18 of Document No. 1 and Comment 38 of Document No. 7 and Section 4.1.6.

Document No. 16 **Comment No. 40**

ISSUE: The commentor states that cultural resource surveys (for Action C12 - ASP/LSF Railroad, T1 - Road and Tank Trails, T2 - Multi-Purpose Range Complex, and T3 - Assault Landing Strip) should be performed immediately and construction should be predicated on the results and approvals of the State Historic Preservation Office.

RESPONSE: It is an accepted procedure to coordinate planning and construction activities with the State Historic Preservation Office in accordance with Army Regulation 420-40, Historic Preservation, as described in Section 3.7.3.2 of the Final EIS.

The ASP/LSF Railroad and the Assault Landing Strip projects have been cancelled.

The cultural resource assessment findings were that the Camp Grayling area was both prehistorically and historically one of the lowest populated areas of the state. Archaeological surveys are recommended for Camp Grayling lands adjacent to streams or lakes, areas adjacent to old railroad grades, and areas where extinct communities were known to have been located. Ranges and several other areas were recommended to be deleted from future surveys due to previous disturbance or improbability of past habitation at the sites.

The areas affected by construction of the MPRC-H-R are away from water resources and constructed on lands which have been committed to range use for a considerable time. The previously mentioned cultural assessment study was reviewed by the State Historic

Preservation Office. Use of preliminary archaeological surveys to identify areas of high and low priority is a standard practice which is utilized to focus cultural resource efforts on important areas. An historical/cultural resource survey of the area near and around Kyle Lake will be performed during the summer of 1994 prior to any construction. Should any items of cultural significance be identified, coordination with the State Historical Preservation Officer will be initiated immediately.

Document No. 16 **Comment No. 41**

ISSUE: The EIS should include an assessment of possible impacts on Hartwick Pines State Park and other Grayling area community cultural resources (archaeological and historic sites).

RESPONSE: The Hartwick Pines State Park lies outside the Camp Grayling boundary and could not be affected by construction operations related to the proposed Master Plan actions. No area community cultural resources have been identified within the areas proposed for construction activities or in areas utilized for ongoing training activities.

Document No. 16 **Comment No. 42**

ISSUE: The development of a missile guidance system component in the Hardgrove Lake logging ghost town needs to be addressed in the Draft EIS.

RESPONSE: The DMA is not aware of the development of a missile guidance system component in the area of Hardgrove Lake. A laser guidance device was tested in 1989 at Camp Grayling at the Range 30 complex. This action was documented in a separate environmental document available from DMA upon request.

Document No. 16 **Comment No. 43**

ISSUE: The commentor states that the Draft EIS promises that a Camp Grayling Historic Preservation Plan and Memorandum of Agreement for Camp Grayling will be drafted. These materials should be presented as part of the EIS.

RESPONSE: The Historic Preservation Plan and Memorandum of Agreement for Camp Grayling have been prepared. However, they are intended to address general on-going activities at the installation and not specifically to address concerns related to proposed Master Plan actions.

Document No. 16 **Comment No. 44**

ISSUE: The Draft EIS does not consider up-to-date energy use alternatives for the proposed Master Plan actions.

RESPONSE: The Master Planning process requires the military to consider energy conservation issues at the initial stages of project design. Army regulations mandate

energy conservation. The proposed Master Plan actions reflect these considerations. The Camp has converted all heating units to more efficient and cleaner burning natural gas.

Document No. 16 **Comment No. 45**

ISSUE: The relationship between forest fires and training activities on Camp Grayling land should be investigated and documented.

RESPONSE: This issue is addressed in response to Comment No. 39 of Document No. 7.

Document No. 16 **Comment No. 46**

ISSUE: A detailed off- and on-site cumulative traffic assessment should be conducted to evaluate: on-going troop movements; proposed railroad spur for Action C12 - ASP/LSF Railroad effects on I-75 traffic; damage to local roads from military heavy equipment traffic; a study of historical traffic accidents; noise and fugitive dust effects; the establishment of load limits to prevent damage to roadways under spring thaw conditions; and the formulation of a traffic control plan which addresses scheduling of large troop movements at off-peak times and on special routes.

RESPONSE: This issue is addressed in Comment No. 17 of Document No. 4.

Document No. 16 **Comment No. 47**

ISSUE: The commentor states that the DMA should implement and provide requirements for training in environmental science, ecology, culture, history, values, and quality of life as part of the training mission.

RESPONSE: This issue is discussed in Comment No. 11 of Document No. 16.

Document No. 16 **Comment No. 48**

ISSUE: The commentor states that the DMA should include aesthetics as an assessment in the EIS, including noise, odors, safety, freedom from excessive levels of human activity, free access to public lands.

RESPONSE: The Governor's Camp Grayling Management Advisory Committee reviewed commentary and testimony from local citizens regarding many issues related to the aesthetics of the Camp Grayling environment. They formulated a list of 43 items which are being addressed by the DMA. Many of these items address the aesthetic issues outlined above.

The noise restrictions implemented by the DMA for the firing of large caliber weapons and operations at the air-to-ground range which limit activities on holiday weekends and

between three hours after sunset and sunrise, the investigation of noise reduction techniques for the MPRC, the restriction of 500 pound bomb use at the air-to-ground range, the review of flight corridor elevations and locations, the proposed conversion from 8-inch to other artillery units, the implementation of a noise monitoring system, and the establishment of a plan to acquire privately held property in noise-affected areas where residents wish to sell are actions being implemented by the DMA to address noise concerns (see response to Comment No. 8 of Document No. 4). The 24-hour hot line and public information improvements and the continued role of the Camp Grayling Community Council will also ensure that measures will be taken wherever possible to address the concerns of local residents.

Document No. 16 **Comment No. 49**

ISSUE: The commentor states that the EIS process should not be considered complete until the DNR has provided drafts of the permits needed to implement the projects in the EIS.

RESPONSE: This issue is addressed in response to Comment No. 5 of Document No. 16.

Document No. 16 **Comment No. 50**

ISSUE: The commentor states that the DNR should draft a Consent Agreement with the DMA to augment regulatory permits.

RESPONSE: The DMA entered into a Consent Agreement with the DNR relative to open burning and open detonation activities.

Document No. 16 **Comment No. 51**

ISSUE: The commentor states the EIS does not address alternative technologies for solid waste management.

RESPONSE: This issue is addressed in detail in response to Comment No. 12 of Document No. 4.

Document No. 16 **Comment No. 52**

ISSUE: The commentor states the EIS only vaguely discusses the above- and below-ground storage tank options at the proposed New Fuel Dispensing Facility.

RESPONSE: This issue is addressed in response to Comment No. 12 of Document No. 1.

Document No. 16 **Comment No. 53**

ISSUE: The commentor states the EIS should not be considered complete until the DMA and DNR have publicly disclosed and defended every permit exception to military use within 400 feet of a designated natural river.

RESPONSE: The DMA has not requested any permit exemptions. See Section 4.1.5.1.

Document No. 16 **Comment No. 54**

ISSUE: The commentor states the EIS did not identify and analyze the impacts on wetlands.

RESPONSE: This issue is addressed in response to Comment No. 21 and 22 of Document No. 1, Comment No. 16 of Document No. 4, and Comment No. 12 of Document No. 7.

Document No. 16 **Comment No. 55**

ISSUE: The commentor states the EIS does not adequately address the impacts of the operation of the proposed wastewater treatment plant on Bear Swamp.

RESPONSE: This issue is addressed in response to Comment No. 25 of Document No. 1 and Comment No. 43 of Document No. 7.

Document No. 16 **Comment No. 56**

ISSUE: The Draft EIS contains no specified limitation on future training use at Camp Grayling.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Document No. 16 **Comment No. 57**

ISSUE: The commentor states the EIS should include a scientifically sound environmental audit of toxic substances from existing and proposed conditions.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 16 **Comment No. 58**

ISSUE: Camp Grayling troop utilization data does not support a "no growth" scenario.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Document No. 16 **Comment No. 59**

ISSUE: A more detailed analysis of the effects of winter training relative to soil erosion sediment and noise effects on wildlife needs to be conducted.

RESPONSE: A complete description of winter training is located in Section 3.4.1 of the EIS. Vehicle maneuvering activities, the primary source of soil disruption, are reduced due to climatic conditions. The areas most susceptible to erosion are those on a slope greater than 18 percent and current policies on the Post restrict the use of vehicles in these areas. A discussion on soil erosion characteristics is located in Section 3.5.5.3 in the EIS. The issue of noise impacts on wildlife is discussed in response to Comment No. 7 of Document No. 4.

Document No. 16 **Comment No. 60**

ISSUE: An evaluation of the ecological impacts related to discharges from the Camp Grayling wastewater treatment facility (Action C1) to Bear Swamp and in the land application area should be evaluated in more detail relative to impacts on white cedar and critical deer habitat.

RESPONSE: Measures taken to prevent impacts to Bear Swamp habitat during construction are described in response to Comments No. 21, 24 and 25 of Document No. 1. The land application facility site has been inspected by the DNR and application will be conducted in accordance with the specifications contained in the pertinent permits. The forest inventory conducted by the DNR shows that the application area is primarily oak, maple, and aspen with scattered stands of red pine. No cedar trees are reported in the DNR forest inventory for the application area.

Document No. 16 **Comment No. 61**

ISSUE: Mitigations, if endangered plant species are discovered in the construction area prior to construction, are not adequately described. An ecological evaluation of potential impacts to vegetation from cold weather is not provided.

RESPONSE: The DMA has performed a threatened and endangered plant survey. Should endangered plant species be discovered in a proposed construction site, consultation with DNR and USFWS will be initiated. DMA would be required to ensure that the species in question be protected as defined by these regulators.

The proposal to increase winter training has been cancelled.

Document No. 16 **Comment No. 62**

ISSUE: No ecological baseline information is presented to support the conclusion that Lanes Training will have no effect on wildlife.

RESPONSE: Lanes Training is an on-going training strategy and is evaluated as part of baseline conditions.

Document No. 16 **Comment No. 63**

ISSUE: Is landfilling solid waste in conformance with state solid waste management regulations?

RESPONSE: Refer to Document No. 9 Comment No. 8. Solid waste generated at Camp Grayling is handled in accordance with state solid waste regulations and the Crawford County Solid Waste Management Plan.

Document No. 16 **Comment No. 64**

ISSUE: Disposal of unexploded ordnance is not discussed.

RESPONSE: This issue is addressed in response to Comment No. 11 of Document No. 4.

Document No. 16 **Comment No. 65**

ISSUE: Heavy metal residuals from exploded shells are not addressed.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 16 **Comment No. 66**

ISSUE: Spill contingency plans for fuel and ammunition storage are not addressed.

RESPONSE: The Camp Grayling SPCCP and ISCPs are discussed in Section 3.5.6.2. See also the responses to Comments No. 13 through 16 of Document No. 1 and Section 4.1.6.1.

Document No. 16 **Comment No. 67**

ISSUE: The residuals of phosphorus shells are not addressed.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 16 **Comment No. 68**

ISSUE: The use of TCE and pesticides at Camp Grayling is not described.

RESPONSE: The use of TCE has been discontinued at the post through the implementation of the DOD HAZMIN Program. This program ensures that those products which have potential for harming the environment are replaced with less threatening products whenever possible.

However, past use of TCE at the old MATES Facility did result in this product causing environmental contamination. A remedial action is currently being conducted to remove all contaminants from this site. The plume has been identified and is completely contained by several recovery wells. The contaminated water is being recovered and directed through a specially designed treatment system to remove all contamination. Cleanup will continue until all DNR standards have been reached.

Camp Grayling personnel do not utilize pesticides that require mixing for application. These services are contracted through the State Services Procurement Office. The installation does have a pesticide management plan which provides for oversight and monitoring contracts to ensure only appropriate applications are occurring. Pesticides are applied only on an as-needed basis. No spraying for gypsy moths will be conducted during 1994, and it is anticipated that little or no pesticides will be applied on the Camp during 1994.

Document No. 16 **Comment No. 69**

ISSUE: The quantities of artificial smoke and tear gas used at Camp Grayling and their chemical residuals are not discussed.

RESPONSE: In an average year, approximately six smoke generator training operation are conducted at Camp Grayling. The U.S. Armament, Munitions, and Chemical Command has prepared a programmatic life cycle EIS for smoke/obscurants (Muhl, July 1983). The document concluded that the program will not significantly affect the quality of the human environment. The assessment notes that a training exercise usually requires making smoke for approximately two hours. See Sections 3.4.2.6.2 and 3.5.3.

Primary pollutants discharged by the generation of petroleum-based smoke (non-combusted) are particulates and hydrocarbons. Photochemical oxidants are by-products of nitrogen oxides, hydrocarbons, oxygen, and sunlight. The major toxic product of these photochemical reactions is ozone.

Document No. 16 **Comment No. 70**

ISSUE: Does the removal or containment procedures applied at Camp Grayling for asbestos meet EPA standards?

RESPONSE: This issue is addressed in response to Comment No. 8 of Document No. 1.

Document No. 16 **Comment No. 71**

ISSUE: What kind of monitoring system will be used to detect underground leaks at the proposed fuel dispensing facility (Action C15)?

RESPONSE: The proposed fuel dispensing facility consisting of aboveground tanks will be constructed in accordance with the State Fire Marshal's permit for this facility and applicable Michigan rules. There will be no underground storage tanks at the proposed Bulk Fuel Facility.

Document No. 16 **Comment No. 72**

ISSUE: Explicitly, how will the DMA act to protect endangered species at the proposed wastewater treatment plant (Action C1) site?

RESPONSE: The proposed wastewater treatment plant site has been reviewed by the DNR. No threatened or endangered species have been identified.

Document No. 16 **Comment No. 73**

ISSUE: Are either the recently clearcut area or the 35 acres of jack pine proposed to be clearcut at the proposed Assault Landing Strip site suitable Kirtland's warbler breeding habitat?

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 16 **Comment No. 74**

ISSUE: Is the DMA willing to operate only when "heavy snow conditions" exist?

RESPONSE: In order to properly plan for cold weather training, troops are scheduled considerably in advance of each year's cold weather training season. To optimize the likelihood of training during heavy snow conditions, visiting troops are scheduled during the prime cold weather training period primarily during the months of January and February through early March. However, the proposal to increase winter training has been cancelled.

Document No. 16 **Comment No. 75**

ISSUE: Water quality nutrient loadings must be calculated for Action C1 - Repair/Replacement of Camp Grayling Wastewater Treatment Plant before conclusions of impacts can be made.

RESPONSE: A new wastewater treatment plant was put into operation in 1991 as required and permitted by DNR. See Sections 3.3.2.3.3 for a discussion of the wastewater treatment plant and its operation. The treatment plant design evaluation and

applicable permits are available for review from the Camp Grayling Environmental Office and the DNR.

Document No. 16 **Comment No. 76**

ISSUE: How does the DMA propose to enforce its training regulations?

RESPONSE: This issue is addressed in response to Comment No. 6 of Document No. 7.

Document No. 16 **Comment No. 77**

ISSUE: Is the proposed land application area for the Camp Grayling wastewater treatment facility part of white cedar habitat used by deer?

RESPONSE: No. This issue is addressed in response to Comment No. 60 of Document No. 16.

Document No. 16 **Comment No. 78**

ISSUE: Will the proposed training activities generate additional levels of heavy metal residues from exploded ordnance.

RESPONSE: No. The proposed actions will not increase the existing levels of troop usage of Camp Grayling or the levels of firing associated with the existing ranges, including those impact areas affected by explosive ordnance.

Document No. 16 **Comment No. 79**

ISSUE: The EIS must explain in more detail how sewage is to be handled during the winter months.

RESPONSE: This issue is addressed in response to Comments No. 24 and 25 of Document No. 1.

Document No. 16 **Comment No. 80**

ISSUE: References to pages 2-3.9, 2-3.28, 2-3.24 on page 8-1.3 of the Draft EIS are incorrect.

RESPONSE: The information has been revised and references corrected.

Document No. 16 **Comment No. 81**

ISSUE: The EIS does not fully consider the impacts of noise on the recreational values of the AuSable River system.

RESPONSE: This issue is addressed in response to Comment No. 7 of Document No. 4.

Document No. 16 **Comment No. 82**

ISSUE: The EIS does not evaluate the feasibility of moving all or a portion of the training activities to another site in the state or region, or the social and economic values and impacts of such a move.

RESPONSE: DMA has added an alternative to train at an out-or-state MPRC.

Document No. 16 **Comment No. 83**

ISSUE: The commentor states that the DMA does not appear to fully comply with its lease agreement

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Document No. 16 **Comments No. 84 and 85**

ISSUE: The EIS does not assess possible terrestrial contamination in Ranges 40, 13 and possibly 30 as associated human and animal health implications.

RESPONSE: This issue is addressed in response to Comments No. 10 and 11 of Document No. 4.

Document No. 16 **Comment No. 86**

ISSUE: The commentor states the impacts of noise on recreation and property values and winter recreation should be evaluated.

RESPONSE: The effect of noise on residents and recreational values is addressed in response to Comment No. 7 of Document No. 4. Property value effects are addressed in response to Document No. 4 Comment No. 19.

Document No. 16 **Comment No. 87**

ISSUE: The EIS does not evaluate the feasibility of relocating the proposed training activities to another site in the state or region, or the related economic or social effects of the associated reductions in noise and/or toxic substance emissions.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7.

Document No. 16 **Comment No. 88**

ISSUE: Since there is no guarantee that the assumptions analyzed in the EIS for future use of the proposed facilities will come true, the EIS should analyze the impacts of possible variations in projected future use including increased and decreased activity from that proposed.

RESPONSE: The purpose of the EIS is to evaluate the effects of implementing these proposed actions "as proposed", "no action" (on-going). Should future conditions vary significantly from that proposed, subsequent environmental documentation would be required to be prepared at that time.

Document No. 16 **Comment No. 89**

ISSUE: Since the trainee spending data utilized in the Draft EIS came from a non-random survey conducted by the Grayling Chamber of Commerce in 1980, it may not accurately reflect the existing trainee expenditures due to changes in training practices or spending patterns in route to Camp Grayling.

RESPONSE: The results of the survey conducted by the Grayling Area Chamber of Commerce were the best available data at the time the economic evaluation was conducted. Though a random survey with a large sample size may have yielded a different value, actual documented data from troops training at Camp Grayling was considered to be adequate for this application.

Document No. 16 **Comment No. 90**

ISSUE: The commentor states that apparently no multiplier was used to estimate the total impact of trainee spending in the area.

RESPONSE: The Economic Impact Forecasting System developed by the Army Construction Engineering Research Laboratory in Champaign, Illinois utilizes sales volume, employment, income, and net change to local government costs as indices to evaluate the "total economic impact" of a military installation on the surrounding area. The model utilizes established relationships based on the size of the region, diversity of its industrial and commercial base, and size of its population and type of expenditure to estimate appropriate multipliers, as stated in Appendix G. A sales multiplier of approximately 2.14 was applied to estimate sales generated by direct and indirect effects of troop expenditures.

Document No. 16 **Comment No. 91**

ISSUE: It is not clear whether the "net change to local government costs" includes indirect effects such as the impacts of military vehicles on county road maintenance cost.

RESPONSE: The net change to local government cost category essentially reflects government revenues related to taxes generated as a result of employment and sales generated by expenditures related to the construction, operations and maintenance and training at the military installation. It does not reflect road maintenance costs related to Camp Grayling.

Document No. 16 **Comment No. 92**

ISSUE: The commentor recommends that a new survey of trainee spending patterns and a re-estimation of trainee spending multipliers and related fiscal impacts be conducted.

RESPONSE: At this time, no re-evaluation of trainee spending and multipliers is anticipated.

Document No. 16 **Comment No. 93**

ISSUE: The effects upon recreational uses of extending the MPRC safety fans eastward, expanded winter training, developing the Assault Landing Strip site, and related Assault Landing Strip noise, as well as the effect of land closures upon recreation, are not evaluated.

RESPONSE: The effects of extending the MPRC safety fan eastward in relation to recreation is addressed in Section 4.3.1.1. The Assault Landing Strip project has been cancelled.

Document No. 16 **Comment No. 94**

ISSUE: The commentor states there is no commitment on the part of the DMA to prepare a new snowmobile trail to replace portions of the trial which may be closed due to the MPRC range fan extension.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7.

Document No. 16 **Comment No. 95**

ISSUE: The DMA must renegotiate the existing leases with the DNR.

RESPONSE: This issue is addressed in Comment No. 2 of Document No. 7.

Document No. 16 **Comment No. 96**

ISSUE: The commentor states that the EIS neglects to evaluate the benefits to the economy if Camp Grayling lands were converted to private use.

RESPONSE: This issue is addressed in Comments No. 18 and 19 of Document No. 7.

Document No. 16 **Comment No. 97**

ISSUE: The EIS does not estimate the economic and social values related to losses of endangered species and timber related to on-going training activities.

RESPONSE: The DMA has conducted a Section 7 Consultation with the U.S. Fish and Wildlife Service to evaluate the potential effects of the proposed projects on threatened or endangered species. This is described in response to Comment No. 4 of Document No. 1. In summary, it is their evaluation that the proposed projects are not likely to jeopardize the continued existence of Kirtland's warblers or result in the adverse modification of critical habitat. Therefore, no economic or social losses related to endangered species will occur.

The economic effects of timber clearing is addressed in response to Comment No. 18 of Document No. 7.

Document No. 16 **Comment No. 98**

ISSUE: Because of the number of complaints of troop behavior, the effect of the installation's on-going activities upon living conditions in the area should be evaluated.

RESPONSE: As a result of the Governor's Camp Grayling Management Advisory Committee, a Civilian Advisory Community Council was appointed to evaluate the on-going concerns relative to operation of the Camp Grayling installation. The DMA has also taken numerous steps to ensure better communication with the public through establishment of a telephone hotline for receiving complaints and providing appropriate follow-up actions and through implementation of the Camp Grayling Community Council. These activities will provide a positive impact on the social living conditions in the area.

Document No. 16 **Comment No. 99**

ISSUE: The commentor recommends that Camp Grayling utilize the services of the U.S. Army Construction Engineering Research Lab to establish noise monitoring devices in the noise impacted residential areas near Camp Grayling and that the system be connected to a microcomputer which will calculate noise contours. The implementation of a Doppler weather radar with a trained meteorologist to forecast noise contours is recommended to review and modify all noise-generating activities prior to conducting them.

RESPONSE: The DMA concurs with this suggestion and has implemented such a system. Data from this system will be capable of being used with a computer system to generate noise contours, although a real-time connection to a noise model is not technically possible at this time. The noise monitoring points will provide an actual measurement of noise levels near the receptors and will be more accurate than a sound level estimated from a model for that specific point in time.

Camp Grayling utilizes the services of the Army Construction Engineering Research Laboratories and the Army Environmental Hygiene Agency to evaluate noise-generating activities through modeling and site-specific measurements. These actions are conducted for proposed as well as ongoing activities at the installation to better define the Camp Grayling noise environment and to identify possible mitigations.

A Doppler weather radar system and a skilled operator could provide information which would improve the forecasting of noise levels at particular receptors, although information about air temperature and wind speed and their variations with altitude are necessary to predict the sound velocity profiles with significant accuracy. Under many weather conditions, air temperature and wind velocity can vary on an hourly basis. In addition, available noise models need to be calibrated to account for terrain conditions along the noise path from each potential noise source to each receptor. While these conditions can be more accurately addressed in a model which averages changes in conditions over time, forecasting specific noise levels at specific receptors on an instantaneous basis can be more effectively accomplished by using established monitoring points as the DMA has proposed.

Document No. 16 **Comment No. 100**

ISSUE: The commentor states the DMA should retain the Army Construction Engineering Research Lab to perform an attitudinal survey of the residents around Camp Grayling to understand the response of residents to the presence of high noise impact.

RESPONSE: During public meetings conducted by the Governor's Camp Grayling Management Advisory Committee, hours of testimony were taken from residents adjacent to Camp Grayling regarding training activities which generate noise impacts. As a result of concerns voiced, noise mitigations were recommended to the Governor and are currently being implemented. An attitudinal noise survey is not one of the mitigations planned at this time.

Document No. 16 **Comment No. 101**

ISSUE: The commentor states the DMA should reduce its decibel level criteria for impulsive noise zones and expand their contours to cover the corresponding larger area. The comment cites recent work by Paul Schomer at the CERL as the basis for this conclusion.

RESPONSE: It is U.S. Army policy to utilize the noise zone criteria stipulated in Army Regulation 200-1. This regulation was most recently revised on April 23, 1990. The CERL staff, including Dr. Paul Schomer, was involved in this revision. No changes to the noise criteria were made.

Document No. 16 **Comment No. 102**

ISSUE: The commentor states the DMA should reevaluate the impacts of cold weather training on vegetation, soils and small mammals using biologists who understand winter ecology of the site.

RESPONSE: The DMA has initiated the Land Condition-Trend Analysis (LCTA) Program at Camp Grayling to establish an ecological baseline and a vegetation monitoring program to monitor heavily used cold weather training areas as described in response to Comment No. 22 of Document No. 1. The LCTA Program will include a wildlife species and wetland survey of the entire installation and will be used to identify any species or areas requiring special management restoration or rotation of land use. The DMA will work with DNR experts and use this baseline data to ensure minimum impacts to natural resources.

Document No. 16 **Comment No. 103**

ISSUE: The commentor states the DMA should conduct a long-term scientific study regarding the effects of aviation noise on wildlife.

RESPONSE: The DMA has conducted a Section 7 Consultation with the U.S. Fish and Wildlife Service to address concerns related to aviation activities and endangered species. This formal biological opinion recommends measures for evaluating the effects of the proposed projects on the Kirtland's warbler. These recommendations will be implemented by the DMA. A qualitative evaluation of the effects of training activities on wildlife is provided in Section 4.2.4. It is noted that long-term site-specific studies are often required to address specific responses of specific groups of birds and mammals to specific noise generating activities. However, this level of analysis is not appropriate for the entire 147,000-acre installation.

Document No. 16 **Comment No. 104**

ISSUE: The commentor requests that the EIS include a management plan for pine martens which have been introduced in lands nearby Camp Grayling by the DNR.

RESPONSE: The DMA has coordinated with the DNR Wildlife Division to determine any necessary management guidelines it should be implementing in regards to the pine martin. None are suggested at this time. The MNFI report from the threatened and endangered species survey identifies areas with the highest potential for occurences of pine martens. In February of 1995, a survey of these areas will be conducted to confirm or deny the occurence of pine martens.

Document No. 16 **Comment No. 105**

ISSUE: The commentor requests the DMA conduct a study to assess the impacts of military training on nesting of red-shouldered hawks and habitat.

RESPONSE: The DMA has coordinated the DNR Wildlife Division to determine any necessary management guidelines it should be implementing for red-shouldered hawks. None are suggested at this time. The LCTA bird survey included three sightings of red-shouldered hawks on Camp Grayling, but did not verify nesting.

Document No. 16 **Comment No. 106**

ISSUE: The commentor requests the DMA revise or renegotiate the portions of the Kirtland's warbler management plan regarding military activities in the vicinity of current Kirtland's warbler nesting areas and maintenance of existing habitat.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Document No. 16 **Comment No. 107**

ISSUE: The commentor requests the DMA conduct a survey for ospreys on Camp Grayling lands and consider development of a management plan if necessary.

RESPONSE: The DMA has coordinated with the DNR Wildlife Division to determine any necessary management guidelines it should be implementing in regards to the osprey. None are suggested at this time. The MNFI threatened and endangered species survey and the LCTA bird survey indicate no occurences of the osprey on Camp Grayling.

Document No. 17 **Comment No. 1**

ISSUE: The commentor notes the Kirtland's warbler is a federally protected endangered species and that recent statistics show a dramatic decline of warbler population in Crawford County.

RESPONSE: The 1993 Kirtland's Warbler census (see Section 3.6.2.6.1, Table 3-24) shows a dramatic increase in the number of warblers, with 485 singing males being reported. This is a 22 percent increase over the 1992 census and the largest number reported since 1961.

Document No. 18 **Comment No. 1**

ISSUE: The commentor states that the EIS does not provide assurances for adequate resource management or recreational and tourism access to lands within Camp Grayling.

RESPONSE: The issue of recreational access to lands controlled by the DMA is addressed in response to Comment No. 2 of Document No. 7. The utilization of proper resource management techniques is discussed in response to Comment No. 5 of Document No. 7. The DNR is conducting a thorough environmental assessment of all leased lands to determine the Guard's compliance with its land management agreements. A similar review will be an annual activity in the future as prescribed by the Governors Advisory Council recommendations.

Document No. 18 **Comment No. 2**

ISSUE: The commentor states that the implementation of the Master Plan actions will damage additional lands.

RESPONSE: No new lands will be acquired to implement the Master Plan actions. Proper resource management techniques will be utilized (see response to Comment No. 5 of Document No. 7).

Document No. 18 **Comment No. 3**

ISSUE: The EIS fails to take into account the wetlands contained in the proposed area of the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 18 **Comment No. 4**

ISSUE: The EIS fails to address the dangers to the Kirtland's warbler.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1 and Sections 3.6.2.6.1.

Document No. 20 **Comments No. 1 and 2**

ISSUE: No soil testing of the current Camp Grayling area was conducted as part of the EIS.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 20 **Comment No. 3**

ISSUE: The commentor states that the EIS did not address the noise impact of the proposed MPRC on the civilian populations surrounding the present tank range area.

RESPONSE: This issue is addressed in response to Comment No. 1 of Document No. 1 and Comment No. 7 of Document No. 4.

Document No. 21 **Comment No. 1**

ISSUE: The commentor states that the toxicity from explosive residues and unexploded ordnance on all ranges is not addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 21 **Comments No. 1 and 2**

ISSUE: The commentor states the DMA has not demonstrated compliance with RCRA regulations regarding the handling, storage, and disposal of waste munitions.

RESPONSE: This issue is addressed in response to Comment No. 11 of Document No. 4.

Document No. 21 **Comment No. 3**

ISSUE: The Draft EIS does not disclose the contents of railroad cars that would utilize the ASP/LSF Railroad (Proposed Action C12).

RESPONSE: The ASP/LSF Railroad project has been cancelled.

Document No. 21 **Comment No. 4**

ISSUE: The commentor states that the Draft EIS does not address the economic effects upon tourism of the proposed implementation of the Master Plan actions.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7.

Document No. 22 **Comment No. 1**

ISSUE: The commentor states the Draft EIS does not address the effects of year-round helicopter operations at the Grayling Army Airfield on the adjacent Sherwood Forest Subdivision.

RESPONSE: This issue is addressed in response to Comment No. 5 of Document No. 1.

Document No. 22 **Comment No. 2**

ISSUE: The mobile home park designed as Ingersol Camp on page 4-3.20 of the Draft EIS is currently named Timberly Village and on page 2-2.1, the correct location of the new MATES is northeast not northwest of the City of Grayling.

RESPONSE: These corrections are noted.

Document No. 23 **Comment No. 1**

ISSUE: The commentor states that the EIS must address the noise from the existing helicopter operations at the Grayling Army Airfield upon the City of Grayling.

RESPONSE: This issue is addressed in response to Comment No. 5 of Document No. 1.

Document No. 23 **Comment No. 2**

ISSUE: The commentor states the EIS does not address the sewage treatment plans for the expansion at the Grayling Army Airfield.

RESPONSE: This project is no longer being considered.

Document No. 25 **Comment No. 1**

ISSUE: The EIS does not address wildfire control relative to on-going activities.

RESPONSE: This issue is addressed in response to Comment No. 39 of Document No. 7.

Document No. 25 **Comment No. 2**

ISSUE: The commentor states that the detrimental noise pollution and increased mechanical use of the Assault Landing Strip would seriously damage the recreational nature of the area surrounding the site.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 26 **Comment No. 1**

ISSUE: The commentor states that construction of the MPRC will increase the size of the range over three times the present area utilized for tank training and will include the whole East Branch of the AuSable River.

RESPONSE: The proposed MPRC-H-R is shown in Figure 2-4. The MPRC-H-R will consolidate training from Ranges 35, 36, and 37 and contain two firing lanes. This new layout will concentrate training on these two lanes minimizing off-trail use and associated impacts. No water resources are contained in the firing box of the MPRC-H-R. Also refer to the response to Comment No. 40 of Document No. 7.

Document No. 26 **Comment No. 2**

ISSUE: The construction of the MPRC will cause heavy military traffic through the village of Grayling.

RESPONSE: The construction of the MPRC-H-R will not cause any change in current military traffic passing through Grayling.

Document No. 26 **Comment No. 3**

ISSUE: The commentor states that the impacts of noise related to the MPRC in winter training need to be discussed in more detail and actions need to be taken to mitigate the impacts to residents of the area.

RESPONSE: Refer to Document 4, Comment 7.

Document No. 27 **Comment No. 1**

ISSUE: The commentor states that current noise levels are far too excessive and mitigations must be taken to reduce the effects.

RESPONSE: This issue is addressed in response to Comment No. 8 of Document No. 4.

Document No. 28 **Comment No. 1**

ISSUE: The commentor states that the relocation of the Multi-Purpose Range Complex and Assault Landing Strip to an off-post location should be evaluated.

RESPONSE: The Assault Landing Strip project has been cancelled. See Chapter 2, Section 2.4.3 of the Final EIS for the new MPRC alternative.

Document No. 29 **Comment No. 1**

ISSUE: The commentor states that the development of the MPRC Range will increase the utilization and noise associated with the tank training activities at Camp Grayling.

RESPONSE: The noise effects related to the development of the proposed MPRC-H-R are discussed in response to Document No. 1 Comment No. 1, Document No. 4 Comment No. 8, and Document No. 4 Comment No. 7. Use of the MPRC-H-R will be comparable to the use of the existing tank range complex. Units that currently train at Camp Grayling will be the predominant users of the MPRC-H-R and ammunition allocations are anticipated to be reduced from recent distributions. The MPRC-H-R will also allow for increased use with laser weapon simulators, further decreasing current noise generation.

Document No. 30 **Comment No. 1**

ISSUE: The commentor states that Figure 3-3.1C of the Draft EIS (Annual Noise Contours for Air-to-Ground Range Aircraft Activities) shows Zone II noise levels (within Camp Grayling), but no comment is made concerning how these effects might be mitigated for Lovell's residents.

RESPONSE: Refer to Section 4.1.3.1 Mitigation. It is the policy of the U.S. Department of Defense that Zone II contours within the boundary of an installation are not in conflict with the primary land use which is military training.

Document No. 30 **Comment No. 2**

ISSUE: The commentor states that on page 4-3.15 of the Draft EIS, it is stated that the increase in non-impulsive noise during active training produced by vehicle traffic, helicopter overflights, etc., is fully evaluated in the data; but they find no comment related to this increased non-impulsive noise.

RESPONSE: The non-impulsive noise data referenced in this comment is addressed in the following paragraph on page 4-3.17 of the Draft EIS. In summary, the analysis demonstrates that A-weighted DNL values were about 49 to 51 dBA at Guthrie Lakes in the absence of training activities and approximately 54 to 58 dBA during training, and that the non-impulsive noises during training activities produced an increase in the day-night levels of approximately 5 to 7 dB. The text also notes these observations do not incorporate active use of the air-to-ground range because activities there were not being conducted during this particular measurement period.

Document No. 31A **Comment No. 1**

ISSUE: The commentor states that during on-going training, troop traffic on Marlette Road (near Guthrie Lake) is congested and the shoulders of the road are damaged. It is stated that the proposed Master Plan activities will increase problems on Marlette Road.

RESPONSE: None of the proposed Master Plan actions will affect activities associated with the Range 40 complex and thus, will not affect traffic in this area.

This issue is addressed in relation to on-going activities in response to Comment No. 17 of Document No. 4. The DMA has committed to prepare a Master Traffic Plan that coordinates Camp Grayling's traffic with the county plans and attempts to minimize the impact of military traffic on the surrounding communities. The plan will evaluate the potential for development of an internal road system. A study to evaluate problems will include interviews with residents, highway maintenance employees for the county and City of Grayling, state troopers, and local police to identify and provide solutions to their concerns.

Document No. 31B **Comment No. 1**

ISSUE: The commentor questions if it is possible to move the location of the air-to-ground range further away from the Guthrie Lakes area.

RESPONSE: The Camp Grayling Management Advisory Committee has recommended that the DMA conduct a study to explore the feasibility and possible options of relocating

the air-to-ground range activities. This study was implemented. At this time the activities are not proposed to be relocated.

Document No. 32 **Comment No. 1**

ISSUE: The commentor states the DMA did not provide adequate time for public comment on the Draft EIS.

RESPONSE: The DMA provided a period of public comment which extended from April 21 through July 31, 1989, effectively doubling the minimum 45-day requirement for comments on Draft EIS. The DMA conducted three public hearings within the study area and numerous public information meetings at different locations in order to reach the maximum number of concerned residents.

Document No. 32 **Comment No. 2**

ISSUE: The commentor states the DNR refuses to shut down activities at Camp Grayling that are currently in violation of the 1978 lease agreements.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Document No. 33 **Comment No. 1**

ISSUE: The commentor states that alternatives for conducting the proposed Master Plan actions at locations other than Camp Grayling were not fully explored.

RESPONSE: This comment is addressed in response to Comment No. 19 of Document No. 7. There is a new alternative for the MPRC-H-R to train out-of-state.

Document No. 33 **Comment No. 2**

ISSUE: The loss of recreational value within and outside Camp Grayling is not evaluated.

RESPONSE: This is addressed in response to Comment No. 18 of Document No. 7.

Document No. 33 **Comment No. 3**

ISSUE: The question of underground fuel storage tanks (at the proposed bulk fuel facility) was never addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 12 of Document No. 1.

Document No. 33 **Comment No. 4**

ISSUE: The commentor is concerned that contamination related to explosive residues in impact areas could lead to off-site pollution.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 33 **Comment No. 5**

ISSUE: The commentor is concerned that the extensive noise related to range firing will increase with the proposed projects (MPRC and winter training).

RESPONSE: The noise effects related to the development of the proposed MPRC-H-R are discussed in response to Document No. 1 Comment No. 1, Document No. 4 Comment No. 8, and Document No. 4 Comment No. 7. The issue of noise generated relative to cold weather training is discussed in response to Comment No. 7 of Document No. 4.

Document No. 33 **Comment No. 6**

ISSUE: The commentor states that adverse effects of increased stream crossings related to the proposed projects are not addressed.

RESPONSE: Open stream crossings are prohibited at Camp Grayling.

Document No. 33 **Comment No. 7**

ISSUE: The commentor states that probable negative social effects of crime and health and economic consequences of increased Guard activity were not adequately discussed in the Draft EIS.

RESPONSE: The issue of crime relative to troop utilization of Camp Grayling is addressed in response to Comment No. 17 of Document No. 4.

Economic aspects of the alternatives are discussed in Section 4.4 of the Final EIS. Additional information is provided in response to Document No. 7 Comment No. 18.

Document No. 33 **Comment No. 8**

ISSUE: The commentor states the Draft EIS did not address the worst case scenario for accidents, fuel spills, fires, etc.

RESPONSE: This issue is addressed in response to Comment No. 17 of Document No. 9.

Document No. 34B **Comment No. 1**

ISSUE: The adverse impact of noise on wildlife was not addressed in the Draft EIS.

RESPONSE: The effects of noise on wildlife is addressed in Section 4.1.3.1.6 of the EIS.

Document No. 38 **Comment No. 1**

ISSUE: The EIS does not provide a detailed description of future monitoring required to enforce compliance with standards.

RESPONSE: This comment is addressed in responses to Comments No. 5 and 6 of Document No. 7.

Document No. 39 **Comment No. 1**

ISSUE: The Draft EIS does not address all concerns expressed over water pollution from explosives residue and ammunition dumped in waters of the Camp.

RESPONSE: This issue is addressed in response to Comment No. 1 of Document No. 12.

Document No. 39 **Comment No. 2**

ISSUE: The commentor states the Draft EIS does not address the use of radioactive penetrators at the tank range.

RESPONSE: Only inert rounds are fired at the tank range. Armor-piercing rounds, including radioactive penetrators, are not fired at Camp Grayling range.

Document No. 39 **Comment No. 3**

ISSUE: The commentor states the computer noise studies do not accurately calculate sound levels generated from 8-inch artillery and 500-pound bombs.

RESPONSE: The Final EIS noise analysis utilizes noise contours based on C-weighted day-night noise levels applied according to procedures outlined by the National Research Council (1981). The criteria for establishing the different noise zones are based on standards enacted by the Federal Department of Housing and Urban Development and the Department of Transportation/Federal Highway Administration.

The BNOISE model developed by the U.S. Army Corps of Engineers, Construction Engineering Research Laboratory (USACERL), reflects blast noise research conducted over the past 6 years. This model is the state-of-the-art for addressing day-night noise levels associated with impulse noise from military activities. The model has been reviewed and calibrated for operation at numerous sites and is capable of addressing

8-inch artillery as well as 500-pound bombs. Also see response to Document No. 16 Comment No. 99.

Document No. 39 **Comment No. 4**

ISSUE: The commentor states the Draft EIS does not explain the meaning of the suffix "H" to the MPRC.

RESPONSE: The MPRC-"H" (heavy) designation differs from the MPRC-"L" (light) because the latter is not designed for Tank Tables 10 and 12, and the infantry platoon battle course.

Document No. 39 **Comment No. 5**

ISSUE: The commentor states the Draft EIS does not address the use of artillery at the MPRC Range or describe the related noise impacts on adjacent areas.

RESPONSE: The design of the MPRC-H-R does not allow for explosives or indirect fire artillery rounds to be used. All existing artillery firing points in the North Post area are north of Highway 612, north of the proposed MPRC-H-R. No new artillery firing points will be established with the development of the MPRC-H-R.

Document No. 39 **Comment No. 6**

ISSUE: The Draft EIS does not provide documentation that guarantees that troop training at Camp Grayling will not increase significantly in the future.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Document No. 39 **Comment No. 7**

ISSUE: The commentor questions if the new MPRC will be designed to handle the 120 mm tank gun.

RESPONSE: Should the DMA propose to use the MPRC-H-R or any existing range with weapons which generate more noise than those currently used, additional environmental documentation will be required and prepared.

Document No. 39 **Comment No. 8**

ISSUE: The commentor questions how the MPRC will reduce noise generated in association with tank training when larger tank guns and more equipment will be present.

RESPONSE: This issue is addressed in response to Comment No. 1 of Document 1 and Comment No. 7 of Document No. 39.

Document No. 39 **Comment No. 9**

ISSUE: The commentor states the Draft EIS does not adequately describe the meaning of the term "Combined Arms Training" relative to activities at the proposed Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled. Refer to Section 3.4.2.3.7.3 for a description of "Combined Arms Training".

Document No. 39 **Comment No. 10**

ISSUE: The commentor questions whether the new Camp Grayling wastewater treatment plant will be utilized to provide service to lakeshore residents in Grayling Township.

RESPONSE: Initially, this option was considered as a benefit to township residents. However, due to economic considerations, the post's new wastewater treatment system was designed and constructed to handle only current levels of troop training being conducted at the post.

Document No. 39 **Comment No. 11**

ISSUE: The commentor questions whether the rail siding project C11 will serve as a stationing site for MX missiles.

RESPONSE: The rail siding project has been cancelled.

Document No. 39 **Comments No. 12 and 13**

ISSUE: The commentor questions whether Action C12 - ASP/LSF Railroad will serve as a site of MX missiles or involve construction across Highway I-75.

RESPONSE: The ASP/LSF Railroad project has been cancelled.

Document No. 39 **Comment No. 14**

ISSUE: The commentor questions whether jet aircraft will be utilized at the MPRC and whether these noise effects have been considered in the EIS.

RESPONSE: No fixed-wing aircraft firing exercises will be conducted on the MPRC-H-R. However, fixed-wing aircraft will continue to overfly the Range 30 complex at about the same frequency as is currently experienced. Refer to Section 3.4.3.1. Aircraft noise in conjunction with Grayling Army Airfield and the Air-to-Ground range has been evaluated.

Document No. 39 **Comment No. 15**

ISSUE: The Draft EIS does not explain the use of covered bleachers at the MPRC.

RESPONSE: Covered bleachers are proposed at the MPRC-H-R to optimize the educational opportunities of the range. They will provide an area during inclement weather where lectures can be given and training can be observed. By observing the training practices of other tank and infantry units, other trainees can learn correct techniques and reduce the actual range training time required to gain proficiency in their required skills.

Document No. 39 **Comment No. 16**

ISSUE: The Draft EIS does not mention all public road and snowmobile trail closures that result from construction and use of the MPRC.

RESPONSE: No snowmobile trail closures are anticipated as a result of construction or operation of the proposed MPRC-H-R. A discussion of the anticipated impacts on road usage is described in Section 4.3.1.1.

Document No. 39 **Comment No. 17**

ISSUE: The commentor questions how wetlands lying north of the Assault Strip will be preserved during training.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 39 **Comment No. 18**

ISSUE: The Draft EIS does not illustrate flight paths for the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 39 **Comment No. 19**

ISSUE: The commentor states that public health effects related to noise generated by Camp Grayling activities are not addressed in the EIS.

RESPONSE: This issue is addressed in response to Comment No. 7 of Document No. 4.

Document No. 39 **Comments No. 20 and 21**

ISSUE: The commentor questions whether activities related to winter training and the MPRC will force increases in training utilization of Camp Grayling.

RESPONSE: The proposal to increase winter training is no longer being considered. Training on the MPRC is not anticipated to increase.

Document No. 39 **Comment No. 22**

ISSUE: The commentor states the DMA should get a current soil survey.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 7.

Document No. 39 **Comment No. 23**

ISSUE: The commentor states that Figure 4-5.1 of the Draft EIS has omitted gas wells on the Draper land in the north Camp area.

RESPONSE: Seismic testing for oil and natural gas deposits and development was being conducted at the time the EIS was being prepared and therefore all well locations were not known. The DMA has allowed seismic testing on Camp lands. Deposits discovered beneath installation lands are currently being accessed under DNR permits for directional drilling from off-post locations.

Document No. 39 **Comment No. 24**

ISSUE: The commentor questions how protection of wetlands in relation to the proposed Master Plan projects can be conducted without a detailed wetlands inventory for the entire installation.

RESPONSE: This issue is addressed in response to Comment No. 6 and 7 of Document No. 10.

Document No. 39 **Comment No. 25**

ISSUE: The commentor states that the Draft EIS omitted the eagle nest at Firing Point No. 117 which must be addressed.

RESPONSE: In 1986, the Michigan DNR Natural Features Inventory, the Local DNR Wildlife Specialist, and the U.S. Fish and Wildlife Service were all contacted to identify locations of eagle nests which have been active in the last five years. The five nesting areas identified did not include any eagle nest near Firing Point No. 117 (approximately one mile within the northern-most tip of the north post area) at that time. This nest was constructed in 1987 and was utilized in 1988, 1989, and 1990 and is being monitored by Camp Grayling Environmental personnel. This nest has not been occupied since 1990 and was not occupied during the breeding season of 1994. The USFWS management guidelines have been implemented and activities near new nest locations will be governed by these guidelines.

Document No. 39 **Comment No. 26**

ISSUE: The commentor states the DMA does not maintain roads in good condition so as to make them passable for public use.

RESPONSE: Refer to Comment No. 17 of Document No. 4. However, other road and trails throughout the installation are for training operations and will not be improved for public utilization.

Document No. 39 **Comment No. 27**

ISSUE: The commentor states that the EIS should address measures to reduce the extent of the Zone II contours off post.

RESPONSE: This issue is addressed in response to Comment No. 8 of Document No. 4. Figures 4-1 and 4-5 display the predicted Zone II and Zone III contours for the MPRC-H-R and the existing tank range complex. The Zone II contour area is reduced 30.25 acres, from 6922.36 to 6892.11 acres. The Zone III contour area is reduced 427.48 acres, from 2842.93 to 2415.45 acres. The MPRC-H-R contour occurs to the north and east of the existing contour. This shift results in decreasing the Zone II contour off-post from 1367.35 to 201.63 acres, a reduction of 1165.72 acres. Less than 15 acres of Zone II contour occurs off-post in conjunction with Range 40.

Document No. 39 **Comment No. 28**

ISSUE: The commentor questions whether refueling operations will be conducted at the assault landing strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Document No. 40 **Comment No. 1**

ISSUE: The commentor states the Draft EIS is inadequate in the discussion of the contamination of land and waters due to residues in the impact areas.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Document No. 40 **Comment No. 2**

ISSUE: The commentor states the Draft EIS does not adequately describe noise effects relative to acceptable standards.

RESPONSE: Refer to Section 3.5.4.1 for a discussion of standards and guidelines pertaining to noise.

Document No. 40 **Comment No. 3**

ISSUE: The commentor states the Draft EIS fails to address the impacts of military air traffic over ranges in relation to the MPRC.

RESPONSE: This issue is addressed in response to Comment No. 14 of Document No. 39.

Document No. 40 **Comment No. 4**

ISSUE: The commentor states that the Draft EIS does not adequately describe the psychological, physiological, or community needs in lifestyles effects of the proposed Master Plan actions.

RESPONSE: The Draft EIS focuses on these issues primarily as they relate to the effects of noise. (See response to Comment 7 of Document 4.) In addition to the mitigations described in the Draft EIS, the DMA has also committed to the actions to reduce noise described in response to Comment No. 8 of Document No. 4. Other recommendations generated as a result of the Governor's Camp Grayling Management Advisory Committee have been implemented by the DMA.

Document No. 41 **Comment No. 1**

ISSUE: The commentor proposes that permanent restrictions on the hours of military activity be established to alleviate stress and annoyance of residents.

RESPONSE: Refer to Section 4.1.3.1 (B).

Document No. 42 **Comment No. 1**

ISSUE: The commentor states that alternatives for locating the MPRC outside the State of Michigan were not considered.

RESPONSE: Training at an out-of-state MPRC is now being discussed (see Section 2.4.3 of the Final EIS).

Document No. 42 **Comment No. 2**

ISSUE: The commentor states that the negative impact that Camp Grayling has on the regional economy was not discussed.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7 and response to Comment No. 18 of Document No. 4.

Document No. 42 **Comment No. 3**

ISSUE: The commentor states the additional helicopter units will cause additional disturbance for the Grayling High School classes which are already disrupted by flight paths from the Grayling Army Airfield.

RESPONSE: No additional helicopter units are to be stationed at Camp Grayling. The issue of existing noise impacts is addressed in response to Comment No. 5 of Document No. 1.

Transcript No. 1 **Comment No. 1**

ISSUE: The commentor say that the types and amounts of ongoing and proposed training at Camp Grayling are beyond the limits described in the terms of the "in-perpetuity lease" and the "primary recreational purposes of these lands".

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Transcript No. 1 **Comment No. 2**

ISSUE: The commentor states that the impacts off-site on recreation values and tourism are not addressed in the EIS.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7.

Transcript No. 1 **Comment No. 3**

ISSUE: The economic impacts of training on the area are not based on the objective scientific assessment of expenditure levels.

RESPONSE: Refer to Section 4.4.2 and the response to Comment No. 89 of Document No. 16.

Transcript No. 1 **Comment No. 4**

ISSUE: The commentor states that the loss in real recreational values of leased land could effectively nullify the land use clause (of the in-perpetuity lease).

RESPONSE: Land use regulation/police issues are addressed in response to Comment No. 2 of Document No. 7.

Transcript No. 1 **Comment No. 5**

ISSUE: The commentor states that no quantitative baseline data is presented regarding recreational activities in the Camp Grayling area.

RESPONSE: The evaluation of recreational effects is based on a qualitative analysis, as described in response to Comment No. 18 of Document No. 7.

A recreational survey was also conducted in the summer of 1993 to identify the type and magnitude of outdoor recreational use of the area, especially dispersed recreation use. Results of the survey to date can be found in Section 3.7.4 of the EIS.

Transcript No. 1 **Comment No. 6**

ISSUE: The commentor states that the non-random survey done by the Grayling Chamber of Commerce to determine expenditures was by Guardsmen during annual training was not based on standard statistical procedures.

RESPONSE: This issue is addressed in response to Comment No. 89 and 92 of Document No. 16.

Transcript No. 1 **Comment No. 7**

ISSUE: The commentor states the loss in recreational values due to noise and traffic interference with the use of Camp Grayling lands could effectively reduce the recreational value to zero, which is equivalent to not permitting recreational use of these lands.

RESPONSE: It is the DMA policy that the primary use of the lands controlled by the DMA is for military training and that other uses will be accommodated as possible (see response to Comment No. 17 of Document No. 4).

Transcript No. 1 **Comment No. 8**

ISSUE: The draft permits should be provided in an appendix for the EIS.

RESPONSE: This issue is addressed in response to Comment No. 5 of Document No. 16.

Transcript No. 1 **Comment No. 9**

ISSUE: The commentor states that nutrient loadings in response to construction of the Camp Grayling Wastewater Treatment Facility (Action C1) will destroy cedar trees in the application area. He further states that mass balance numbers for the loadings are not evaluated in the Draft EIS.

RESPONSE: This issue is addressed in response to Comments No. 60 of Document No. 16.

Transcript No. 1 **Comment No. 10**

ISSUE: The commentor states that landfilling is the only manner of treating solid waste considered in the EIS.

RESPONSE: This issue is addressed in response to Comment No. 12 of Document No. 4.

Transcript No. 1 **Comment No. 11**

ISSUE: The commentor states that the EIS does not specifically state whether the tanks at the proposed bulk storage facility (Action C15) will be above or below ground.

RESPONSE: This issue is addressed in response to Comment No. 12 of Document No. 1.

Transcript No. 1 **Comment No. 12**

ISSUE: The commentor states the EIS does not specifically address the activities associated with the proposed master plan actions that will take place within the buffer areas associated with the Natural Rivers Act.

RESPONSE: Refer to Section 4.1.5.1.

Transcript No. 1 **Comment No. 13**

ISSUE: The commentor states that the issue of ecologic impact of off-road movement by track vehicles in the wintertime requires further investigation.

RESPONSE: The effects of off-road movement of track vehicles is discussed in response to Comment No. 7 of Document No. 4. Vegetation monitoring proposed to monitor heavily used cold weather training areas is discussed in response to Comment No. 22 of Document No. 1.

Transcript No. 1 **Comment No. 14**

ISSUE: The commentor states that heavy metals accumulating in the impact areas as residuals from exploding shells pose a major toxicological problem for wildlife.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 1 **Comment No. 15**

ISSUE: The commentor states there is no legally enforceable restriction which places limits on the growth and expansion of utilization of Camp Grayling, which has increased significantly in recent years.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7. The capacity of the proposed Camp Grayling Wastewater Treatment Plant is designed to handle a wastewater capacity associated with the utilization of Camp Grayling of approximately 500,000 man-days per year.

Transcript No. 1 **Comment No. 16**

ISSUE: The commentor states that the Draft EIS does not make it clear that the existing impact areas at Camp Grayling utilized for artillery and mortars are lands which will always be off-limits to the public.

RESPONSE: It is noted that current technologies make it extremely difficult to guaranty that historic impact areas which contain unexploded ordnance can be 100 percent cleared. Therefore, these areas are off-limits to the public and most troops training at the Camp as discussed in Section 3.4.2.3.5 in the EIS.

Transcript No. 1 **Comment No. 17**

ISSUE: The commentor states that further sampling should be done at Range 40 to insure that heavy metals and radioactivity are not being taken up by the vegetation and wildlife.

RESPONSE: Radioactive weapons have not been used at Camp Grayling (also see response to Comment No. 10 of Document No. 4).

Transcript No. 1 **Comment No. 18**

ISSUE: The commentor states that the Kirtland's Warbler Management Plan should be reviewed with regard to the proposed master plan projects.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Transcript No. 1 **Comment No. 19**

ISSUE: The commentor states that the light from phosphorus flares prevents nighttime fishing.

RESPONSE: The proposed projects do not alter the use of phosphorus flares at Camp Grayling. Restrictions apply to the use of phosphorus flares so that conflicts with fishing activities are minimized.

Transcript No. 1 **Comment No. 20**

ISSUE: The commentor states that the EIS does not evaluate the benefits to the economy if Camp Grayling lands were converted into private use. The commentor also states that the expenditure value of twenty dollars per person per weekend trainee appears low.

RESPONSE: This issue is addressed in response to Comments No. 18 and 19 of Document No. 7.

Your comment concerning trainee expenditures is noted.

Transcript No. 1 **Comment No. 21**

ISSUE: The commentor states that the DMA should consider alternatives to mitigate the use of helicopters and jets on the MPRC.

RESPONSE: The use of helicopters and jets on the MPRC-H-R will occur at about the same frequency as that on the current Range 30 complex.

Transcript No. 1 **Comment No. 22**

ISSUE: The commentor states that the expansion of cold weather training will force recreational uses to move to other areas outside the Grayling area.

RESPONSE: The proposal to increase winter training has been cancelled.

Transcript No. 1 **Comment No. 23 and 24**

ISSUE: The EIS does not address the existence of heavy metals contamination at the Range 40 complex.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 1 **Comment No. 25**

ISSUE: The commentor states that the aircraft usage at the proposed MPRC will have to be mitigated or he will have to sell us his house and will not be able to find a buyer.

RESPONSE: The use of helicopters and fixed-wing aircraft on the MPRC-H-R will be essentially the same as the current use of the Range 30 complex. The DMA continues to offer to purchase lands in close proximity to noise sources at fair market value.

Transcript No. 1 **Comment No. 26**

ISSUE: The commentor states that the escalating utilization of Camp Grayling is not compatible with the site's ecology.

RESPONSE: This issue is addressed in response to Comment No. 22 of Document No. 1.

Transcript No. 1 **Comment No. 27**

ISSUE: The commentor states that the trailer camp immediately adjacent to the Grayling Army Airfield is incorrectly named the "Ingersol" trailer camp in the EIS (Section 4-3).

RESPONSE: It is noted that the correct name of the mobile home park adjacent to the Grayling Army Airfield is Timberly Village.

Transcript No. 1 **Comment No. 28**

ISSUE: The commentor states that the name Donald L. Wilser on page 7-1.3 of the Draft EIS is misspelled.

RESPONSE: Comment noted.

Transcript No. 1 **Comment No. 29**

ISSUE: The commentor notes that the new MATES building is located northwest of Grayling, approximately two miles, not northeast of Grayling.

RESPONSE: Comment noted.

Transcript No. 1 **Comment No. 30**

ISSUE: The EIS does not describe how treatment will be provided for sewage generated by the construction of new housing (Action C4-Grayling Army Airfield Housing) at the Grayling Army Airfield will be provided.

RESPONSE: The housing at the Grayling Army Airfield is no longer being considered at this time.

Transcript No. 1 **Comment No. 31**

ISSUE: The commentor states that the EIS does not adequately address the impacts of Camp Grayling on tourism and recreation.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7.

Transcript No. 1 **Comment No. 32**

ISSUE: The commentor states that Roscommon County, particularly the Higgins Lake area, should have been included in the Draft EIS because the area has been historically affected by sonic booms from jet aircraft runs and periodically by impulse noise.

RESPONSE: Air National Guard jet aircraft operate in flight corridors throughout northern Michigan with minimum elevations of 500 feet above ground level. The EIS study area of Crawford, Kalkaska, and Otsego Counties was selected because the installation is comprised of land entirely within these counties.

The Zone II noise contour boundary associated with activities in the North Post area of Camp Grayling is at least 14 miles from the Higgins Lake area; however, the Higgins Lake area is approximately 5 miles of the Zone II contour related to training at the mortar range in the South Post area. Though the Higgins Lake area is well removed from the Zone II contour, it is noted that under certain climatic conditions the impulse noise generated at Camp Grayling may be notable at the Higgins Lake area.

Transcript No. 1 **Comment No. 33 and 34**

ISSUE: The commentor questions why there are troops other than Michigan National Guard that train at Camp Grayling and what the DMA is doing to mitigate noise impacts.

RESPONSE: Army National Guard units, other than Michigan troops, who frequently train at Camp Grayling include units from Ohio and Indiana. These units are affiliated with the Michigan units as components of the 1st Army. National Guard Bureau funds Camp Grayling as a regional training site. Training sites in Indiana and Ohio are unavailable or unequipped with the proper facilities for the necessary training.

Recent actions taken by the DMA to reduce noise impacts at Camp Grayling are discussed in response to Comment No. 8 of Document No. 4.

Transcript No. 1 **Comment No. 35**

ISSUE: The commentor states that the EIS does not adequately discuss the occurrence of range wildfire in relation to the proposed master plan projects.

RESPONSE: Wildfires occurring at Camp Grayling during FY88 and 93 are discussed in response to Comment No. 39 of Document No. 7 and Section 4.2.2.

Transcript No. 1 **Comment No. 36**

ISSUE: The commentor questions how the DMA will insure all solid waste is collected from units conducting field training, particularly during winter conditions, and mentions past problems in relation to this issue.

RESPONSE: Units in training at Camp Grayling are provided with trash bags. Additionally, Camp garbage trucks make daily visits to the field areas during training. In addition, the Camp has leased four commercial trash compactors and installed them near training areas with the highest troop density to accommodate the disposal of non-biodegradable wrappings and non-recyclable materials. In cases where troops have not disposed of trash properly, the Camp has been notified and personnel have been sent out to pick up the areas. Representatives of the offending unit have been called back to Camp Grayling to clean up their training area. The Governor's Camp Grayling Management Advisory Committee has recommended a major training agreement be developed by the DMA which includes conditions of use provisions addressing litter clean up and proper waste disposal during field training. This agreement has been developed and implemented. The Camp Grayling Range Control staff also sweeps areas to inspect for violations when units leave their assigned field training areas.

Transcript No. 1 **Comment No. 37**

ISSUE: The commentor states the EIS does not address the groundwater quality effects associated with carcinogens related to explosive residues in the impact areas.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 1 **Comment No. 38**

ISSUE: The commentor states the relocation of the proposed Master Plan Actions to locations away from Camp Grayling was not addressed in the EIS.

RESPONSE: The relocation of the EIS Master Plan Actions is addressed in response to Comment No. 19 of Document No. 7.

Transcript No. 1 **Comment No. 39**

ISSUE: The commentor states that the EIS should include commitments by the DMA to reduce noise to levels experienced prior to 1980 and that existing noise levels are not acceptable.

RESPONSE: The noise environment at Camp Grayling related to the proposed actions is discussed in response to Comment No. 1 of Document No. 1 and Comment No. 7 of Document No. 4 (MPRC-H-R). The proposal to increase winter training has been cancelled.

Steps taken by the DMA made to reduce noise levels are discussed in response to Comment No. 8 of Document No. 4. New noise contours have been prepared to evaluate the potential effects related to the proposed actions. The issue of noise control was also a central focus of the Governors Camp Grayling Management Advisory Committee Report. The DMA has considered means of implementing all

recommendations of the Governor's Camp Committee and it is hoped that the actions taken will significantly reduce the noise effects related to training at Camp Grayling.

Transcript No. 1 **Comment No. 40**

ISSUE: The commentor questions how much land expansion the DMA will require for Camp Grayling to provide for regular army training.

RESPONSE: Regular Army training on a large scale is not being considered for Camp Grayling.

Transcript No. 1 **Comment No. 41**

ISSUE: The commentor states that the proposed Master Plan improvements will damage the tourist business of the area.

RESPONSE: The Governor's Camp Grayling Management Advisory Committee has reviewed the available information regarding the effects of Camp Grayling on tourism employment and determined there was no evidence of adverse effects on Crawford County compared to the adjacent eight counties (see response to Comment No. 4 of Document No. 20).

Transcript No. 1 **Comment No. 42**

ISSUE: The commentor states that the issue of groundwater contamination from explosive residues identified in the Scoping Document was not addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 1 **Comment No. 43**

ISSUE: The commentor states the Draft EIS is based on comparisons to already unacceptable conditions; it does not address cumulative effects.

RESPONSE: The issue of cumulative analysis is addressed in response to Comment No. 1 of Document No. 16.

Transcript No. 1 **Comment No. 44 and 45**

ISSUE: The commentor states the Draft EIS does not describe the timing of construction in addition to the Master Plan Projects.

RESPONSE: This issue is addressed in response to Comment No. 21 of Document No. 7.

Transcript No. 1 **Comment No. 46 and 47**

ISSUE: The commentor states the Draft EIS ignores the importance of multiple uses of reservation lands.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Transcript No. 1 **Comment No. 48**

ISSUE: The commentor states the Draft EIS does not address social issues including crime and trespassing and that the economic analysis should address the three county area and the adverse economic impacts of Camp Grayling.

RESPONSE: This issue is addressed in response to Comment No. 17 of Document No. 4. The economic analysis provided in Section 4.4.2 of the Final EIS addresses Camp Grayling's economic impacts on Otsego, Crawford, and Kalkaska Counties.

Transcript No. 1 **Comment No. 49**

ISSUE: The commentor states that human health hazards have not been discussed in the Draft EIS.

RESPONSE: One of the primary human health concerns at Camp Grayling is the effect of noise. Section 3.5.4.1 of the Final EIS presents criteria regarding the threshold of physiological damage to unprotected ears to impulse noise and presents a noise contour analysis based on population annoyance as an index of human health effects. Human health effects are further discussed in response to Comment No. 7 of Document No. 4.

The potential effects of explosive residues on water quality are addressed by the DMA water quality study for Range 40. This preliminary analysis has not identified any significant risks to human health; however, the DMA has agreed to additional investigations as required by the Consent Order entered into between DNR and DMA. (see response to Comment No. 10 of Document No. 4).

Transcript No. 1 **Comment No. 50**

ISSUE: The commentor states the master plan projects will significantly increase the use of Camp Grayling.

RESPONSE: The implementation of the remaining proposed Master Plan projects will not significantly increase the utilization of Camp Grayling in comparison to the last ten years of use (see response to Comment No. 4 of Document No. 7).

Transcript No. 1 **Comment No. 51**

ISSUE: The commentor states the Draft EIS does not address explosive residues in soils within Range 40.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 1 **Comment No. 52**

ISSUE: The commentor states the Draft EIS does not address stream crossings.

RESPONSE: Open water stream crossings are prohibited at Camp Grayling.

Transcript No. 1 **Comment No. 53**

ISSUE: The commentor states the Draft EIS does not address the cleanup costs associated with clearing the impact areas.

RESPONSE: This issue is addressed in response to Comment No. 20 of Document No. 1.

Transcript No. 1 **Comment No. 54**

ISSUE: The commentor states the Draft EIS does not adequately protect the Kirtland's warbler.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Transcript No. 1 **Comment No. 55 and 56**

ISSUE: The commentor states the Draft EIS does not address contingency measures for a fuel spill cleanup related to potential aircraft crashes or equipment spills (at the Assault Landing Strip).

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 1 **Comment No. 57**

ISSUE: The Draft EIS does not address wildfire.

RESPONSE: A discussion of fire can be found in Section 3.6.1.3 and 4.2.2 of the Final EIS.

Transcript No. 1 **Comment No. 58**

ISSUE: The commentor states the EIS does not address the potential for accidents including the possibility of artillery shells landing outside the impact area.

RESPONSE: This issue is address in response to Comment No. 20 of Document No. 11.

Transcript No. 1 **Comment No. 59**

ISSUE: The commentor states the alternatives in relocation of the proposed master plan actions to locations outside of Camp Grayling are not evaluated.

RESPONSE: Alternative locations outside of Camp Grayling for the proposed Master Plan projects are discussed in response to Comment No. 19 of Document No. 7.

Transcript No. 1 **Comment No. 60**

ISSUE: The commentor states the Draft EIS should present analyses of the fish in the East branch of the AuSable River.

RESPONSE: Please refer to Section 3.6.2.5.

Transcript No. 1 **Comment No. 61**

ISSUE: The commentor states concern that the proposed master plan projects will establish new impact areas.

RESPONSE: The proposed master plan activities will not establish new impact areas with unexploded ordnance. The MPRC will expand the range safety fan of the existing tank range; however, only inert ammunition (ammunition not containing explosives) will be fired at this range.

Transcript No. 1 **Comment No. 62**

ISSUE: The commentor states concern that the Kirtland's warbler will not be adequately protected as a result of the implementation of the proposed master plan projects.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Transcript No. 1 **Comment No. 63**

ISSUE: The commentor states concern that nitrogen containing compounds and air emissions from explosions in the impact area will have adverse impacts on water and air quality.

RESPONSE: Please refer to Section 3.9.2.

Transcript No. 1 **Comment No. 64**

ISSUE: The commentor states that concerns over water pollution from explosion residue and ammunitions dumped in waters within the camp were not addressed in the Draft EIS.

RESPONSE: This issue is addressed in response to Comment No. 1 of Document No. 12.

Transcript No. 1 **Comment No. 65 and 66**

ISSUE: The commentor questions who was responsible for expressing concern regarding the danger of potential contamination related to explosive residue or unexploded ordnance at the impact areas and what was the course of events leading to the release of the Range 40 Water Quality Study in 1989.

RESPONSE: The initial concern regarding the effects of contamination at Range 40 on water quality was expressed during the September 1986 scoping process by Mr. Ernest E. Lindsey in his letter.

Upon receipt of the final AEHA Water Quality Study, the DMA released the report to the DNR and representatives of the public. The AEHA selected test sites for these preliminary study. This study represents a considerable investment in time and effort for planning, organizing, sampling, sample analysis, and report preparation. The Range 40 site was selected for an initial investigation of a worst case site. The information from this study was unavailable at the time the DEIS was prepared. DNR has subsequently reviewed this document and the DMA has agreed to further studies based on their review. Depending on results of the Phase II Range 40 study, other ranges will be investigated accordingly. Also refer to Section 3.9.2.

Transcript No. 1 **Comment No. 67**

ISSUE: The commentor questions what the impact of training at Camp Grayling is on tourism.

RESPONSE: The effects of Camp Grayling upon tourism is discussed in response of Comment No. 7 of Document No. 4.

Transcript No. 1 **Comment No. 68**

ISSUE: The commentor questions whether the location of the new fuel dispensing facility (Action C-15) is far enough away from the ammunition supply point to prevent an accidental explosion at either facility from affecting the other.

RESPONSE: The proposed site is approximately 3/4-mile away from the ammunition supply point. The quantity/distance zoning used to site the ammunition supply point was considered in this decision.

Transcript No. 1 **Comment No. 69**

ISSUE: The commentor questions what the effect of the multi-purpose range complex will be upon his property and if the military is willing to buy his land.

RESPONSE: The effects of the construction of the MPRC-H-R are discussed in response to Comment No. 1 of Document No. 1 and Comment No. 7 of Document No. 4. The DMA has offered to purchase property in close proximity to noise-generating activities at fair market value.

Transcript No. 1 **Comment No. 70**

ISSUE: The commentor questions what the DMA will do to move helicopter approach patterns to the Grayling Army Airfield away from the Grayling High School.

RESPONSE: Helicopter approach patterns have since been altered to keep as far as possible from the Grayling High School.

Transcript No. 2 **Comment No. 1**

ISSUE: The commentor states the Draft EIS does not address all concerns expressed over water pollution from explosives residue and ammunition dumped in waters of the camp.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 2 **Comment No. 2**

ISSUE: The commentor states the Draft EIS does not address the use of radioactive penetrators at the tank range.

RESPONSE: Only inert rounds are fired at the tank range. Radioactive penetrators are not fired at any of the Camp Grayling ranges.

Transcript No. 2 **Comment No. 3**

ISSUE: The commentor states the computer noise studies do not accurately calculate sound on levels generated from 8-inch artillery in 500 pound bombs.

RESPONSE: This issue is addressed in response to Comment No. 3 of Document No. 39.

Transcript No. 2 **Comment No. 4**

ISSUE: The commentor states the Draft EIS does not explain the meaning of the suffix "H" to the MPRC.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 39.

Transcript No. 2 **Comment No. 5**

ISSUE: The commentor states the Draft EIS does not address the use of artillery at the MPRC Range or describe the related noise impacts on adjacent areas.

RESPONSE: This issue is addressed in response to Comment No. 5 of Document No. 39.

Transcript No. 2 **Comment No. 6**

ISSUE: The commentor states that the Draft EIS does not provide documentation that guarantees that the troop training at Camp Grayling will not increase significantly in the future.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Transcript No. 2 **Comment No. 7**

ISSUE: The commentor questions if the new MPRC will be designed to handle the new 120 millimeter tank gun.

RESPONSE: This issue is addressed in response to Comment No. 7 of Document No. 39.

Transcript No. 2 **Comment No. 8 and 9**

ISSUE: The commentor questions how the MPRC will reduce noise generated in association with tank training when larger tanks and guns and more equipment will be present.

RESPONSE: This issue is addressed in response to Comment No. 7 of Document No. 39.

Transcript No. 2 **Comment No. 10**

ISSUE: The commentor states that the Draft EIS does not adequately describe the meaning of the term "combined arms training" relative to activities at the proposed Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 11**

ISSUE: The commentor questions whether the new Camp Grayling Wastewater Treatment Plant will be utilized to provide service to lakeshore residents in Grayling Township.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 39.

Transcript No. 2 **Comment No. 12**

ISSUE: The commentor questions whether Action C-11-Rail Sidings will serve as a stationing site for MX missiles.

RESPONSE: The Rail Siding project has been cancelled.

Transcript No. 2 **Comment No. 13 and 14**

ISSUE: The commentor questions whether Action C12-ASP/LSF Railroad will serve as a site for MX missiles or involve construction across Highway I-75.

RESPONSE: The ASP/LSF Railroad project has been cancelled.

Transcript No. 2 **Comment No. 15**

ISSUE: The commentor questions whether jet aircraft will be utilized at the MPRC and what mitigations will be taken to address these additional noise effects.

RESPONSE: This issue is addressed in response to Comment No. 14 of Document No. 39.

Transcript No. 2 **Comment No. 16**

ISSUE: The Draft EIS does not explain the use of the covered bleachers at the MPRC.

RESPONSE: This issue is addressed in response to Comment No. 15 of Document No. 39.

Transcript No. 2 **Comment No. 17**

ISSUE: The commentor states the Draft EIS does not mention all public road and snowmobile trail closures that will result from construction and use of the MPRC.

RESPONSE: This issue is addressed in response to Comment No. 16 of Document No. 39.

Transcript No. 2 **Comment No. 18**

ISSUE: The commentor questions how wetlands lying north of the Assault Landing Strip will be preserved during training.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 19**

ISSUE: The commentor states the Draft EIS does not show the flight paths to be used at the Assault Landing Strip, including guaranteed traffic patterns and altitude restrictions.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 20**

ISSUE: The commentor questions whether the activities related to winter training and the MPRC use will force increases in training utilization of Camp Grayling.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7.

Transcript No. 2 **Comment No. 21**

ISSUE: The commentor states the DMA should get a current soil survey as part of the Draft EIS. He also states that Figure 4-5.1 of the Draft EIS has omitted gas wells on the Draper land in the north Camp area and that the installation prevents development of new oil/gas reserves.

RESPONSE: The soil survey for Camp Grayling is discussed in response to Comment No. 10 of Document No. 7. Figure 4-5.1 was not applicable in the Final EIS and therefore removed. Oil and natural gas exploration and production are discussed in Section 3.5.5.2 of the EIS.

Transcript No. 2 **Comment No. 22**

ISSUE: The commentor questions how protection of wetlands in relation to the proposed master plan projects can be conducted without a detailed wetlands inventory for the entire installation.

RESPONSE: This issue is addressed in response to Comment No. 21 and 22 of Document No. 1 and Comment No. 12 of Document No. 7.

Transcript No. 2 **Comment No. 23**

ISSUE: The commentor states that the Draft EIS omitted the eagle nest at Firing Point No. 117 which must be addressed.

RESPONSE: This issue is addressed in response to Comment No. 25 of Document No. 39.

Transcript No. 2 **Comment No. 24**

ISSUE: The commentor states the DMA does not maintain roads within the installation to keep them in good condition for public use.

RESPONSE: This issue is addressed in response to Comment No. 26 of Document No. 39.

Transcript No. 2 **Comment No. 25**

ISSUE: The commentor states the EIS should include measures taken to reduce the extent of the Zone II contours off-post.

RESPONSE: This issue is addressed in response to Comment No. 30 of Document No. 11.

Transcript No. 2 **Comment No. 26**

ISSUE: The commentor questions whether increased winter training will significantly increase utilization levels at Camp Grayling.

RESPONSE: The proposal to increased winter training is no longer being considered.

Transcript No. 2 **Comment No. 27**

ISSUE: The commentor questions whether refueling operations will be conducted at the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 28**

ISSUE: The commentor states that no one from the military has guaranteed that there will not be an increase in use as a result of the Master Plan projects being implemented.

RESPONSE: This issue is addressed in Response to Comment No. 4 of Document No. 7.

Transcript No. 2 **Comment No. 29**

ISSUE: The commentor states that the master plan projects were planned and finalized almost before the notification of the EIS scoping process.

RESPONSE: This issue is addressed in response to Comment No. 1 of Document No. 14.

Transcript No. 2 **Comment No. 30**

ISSUE: The commentor states that the social and economic negatives of Camp Grayling's existence are not adequately addressed.

RESPONSE: Issues related to police, fire, health care, and traffic are addressed in response to Comment No. 17 of Document No. 4. Issues related to human health are involved primarily around concerns related to noise and water quality. Health concerns related to noise are addressed in response to Comment No. 7 of Document No. 4 and Comment No. 17 of Document No. 7. Issues related to aesthetics are indirect effects of the impacts evaluated throughout the EIS. Aesthetics issues are discussed in response to Comment No. 48 of Document No. 16. Economic issues are addressed in response to Comment No. 18 of Document No. 7, as well as in Section 4.4.1 of the EIS.

Transcript No. 2 **Comment No. 31**

ISSUE: The commentor states the EIS should include a detailed modern soil survey.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 7.

Transcript No. 2 **Comment No. 33**

ISSUE: The commentor states an inventory of threatened and endangered species needs to be conducted on all areas of the installation.

RESPONSE: This issue is addressed in response to Comment No. 13 of Document No. 7.

Transcript No. 2 **Comment No. 34**

ISSUE: The commentor states that the discussion of locations outside of Camp Grayling and the option of reduced activities for the installation is not discussed in the EIS.

RESPONSE: This issue is addressed in response to Comments No. 19 and 20 of Document No. 7.

Transcript No. 2 **Comment No. 35**

ISSUE: The commentor states that the psychological and physiological effects of noise are not thoroughly addressed.

RESPONSE: Additional information regarding the physiological and psychological effects of noise is presented in response to Comment No. 7 of Document No. 4. Section 4.1.3 of the EIS provides information which relates day-and-night noise levels to annoyance, which is the accepted index of measurement of human health effects from this measurement scale.

Transcript No. 2 **Comment No. 36**

ISSUE: The commentor states that the EIS does not mention the hazards associated with the possibilities of accidents or negligence in relation to troop training. On-going incidents including fuel spills, lack of buzz numbers on helicopters, and firing into Barnes Lake are not mentioned.

RESPONSE: Camp Grayling has prepared Spill Prevention Control and Countermeasure Plans as well as Installation Spill Contingency Plans to address fuel spills in relation to training activities. See response to Document 1, Comments 13-16, Document 7, Comment 38 and Sections 4.1.6 and 3.9.2. Buzz numbers visible at low altitudes have been added to all helicopters.

Transcript No. 2 **Comment No. 37**

ISSUE: The Draft EIS does not address the problems of controlling the training activities of troops from outside the State of Michigan during performance of their training tasks on installation lands.

RESPONSE: This issue is addressed in response to Comment No. 6 of Document No. 7.

Transcript No. 2 **Comment No. 38**

ISSUE: The commentor states the EIS does not address the operational concerns related to proposed Master Plan actions.

RESPONSE: Impacts related to operational effects of the proposed actions are discussed throughout the EIS.

Transcript No. 2 **Comment No. 39**

ISSUE: The commentor states the EIS does not adequately address toxic contamination related to exploded and unexploded ordnance in the Range 40 area.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 2 **Comment No. 40**

ISSUE: The commentor states the EIS should consider the impact of radioactive penetrators fired on various ranges.

RESPONSE: Radioactive penetrators for armor piercing rounds have never been fired at Camp Grayling on any range.

Transcript No. 2 **Comment No. 41**

ISSUE: The commentor states the discussion of noise in the EIS is inadequate because it does not contain a detailed discussion of impacts on humans.

RESPONSE: Additional information regarding human health effects and noise is provided in Response to Comment No. 7 of Document No. 4.

Transcript No. 2 **Comment No. 42**

ISSUE: The commentor states the Draft EIS does not address the impacts of military air traffic over the MPRC Range during operation and questions why noise will not increase.

RESPONSE: This issue is addressed in response to Comment No. 14 of Document No. 39.

Transcript No. 2 **Comment No. 43**

ISSUE: The commentor states the Draft EIS does not reflect the adverse effects upon the psychological, physiological or community needs and lifestyles of residents in the Camp Grayling area.

RESPONSE: In addition to the information provided in the EIS, the response to Comment No. 7 of Document No. 4 discusses the effect of noise on area residents in more detail. The Governor's Camp Grayling Management Advisory Committee Report summarizes the findings of this Committee regarding local concerns with Camp Grayling. A complete record of all comments and oral testimony received as part of the EIS process is included in the Appendices N and O of this FEIS. Actions being taken by the DMA to address concerns related to the noise are outlined in response to Comment No. 8 of Document No. 4. Actions taken by the DMA to address concerns related to potential contamination at Range 40 are addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 2 **Comment No. 44**

ISSUE: The commentor questions why Roscommon or Missaukee Counties are not included in the effects area addressed by the Draft EIS.

RESPONSE: The EIS study area was comprised of the counties with land within the installation boundaries (i.e., Crawford, Kalkaska, and Otsego Counties).

Transcript No. 2 **Comment No. 45**

ISSUE: The commentor states that traffic on King Road or Sunset Trail will increase as a result of the use of the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 46 and 47**

ISSUE: The commentor states that the Assault Landing Strip will bring aircraft in approach and take-off patterns close to or across the Manistee River, which will affect residents, tourists, campers, fishermen, and others in the river usage area.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comments No. 48 and 49**

ISSUE: The commentor states that additional mitigations are necessary to reduce impacts on eagles and warblers in the relation to activities at the Assault Landing Strip.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 50**

ISSUE: The commentor states that the Assault Landing Strip parallels the Manistee River and related deer wintering area and the low flying aircraft must have adverse effects on wintering deer.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 51**

ISSUE: The commentor states that winter training exercises will occur in areas used by bird, deer, and bear hunters and have a significant and adverse effect upon recreation and the tourist industry.

RESPONSE: Cold weather training activities at Camp Grayling will be focused during the prime winter training period from late December through early March. By January 1,

deer, bear, and grouse hunting have concluded for the year. However, the proposal to increase winter training is no longer being considered.

Transcript No. 2 **Comment No. 52**

ISSUE: The commentor states that the construction of the upgraded CCC bridge will lead to tanks, armored personnel carriers, field trucks, semi-trailer and tractor units utilizing Sunset Trail, King Road, and affect adjacent Riverview Road Recreation Area and the State Campgrounds at the old CC Bridge site.

RESPONSE: The decision to construct the new CCC bridge was done without any input from the DMA. The old bridge was satisfactory for any vehicle movement to associated training sites required by the DMA. However, tanks, armored personnel carriers, or any other tracked vehicles are prohibited from all south post lands north of the Manistee which could be reached by crossing the bridge.

Transcript No. 2 **Comment No. 53**

ISSUE: The commentor questions what the effects of explosive residues in Range 40 are on groundwater in the area.

RESPONSE: Please refer to Section 3.9.2.

Transcript No. 2 **Comments No. 54 and 55**

ISSUE: The commentor notes that the Kirtland's warbler is a state threatened and federally endangered species and questions whether the clearing conducted in construction of the Multi-Purpose Range Complex will affect the Kirtland's warbler.

RESPONSE: This issue is addressed in Comment No. 4 of Document No. 1.

Transcript No. 2 **Comment No. 56**

ISSUE: The commentor states that it is unclear how many helicopters and fixed wing aircraft will use the Assault Landing Strip and how many troops will be involved.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 57**

ISSUE: The commentor states that the use of straw bales at the Assault Landing Strip to prevent sediment from moving off-site during construction should be augmented by a permanent filtering system which can be maintained or cleared periodically.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comments No. 58, 59, and 60**

ISSUE: The commentor states that refueling operations at the Assault Landing Strip could lead to a significant contamination problem because groundwater is at shallow depth.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 61 and 62**

ISSUE: The commentor states the EIS does not address the use of monitoring wells on a long-term basis to evaluate groundwater contamination related to toxic or hazardous chemicals and
does not provide a proper compliance in this area.

RESPONSE: This issue is addressed in response to Comments No. 10 and 11 of Document No. 4 and Comment No. 14 of Document No. 7.

Transcript No. 2 **Comment No. 63**

ISSUE: The commentor states that the DMA must institute procedures for disposal of unserviceable ordnance that are in compliance with RCRA regulations.

RESPONSE: This issue is addressed in response to Comment No. 11 of Document No. 4.

Transcript No. 2 **Comment No. 64**

ISSUE: The commentor states that adequate protection from aircraft crash related spills of gasoline in the Manistee River are not provided.

RESPONSE: This issue is addressed in Sections 4.1.5 and 4.1.6 of the EIS.

Transcript No. 2 **Comment No. 65**

ISSUE: The commentor states that there is developing Kirtland's warbler habitat near the site of the proposed Assault Landing Strip and that survey and clearing work has begun in this area.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1 and addresses developing warbler habitat concerns. A survey was conducted to locate the site, but no clearing was performed. However, the Assault Landing Strip project has been cancelled.

Transcript No. 2 **Comment No. 66**

ISSUE: The commentor states the EIS does not address traffic problems related to troop activities on Highway 612 in the North Camp area.

RESPONSE: This issue is addressed in response to Comment No. 17 of Document No. 4.

Transcript No. 2 **Comments No. 67, 68, and 69**

ISSUE: The commentor states that the size of the proposed Camp Grayling Wastewater Treatment facility suggests increased activities beyond those specified by the DMA.

The commentor also questions whether the housing for 900 individuals at the Grayling Army Airfield suggests increased activities.

RESPONSE: The DMA has stated that troop utilization in the future will not significantly exceed the levels experienced during the last ten years. This issue is addressed in response to Comment No. 4 of Document No. 7. The size of the new treatment system is based on current levels of training. The housing project for the Grayling Army Airfield is no longer being considered.

Transcript No. 2 **Comment No. 70 and 71**

ISSUE: The commentor states the DMA has pre-determined its decision with regards to implementation of the proposed master plan projects by rejecting the option of relocation to sites outside of Camp Grayling and the proposed Master Plan actions suggest increased intensity of training.

RESPONSE: A final decision by the DMA regarding the proposed Master Plan actions will be provided in the record of decision which will follow completion of the EIS process. No funding will be committed to implementing these projects until a record of the decision has been prepared. The issue of pre-decision is addressed in Comment No. 29 of Transcript No. 2.

The DMA has stated that the implementation of the proposed Master Plan project will not significantly increase training levels over those of the previous ten years (see response to Comment No. 4 of Document No. 7).

The Army National Guard is mandated to follow applicable federal, state, and local regulations. It is subject to the legal penalties of non-compliance. This includes binding commitments made as part of the permitting process and memoranda of understanding and other official agreements signed by the DMA.

Transcript No. 2 **Comment No. 72**

ISSUE: The commentor states the EIS does not adequately address the adverse effects of psychological or physiological or community needs of lifestyles of residences in the Grayling area.

RESPONSE: This issue is addressed in Comment No. 7 of Document No. 4.

Transcript No. 2 **Comment No. 73**

ISSUE: The commentor states the EIS does not adequately address the transport of toxic chemicals from impact areas into the ecosystem via air, water, and food chain pathways.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 2 **Comment No. 74**

ISSUE: The commentor questions whether the studies will be made on heavy metals, including mercury, lead, zinc, cadmium, chromium, and organic carcinogen which may have leached from the impact areas into ground and surface waters and entered the food chain.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 2 **Comment No. 75**

ISSUE: The commentor states that the existing Kirtland's Warblers Cooperative Management Agreement does not adequately protect the Kirtland's warblers in relation to the effects of construction of the proposed MPRC.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Transcript No. 2 **Comment No. 76**

ISSUE: The commentor states the attraction of training at a MPRC will draw significantly larger number of troops to train at Camp Grayling and that these units will conduct maneuvers on other areas of the installation as well.

RESPONSE: Please refer to Sections 1.3 and 2.3.3.

Transcript No. 3 **Comments No. 1 and 2**

ISSUE: The commentor states that expanded cold weather training would severely restrict access for wildlife user groups and that deer hunters, especially in Kalkaska

County, could find themselves without access to lands they acquired (by DNR) with hunting license money. The lands in question include the southwestern one-quarter of Kalkaska County. He also states that loss of access and management prerogatives would have a negative effect on grouse, woodcock, and hare hunting.

RESPONSE: The Camp Grayling Military Installation does not own lands in the southwestern one-quarter of Kalkaska County and no additional land acquisitions are required to implement the proposed Master Plan actions. There are, however, approximately 20,000 acres of 20-year lease lands in the southeastern one-quarter of Kalkaska County which are utilized by the DMA for military training. The DMA has not identified any specific cold weather training activities which would focus on the 20-year lease lands in Kalkaska County.

While cold weather training could be conducted any time between October and April, this training has, and will, primarily be conducted during the prime cold weather training period, including January through early March. However, the proposal to increase winter training has been cancelled. No military training is or will be conducted during the gun deer season. The small game bird season and deer season will be closed by January 1, although rabbit season would still be open. The wildlife management actions desired by the DNR would be addressed through DNR/DMA meetings in the same manner as activities are addressed on other lease lands.

Transcript No. 3 **Comment No. 3**

ISSUE: The commentor states that the Draft EIS does not address the impacts of noise on wildlife or the disturbance due to the light from flares fired by artillery on recreationists.

RESPONSE: The effects of noise on wildlife are addressed in response to Comment No. 7 and 8 of Document No. 4. Flares are fired by artillery and mortars for use in spotting the locations of projectile impact points within the Range 40 and Range 13 areas. The artillery firing restrictions described in response to Comment No. 8 of Document No. 4 restrict firing between three hours after sunset and sunrise and on certain holidays. These restrictions will reduce the use of flares.

Transcript No. 3 **Comment No. 4**

ISSUE: The commentor questions whether there will indeed be no significant impacts on noise generation as a result of implementation of the proposed Master Plan projects since there are existing areas which are clearly unacceptable for noise-sensitive land uses.

RESPONSE: The DMA has taken steps to reduce noise effects. These actions are outlined in response to Document No. 4 Comment No. 8. Restrictions already placed on training have reduced noise levels to the extent that there is no longer a Zone III contour off-post and only a very small area of the Zone II contour off-post.

Transcript No. 3 **Comment No. 5**

ISSUE: The commentor states that the existing Kirtland's Warbler Management Agreement in Appendix A of the Draft EIS does not adequately address the use of pre-existing warbler habitat within areas affected by implementation of the MPRC.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Transcript No. 3 **Comment No. 6**

ISSUE: The commentor states that the EIS does not address the proposed surface-to-air missile (SAM) site in the vicinity of Hardgrove Lake.

RESPONSE: The DMA is not aware of any proposed surface-to-air missile site at the post.

Transcript No. 3 **Comment No. 7**

ISSUE: The commentor states the Draft EIS does not address the cumulative impact of the proposed actions.

RESPONSE: This issue is addressed in Chapter 4 of the Final EIS.

Transcript No. 3 **Comment No. 8**

ISSUE: The commentor questions what provisions have been taken to ensure that the terms of the historic lease agreements and future lease agreements are enforced. The commentor is of the opinion that the existing lease agreements preclude the proposed Master Plan actions.

RESPONSE: The DMA has not been informed by the Attorney General that the existing leases are in any way inadequate for the proposed Master Plan actions. The DNR will annually review all current land use leases and agreements to ensure compliance. Any long-term transfer or lease of additional land around Camp Grayling to the DMA, via any mechanism, will include adequate public hearings or procedures for public involvement.

Transcript No. 3 **Comment No. 9**

ISSUE: The commentor asks if Action C12 - ASP/LSF Railroad, Action T1 - Road and Tank Trails, Action T2 - Multi-Purpose Range Complex, and Action T3 - Assault Landing Strip are economically viable when compared to the cost of using an existing facility or facilities in other locations.

RESPONSE: All projects have been dropped from consideration except the MPRC. Training at a MPRC out of state is now an alternative (see Section 2.4.3).

Transcript No. 3 **Comment No. 10**

ISSUE: The commentor states that a complete wetland inventory of the installation must be prepared in order to prevent impacts to wetlands from on-going training activities.

RESPONSE: This issue is addressed in response to Comment No. 21 and 22 of Document No. 1 and Comment No. 12 of Document No. 7.

Transcript No. 3 **Comments No. 11 and 12**

ISSUE: The commentor states that military vehicles hauling hazardous or explosive cargo without DOT-approved markings pose an unacceptable risk to the area and appropriate labeling should be enforced.

RESPONSE: The DMA must placard vehicles transporting explosives and hazardous materials according to Army Regulation 55-355, Technical Manual 9-1300-206 and all applicable Resource Conservation and Recovery Act (RCRA) and Department of Transportation (DOT) rules and regulations. These requirements are enforced by the Military and the State Highway Patrol.

Transcript No. 3 **Comment No. 13**

ISSUE: The commentor states that there is no 800 number available to register complaints related to on-going training activities at Camp Grayling and that the Guard needs to demonstrate community responsibility and discipline towards the troops they are supposed to manage.

RESPONSE: Camp Grayling does have an 800 number which can be used to report complaints (1-800-628-5820). The Camp Grayling Management Advisory Committee reviewed concerns related to the on-going operations at Camp Grayling. In response to the Committee recommendations, several actions have been taken by the DMA to be more responsive to complaints. In 1990, the DMA established a dedicated reporting hotline to be used for citizen complaints with full documentation of each complaint and its resolution. To provide better citizen involvement, a Community Council for Camp Grayling operations has been established. A Training Site Agreement has been developed which specifically describes the Camp Grayling conditions of use provisions for regulating training hours, noise control, environmental regulatory compliance, and disciplinary measures. Signature of this agreement is required of all units training at Camp Grayling. The DMA is currently in the process of reviewing, strengthening, and publicizing rules associated with the enforcement of proper use of military vehicles and reporting and claim procedures regarding trespassing and accidental incursions onto private property and associated damage.

Transcript No. 3 **Comment No. 14**

ISSUE: The commentor suggests that a mechanism be established to provide the Grayling Regional Chamber of Commerce to become involved in the communication network between the citizens of the local community and the National Guard.

RESPONSE: The recently implemented Camp Grayling Community Council monitors, investigates, and reports civilian complaints, environmental violations, and compliance with Federal and State statutory and regulatory requirements. The Council will work with all interested parties to minimize potential conflicts and resolve problems. This council may serve as an effective mechanism for involvement of the Chamber.

Transcript No. 3 **Comment No. 15**

ISSUE: The commentor questions what the legal minimum altitude is for troop transport planes flying over the Higgins Lake area.

RESPONSE: National Guard aircraft are permitted to fly as low as 500 feet above ground level in the Higgins Lake area.

Transcript No. 3 **Comment No. 16**

ISSUE: The commentor states that the ecology of the Camp Grayling area cannot survive under the impact of an expansion program.

RESPONSE: None of the remaining proposed projects result in expansion at the post. The DMA has established an ecological baseline and ecological monitoring program with the initiation of the Army's Land Condition Trend Analysis (LCTA) program in FY91. This program is addressed in more detail in Chapters 3 and 4 of the Final EIS. The LCTA program provides a quantitative ecological baseline and identifies portions of the installation which may be overused by military or non-military activities. The DMA has made a commitment to identify and restore areas subject to overuse, as discussed in response to Comment No. 7 of Document No. 4.

Transcript No. 3 **Comment No. 17**

ISSUE: The commentor expresses the opinion that measures for ensuring DMA compliance with the terms of their lease agreements need to be specified.

RESPONSE: This issue is addressed in response to Comment No. 8 of Transcript No. 3.

Transcript No. 3 **Comment No. 18**

ISSUE: The commentor questions what actions have been taken by the DMA to mitigate helicopters over the AuSable River, troops coming down the stream in rafts, night bombings, and night use of flares.

RESPONSE: All helicopter pilots receive a briefing which includes instructions directing them not to fly directly over area streams at altitudes below 1,000 feet. Range regulations prohibit rafting operations on the Manistee and Au Sable Rivers or their tributaries. Refer to Comment No. 8 of Document No. 4 and Comment No. 17 of Document No. 4.

Transcript No. 3 **Comment No. 19**

ISSUE: The commentor states concerns that clearing related to the proposed Master Plan projects will increase groundwater temperatures, which will in turn increase temperatures of area streams and prevent good fishing. He states the clearing related to the proposed Master Plan projects will increase siltation to rivers and lower ground water and stream levels.

RESPONSE: Ground water and stream temperatures and stream levels will not be affected by the minimal clearing related to the proposed projects. The MPRC is well removed from streams and have been inspected for wetlands/waterbodies.

Clearing related to the MPRC-H-R includes cutting of firing lanes within 350 acres of forested areas. The affected acreages of the MATES vhicle storage buildings and Bulk Fuel Facility are small and located in different portions of the installation. All clearing contracts will be coordinated with the DNR. All construction contracts will include a requirement for preparation of a site-specific erosion/sedimentation control plan although none of the projects are close to waterbodies.

Transcript No. 3 **Comment No. 20**

ISSUE: The commentor states the samples taken as part of the AEHA preliminary water quality engineering study for Range 40 were not taken from inside the Range 40 boundary. He also states that the water samples were not taken properly.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 3 **Comment No. 21**

ISSUE: The commentor states the existing lease agreements do not permit the type and extent of training currently being conducted by the DMA or the construction of buildings and other long-term capital improvements.

RESPONSE: This issue is addressed in response to Comment No. 2 of Document No. 7.

Transcript No. 3 **Comment No. 22**

ISSUE: The commentor states that the DMA is in violation of the Federal Solid Waste Disposal Act.

RESPONSE: Solid waste disposal at Camp Grayling is regulated under the Michigan Solid Waste Management Act (PA 641). This issue is addressed in response to Document No. 4 Comment No. 12.

Transcript No. 3 **Comment No. 23**

ISSUE: The commentor questions why an environmental impact study was not conducted in association with the 20-year lease agreement signed in 1984, affecting approximately 20,000 acres of Kalkaska County.

RESPONSE: The DNR had authority to enter into the 20-year lease agreement with the DMA without preparing an EIS. The DMA and DNR have since determined that any future lease agreements will involve public notice.

Transcript No. 3 **Comment No. 24**

ISSUE: The commentor questions how the military can train on lands where bald eagles have been sighted.

RESPONSE: The Threatened and Endangered Species Act protects "critical" habitat for listed species. Nest sites are considered critical habitat for bald eagles. Bald eagles can be seen in many locations during migration and feeding. However, the bald eagle nesting sites are the focus of the Eagle Management Guidelines. Areas where bald eagles are sighted are not necessarily nesting sites. All eagle nests (active or inactive) located on or near the Camp are monitored annually by the DNR and Camp Grayling Environmental staff and if occupied are protected as required by Eagle Management Guidelines, DNR, and U.S. Fish and Wildlife Service.

Transcript No. 3 **Comment No. 25**

ISSUE: The commentor questions why the DMA has not undertaken fugitive dust control on South Sharon Road in Kalkaska County.

RESPONSE: The issue of fugitive dust relative to training activities at Camp Grayling is discussed in response to Comment No. 9 of Document No. 1. If a significant fugitive dust problem attributable to training occurs at Camp Grayling and the Camp is duly notified, the problem will be addressed. If not, a complaint should be filed requesting an explanation for the lack of responsiveness.

Transcript No. 3 **Comment No. 26**

ISSUE: The commentor is concerned that an aircraft accident (at the proposed Assault Landing Strip) would contaminate the Manistee River.

RESPONSE: The Assault Landing Strip project has been cancelled.

Transcript No. 3 **Comment No. 27**

ISSUE: The commentor is concerned that artillery will be fired at the proposed MPRC which will pass over KP Lake and pose health and safety issues.

RESPONSE: No artillery firing exercises will be conducted on or in relation to the proposed MPRC-H-R.

Transcript No. 3 **Comment No. 28**

ISSUE: The commentor states the EIS should address the quality of life in the Grayling region in terms of crime, property taxes, and tax base.

RESPONSE: Police demands relative to Camp Grayling are discussed in response to Comment No. 17 of Document No. 4. Property value is addressed in response to Comment No. 18 of Document No. 7. The economic effect of Camp Grayling is considered in Section 4.4 of the EIS.

Transcript No. 3 **Comments No. 29 and 30**

ISSUE: The commentor states that the EIS should include a much more detailed evaluation of baseline soils, vegetation, and wildlife conditions, especially with respect to the effects of heavy tracked vehicles upon vegetation and the effects of winter disturbance on wildlife already stressed by cold weather conditions.

RESPONSE: The effect of cold weather training on soils, vegetation, and wildlife is discussed in response to Comment No. 7 of Document No. 4. However, the proposal to increase winter training is no longer being considered. The use of the Army's Land Condition-Trend Analysis Program to establish an ecologic baseline for the installation is discussed in response to Comment No. 22 of Document No. 1.

Transcript No. 3 **Comment No. 31**

ISSUE: The commentor states that the Draft EIS does not sufficiently address the effects of cold weather training on recreation activities.

RESPONSE: The issue of winter training effects upon recreation is addressed in response to Comment No. 7 of Document No. 4. However, the proposal to increase winter training is no longer being considered.

Transcript No. 3 **Comment No. 32**

ISSUE: The commentor questions whether the railroad spur (Action C12 - ASP/LSF Railroad) will be built through the middle of wetlands and if a study has been conducted to assess the environmental impact to these wetlands. The commentor also questions

what the content of the railroad cars would be and if adequate contingency plans have been developed for potential accidents releasing the contents.

RESPONSE: The ASP/LSF Railroad project has been cancelled.

Transcript No. 3 **Comment No. 33**

ISSUE: The commentor questions how the Kirtland's Warbler Management Plan will be administered to protect warbler nesting areas within the installation from on-going training activities, particularly in the area south of KP Lake.

RESPONSE: The DNR Director's Closure Orders designate areas of the installation which are to be posted and protected to prevent disturbance of Kirtland's warbler nests between May and September of each year. An annual spring census is conducted to establish areas which require protection for that year. The exact location of these areas may change on an annual basis. If a specific area appears to have matured beyond the types of habitat suitable for warblers and has been unused for three years, it is no longer considered active Kirtland's warbler habitat and is no longer subject to closure (see response to Comment No. 4 of Document No. 1).

Transcript No. 3 **Comment No. 34**

ISSUE: The commentor states that a quantitative assessment, including economic aspects, should be conducted for off-site alternatives to the proposed Master Plan projects.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7.

Transcript No. 3 **Comment No. 35**

ISSUE: The commentor states that the lease of 1948, renewed in 1978, includes restrictions which preclude permanent building and improvements, and that construction of the proposed Master Plan projects is in violation of existing leases.

RESPONSE: This issue is addressed in Comment No. 2 of Document No. 7.

Transcript No. 3 **Comment No. 36**

ISSUE: The commentor states that there should be an assessment of the noise effects on population and animal behavior relative to training at Camp Grayling.

RESPONSE: This issue is addressed in response to Comment No. 7 of Document No. 4. The effects of noise in relation to the MPRC-H-R are addressed in response to Comments No. 1 through 4 of Document No. 1 and Comment No. 8 of Document No. 4.

Transcript No. 3 **Comment No. 37**

ISSUE: The commentor questions what the effects of impact area explosions are on air quality, specifically, what chemicals are released and what is the fate of these chemicals and their toxicological implications.

RESPONSE: This issue is addressed in response to Comment No. 10 and 11 of Document No. 4.

Transcript No. 3 **Comment No. 38**

ISSUE: The commentor questions where the results of the noise studies conducted by the Army Environmental Hygiene Agency (1982 to 1984) and the Army Engineering Research Lab (1985), as well as measurements by the DMA, are presented.

RESPONSE: Section 3.5.4 and 4.1.3 of the EIS discusses the Camp Grayling noise environment and summarizes the results of the recent study conducted at Camp Grayling. The 1984 study is included in Appendix J of the Draft EIS. Additional discussion related to the impacts of the existing noise environment is presented in response to Comment No. 7 of Document No. 4.

Transcript No. 3 **Comment No. 39**

ISSUE: The commentor states that the military will be likely to fully utilize the winter housing available for another 4,000 people, causing a significant increase in the annual training utilization of Camp Grayling, and that this action contradicts the military's statement that training levels will not significantly increase.

RESPONSE: This project is no longer being considered.

Transcript No. 3 **Comment No. 40**

ISSUE: The commentor states that a forum which provides for a civilian responsibility in the gathering and assessment of information related to the expansion of military operations at Camp Grayling needs to be provided and that this civilian body must have the power to ensure its views are considered in the decision-making process.

RESPONSE: The Camp Grayling Community Council has been initiated to serve this purpose.

Transcript No. 3 **Comment No. 41**

ISSUE: The commentor states that the DMA has been slow in implementing the recommendations of the Camp Grayling Management Advisory Committee.

RESPONSE: The Camp Grayling Management Advisory Committee recommendations and a schedule for DMA implementation are located in the 1989 DEIS and are also available from DMA. The DMA is on or ahead of schedule in its responses to the Committee's recommendations (see response to Comment No. 7 of Document No. 7).

Transcript No. 3 **Comment No. 42**

ISSUE: The commentor states concern regarding effects of the proposed Master Plan action on the Kirtland's warbler and bald eagle.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 1.

Transcript No. 3 **Comment No. 43**

ISSUE: The commentor questions what the effects of Camp Grayling will be on future fishing in the Camp Grayling area.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 3.

Transcript No. 3 **Comment No. 44**

ISSUE: The commentor questions what actions will be taken to reduce the effects of noise related to 500-pound bomb drops on the air-to-ground range.

RESPONSE: The proposed Master Plan actions will have no effect upon operations at the existing air-to-ground range. Actions taken by the DMA to reduce the noise effects related to 500-pound bomb drops at the air-to-ground range are described in response to Comment No. 8 of Document No. 4.

Transcript No. 3 **Comment No. 45**

ISSUE: The commentor questions what the existing procedures are for recording, processing, and reviewing noise complaints.

RESPONSE: The DMA has established a telephone hotline for citizen complaints. Documentation for each complaint includes date and time of complaint, name, address, and phone number of complainant, detailed information regarding the complaint, action taken to resolve the complaint (including date, time, and staff assigned), and response to the complaint (including date and complainants evaluation of resolution). Noise complaints are recorded on Army-approved forms and entered into a microcomputer complaint data system. This microcomputer data system allows data to be sorted according to location and cause. Annual reports are prepared and kept on record.

Transcript No. 3 **Comment No. 46**

ISSUE: The commentor states that the data presented in the Draft EIS indicate a doubling of troop utilization levels about every seven years and that the development of the MPRC and the Assault Landing Strip will lead to increased year-round use of the installation, and possibly even ,greater increases than the future annual utilization projections for the installation.

RESPONSE: This issue is addressed in response to Comment No. 4 of Document No. 7. However, the Assault Landing Strip project has been cancelled.

Transcript No. 3 **Comment No. 47**

ISSUE: The commentor states concern that the development of the proposed Master Plan projects will force training to occur during the gun deer season in November.

RESPONSE: Camp Grayling has traditionally suspended training during the gun deer season and will continue to do so.

Transcript No. 3 **Comment No. 48**

ISSUE: The commentor states the Draft EIS should address the relocation of the Master projects at locations in other states.

RESPONSE: This issue is addressed in response to Comment No. 19 of Document No. 7.

Transcript No. 3 **Comment No. 49**

ISSUE: The commentor states that the Draft EIS does not define site-specific mitigation plans for each individual action.

RESPONSE: Site-specific mitigations for threatened and endangered species concerns related to MPRC and Assault Landing Strip development are outlined in the U.S. Fish and Wildlife Biological Opinion in Appendix I. However, the Assault Landing Strip project has been cancelled. Specific noise mitigations are outlined in response to Comment No. 8 of Document No. 4. Site-specific inspections for wetlands are discussed in response to Comment No. 21 of Document No. 1.

The EIS cites applicable regulations and permits/approvals needed for implementation of each proposed Master Plan project. Detailed site-specific mitigations require detailed site-specific plans which are normally unavailable at the EIS stage of project review. Specific mitigations are normally addressed as permitting issues. Permits required for the proposed Master Plan projects are discussed in response to Comment No. 5 of Document No. 16.

Transcript No. 3 **Comment No. 50**

ISSUE: The commentor states that Figure 4-3.1c of the Draft EIS, which shows annual noise contours for the air-to-ground range aircraft activities, is incorrect and does not accurately represent noise underneath the flight paths.

RESPONSE: Your comment is noted. The annual noise contours for air-to-ground range aircraft activities shown on Figure 4-3.1c of the Draft EIS were developed from site-specific aircraft operation patterns, power settings, and actual site utilization information using a state-of-the-art computer simulation model.

Transcript No. 3 **Comment No. 51**

ISSUE: The commentor states that the Camp Grayling staff has informed her that the installation has no (direct) control over aircraft utilizing the air-to-ground range. The commentor states that the pilots are out of control and harassing the public.

RESPONSE: When performing tactical maneuvers at the Camp Grayling Air-to-Ground Range, the aircraft are "in control" of the Camp Grayling Air-to-Ground Range control tower staff. However, the ultimate authority over designating flight paths and determining activity schedules is the Adjutant General. His representative at the installation, the Camp Commander, is empowered to identify, stop, and document all violations of Camp Grayling training regulations for appropriate action.

Transcript No. 3 **Comment No. 52**

ISSUE: The commentor states concern that the artillery rounds (and possibly tank rounds) fired within the MPRC will fall outside the range safety fan and be a public safety concern.

RESPONSE: No artillery will be fired at the MPRC-H-R. Whereas artillery rounds may be propelled by a varying number of propellant charges, tank rounds are propelled by fixed charges. The safety fan established for the MPRC-H-R reflects the maximum distance possible for tank rounds to travel.

Transcript No. 3 **Comment No. 53**

ISSUE: The commentor states that the EIS noise contours (Air-to-Ground Range) do not accurately express the noise conditions associated with low-level fighter plane overpasses in off-post locations.

RESPONSE: This issue is addressed in response to Comment No. 50 of Transcript No. 3.

Transcript No. 3 **Comment No. 54**

ISSUE: The commentor states that tests for soil and groundwater contamination should be conducted within the Range 40 complex as part of the DMA Range 40 Water Quality Study.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4 and Section 3.9.2 in the EIS.

Transcript No. 3 **Comment No. 55**

ISSUE: The commentor states that the EIS does not consider the long-range economic effects of environmental damage related to military training at Camp Grayling which may eventually cause irreparable damage to the Manistee and AuSable River watersheds.

RESPONSE: DMA is currently involved in continuing efforts to determine the potential effects of training on the Manistee and Au Sable Rivers and other water resources (See Section 3.9.2). Mitigation measures and restoration efforts regarding stream resources are addressed in response to Comment No. 28 of Document No. 1. Currently available fishery information indicates that stream restoration efforts are successful and that trout populations are the highest they have been since 1988 (see Section 3.6.2.5) which increases the economic value of the fishery. At this time results from the various studies conducted on and around the installation indicate that there is no "irreparable" damage to fisheries.

Transcript No. 3 **Comment No. 56**

ISSUE: The commentor questions whether the comments made as part of the public hearing will be expressed to the Governor, DNR, or the federal decision-makers.

RESPONSE: The comments made as part of the EIS public hearings have been transcribed and included in the Final EIS, which will be submitted to the Governor, DNR, and various Federal agencies, including those parties identified in the distribution list in Section 7 of the EIS.

Transcript No. 3 **Comment No. 57**

ISSUE: The commentor states the Draft EIS does not provide detailed information regarding the Assault Landing Strip operations, including the gallons of fuel and size of fuel storage tanks and exact number of aircraft utilizing the facility.

RESPONSE: The Assault landing Strip project has been cancelled.

Transcript No. 3 **Comment No. 58**

ISSUE: The commentor states that the bridge recently constructed over the Manistee River by the DMA was deliberately oversized and asks what Assault Landing Strip operations this improvement was conducted to support.

RESPONSE: This issue is addressed in response to Comment No. 52 of Transcript No. 2. However, the Assault Landing Strip project has been cancelled.

Transcript No. 3 **Comment No. 59**

ISSUE: The commentor questions whether new areas will be fenced off or contaminated with unexploded ordnance as a result of implementation of the proposed Master Plan actions.

RESPONSE: This issue is addressed in response to Comment No. 36 of Document No. 16 and Comment No. 61 of Transcript No. 1.

Transcript No. 3 **Comment No. 60**

ISSUE: The commentor questions what steps are being taken by the DMA to reduce the of conflicts between recreationists and troops conducting military training.

RESPONSE: One of the major findings of the Camp Grayling Management Advisory Committee was that steps need to be taken to improve the communications between the public/recreationists and the military. Many of the actions the DMA has recently committed to implementing, address the issue identified above.

A Civilian Community Council has been implemented to monitor, investigate, and report civilian complaints and regulatory issues, whereupon the Council will work with all interested parties to minimize potential conflicts and resolve problems.

The DMA has also committed to expand its public notification program by utilizing local media to identify any public lands being closed for military purposes. Maps will be prepared designating restricted areas and notices of restrictions to recreational use will be provided on all major access roads which are subject to closure due to training. The DMA has developed a major training agreement for signature by all units training at Camp Grayling that includes conditions of use for training hours and noise control, and establishes effective disciplinary measures for military and civilian infractions committed by visiting soldiers.

The DMA has agreed to review its rules regarding its reporting and claim procedures for trespassing and accidental incursions onto private property and associated damage, and to strengthen them (if necessary). The DMA has established a reporting hotline to be used for citizen complaints with a reporting system that includes the Camp Grayling Community Council.

Transcript No. 3 **Comment No. 61**

ISSUE: The commentor states that the DMA has not adequately investigated contamination associated with Range 13 - Mortar Range, Range 30 - Tank Range, and Range 40 - Artillery, Mortar, and Air-to-Ground Range. With the respect to the potential water, soil, and air contamination related to the operation of these facilities, he states that the study results are meaningless because sampling within the actual Range 40 area was not conducted.

RESPONSE: This issue is addressed in response to Comment No. 10 of Document No. 4.

Transcript No. 3 **Comment No. 62**

ISSUE: The commentor states that the air emissions released as a result of burning excess propellant bags are not addressed in the EIS.

RESPONSE: Open burning of excess propellant bags no longer occurs. This issue is addressed in response to Comment No. 11 of Document No. 4.

Transcript No. 3 **Comment No. 63**

ISSUE: The commentor states the DMA has failed to address the proper disposal of high explosive materials within the Range 40 impact area.

RESPONSE: This issue is addressed in response to Comment No. 11 of Document No. 4.

Transcript No. 3 **Comment No. 64**

ISSUE: The commentor states that the fish analysis procedures conducted as part of the Range 40 Water Quality Engineering Study were improper for the types of testing related to bioaccumulated materials analyses.

RESPONSE: The information generated from the AEHA study has been superseded by a much more extensive assessment conducted in 1992. The results of this Range 40 study by ESE are summarized in section 3.9.2. Also refer to the response to Comment No. 10 of Document No. 4.

Transcript No. 3 **Comment No. 65**

ISSUE: The commentor states that local residents are concerned about groundwater contamination and feel that a study should be conducted which evaluates private wells in the area.

RESPONSE: Further sampling to be conducted by the DMA is described in response to Comment No. 10 of Document No. 4.

Transcript No. 3 **Comment No. 66**

ISSUE: The commentor states that since the public is not allowed to use lead shot in wetland areas due to the danger of contamination for waterfowl, that the DMA Small Arms Range which contains portions of Bear Swamp within its firing safety fan likely poses contamination problems for waterfowl in Bear Swamp and should be investigated.

RESPONSE: DMA has completed the construction of protective berms behind Ranges 18 and 19 to prevent bullets from entering wetlands and to provide increased safety. Protective berms are planned to be installed behind Ranges 7, 8, and 9 during 1994.

Transcript No. 3 **Comment No. 67**

ISSUE: The commentor questions how many papers the announcement for the July 22 pubic hearing was noticed in.

RESPONSE: The July 22 public hearing at the Grayling High School in Grayling, Michigan was noticed in the Grayling, Gaylord, and Kalkaska papers (see response to Comment No. 12 of Document No. 11).

Transcript No. 3 **Comment No. 68**

ISSUE: The commentor states that the Draft EIS does not adequately address economic issues and further study is required.

RESPONSE: This issue is addressed in response to Comment No. 18 of Document No. 7.

Transcript No. 3 **Comment No. 69**

ISSUE: The commentor questions why an environmental impact study was not conducted prior to the 20-year lease agreement involving the 20,000 acres of Kalkaska County.

RESPONSE: The DNR at that time had regulatory authority to enter into the 20-year lease agreement with the DMA without preparing an EIS.