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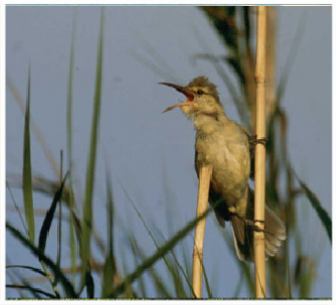
ENVIRONMENTAL IMPACT STATEMENT

FOR

DIVERT ACTIVITIES AND EXERCISES,

GUAM AND COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS









Headquarters, Pacific Air Forces

Joint Base Pearl Harbor-Hickam, Hawai'i

JUNE 2012

Report Documentation Page

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14. ABSTRACT

The USAF proposes to improve an existing airport or airports and associated infrastructure in support of expanding mission requirements in the western Pacific.

15. SUBJECT TERMS

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Privacy Advisory

Public comments on this Draft EIS are requested pursuant to the National Environmental Policy Act (42 U.S.C. 4321 et seq.). All comments received during the comment period will be made available to the public and considered during Final EIS preparation. The provision of private address information with your comment is voluntary. However, this information is used to compile the mailing list for Final EIS distribution, and failure to provide such information will result in your name not being included on the list. Private address information will not be released for any other purpose unless required by law.

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COVER SHEET

ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED DIVERT ACTIVITIES AND EXERCISES, GUAM AND COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI)

Responsible Agencies: **Lead Agency -** U.S. Air Force (USAF)
Cooperating Agencies - U.S. Navy, U.S. Marine Corps (USMC), Federal Aviation Administration (FAA).

Affected Location: Mariana Islands Region.

Proposed Action: The USAF proposes to improve an existing airport or airports and associated infrastructure in the Mariana Islands in support of expanding mission requirements and to achieve divert capabilities in the western Pacific.

Report Designation: Draft Environmental Impact Statement (EIS)

Abstract: The USAF proposes to improve an existing airport or airports and associated infrastructure in support of expanding mission requirements in the western Pacific. Under this action, the USAF proposes to construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for divert landings, periodic exercises, and humanitarian assistance and disaster relief. Unplanned divert landings and humanitarian assistance and disaster relief would occur at the airport or airports proposed for improvements as required. The purpose of the Proposed Action is to establish additional divert capabilities to support and conduct current, emerging, and future training activities, while ensuring the capability to meet mission requirements in the event that access to Andersen Air Force Base (AFB) or other western Pacific locations is limited or denied. The Proposed Action is needed because there is not an existing divert or contingency airfield on U.S. territory in the western Pacific that is designed and designated to provide strategic operational and exercise capabilities for U.S. forces when needed and humanitarian airlift and disaster relief in times of natural or man-made disasters.

The USAF has determined that an EIS is required for this proposal. The EIS was prepared pursuant to the Council on Environmental Quality (CEQ) Regulations (Title 40, Code of Federal Regulations [CFR] Parts 1500–1508) for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) and USAF Procedures for Implementing NEPA (32 CFR Part 989). According to the CEQ regulations, the purpose of an EIS "is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the federal government. It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

Topics considered in the impacts analysis are those determined, through both the internal and public scoping processes, to be relevant to the Proposed Action, and include noise; air quality; airspace management and airport operations, and bird/wildlife aircraft strike hazard; geological resources and soils; water resources; terrestrial biological resources; marine biological resources; cultural resources; recreation; land use; transportation; hazardous materials and waste management; infrastructure and utilities; socioeconomics and environmental justice; and human health and safety.

The Draft EIS was made available to the public for a 45-day public review and comment period calculated from the publication date of the Notice of Availability in the Federal Register. Comments received from the public and agencies will be considered in preparing the Final EIS, and responded to as appropriate.

Inquiries regarding this document should be sent to Capt. Rebecca Heyse, PACAF/PA, 25 E Street, Suite G-108, Joint Base Pearl Harbor-Hickam, HI 96853, ATTN: PACAF Divert Marianas EIS.

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ENVIRONMENTAL IMPACT STATEMENT
FOR
DIVERT ACTIVITIES AND EXERCISES

GUAM AND COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI)

HEADQUARTERS PACIFIC AIR FORCES (PACAF)
JOINT BASE PEARL HARBOR-HICKAM, HAWAI'I 96853-5233

JUNE 2012

Executive Summary

ES 1. Introduction

The U.S. Air Force (USAF) seeks to improve an existing airport or airports in the Mariana Islands in proximity to the Philippine Sea in support of expanding U.S. strategic interests and Department of Defense (DOD) mission requirements in the western Pacific. The U.S. territories of Guam and Commonwealth of the Northern Mariana Islands (CNMI) (including Saipan, Rota, and Tinian) are located to the east of the Philippine Sea (see **Figure ES-1**) and make up the southern portion of the Mariana Islands. The Philippine Sea is a section of the western North Pacific Ocean, located east and north of the Philippines. Pacific Air Forces (PACAF) is a USAF major command (MAJCOM), and is headquartered at Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i. PACAF is designated by the USAF as the executive agent to develop this Environmental Impact Statement (EIS).

The lead agency for this EIS is the Department of the Air Force. The EIS was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] Section [§] 4321 et seq.); the Council on Environmental Quality [CEQ] Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] §§ 1500–1508). Cooperating agencies include the U.S. Navy, U.S. Marine Corps (USMC), and the Federal Aviation Administration (FAA). As cooperating agencies, PACAF coordinates with the U.S. Navy, USMC, and FAA throughout the EIS development process. Additionally, FAA must approve the airport layout plan (ALP) before the proposed action can be implemented.

The 2012 DOD Strategic Guidance places increased emphasis on the Asia-Pacific region (DOD 2012). Relationships with Asian allies and key partners are critical to the future stability and growth of this region to maintain regional access and the ability to operate freely. PACAF's primary mission is to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war (PACAF undated b). PACAF maintains a forward presence to help ensure stability in the region (PACAF undated b). In order to successfully fulfill its mission in the region, PACAF must continually anticipate future needs and adapt to an ever-evolving geopolitical setting.

The area of focus for potential implementation of the Proposed Action is the Mariana Islands Archipelago (see **Figure ES-1**). For the purposes of this EIS, the Study Area includes existing airports in the Marianas region, existing seaports, and surrounding areas including easements or routes needed to transport petroleum products. The Mariana Islands Archipelago straddles the Pacific Ocean and the Philippine Sea and hosts the U.S. military's westernmost training complex on U.S. soil, the Mariana Islands Range Complex (MIRC). The MIRC consists of special use airspace (SUA), the Farrallon de Medinilla (FDM) live-fire bombing range, and other land training areas. The MIRC includes land ranges and training areas and facilities on Guam, Rota, Tinian, and Saipan, and encompasses 85 square miles (mi^2) (220 square kilometers [km^2]) of land. SUA consisting of Warning Area 517 (W-517), restricted airspace over FDM (R-7201), and Air Traffic Control Assigned Airspace (ATCAA) encompass 63,000 square nautical miles (NM^2) (216,000 km^2) of airspace. Not within, but to the north and east of the Study Area, are portions of the Marianas Trench Marine National Monument, which was established in January 2009 by Presidential Proclamation under the authority of the Antiquities Act (16 U.S.C. 431).

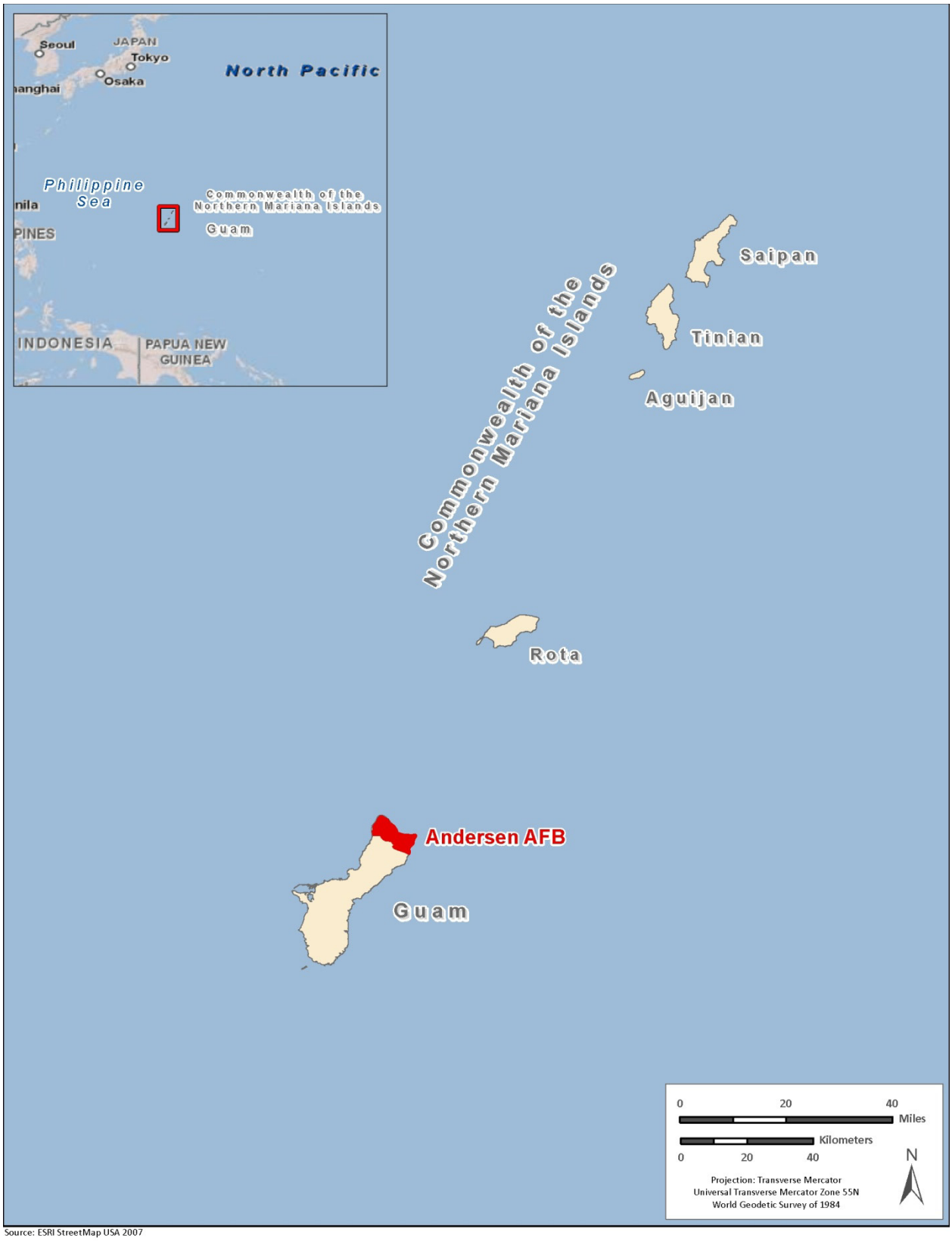


Figure ES 1. Location of the Philippine Sea, Guam, and CNMI Region

ES 2. Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to establish additional divert capabilities to support and conduct current, emerging, and future exercises, while ensuring the capability to meet mission requirements in the event that access to Andersen Air Force Base (AFB) or other western Pacific locations is limited or denied. For example, the need for humanitarian assistance can arise suddenly and without warning, such as disaster response to Japan during the 2011 earthquake and tsunami. If this were to occur during scheduled training exercises at Andersen AFB, then either training or response efforts might be delayed or impeded. Furthermore, natural or man-made disasters could impact Andersen AFB's missions, requiring reliance on designed and designated divert airfield capabilities. Because of the proximity to forward-deployed forces in the western Pacific, the Marianas provides the best economic alternative for forward-deployed U.S. forces to train on U.S. lands and to develop the proposed additional divert capabilities.

The Proposed Action would develop critical enhancements to an existing airport or airports and associated infrastructure in the Marianas to increase operational and divert capabilities needed by the USAF, especially in humanitarian relief and joint exercises. These enhancements are required if the USAF is to maintain a state of military readiness commensurate with the national defense and humanitarian relief missions.

The Proposed Action is driven by the USAF need to achieve its mission mandated by Title 10 U.S.C. § 8062 in the event of a disruption of operational capabilities at Andersen AFB or other western Pacific locations. The need for the Proposed Action is derived from the following operational requirements that are necessary to successfully support the PACAF mission:

- Ensure airfield accessibility if access to Andersen AFB or other western Pacific airfields is limited or denied
- Provide for contingency operations to include humanitarian relief efforts
- Accommodate future increases in operational tempo and associated training
- Achieve and sustain readiness.

In summary, the Proposed Action is needed because there is not an existing divert or contingency airfield on U.S. territory in the western Pacific that is designed and designated to provide strategic operational and exercise capabilities for U.S. forces when needed and humanitarian airlift and disaster relief in times of natural or man-made disasters. Implementation of the Proposed Action would support the PACAF mission to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war.

ES 3. Scope and Content of the EIS

ES 3.1 NEPA

This EIS provides an analysis of environmental effects associated with the proposed action. The following summarizes the formal NEPA process followed by the USAF for this proposal and opportunities for public involvement and input into the EIS process:

Pre-Notice of Intent Briefings. Prior to issuing the Notice of Intent (NOI) that formally started the EIS process, PACAF and U.S. Pacific Fleet, representing the cooperating agency the U.S. Navy, provided pre-NOI briefings to senior-level stakeholders in Guam and CNMI concerning this and other ongoing

military-sponsored environmental impact studies in the region. The briefing team conducted pre-NOI briefings and question and answer sessions to provide early information about the Proposed Action and alternatives to regional political leadership. The pre-NOI briefings included briefings in Guam to the Guam legislature and Governor's office and to the office of the Guam Congressional Delegate. Briefings in Saipan, CNMI, were presented to the Military Integration Management Committee (MIMC) (which consists of the Governor; members of Legislature; and Mayors of Tinian, Rota and Saipan) and to the office of the CNMI Congressional Delegate. One briefing was presented in Honolulu, Hawai'i, to the USFWS.

Scoping. Formal public scoping began with the issuance of an NOI in the *Federal Register* on September 27, 2011. PACAF also issued notices in local media on September 28, October 3, October 10, October 11, October 12, October 14, October 17, and October 18, 2011, that announced schedules and locations for public scoping meetings. PACAF welcomed public comments on the Proposed Action and alternatives during the open public scoping period, which began with publication of the NOI. Comments were accepted at two public scoping meetings in Guam, one public scoping meeting in Saipan, one public scoping meeting in Tinian, and one public scoping meeting in Rota. Comments were also accepted via the project Web site (http://www.PACAFDivertMarianasEIS.com), postal service, and telephone recording system. Once the scoping period was completed, the scoping comments received were summarized in a scoping comment report, and comments were considered during the development of the Draft EIS.

Post-NOI Briefings. During the public scoping period, PACAF project team members provided post-NOI briefings to senior-level stakeholders in Guam and CNMI. The briefings were an updated and expanded version of the pre-NOI briefings, and were offered to a wider audience of stakeholders. The purpose of the briefings was to provide ongoing communication with local stakeholders, and to inform the stakeholders of up-to-date information regarding the Proposed Action and alternatives. The post-NOI briefings were conducted to coincide with public scoping meetings.

Draft EIS Public Review. This Draft EIS is the first public version of the EIS. This Draft EIS was distributed to selected Federal, state, territory, commonwealth, regional, and local agencies; private citizens; and organizations that requested copies. The Draft EIS was also made available at 10 different information repositories and on the project Web site (http://www.PACAFDivertMarianasEIS.com). USAF provided a 45-day public review period for the Draft EIS (40 CFR 1506.10). The public review period was initiated through the publication of a Notice of Availability (NOA) in the *Federal Register* on June 8, 2012, and was also advertised in local media. The USAF requested public input on the Draft EIS, including the Proposed Action, potential environmental impacts, and alternatives for the Proposed Action. Comments on the Draft EIS were accepted at the public hearings, on the project Web site (http://www.PACAFDivertMarianasEIS.com), via postal service, or via telephone recording system. Details about how to make comments were advertised in notices published in local media. Comments received on the Draft EIS during the 45-day public review period will be considered in preparation of the Final EIS and responded to appropriately.

Post-NOA Briefings. During the public review period for the Draft EIS, PACAF project team members will provide post-NOA briefings to senior-level stakeholders in Guam and CNMI. The briefings will be an updated version of the post-NOI briefings, and will be offered to an audience of stakeholders within the region of the Proposed Action and affiliated with the alternative locations. The purpose of the briefings is to provide ongoing communication with local stakeholders, and to inform the stakeholders of up-to-date information regarding the Proposed Action and alternatives. The post-NOA briefings will be conducted to coincide with public hearings.

Final EIS and Record of Decision Public Review. Prior to implementing any proposed action described in the EIS, a FEIS NOA will be issued in the *Federal Register*. USAF will issue A Record of Decision (ROD) no sooner than 30 days after the NOA for the FEIS has been released. Public outreach efforts will include issuance of an NOA of the Final EIS in the *Federal Register*, advertising the NOA in local newspapers, mailing a notice to individuals and groups that commented on the Draft EIS, and posting notification on the project Web site. The signed ROD will be posted on the project Web site. An NOA for the ROD will also be published in the *Federal Register* and local newspapers.

ES 3.2 Other Environmental Requirements Considered

The USAF must comply with a variety of other Federal environmental requirements. These include (among other applicable laws and regulations) the following:

- Marine Mammal Protection Act (MMPA)
- Endangered Species Act (ESA)
- Migratory Bird Treaty Act (MBTA)
- Coastal Zone Management Act (CZMA)
- Clean Air Act (CAA)
- Federal Water Pollution Control Act (Clean Water Act [CWA])
- National Historic Preservation Act (NHPA)
- Resource Conservation and Recovery Act (RCRA)
- Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045, Environmental Health and Safety Risks to Children
- EO 13112, Invasive Species.

In addition, laws and regulations of the CNMI that are applicable to military actions are identified and addressed in this EIS.

ES 4. Description of the Proposed Action and Alternatives

ES 4.1 Proposed Action

The Proposed Action is to improve an existing airport or airports and associated infrastructure in support of expanding mission requirements in the western Pacific. Under this action, the USAF proposes to construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for divert landings, periodic exercises, and humanitarian assistance and disaster relief. Unplanned divert landings and humanitarian assistance and disaster relief would occur at the airport or airports proposed for improvements as required. Saipan International Airport (FAA airport code GSN) in Saipan and Tinian International Airport (FAA airport code TNI) in Tinian are being considered as alternatives for the Proposed Action. A summary of the Proposed Action is provided below.

Summary of the Proposed Action

1. ***Construction Phase***. The KC-135 Stratotanker (KC-135) aircraft is indicative of tanker or cargo aircraft used by the USAF in the western Pacific. The KC-135 aircraft is being used as the design aircraft for cargo and tanker aircraft in the EIS. The following elements would be designed and then constructed or improved at the selected airport or airports:

    a. *Runway* - Potential extension of the runway up to 10,000 feet in order to meet optimal KC-135 requirements as identified by PACAF Strategy, Policy and Requirements Division (A5U). Options that would expand the runway to less than 10,000 feet, or not at all, are also analyzed.

    b. *Parking apron* - The parking aprons at the airport selected for expansion would need to meet design requirements for KC-135 aircraft.

    c. *Associated pavement markings, lighting, and navigational aids* - All pavement markings, lighting, and navigational aids would be installed, upgraded, or relocated, as appropriate.

    d. *Temporary munitions storage area* - The temporary munitions storage area would mainly be used to store munitions safely from diverted aircraft until the aircraft could return to its place of origin, or proceed to its planned destination.

    e. *Hazardous cargo pad and arm/disarm pad* - The hazardous cargo pad would mainly be used to safely handle munitions or other hazardous cargo from diverted aircraft until the aircraft could return to its place of origin, or planned destination. The arm/disarm pad would be used to perform final safety checks on aircraft before takeoff by aircraft maintenance personnel. The arm/disarm pad would also be used to perform initial safety checks on aircraft after landing. The hazardous cargo pad could be designed and constructed to double as an arm/disarm pad.

    f. *Aircraft hangar* - The hangar would be a closed structure to store aircraft awaiting maintenance or being repaired.

    g. *Maintenance facility* - The maintenance facility would be used as an Aircraft Maintenance Unit/Aircraft Spares Management and for storage to assist aircraft at the proposed airfield.

    h. *Jet fuel receiving, storage, and distribution infrastructure* - USAF proposes to maintain a 30-day supply of jet fuel to be able to provide fuel to aircraft through a hydrant system. In order to maintain the 30-day supply of jet fuel, a combination of fuel tanks including bulk storage and smaller operating tanks would be required. The ability to receive jet fuel on the island and ability to transfer it to the airfield would also be required.

    i. *Billeting* - Temporary billeting, including medical, transportation, and dining services, would be required for the personnel supporting aircraft operations.

2. ***Implementation Phase.*** It is assumed that any mix of joint fighter, cargo, and tanker aircraft, not to exceed the design capabilities of the airport, could be diverted to or exercised from the airport or airports selected for improvements. KC-135s would remain the design aircraft for the implementation phase. The following activities would occur at the selected airport or airports:

    a. *Unscheduled/unplanned divert landings* - Unscheduled aircraft landings, also known as "divert" landings would occur; divert landings would occur at these airports if other locations in the western Pacific, for example Andersen AFB, are unavailable for landing, such as during emergencies or natural disasters.

b. *Unscheduled/unplanned humanitarian airlift staging* - Humanitarian airlift staging, including non-combatant evacuation operation (NEOs), would also occur at the airport or airports proposed for improvements in the event of an emergency or disaster.

c. *Military exercises* - A limited number of scheduled joint, combined, and unit-level military training activities and exercises, as described and analyzed in the MIRC EIS, for which a ROD was issued on July 20, 2010, would occur (DON 2010 a). Both unit-level training and joint military exercises would each take place annually for a maximum combined total of 60 days per year at the airport or airports selected for improvements. This EIS addresses only the ground movements and immediate approaches and departures at the airport or airports selected for improvement (e.g., take-offs and landings) during unit-level training and exercises. Actual air warfare and air logistics training (i.e., above 10,000 feet) are addressed by the MIRC EIS, for which a ROD was issued on July 20, 2010 (DON 2010a). Copies of the MIRC EIS can be reviewed at http://www.PACAFDivertMarianasEIS.com.

d. *Jet fuel receiving, storage, and distribution* - A fuel delivery system, jet fuel storage, and means of fuel resupply would be required for the airport or airports selected for improvements. The ability to store fuel and transfer fuel from the receiving port to the airfield would also occur.

e. *Billeting* - Temporary billeting, including medical, transportation, and dining services, would be required for the personnel supporting aircraft operations.

ES 4.2 Evaluation and Selection of Alternatives

Considering alternatives helps to avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be suitable for decisionmaking, capable of implementation, and sufficiently satisfactory with respect to meeting the purpose of and need for the action. CEQ regulations define reasonable alternatives as those that are economically and technically feasible, and that show evidence of common sense. During the scoping process for this EIS, PACAF considered several existing FAA-regulated airports in the Marianas for developments and improvements to meet expanding mission requirements in the western Pacific. GSN, Saipan; TNI, Tinian; and Rota International Airport (GRO), Rota, in CNMI; and GUM, Guam, were identified during scoping as potential locations for the airport improvements because of their location in the western Pacific and proximity to the Philippine Sea.

Certain facility, operational, and mission requirements must be present or reasonably attainable to meet the purpose of and need for the Proposed Action. There are many potential divert airfield locations across the Pacific Rim, but they all fall too far outside USAF-established selection standards for consideration in this EIS. For this reason, the following locations were considered and dismissed from analysis during the development of the Proposed Action and will not be addressed in this EIS: Kwajalein Atoll, Midway, Hawai‘i, Wake Island Airfield, and the Aleutian Islands.

The following selection standards were developed based on USAF operational requirements for proposed airfield improvements and flight operations. The selection standards were then applied to the possible site alternatives identified during scoping to select those alternatives considered reasonable for implementing the Proposed Action and carried forward for detailed analysis in this EIS. Following are the selection standards required for the airfield:

- Be located in a U.S. territory

- Not be located within the average diameter of the eye of a typhoon having damaging winds affecting Andersen AFB (storm radius)
- Provide existing land and infrastructure with expansion capabilities
- Be located within the MIRC training area
- Provide existing fuel-receiving capabilities at the port of debarkation.

The evaluation of possible site alternatives identified only two site alternatives that meet, or have the ability to meet, each selection standard. Accordingly, TNI and GSN are able to meet the purpose of and need for the Proposed Action and will be considered in the analysis as alternatives. A potential site alternative that does not meet the selection standard, shown with red in **Table ES-1,** cannot meet the stated purpose and need, and will not be considered in detail in the EIS. **Table ES-1** provides a summary of each site alternative evaluated against the selection standards.

Table ES-1. Evaluation of Alternatives Against Selection Standards

Selection Standard	GUM	GRO	TNI	GSN
U.S. Territory				
Storm radius				
Adequate land and existing infrastructure with expansion potential to satisfy Proposed Action requirements				
Provide a secondary airfield within MIRC (average approximate 30-minute flight time)				
Access to fuel vessels				

Key:
Green = meets selection standard
Yellow = limited capability to meet selection standard, or can be brought to standard
Red = does not meet selection standard

ES 4.3 Alternative 1 – GSN

Under Alternative 1, GSN would be improved to an airfield design that could accommodate 12 KC-135 aircraft to meet the purpose of and need for the Proposed Action. During the Construction Phase under Alternative 1, the USAF would develop and construct facilities and infrastructure at GSN consistent with the facilities and infrastructure described under the Proposed Action. During the Implementation Phase at GSN, the improved facilities and infrastructure would support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises, unplanned divert landings, and humanitarian assistance and disaster relief in the western Pacific, as described under the Proposed Action.

The airfield design would also accommodate other military logistics and tactical aircraft. The airfield design assumes that the KC-135 aircraft represents large logistics (or heavy lift cargo) aircraft and it is assumed that the space to accommodate a KC-135 is roughly twice as large as the space to accommodate most tactical or fighter aircraft. A size ratio of 1 to 2 is assumed for heavy lift cargo aircraft to fighter and tactical aircraft; therefore, 24 fighter or tactical aircraft could be diverted to or exercised from GSN simultaneously for any element of the Proposed Action, not to exceed the capabilities of the proposed design. Finally, it is also assumed that a mix of fighter, tactical, and large logistics aircraft (e.g., 10 large logistics aircraft and 4 fighters), aircraft could be diverted to or exercised from GSN simultaneously for any element of the Proposed Action as long as the mix does not exceed airfield design capabilities. The

potential numbers of aircraft represent the highest or "worst-case" scenario under the Proposed Action. The temporary support personnel population accompanying the aircraft under Alternative 1 would not exceed 700, regardless of what mix of aircraft is diverted to or exercised from GSN.

ES 4.4 Alternative 2 – TNI

Under Alternative 2, TNI would be improved to an airfield design that could accommodate 12 KC-135 aircraft to meet the purpose of and need for the Proposed Action. During the Construction Phase under Alternative 2, the USAF would develop and construct facilities and infrastructure at TNI consistent with the facilities and infrastructure described under the Proposed Action. During the Implementation Phase at TNI, the improved facilities and infrastructure would support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises, unplanned divert landings, and humanitarian assistance and disaster relief in the western Pacific, as described under the Proposed Action.

The airfield design would also accommodate other military logistics and tactical aircraft. The airfield design assumes that the KC-135 aircraft represents large logistics (or heavy lift cargo) aircraft and it is assumed that the space to accommodate a KC-135 is roughly twice as large as the space to accommodate most tactical or fighter aircraft. A size ratio of 1 to 2 is assumed for heavy lift cargo aircraft to fighter and tactical aircraft; therefore, 24 fighter or tactical aircraft could be diverted to or exercised from TNI simultaneously for any element of the Proposed Action, not to exceed the capabilities of the proposed design. Finally, it is also assumed that a mix of fighter, tactical, and large logistics aircraft (e.g., 10 large logistics aircraft and 4 fighters), aircraft could be diverted to or exercised from TNI simultaneously for any element of the Proposed Action as long as the mix does not exceed airfield design capabilities. The potential numbers of aircraft represent the highest or "worst-case" scenario under the Proposed Action. The temporary support personnel population accompanying the aircraft under Alternative 2 would not exceed 700, regardless of what mix of aircraft is diverted to or exercised from TNI.

ES 4.5 No Action Alternative

CEQ regulations require consideration of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be evaluated. Under the No Action Alternative, the USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises, unplanned divert landings, and humanitarian assistance and disaster relief in the western Pacific.

Divert Landings. Currently in the Mariana Islands, emergency divert landings occur at GUM, Guam; GSN, Saipan; and GRO, Rota, in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*. Under the No Action Alternative, emergency divert landings would continue to occur at these locations.

Joint Military Exercises. Currently, planned joint military exercises occur within the MIRC and Mariana Islands. Under the No Action Alternative, these planned exercises would continue to take place, using Andersen AFB and surrounding airspace and range area. However, under the No Action Alternative, an additional designed and designated divert airfield would not be developed.

Humanitarian Airlift Staging. Currently, humanitarian airlift staging can occur at Andersen AFB or GUM, Guam, to support natural disaster and humanitarian assistance response in the western Pacific. However, humanitarian efforts from these locations are limited due to lack of infrastructure such as parking areas, refueling capabilities, and billeting. Under the No Action Alternative, USAF humanitarian

response in the western Pacific would likely use existing fully functional airfields, such as Andersen AFB or GUM, Guam.

ES 5. Preferred Alternative

According to CEQ guidelines, an agency's preferred alternative is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors (CEQ 1981). CEQ regulations require the section of the EIS on alternatives to "identify the agency's preferred alternative or alternatives if one or more exists, in the draft statement, and identify such alternative in the final statement…" This means that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS (CEQ 1981).

The USAF preferred alternative would be to implement the Proposed Action under Alternative 1 - GSN, as described in **Section ES 4.3**. Under the preferred alternative, there are two proposed runway extension scenarios that are considered in the analysis of impacts in this Draft EIS, and one scenario in which the runway would not be extended. No determination has been made regarding which of these three options would be the preferred option at this time. The analysis of impacts in the DEIS also includes the alternative of implementing the Proposed Action on the Island of Tinian as outlined in **Section ES 4.4**, and the No Action Alternative as described in **Section ES 4.5**. The USAF is identifying the preferred alternative at this time pursuant to 40 CFR § 1502.14(e); however, no final decision selecting a particular alternative for implementation has been made. Upon completion of the EIS, the USAF decisionmaker will use the EIS to support the decision about how best to satisfy the stated purpose and need within mission constraints. The final decision will be documented in the ROD.

ES 6. Summary of Environmental Impacts

Chapter 3 of this EIS describes existing environmental conditions and **Chapter 4** describes environmental consequences for resources potentially affected by the Proposed Action and Alternatives described in **Chapter 2**. The affected environment and environmental consequences are described and analyzed according to categories of resources.

Environmental impacts which might result from the implementation of the USAF's Proposed Action alternatives and the No Action Alternative have been summarized in **Table ES-2**. A detailed analysis of effects is provided in **Chapter 4**.

ES 7. Cumulative Effects

CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

CEQ guidance in considering cumulative effects states that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects that coincide with the location and timetable of a proposed action and

other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).

A cumulative project list was developed to identify projects on Saipan, Tinian, or in the region in general, based on readily available information. The most substantial projects from the cumulative projects list include the Establishment and Operation of an Intelligence, Surveillance, Reconnaissance, and Strike (ISR/Strike) Capability Project on Andersen AFB; the Guam and MIRC improvements; the Guam and CNMI Military Relocation; the Mariana Islands Training and Testing (MITT); improvements at GSN, TNI, and Tinian harbor; and other local development projects on each island. A summary of cumulative effects is provided in **Table ES-3**.

ES 8. Mitigation Measures

The proposed project has the potential to result in adverse environmental impacts. The proposed project would include best management practices (BMPs), mitigation and conservation measures, and design concepts to avoid adverse impacts to the extent practicable and are described in **Section 4** as applicable. Unavoidable impacts would be minimized or compensated for to the extent practicable. In accordance with Council on Environmental Quality regulations, mitigation measures are considered for adverse environmental impacts.

Table ES-2. Summary of Environmental Impacts

Resource	Alternative	Summary of Environmental Impacts
Noise (Sections 3.1 and 4.1)	Alternative 1 – GSN	***Construction Phase.*** Short-term, minor, direct, adverse impacts from construction noise and construction-related traffic from construction activities associated with Alternative 1.
		Implementation Phase. Periodic, direct, moderate to major, adverse impacts on the noise environment would be expected from the implementation of the High Scenario, which models 12 F-16 and 12 F-22 aircraft operating from GSN. This represents a significant impact on noise sensitive receptors. Impacts would be less in the Low Scenario (12 KC-135) and Medium Scenario (6 KC-135, 9 F-16, and 3 F-22) which model aircraft with lower noise levels. Short-term and periodic, direct, negligible, adverse impacts on noise would be expected from an increase in vehicle traffic from implementation of Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, minor, direct, adverse impacts from construction noise and construction-related traffic from construction activities associated with Alternative 2.
		Implementation Phase. Periodic, direct, moderate to major, adverse effects on the noise environment would be expected from the implementation of the High Scenario, which models 12 F-16 and 12 F-22 aircraft operating from TNI. Impacts would be less in the Low Scenario (12 KC-135) and Medium Scenario (6 KC-135, 9 F-16, and 3 F-22) which model aircraft with lower noise levels. Short-term and periodic, direct, negligible to minor, adverse impacts on noise would be expected from an increase in vehicle traffic from implementation of Alternative 2.
	No Action Alternative	No impacts on noise would be expected from implementation of the No Action Alternative.
Air Quality (Sections 3.2 and 4.2)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, minor, adverse impacts would be expected from construction emissions and land disturbance.
		Implementation Phase. Periodic, minor, adverse impacts would be expected from all activities associated with the implementation phase of Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, direct, minor, adverse impacts would be expected from construction emissions and land disturbance.
		Implementation Phase. Periodic, minor, adverse impacts would be expected from all activities associated with the implementation phase of Alternative 2.
	No Action Alternative	No impacts on air quality would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Airspace Management and Airfield Operations (Sections 3.3 and 4.3)	Alternative 1 – GSN	***Construction Phase.*** Long- and short-term, direct and indirect, minor to moderate, adverse impacts would be expected on airport operations from construction activities associated with Alternative 1.
		Implementation Phase. Short-term and periodic, direct, moderate, adverse impacts would be expected on the immediate airspace and airfield operations from the implementation of Alternative 1. Long-term, direct, moderate, beneficial, impacts on the airspace and airfield would be expected from implementation of the jet fuel receiving, storage, and distribution system.
	Alternative 2 – TNI	***Construction Phase.*** Long-term and short-term, direct and indirect, minor to moderate, adverse impacts would be expected on airport operations from construction at TNI under Alternative 2.
		Implementation Phase. Short-term and periodic, direct, moderate, adverse impacts would be expected on the immediate airspace and airfield operations from the implementation of Alternative 2. Long-term, direct, moderate, beneficial, impacts on the airspace and airfield would be expected from implementation of the jet fuel receiving, storage, and distribution system.
	No Action Alternative	Short-term, direct, moderate, adverse, impacts on airspace and airport operations -would be expected from emergency divert landings under the No Action Alternative.
Geological Resources and Soils (Sections 3.4 and 4.4)	Alternative 1 – GSN	***Construction Phase.*** Short- and long-term, direct, minor to moderate, adverse impacts on soils would be expected as a result of runway extension Options A and B.
		Implementation Phase. Long-term, direct, minor to moderate, adverse impacts on geology and topography would be expected from the potential removal of surface rock and alteration in topography from grading activities.
	Alternative 2 – TNI	***Construction Phase.*** Short- and long-term, direct, moderate, adverse impacts on soils would be expected from implementing Alternative 2. Impacts would be similar but greater than those described for Alternative 1.
		Implementation Phase. Long-term, minor to moderate, adverse impacts on geology and soil would be anticipated under the implementation phase for Alternative 2. Impacts would be similar to those described for Alternative 1.
	No Action Alternative	No impacts on geology and soils would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Water Resources (Sections 3.5 and 4.5)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, minor, adverse impacts on water quality would be expected from construction activities associated with Alternative 1. No flood zones occur within the proposed GSN or Port of Saipan fuel site project sites; therefore, no impacts on flood zones would be expected under Alternative 1.
		Implementation Phase. Long-term, direct, minor to major, adverse impacts on groundwater quality as a result of sheet runoff or petroleum spills would be expected from implementing Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Long-term, direct, moderate, adverse impacts on local hydrologic conditions from the increases in impervious surfaces under Alternative 2 would be similar to, but greater than, Alternative 1.
		Implementation Phase. Long-term, direct, minor to major, adverse impacts on groundwater quality as a result of sheet runoff or petroleum spills would expected from implementing Alternative 2.
	No Action Alternative	No impacts on hydrologic conditions would be expected from implementation of the No Action Alternative.
Terrestrial Biological Resources (Sections 3.6 and 4.6)	Alternative 1 – GSN	***Construction Phase.*** Short-term, minor, direct, adverse impacts on vegetation and wildlife and short- to long-term, direct and indirect, adverse impacts on threatened and endangered species would be expected from construction activities associated with Alternative 1. Based on the site investigations, there are no wetlands in the Project Area; therefore, no impacts on wetlands are expected from construction activities.
		Implementation Phase. Short-term and periodic, direct, minor, adverse impacts on vegetation and short- and long-term, direct, minor, adverse impacts on wildlife would be expected from noise generated by implementation of Alternative 1. Long-term, minor, indirect, adverse impacts on threatened and endangered species would be expected from the noise generated during the implementation of Alternative 1. Based on the site investigations there are no wetlands in the Project Area; therefore, no impacts on wetlands are expected from construction activities.

Resource	Alternative	Summary of Environmental Impacts
Terrestrial Biological Resources (Section 3.6 and 4.6) (continued)	Alternative 2 – TNI	***Construction Phase.*** Short-term, minor, direct, adverse impacts on vegetation and wildlife and would be expected from construction activities associated with Alternative 2. No impacts on threatened and endangered species are expected from construction activities associated with Alternative 2. Based on the site investigations there are no wetlands in the Project Area; therefore, no impacts on wetlands are expected from construction activities.
		Implementation Phase. Short-term and periodic, direct, minor, adverse impacts on vegetation and short- and long-term direct minor adverse impacts on wildlife would be expected from noise generated by implementation of Alternative 2. Long-term, indirect, negligible, adverse impacts on threatened and endangered species would be expected from the implementation of Alternative 2. Based on the site investigations there are no wetlands in the Project Area; therefore, no impacts on wetlands are expected from construction activities.
	No Action Alternative	No impacts on terrestrial biological resources would be expected from implementation of the No Action Alternative.
Marine Biological Resources (Sections 3.7 and 4.7)	Alternative 1 – GSN	***Construction Phase.*** No impacts on marine biological resources would occur as a result of the construction phase of Alternative 1.
		Implementation Phase. Short-term and periodic, direct, minor, adverse impacts on sea turtles and marine mammals could occur from the implementation of Alternative 1. However, Alternative 1 is not likely to adversely affect green sea turtles and marine mammals. Any impacts would be discountable because the impacts would not be sufficient to harm or harass sea turtles.
	Alternative 2 – TNI	***Construction Phase.*** No impacts on marine biological resources would occur as a result of the construction phase of Alternative 2.
		Implementation Phase. Short-term and periodic, direct, minor, adverse impacts on sea turtles and marine mammals could occur from the implementation of Alternative 2. However, Alternative 2 is not likely to adversely affect green sea turtles and marine mammals. Any impacts would be discountable because the impacts would not be sufficient to harm or harass sea turtles.
	No Action Alternative	No impacts on marine biological resources would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Cultural Resources (Section 3.8 and 4.8)	Alternative 1 – GSN	***Construction Phase.*** Major, direct and indirect, adverse impacts on the contributing historic fabric of the Aslito/Isley Field National Historic Landmark and NRHP-listed District could occur during the construction phase under Alternative 1. Possible major, direct and indirect, adverse impacts on cultural resources could occur during the construction phase under Alternative 1.
		Implementation Phase. Direct and indirect adverse impacts on the contributing historic fabric of the Aslito/Isley Field National Historic Landmark and NRHP-listed District could occur during the implementation phase under Alternative 1. Minor to major, direct and indirect, adverse impacts on cultural resources during the implementation phase could occur under Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Possible moderate to major, direct and indirect, adverse impacts on cultural resources could occur during the construction phase under Alternative 2.
		Implementation Phase. Minor to major, direct and indirect, adverse impacts on cultural resources during the implementation phase could occur under Alternative 2.
	No Action Alternative	No impacts on cultural resources would be expected from implementation of the No Action Alternative.
Recreation (Sections 3.9 and 4.9)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, negligible, adverse, impacts on recreational activities would be expected from noise generated by construction activities associated with Alternative 1.
		Implementation Phase. Long-term, direct, minor to moderate, and adverse impacts on recreational resources would be expected from the implementation of Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, indirect, negligible to minor, adverse impacts on recreational resources would be expected from construction activities associated with Alternative 2. Impacts from Alternative 2 would be similar to, but greater than, Alternative 1.
		Implementation Phase. Long-term, direct, negligible to minor, adverse impacts on recreational resources would be expected from the implementation of Alternative 2. Impacts from Alternative 2 are expected to be similar to, but less extensive, than those described in Alternative 1.
	No Action Alternative	No impacts on recreational resources would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Land Use (Sections 3.10 and 4.10)	Alternative 1 – GSN	***Construction Phase.*** No impacts on land use or land ownership would be expected from construction activities associated with Alternative 1. Potential negligible adverse impacts on Areas of Particular Concern (APC) would be expected from construction activities associated with Alternative 1.
		Implementation Phase. No impacts on land use or land ownership would be expected from the implementation of Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** No impacts on land use or land ownership would be expected from construction activities associated with Alternative 2.
		Implementation Phase. No impacts on land use or land ownership would be expected from the implementation of Alternative 2.
	No Action Alternative	No impacts on land use would be expected from implementation of the No Action Alternative.
Transportation (Sections 3.11 and 4.11)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, minor, adverse impacts would be expected on the local transportation network in Saipan from construction activities associated with Alternative 1.
		Implementation Phase. Long-term, direct, minor, adverse impacts would be expected on the local transportation network in Saipan from the implementation of Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, direct, minor, adverse impacts would be expected on the local transportation network in Tinian from construction activities associated with Alternative 2.
		Implementation Phase. Long-term, direct, minor, adverse impacts would be expected on the local transportation network in Tinian from the implementation of Alternative 2.
	No Action Alternative	No impacts on ground transportation would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Hazardous Materials and Wastes (Sections 3.12 and 4.12)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, minor, adverse impacts associated with hazardous materials and hazardous wastes, petroleum products, existing contamination areas, asbestos-containing materials (ACMs), and lead-based paint (LBP) would be expected from construction activities associated with Alternative 1. Short-term, direct, negligible, adverse impacts associated with PCBs would be expected from construction activities associated with Alternative 1. No impacts are expected on pesticides or radon.
		Implementation Phase. Long-term, direct, minor, adverse impacts associated with hazardous materials and hazardous wastes would be expected from the implementation of Alternative 1. Long-term, direct, minor to moderate, adverse impacts from petroleum products would be expected due to the implementation of Alternative 1. Long-term, direct, negligible to minor, adverse impacts associated with radon could be encountered during the implementation of Alternative 1. No impacts on existing contamination areas, ACMs, LBP, polychlorinated biphenyls (PCBs), or pesticides would be expected.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, direct, minor, adverse impacts associated with hazardous materials and hazardous wastes, petroleum products, existing contamination areas, ACMs, and LBP would be expected from construction activities associated with Alternative 2. Short-term, direct, negligible, adverse impacts associated with PCBs would be expected from construction activities associated with Alternative 2. No impacts are expected on pesticides or radon.
		Implementation Phase. Long-term, direct, minor, adverse impacts associated with hazardous materials and hazardous wastes would be expected from the implementation of Alternative 2. Long-term, direct, minor to moderate, adverse impacts from petroleum products would be expected due to the implementation of Alternative 2. Long-term, direct, negligible to minor, adverse impacts associated with radon could be encountered during the implementation of Alternative 2. No impacts on existing contamination areas, ACMs, LBP, PCBs, or pesticides would be expected.
	No Action Alternative	No impacts associated with hazardous materials and wastes would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Infrastructure and Utilities (Sections 3.13 and 4.13)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, negligible to moderate, adverse impacts on the airfield, the Saipan Port, liquid fuel supply, water supply, existing electrical system, communications systems, storm water management system, sewer system, and solid waste management would be expected from construction activities associated with Alternative 1. Long-term, direct, minor, beneficial impacts would also be expected from the proposed upgrades and additions to the existing communications. No impacts would be expected on heating or cooling systems or natural gas supply. Long-term, direct, moderate to major, beneficial impacts on the airfield, water supply, and capacity to receive, store and distribute aviation fuel would be expected from construction activities associated with Alternative 1.
		Implementation Phase. Long-term, direct and indirect, negligible to minor, adverse impacts on the airfield, electrical supply, liquid fuel supply, water supply, sanitary sewer and wastewater treatment, storm water, and solid waste would be expected from implementation of the Proposed Action under Alternative 1. No impacts would be expected to port infrastructure, central heating or cooling, or natural gas supply. Long-term, direct and indirect, moderate, beneficial impacts on communication systems would be expected from implementation of the Proposed Action under Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, direct, negligible to moderate, adverse impacts on the airfield, the Tinian Port, liquid fuel supply, water supply, existing electrical system, communications systems, storm water management system, and solid waste management would be expected from construction activities associated with Alternative 2. No impacts would be expected on heating or cooling systems, sewer systems, or natural gas supply. Long-term, direct, moderate to major, beneficial impacts on the airfield, water supply, and capacity to receive, store and distribute aviation fuel would be expected from construction activities associated with Alternative 2.
		Implementation Phase. Long-term, direct and indirect, negligible to minor, adverse impacts on the airfield, electrical supply, liquid fuel supply, water supply , storm water, and solid waste would be expected from implementation of the Proposed Action under Alternative 2. No impacts would be expected to port infrastructure, central heating or cooling, natural gas supply, sanitary sewer and wastewater treatment. Long-term, direct and indirect, moderate, beneficial impacts on communication systems.
	No Action Alternative	No impacts on infrastructure and utilities would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Socioeconomics and Environmental Justice (Sections 3.14 and 4.14)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct and indirect, minor to moderate, adverse impacts on the population of Saipan, housing and public services would be expected from construction activities associated with Alternative 1. Short-term, direct and indirect, minor, adverse and short-term, direct and indirect, negligible to moderate, beneficial impacts on the Saipan economy would be expected from construction of Alternative 1. Short-term, direct, negligible to minor, adverse sociocultural issues would be expected under Alternative 1 from the potential of removing land from local use during construction activities.
		Implementation Phase. Long-term, negligible to moderate, adverse impacts on Saipan's population, housing, public services and sociocultural issues would be expected as a result of implementation of Alternative 1. These impacts would be continuing from the construction phase if land were permanently removed from use by local CNMI residents. Long-term, negligible to minor, direct, adverse and long-term, negligible to minor, direct and indirect, beneficial impacts on the CNMI and Saipan economy would be expected from implementation of Alternative 1. There is potential for impacts on minority or low-income populations under Alternative 1 to be disproportionately high and adverse based on increased noise levels.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, minor to major, adverse impacts on the population of Tinian, housing, public services and sociocultural issues would be expected from construction of Alternative 2. Short-term, minor to moderate, direct and indirect, adverse and short-term, moderate to major, direct and indirect, beneficial impacts on economies of Tinian and the CNMI would be expected from construction activities associated with Alternative 2.
		Implementation Phase. Long-term, negligible to moderate, adverse impacts on Tinian's population, public services, sociocultural issues, and environmental justice would be expected from implementation of Alternative 2. Long-term, negligible to moderate, direct, adverse and long-term, negligible to minor, direct and indirect, beneficial impacts on the CNMI and Tinian economy would be expected from implementation of Alternative 2. No impacts on housing would be expected from the implementation of Alternative 2. Impacts on minority or low-income populations under Alternative 2 are not expected to be disproportionately high and adverse based on increased noise levels.
	No Action Alternative	No impacts on socioeconomics and environmental justice would be expected from implementation of the No Action Alternative.

Resource	Alternative	Summary of Environmental Impacts
Human Health and Safety (Sections 3.15 and 4.15)	Alternative 1 – GSN	***Construction Phase.*** Short-term, direct, minor, adverse impacts on the health and safety of construction and airfield personnel would be expected from construction activities associated with Alternative 1. No impacts on the health and safety of military personnel or the public would be expected.
		Implementation Phase. Long-term, direct, negligible, adverse impacts on the health and safety of construction personnel and the public would be expected during implementation of Alternative 1. Long-term, minor, beneficial effects on the health and safety of military and airfield personnel would be expected implementation of Alternative 1.
	Alternative 2 – TNI	***Construction Phase.*** Short-term, direct, minor, adverse impacts on the health and safety of construction and airfield personnel would be expected from construction activities associated with Alternative 2. No impacts on the health and safety of military personnel or the public would be expected.
		Implementation Phase. Long-term, direct, negligible to minor, adverse impacts on the health and safety of construction personnel and the public would be expected during implementation of Alternative 2. Long-term, minor, beneficial effects on the health and safety of military and airfield personnel would be expected from implementation of Alternative 2.
	No Action Alternative	Adverse impacts on human health and safety would continue to be expected as a result of the potential for planes to overrun the runway and the inability to handle munitions safely during emergency landings.

Table ES-3. Summary of Cumulative Impacts

Resource	Alternative	Summary of Cumulative Impacts
Noise	Alternative 1 – GSN	• Short-term, minor to moderate, adverse, cumulative impacts could occur from temporary increases in construction and vehicle traffic noise under Alternative 1 and numerous other construction projects on Saipan.
	Alternative 2 – TNI	• Short-term, minor to moderate, adverse, cumulative impacts could occur from temporary increases in construction and vehicle traffic noise under Alternative 2 and numerous other construction projects on Tinian. • Periodic, long-term, moderate, adverse cumulative impacts could occur from the increase in aircraft operations under Alternative 2 combined with the increase in other military operations on Tinian.
Air Quality	Alternative 1 – GSN	• Short-term, minor, adverse, cumulative impacts on air quality could occur due to the generation of criteria air pollutant emissions from Alternative 1 and other construction activities in the region. • Periodic, minor, adverse, cumulative impacts on air quality would be expected due to the introduction of new sources of air emissions in Saipan anticipated from Alternative 1 and other reasonably foreseeable projects.
	Alternative 2 – TNI	• Short-term, minor, adverse, cumulative impacts on air quality could occur due to the generation of criteria air pollutant emissions from Alternative 2 and other construction activities in the region. • Periodic, minor, adverse, cumulative impacts on air quality would be expected due to the introduction of new sources of air emissions in Tinian anticipated from Alternative 2 and other reasonably foreseeable projects.
Airspace Management and Airport Operations	Alternative 1 – GSN	• Long-term, direct, moderate, beneficial impacts on the airspace and airfield would be expected from implementation of the jet fuel receiving, storage, and distribution system. • Short- and long-term, direct, minor to moderate, adverse cumulative impacts on airspace and airfield operations would be expected from construction and increased military air traffic in the region.
	Alternative 2 – TNI	• Long-term, direct, moderate, beneficial impacts on the airspace and airfield would be expected from implementation of the jet fuel receiving, storage, and distribution system. • Short-term direct, minor to moderate, adverse cumulative impacts on airspace and airfield operations would be expected from construction and increased military air traffic in the region.

Resource	Alternative	Summary of Cumulative Impacts
Geological Resources and Soils	Alternative 1 – GSN	• Short-term, minor to moderate, adverse, cumulative impacts on soils would be expected from vegetation removal, compaction of surrounding soils, and increased soil erosion and sedimentation caused by Alternative 1 and other construction projects on Saipan. • Long-term, minor to moderate, adverse, cumulative impacts would be expected from development under Alternative 1 and other construction projects on Saipan due to an irreversible and irretrievable conversion of natural soils to urban land.
	Alternative 2 – TNI	• Short-term, minor to moderate, adverse cumulative impacts on soils would be expected from vegetation removal, compaction of surrounding soils, and increased soil erosion and sedimentation caused by Alternative 2 and other construction projects on Tinian. • Long-term, minor to moderate, adverse, cumulative impacts would be expected from development under Alternative 2 and other construction projects on Tinian due to grading, compaction, and an irreversible and irretrievable conversion of natural soils to urban land.
Water Resources	Alternative 1 – GSN	• Short-term, minor, adverse, cumulative impacts on the water resources of Saipan could occur from earth-disturbing construction activities from Alternative 1 and other construction activities. • Long-term, minor to moderate, cumulative, adverse impacts on groundwater could occur from the overall increases in impervious surfaces on Saipan from Alternative 1 and other development projects.
	Alternative 2 – TNI	• Short-term, minor, adverse, cumulative impacts on water resources at Tinian could occur from earth-disturbing construction activities from Alternative 2 and other construction activities. • Long-term, moderate, cumulative, adverse impacts on groundwater could occur from the overall increases in impervious surfaces on Tinian from Alternative 2 and other development projects.

Resource	Alternative	Summary of Cumulative Impacts
Terrestrial Biological Resources	Alternative 1 – GSN	• No cumulative impacts on vegetation would be expected. • Short-term, minor, adverse, cumulative impacts on wildlife and threatened and endangered species could occur due to increases in ambient noise levels from Alternative 1 combined with other construction activities in the vicinity. • Long-term, minor, adverse, cumulative impacts on wildlife and threatened and endangered species could occur from permanent displacement and loss of habitat.
	Alternative 2 – TNI	• No cumulative impacts on vegetation or threatened and endangered species would be expected. • Short-term, minor, adverse, cumulative impacts on wildlife species could occur due to increases in ambient noise levels from Alternative 1 combined with other construction activities in the vicinity. • Long-term, minor, adverse, cumulative impacts on wildlife could occur from permanent displacement and loss of habitat.
Marine Biological Resources	Alternative 1 – GSN	• Periodic, short-term, negligible, adverse, cumulative impacts on sea turtles and marine mammals could occur due to increases in noise from take-offs and landings under Alternative 1 combined with increases in noise from other military training activities in the region (e.g., MIRC, operation of ISR/Strike Capability, and MITT activities).
	Alternative 2 – TNI	• Periodic, short-term, negligible, adverse, cumulative impacts on sea turtles and marine mammals could occur due to increases in noise from take-offs and landings under Alternative 2 combined with increases in noise from other military training activities in the region (e.g., MIRC, operation of ISR/Strike Capability, and MITT activities) and Tinian seaport redevelopment and dredging.
Cultural Resources	Alternative 1 – GSN	• Cumulative impacts on prehistoric archaeological sites would not be expected. Long-term, indirect, adverse cumulative impacts on historical resources could occur from vibration-related deterioration due to heavy aircraft traffic, increased vehicle traffic, and personnel presence. Long-term, adverse, cumulative impacts on the historic district could occur due to loss of overall cohesiveness from Alternative 1 combined with other development in the region.
	Alternative 2 – TNI	• Long-term, direct and indirect, adverse, cumulative impacts on historic and archeological resources could occur due vibrations from increased heavy vehicle traffic, depending on the proximity of the supply truck routes to historic structures. If the vibrations are minor, or if the historic structures are sufficient distance from the truck routes to result in no adverse impacts, there would be no cumulative impacts on historic structures in San Jose under Alternative 2. • Long-term, minor, adverse, cumulative impacts on unrecorded archaeological sites and historic structures could occur due to military use of TNI.

Resource	Alternative	Summary of Cumulative Impacts
Recreation	Alternative 1 – GSN	• Short-term, minor, adverse, cumulative impacts could occur from construction activities under Alternative 1 combined with other projects due to increased travel times to recreational resources. • Long-term, minor to moderate, beneficial, cumulative impacts on recreational resources would be expected from Alternative 1 and the future GSN fuel facility project due to an increased fuel capacity at GSN, allowing an increase in international air service and tourism.
	Alternative 2 – TNI	• Short-term, minor, adverse, cumulative impacts could occur from construction activities under Alternative 2 combined with other projects due to increased travel times to recreational resources. • Long-term, minor to moderate, beneficial, cumulative impacts on recreational resources would be expected from Alternative 2 and the future TNI airport fuel farm due to an increased fuel capacity at TNI, allowing an increase in international air service and tourism. • Periodic, long-term, minor to moderate, adverse, cumulative impacts on recreational resources would be expected from Alternative 2 combined with other military exercises on Tinian due to access restrictions and increases in noise associated with those activities.
Land Use	Alternative 1 – GSN	• No cumulative impacts on land use would be expected. Alternative 1 would be consistent with the Saipan Zoning Law of 2008.
	Alternative 2 – TNI	• No cumulative impacts on land use would be expected. Alternative 2 would be consistent with the CNMI Department of Public Lands (DPL) land use designations.
Ground Transportation	Alternative 1 – GSN	• Short-term, minor to moderate, adverse, cumulative impacts on ground transportation in Saipan would be expected due to increased traffic congestion from construction-related traffic under Alternative 1 and other construction activities, in addition to other road maintenance and construction projects in the region.
	Alternative 2 – TNI	• Short-term, minor to moderate, adverse, cumulative impacts on ground transportation in Tinian would be expected due to increased traffic congestion from construction-related traffic under Alternative 2 and other construction activities, in addition to other road maintenance and construction projects in the region.
Hazardous Materials and Wastes	Alternative 1 – GSN	• Short- and long-term, minor, adverse, cumulative impacts associated with hazardous materials, hazardous wastes, and petroleum products would be expected from Alternative 1 combined with other development projects due to increased quantities of hazardous materials and petroleum products to be delivered, stored, and used on Saipan on a short-term basis during construction and on a long-term basis during facility operations.
	Alternative 2 – TNI	• Short- and long-term, minor, adverse, cumulative impacts associated with hazardous materials, hazardous wastes, and petroleum products would be expected from Alternative 2 combined with other development projects due to increased quantities of hazardous materials and petroleum products to be delivered, stored, and used on Tinian on a short-term basis during construction and on a long-term basis during facility operations.

Resource	Alternative	Summary of Cumulative Impacts
Infrastructure and Utilities	Alternative 1 – GSN	• Periodic, short-term, minor, adverse, cumulative impacts on utilities could occur due to utility interconnections during construction activities under Alternative 1 and other development projects. • Long-term, minor to moderate, beneficial, cumulative impacts on several infrastructure resources would be expected due to improvements to infrastructure systems under Alternative 1 and other proposed utility upgrade projects. • Short- and long-term, minor, adverse cumulative impacts on the solid waste system would be expected from waste generated by Alternative 1 combined with other ongoing or future development projects.
	Alternative 2 – TNI	• Implementation of Alternative 2 and other ongoing and reasonably foreseeable projects would contribute to long-term, moderate, beneficial, cumulative impacts on TNI and seaport, airport communication system, and aviation fuel supply and refueling capability. • Implementation of Alternative 2 and other ongoing and reasonably foreseeable projects (e.g., new casinos) would result in short- and long-term, minor, adverse cumulative impacts on the electrical, water supply, and storm water management systems. • Implementation of Alternative 2 and ongoing and reasonably foreseeable projects would result in short- and long-term, moderate, adverse, cumulative impacts on the solid waste system due to an increase in wastes from construction activities.

Resource	Alternative	Summary of Cumulative Impacts
Socioeconomics and Environmental Justice	Alternative 1 – GSN	• Short-term, adverse, cumulative impacts on population characteristics and housing supply could occur due to a temporary increase in worker population on Saipan from Alternative 1 and other development projects. • Short-term and long-term, beneficial, cumulative impacts on the economy of Saipan could occur due to increases in employment and spending on goods and services from Alternative 1 and other development projects. • Short-term, adverse, cumulative impacts on public services could occur due to short- and long-term population increases associated with Alternative 1 and other projects. • Negligible to minor, adverse, cumulative impacts on sociocultural issues could occur due to temporary and periodic population increases that could stress the local communities. • There is potential for cumulative impacts on minority or low-income populations on Saipan to be disproportionately high and adverse due to increased noise levels.
	Alternative 2 – TNI	• Short-term, adverse, cumulative impacts on population characteristics and housing supply could occur due to a temporary increase in worker population on Tinian from Alternative 2 and other development projects. • Short-term and long-term, beneficial, cumulative impacts on the economy of Tinian could occur due to increases in employment and spending on goods and services from Alternative 2 and other development projects. • Short-term and long-term, adverse, cumulative impacts on the economy could occur due to potential airport disruptions and displacement of local ranchers under Alternative 2 combined with displacement of persons and land restrictions caused by other military training activities. • Short-term, adverse, cumulative impacts on public services could occur due to short- and long-term population increases associated with Alternative 2 and other projects. • Negligible to minor, adverse, cumulative impacts on sociocultural issues could occur due to temporary and periodic population increases that could stress the local communities. • There is potential for cumulative impacts on minority or low-income populations on Tinian to be disproportionately high and adverse due to increased noise levels.

Resource	Alternative	Summary of Cumulative Impacts
Human Health and Safety	Alternative 1 – GSN	• Short-term, minor, adverse, cumulative impacts on health and safety could occur during construction activities under Alternative 1 and other development projects due to increased contractor exposure to hazardous work environments and hazardous materials, and increased local construction traffic accessing sites. • Long-term, negligible, adverse, cumulative impacts on contractor health and safety, public health and safety, and explosive safety could occur from Alternative 1 and other development and military training activities. • Long-term, adverse and beneficial, cumulative impacts on health and safety would be expected from the operational activities associated with Alternative 1. • Long-term, minor, beneficial, cumulative impacts on military health and safety and airfield safety would be expected from improvements at the airfield, including communications enhancements.
	Alternative 2 – TNI	• Short-term, minor, adverse, cumulative impacts on health and safety could occur during construction activities under Alternative 2 and other development projects due to increased contractor exposure to hazardous work environments and hazardous materials, and increased local construction traffic accessing sites. • Long-term, negligible, adverse, cumulative impacts on contractor health and safety and explosive safety could occur from Alternative 1 and other development and military training activities. • Long-term, minor, beneficial, cumulative impacts on military health and safety and airfield safety would be expected from improvements at the airfield, including communications enhancements. • Long-term, minor, adverse, cumulative impacts on public health and safety and airfield safety would primarily be associated with the increased air traffic.

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
DIVERT ACTIVITIES AND EXERCISES
GUAM AND COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI)

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1. Purpose of and Need for the Proposed Action

This Environmental Impact Statement (EIS) has been prepared to describe the U.S. Air Force's (USAF) proposal to improve an existing airport or airports, in support of expanding mission requirements. This section presents an introduction to important issues relevant to the project, the purpose of and need for the Proposed Action, the project location, a summary of key environmental compliance requirements and public and stakeholder outreach, and an overview of the organization of the EIS.

1.1 Introduction

The USAF seeks to improve an existing airport or airports in the Mariana Islands in proximity to the Philippine Sea in support of expanding U.S. strategic interests and Department of Defense (DOD) mission requirements in the western Pacific. The U.S. territories of Guam and Commonwealth of the Northern Mariana Islands (CNMI) (including Saipan, Rota, and Tinian) are located to the east of the Philippine Sea (see **Figure 1.1-1**) and make up the southern portion of the Mariana Islands. The Philippine Sea is a section of the western North Pacific Ocean, located east and north of the Philippines. Pacific Air Forces (PACAF) is a USAF major command (MAJCOM), and is headquartered at Joint Base Pearl Harbor-Hickam, Oʻahu, Hawaiʻi. PACAF is designated by the USAF as the executive agent to develop this EIS.

1.2 Background

The lead agency for this EIS is the Department of the Air Force. The EIS was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] Section [§] 4321 et seq.); the Council on Environmental Quality [CEQ] Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] §§ 1500–1508). Cooperating agencies include the U.S. Navy, U.S. Marine Corps (USMC), and the Federal Aviation Administration (FAA). As cooperating agencies, PACAF coordinates with the U.S. Navy, USMC, and FAA throughout the EIS development process. Additionally, FAA must approve the airport layout plan (ALP) before the proposed action can be implemented.

Throughout its history, the Mariana Islands have helped PACAF play a vital role in world events. In addition to its key combat roles in World War II and the Korean and Vietnam Wars, PACAF units fought in Desert Storm in 1991, and they continue to deploy to Afghanistan, Saudi Arabia, Turkey, and Italy for operations. PACAF provided its expertise, aircraft, personnel, and equipment to facilitate the new Expeditionary Air Force. A portion of PACAF forces transited through and were trained in the Mariana Islands en route to these world events. Following the September 11, 2001, terrorist attacks on the United States, PACAF also used and transited through the Mariana Islands when deploying units in support of operations Noble Eagle and Enduring Freedom (PACAF undated a).

Since 1944, PACAF has participated in more than 140 humanitarian operations within its area of responsibility and beyond. In these operations, PACAF personnel quickly and efficiently airlifted food, medicine, and other supplies to areas devastated by storms, floods, earthquakes, volcanic eruptions, and other natural disasters. Additionally, the command supported three of the largest evacuations ever undertaken by the USAF: the Newlife evacuation of Vietnamese in 1975; the Fiery Vigil evacuation of Clark Air Base and Subic Bay Naval Base, Philippines, after the 1991 volcanic eruption of Mount Pinatubo; and the Pacific Haven operation to support and resettle Kurdish evacuees in 1997. Recent efforts include support of tsunami relief efforts during Operation Unified Assistance in 2006 and support of earthquake and tsunami relief efforts in Japan during Operation Tomodachi in 2011 (CRS 2011).

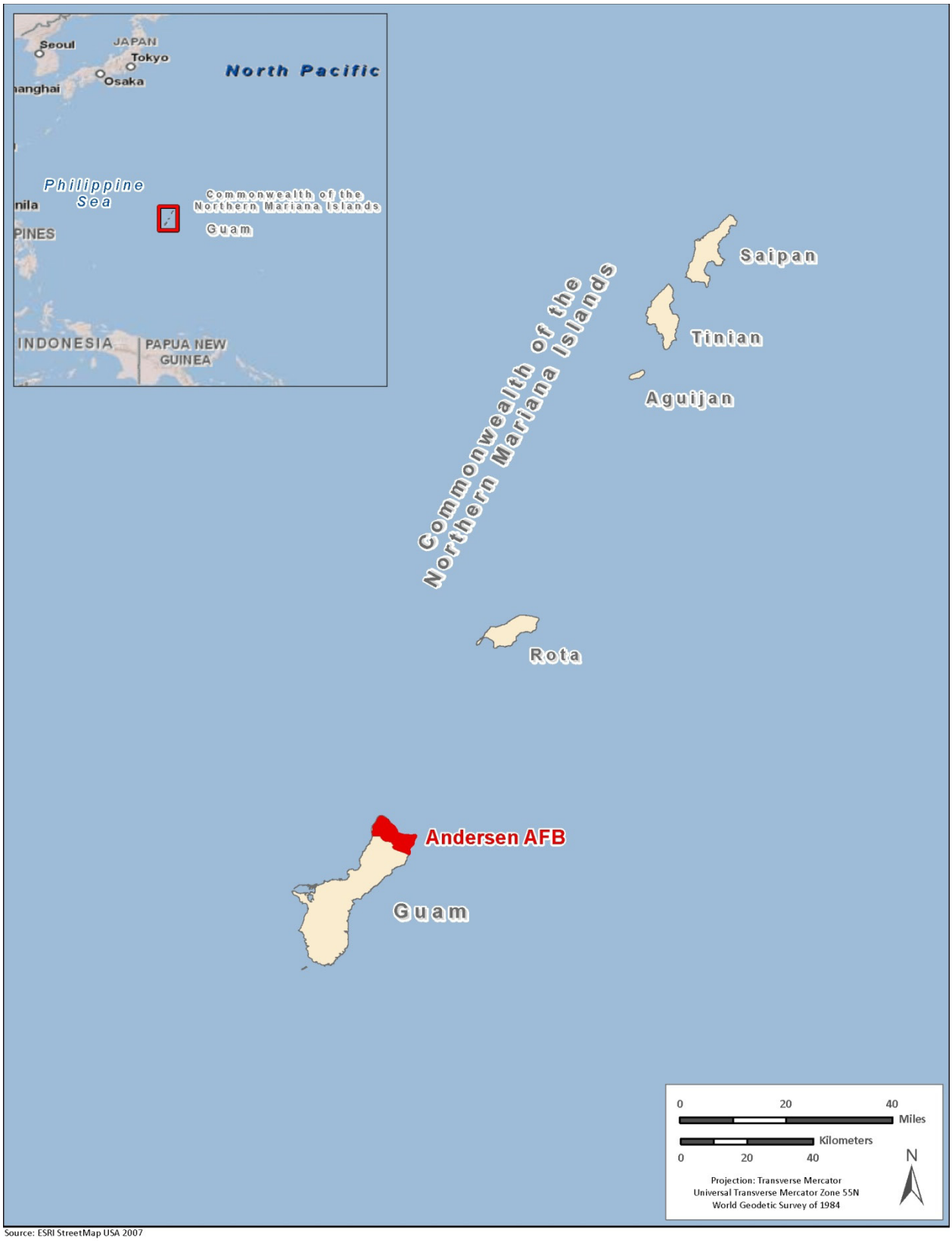


Figure 1.1-1. Location of the Philippine Sea, Guam, and CNMI Region

PACAF established a 24/7 air operations center to organize rescue and relief flight efforts by the USAF, U.S. Navy, USMC, U.S. Coast Guard, and support services of the international community during Operation Tomodachi. In 2008, PACAF delivered supplies and food to China to help victims of China's worst winter storms in more than 50 years. PACAF also delivered 2 million pounds of relief supplies after China was hit by a devastating earthquake and assisted with Myanmar cyclone relief by preparing C-17s to transport personnel and supplies (PACAF undated a). PACAF continually prepares to bring air power quickly and decisively to the far reaches of the Pacific (PACAF undated a).

1.2.1 PACAF Mission

PACAF's primary mission is to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war (PACAF undated b). PACAF's vision is to be the most respected air warrior team employing the full spectrum of air and space power, with Asia-Pacific partners, to ensure peace and advance freedom. PACAF maintains a forward presence to help ensure stability in the region (PACAF undated b). In order to successfully fulfill its mission in the region, PACAF must continually anticipate future needs and adapt to an ever-evolving geopolitical setting.

To support the mission to provide ready air and space power to promote U.S. interests in the Asia-Pacific region, PACAF oversees approximately 43,000 military and civilian personnel serving in nine strategic locations and numerous smaller facilities, primarily in Hawai'i, Alaska, Japan, Guam, and South Korea. Approximately 340 fighter and attack aircraft are assigned to the command with about 100 deployed aircraft rotating on Guam (PACAF undated a).

1.2.2 Proposed Project Region

The area of focus for potential implementation of the Proposed Action is the Mariana Islands Archipelago (see **Figure 1.1-1**). For the purposes of this EIS, the Study Area includes existing airports in the Marianas region, existing seaports, and surrounding areas including easements or routes needed to transport petroleum products. The Mariana Islands Archipelago straddles the Pacific Ocean and the Philippine Sea and hosts the U.S. military's westernmost training complex on U.S. soil, the Mariana Islands Range Complex (MIRC), consisting of special use airspace (SUA), Farrallon de Medinilla (FDM) live-fire bombing range, and other land training areas. The MIRC includes land ranges and training area/facilities on Guam, Rota, Tinian, and Saipan, and encompasses 220 square kilometers (km^2) of land. SUA consisting of Warning Area 517 (W-517), restricted airspace over FDM (R-7201), and Air Traffic Control Assigned Airspace (ATCAA) encompass 63,000 square nautical miles (NM^2) (216,000 square kilometers [km^2]) of airspace. Not within, but to the north and east of the Study Area, are portions of the Marianas Trench Marine National Monument, which was established in January 2009 by Presidential Proclamation under the authority of the Antiquities Act (16 U.S.C. 431).

1.2.3 PACAF Operations and Support in the Proposed Project Region

General Operations. Within the proposed project area, PACAF currently operates at Andersen Air Force Base (AFB) on the Island of Guam, as part of the Joint Region Marianas. Andersen AFB is located on the north end of Guam in the village of Yigo, approximately 15 miles from the capital, Hågatña. Andersen AFB is home to the 36th Wing, Air Mobility Command's 734th Air Mobility Support Squadron, and several other tenant organizations (PACAF 2007). Andersen AFB is one of four of the USAF's Bomber Forward Operating Locations (BFOLs) that provide forward support to bomber crews deploying to Europe, Southwest Asia, and in the Pacific. The mission of Andersen AFB and its host unit, the 36th Wing, is to provide a U.S.-based warfighting platform for the employment, deployment, reception, and support to transiting of air and space forces in the Asia-Pacific region (USAF undated).

With its huge fuel and munitions storage facilities and dual runways, Andersen AFB is an important forward-based logistics support center for contingency forces deploying throughout the southwest Pacific and Indian oceans. Andersen's ideal flying conditions, relatively unlimited airspace, and nearby air-to-ground range make this an ideal training area for the U.S. military and militaries of nearby countries (PACAF 2007).

Humanitarian Support. On December 8, 2002, Typhoon Pongsona, a super-typhoon with sustained winds of 150 miles per hour (mph), struck Guam, and left the island without power and water and only limited telephone service. Damage to Andersen AFB included loss of power and water, and major damage to structures. Several hangars on the installation sustained damage to their walls and roofs, and Hangars 2, 3, and 4 suffered extensive damage. PACAF provided support relief efforts in Guam 10 days after Typhoon Pongsona hit the island, which included the deployment of civil engineers, services personnel, medical experts, aircraft maintenance personnel, and security forces members. More than 30 PACAF and Air Mobility Command (AMC) missions flew support personnel and more than 1,000 tons of supplies to Guam and Andersen AFB (GlobalSecurity 2011).

PACAF also provided assistance and relief efforts to Guam following Typhoon Paka in 1997. Typhoon Paka made landfall on Guam on December 16, 1997, with peak wind gust speeds of 240 mph. The eye of the typhoon passed through Rota Channel and over the northern portion of the island where Andersen AFB is located. A.B. Won Pat International Airport (GUM) in Guam was closed for several days due to the typhoon, with airport infrastructure and facilities sustaining damage. More than 11,500 homes were damaged or destroyed by the storm, leaving approximately 5,000 people homeless on Guam. At Andersen AFB, nearly all bay doors on facilities and hangars were damaged or destroyed and building ceilings were ripped open (EQE International 1998).

1.3 Purpose and Need Background

The 2012 DOD Strategic Guidance places increased emphasis on the Asia-Pacific region (DOD 2012). Relationships with Asian allies and key partners are critical to the future stability and growth of this region to maintain regional access and the ability to operate freely. PACAF's primary mission is to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war (PACAF undated b). PACAF maintains a forward presence to help ensure stability in the region (PACAF undated b). In order to successfully fulfill its mission in the region, PACAF must continually anticipate future needs and adapt to an ever-evolving geopolitical setting.

The vital economic, political, and military interests of the United States are global in nature and scope. In many respects these interests are located across broad oceans, and to a great extent they intersect those of current and emergent regional powers. The western Pacific is where the USAF can train and operate from installations on U.S. territory and have the most influence in support of U.S. interests in Asia. Forward-deployed forces in the western Pacific are particularly well-suited to the entire range of military operations in support of national strategy. Forward-deployed forces continue the historic role of military engagement in preventative diplomacy; support U.S. policies overseas; and play a significant role in demonstrating both the intention and the capability to join allies and other friendly powers in defending shared interests, providing humanitarian relief, and ensuring stability in the region.

To successfully meet its mission, the USAF must be capable of responding quickly and successfully in support of theater commanders. The potential for escalation dictates that forces must be shaped and trained for missions they might encounter, but logistical planning must also be in place for follow-on personnel and materials, and for evacuation of non-combatants or humanitarian refugees out of theater. This pre-planning provides theater commanders with credible crisis-response capabilities. Building on the normally deployed forces, the USAF must plan for the follow-on forces and for the evacuation of

non-combatants or humanitarian refugees during a contingency crisis. To ensure a comprehensive and orderly flow of personnel and materials, the USAF must develop and train personnel at divert locations to provide the comprehensive force capable of meeting national contingency requirements. Divert locations are locations that can be used for landings on an as-needed basis either when an aircraft has malfunctioned or needs to land immediately due to an emergency; or when the scheduled or planned location for landing is no longer accessible or operational, such as during contingencies such as typhoons or other natural disasters.

The USAF, operating from U.S. territories, is free of the political encumbrances that sometimes inhibit and can limit the scope of land-based operations in foreign territories and countries. These considerations are a unique characteristic and advantage of the Mariana Islands, which provide flexible options including the ability to develop contingency plans rapidly, unencumbered by foreign geo-politics. The operational flexibility and responsiveness of forward bases in the Marianas is a matter of record; whether humanitarian relief for Kurdish refugees, humanitarian relief for tsunami victims in Indonesia or Japan, or the ability to flow forces forward to the Middle East, the value of the Marianas as U.S. territory in Asia is unmatched.

As the United States seeks to sustain and strengthen Asia-Pacific alliances and partnerships, the USAF needs to augment and adapt its forward presence to reassure allies of the U.S. commitment to their security, and provide for fast reaction to disasters in the region. Through development of additional divert capabilities and capacity, the USAF intends to meet the challenges in Asia. The vast distances of the Pacific and the low density of U.S. basing and infrastructure in the Pacific places a premium on forward-deployed U.S. forces in the Marianas. Increased capability and U.S. presence in the Marianas would build trust; increase transparency; reduce the risks of crisis or conflict; and encourage U.S. allies and partners to enhance their roles in humanitarian relief and in multilateral security cooperation by augmenting regional rapid-response abilities and increasing the capacity of Asian partners to respond more effectively to contingencies, including humanitarian crises and natural disasters. Finally, in alignment with direction provided in the 2010 Quadrennial Defense Review (QDR) Report, the USAF seeks to develop additional opportunities for joint and combined exercises in the western Pacific that respond to the need for constant readiness of U.S. forces to carry out joint operations, particularly in the areas of humanitarian assistance and disaster relief (DOD 2010a).

The range of potential future challenges is significant. USAF requirements to deal with such challenges include the following: supporting a national response to attacks on, or natural disasters in, the United States, its territories, and other nations; defeating aggression by adversary states; supporting and stabilizing fragile states facing threats from terrorist and insurgent groups; protecting American citizens abroad in harm's way; and preventing human suffering due to mass atrocities or large-scale natural disasters abroad.

These types of challenges are not necessarily distinct. Indeed, the USAF future operational environment is likely to entail complex combinations of multiple challenges at the same time, necessitating multiple venues to execute the mission. U.S. air forces in Asia must be shaped and trained to provide the maximum possible versatility for the broadest potential range of national contingencies as mandated by Title 10 U.S.C. § 8062. Readiness requires specialized locations where military personnel can learn and practice the skills necessary to successfully protect the United States and keep its territories safe. The location and environments of the Mariana Islands are important to the USAF because of the existence of Andersen AFB, but also for realistic training opportunities. The sea space and airspace designated for military use in the Marianas provide safe environments to train airmen on existing equipment in environments similar to those encountered during real-world missions.

1.3.1 Purpose

The purpose of the Proposed Action is to establish additional divert capabilities to support and conduct current, emerging, and future exercises, while ensuring the capability to meet mission requirements in the event that access to Andersen AFB or other western Pacific locations is limited or denied. For example, the need for humanitarian assistance can arise suddenly and without warning, such as disaster response in Japan during the 2011 earthquake and tsunami. If this were to occur during scheduled training exercises at Andersen AFB, then either training or response efforts might be delayed or impeded. Furthermore, natural or man-made disasters could impact Andersen AFB's missions, requiring reliance on designed and designated divert airfield capabilities. Because of the proximity to forward-deployed forces in the western Pacific, the Marianas provides the best economic alternative for forward-deployed U.S. forces to train on U.S.-owned lands and to develop the proposed additional divert capabilities.

1.3.2 Need

The USAF must achieve its mission mandated by Title 10 U.S.C. § 8062 in the event of a disruption of operational capabilities at Andersen AFB or other western Pacific locations. To more assuredly achieve this mission, the USAF must ensure that another location within the Marianas Archipelago has the capabilities to sustain its mission on a temporary basis. This location will not replace the capabilities at Andersen AFB, but will be an additional location on U.S. territory in the western Pacific that can help ensure continued military readiness should access to Andersen AFB or other western Pacific locations be limited or denied such as during a training event, humanitarian relief efforts, or natural or man-made disasters. The need for the Proposed Action is derived from the following operational requirements that are necessary to successfully support the PACAF mission:

- Ensure airfield accessibility if access to Andersen AFB or other western Pacific airfields is limited or denied
- Provide for contingency operations to include humanitarian relief efforts
- Accommodate future increases in operational tempo and associated training
- Achieve and sustain readiness.

Consistent with DOD Strategic Guidance which calls for mission priorities to shift to the Asia-Pacific region (DOD 2012), the Proposed Action would develop critical enhancements to an existing airport or airports and associated infrastructure in the Marianas to increase operational and divert capabilities needed by the USAF, especially in humanitarian relief and joint exercises. These enhancements are required if the USAF is to maintain a state of military readiness commensurate with the national defense and humanitarian relief missions. The Proposed Action focuses on the development and improvement of existing divert or contingency airfield capabilities and will not include the permanent deployment or "beddown" of forces in the Marianas. Hence, any military construction projects would be focused on improvements needed to increase USAF capabilities to respond to emergent needs, to ensure forces that are diverted from Andersen AFB or other western Pacific locations can continue to operate, and to train to these capabilities.

In summary, the Proposed Action is needed because there is not an existing divert or contingency airfield on U.S. territory in the western Pacific that is designed and designated to provide strategic operational and exercise capabilities for U.S. forces when needed and humanitarian airlift and disaster relief in times of natural or man-made disasters. Implementation of the Proposed Action would support the PACAF mission to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war.

1.4 Scope of Analysis

This EIS examines the potential effects of the Proposed Action and alternatives, including impacts related to or upon the following:

- Noise
- Air Quality
- Airspace Management and Airport Operations, and Bird/Wildlife Aircraft Strike Hazard
- Geological Resources and Soils
- Water Resources
- Terrestrial Biological Resources
- Marine Biological Resources
- Cultural Resources
- Recreation
- Land Use
- Transportation
- Hazardous Materials and Waste Management
- Infrastructure and Utilities
- Socioeconomics and Environmental Justice
- Human Health and Safety.

These topics were identified through the scoping process as being potentially relevant to the Proposed Action and alternatives, and include applicable critical elements of the human environment whose review is mandated by statute, Executive Order (EO), regulations, or policy.

1.5 Summary of Key Environmental Compliance Requirements

1.5.1 NEPA Compliance

NEPA (42 U.S.C. §§ 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to support decisionmakers in making well-informed decisions based on an understanding of the potential environmental consequences, and taking actions to protect, restore, or enhance the environment. NEPA established the CEQ that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA.

The process for implementing NEPA is codified in Title 40 CFR, Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EIS be prepared when a Federal agency is proposing a major action with potential to significantly affect the quality of the human environment.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is its *Environmental Impact Analysis Process (EIAP)*, 32 CFR Part 989, as amended. See **Table 1.5-1** for a summary of environmental compliance for the Proposed Action, including NEPA compliance.

Table 1.5-1. Summary of Environmental Compliance for the Proposed Action

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
Clean Water Act (CWA) (33 U.S.C. §§ 1344, et seq.) and implementing regulations as required	USEPA	No permit under the CWA, whether under Section 401, 402, or 404 (b) (1), is required. Storm -water general permit for construction activities that disturb greater than one acre would be required.
Coastal Zone Management Act (CZMA) (16 CFR §§ 1451, et seq.) and implementing regulations as required	Coastal Resources Management Office - CNMI	The USAF has determined that the Proposed Action is consistent to the maximum extent practicable with the CNMI Coastal Management Plan. The Negative Determination for CNMI was submitted after the release of the Draft EIS.
Endangered Species Act (ESA) (16 U.S.C. §§ 1531, et seq.) and implementing regulations as required	USFWS	The EIS analyzes potential effects on species listed under the ESA. The USAF is consulting under Section 7 of the ESA with and USFWS on the potential that the Proposed Action could affect listed species.
Marine Mammal Protection Act (MMPA) (16 U.S.C. §§ 1431, et seq.) and implementing regulations as required	National Marine Fisheries Service (NMFS)	This EIS analyzes potential effects on marine mammals, some of which are species-listed under the ESA. MMPA take authorization will not be required.
National Historic Preservation Act (NHPA) (16 U.S.C. §§ 470, et seq.) and implementing regulations as required	CNMI Historic Preservation Office (HPO)	The USAF is consulting with the CNMI HPO and National Park Service under Section 106 of the NHPA. ACHP may also be invited to consult depending on determination of effects on the NHL under Alternative 1.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	USAF	Potential high and adverse impacts on low-income or minority communities have been identified for elements of the Proposed Action. The USAF will conduct outreach to the potentially impacted communities to ensure they are engaged in the NEPA process and are part of the mitigation development process, if it is determined that mitigation is required.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	USAF	The Proposed Action would not result in disproportionate risks to children from environmental health risks or safety risks.

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
EO 13112, Invasive Species	USAF	EO 13112 requires agencies to identify actions that might affect the status of invasive species and take measures to avoid introduction and spread of those species. This EIS satisfies the requirement of EO 13112 with respect to the Proposed Action.
EO 11990, Protection of Wetlands	USAF	The Proposed Action would not have a significant impact on wetlands.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703–712) and implementing regulations as required	USFWS	The Proposed Action would not have a significant impact on migratory birds, and would comply with applicable requirements of the MBTA.
The Sikes Act of 1960 (16 U.S.C. §§ 670a–670o, as amended by the Sikes Act Improvement Act of 1997, Public Law [P.L.] No. 105-85) requires military installations with significant natural resources to prepare and implement Integrated Natural Resource Management Plans (INRMPs).	USAF	The Proposed Action would not occur on a military installation. There is no requirement for an INRMP under the Proposed Action. The USAF would prepare a natural resources management plan based on the outcome of the EIS process.
The Antiquities Act (34 Stat. 225, 16 U.S.C. 431) and implementing regulations as required	NOAA (National Oceanic and Atmospheric Administration) USFWS	The Study Area does not include any portion of the Marianas Trench Marine National Monument.

1.5.2 Integration of Other Relevant Environmental Compliance Requirements

To comply with NEPA, the planning and decisionmaking process for Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of relevant environmental issues and requirements associated with a proposed action and its alternatives. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively." The environmental regulations and rules for Federal agencies are mandated and followed. See **Table 1.5-1** for a summary of environmental compliance for the Proposed Action. Environmental compliance requiring agency coordination and consultation is discussed in **Section 1.7.2**.

1.5.3 Documents Incorporated by Reference

According to CEQ regulations for implementing NEPA, "material relevant to an EIS may be incorporated by reference with the intent of reducing the size of the document." Some of the programs and projects

within the geographical scope of this EIS have undergone environmental review and documentation to ensure NEPA compliance including the following, which are available for review at http://www.PACAFDivertMarianasEIS.com:

Final Environmental Impact Statement, Establishment and Operation of an Intelligence, Surveillance, and Reconnaissance and Strike (ISR/Strike) Capability, Andersen Air Force Base, Guam, November 2006 (USAF 2006). The proposed action would establish an ISR/Strike operational capability in the western Pacific over an approximate 16-year period beginning in fiscal year 2007. The ISR/Strike capability would consist of fighter, aerial refueling, bomber, unmanned aerial vehicle aircraft, and support personnel. The ISR/Strike EIS was finalized in 2006 and a Record of Decision (ROD) was issued in January 2007 (USAF 2006).

Andersen AFB was identified as the installation best suited to host the ISR/Strike capability. The average airfield operations would increase from 235 to 297 as a result of the action. The increase in aircraft events into and out of Andersen AFB requires improved range infrastructure to accommodate this increased training tempo, newer aircraft, and weapon systems commensurate with ISR/Strike force structure. There would be increased activity on all the current training areas supporting USAF activities. Land acquisition was not proposed.

As part of the ISR/Strike mitigation plan, a new Habitat Management Unit of 148 acres would be established as a mitigation measure for impacts to biological resources. This mitigation plan would include:

- Development of an ungulate control plan
- Ungulate exclusion fencing
- A full-time wildlife management specialist position would be funded
- Trees that are important to the Mariana Fruit Bat or the Marianna Crow would be planted
- A noise study would be conducted.

The USAF was able to address the cumulative impacts of establishing an ISR/Strike Capability in their EIS relative to a host of other cumulative projects identified (USAF 2006).

MIRC EIS/OEIS, May 2010 (DON 2010a). The MIRC EIS/OEIS proposes military training and research, development, test, and evaluation (RDT&E) training activities within the MIRC (DON 2010a). The MIRC consists of the ranges, airspace, and ocean areas surrounding the ranges that make up the Study Area. The MIRC and the Study Area are the same geographical areas. The study area described in the MIRC EIS/OEIS does not include the sovereign territory (including waters out to 12 nautical miles [NM]) of the Federated States of Micronesia.

The proposed action in the MIRC EIS/OEIS would result in critical enhancements to increase training capabilities (especially in the undersea and air warfare areas) that are necessary if the military services are to maintain a state of military readiness commensurate with the national defense mission. The proposed action primarily focuses on the development and improvement of existing training capabilities in the MIRC, and would not include any military construction projects. However, the proposed action does not involve extensive changes to the MIRC facilities, activities, or training capabilities, nor does it involve an expansion of the existing MIRC property or airspace requirements.

Governing procedures for the use of training areas, ranges, and airspace operated and controlled by the Commander U.S. Naval Forces, Marianas (such as instructions and procedures for the use of Guam, Saipan, Tinian, Rota and Farallon de Medinilla) are included in Commander Navy Region Marianas Instruction 3500.4 (Marianas Training Handbook). This guidance identifies specific land use constraints

to enable protection of environmental resources during military training in the MIRC. These procedures would continue to be followed. Modification and augmentations of these procedures are being discussed among stakeholders. No new types of training would be required that would warrant new procedures in the MIRC EIS/OEIS (DON 2010a).

1.6 Decisions to be Made

At the conclusion of the EIS process the USAF will make a decision on whether and how to support identified divert activities and exercises based on the discussion and analyses contained in this EIS. The USAF decision will be based on the EIS and will be reflected in a ROD.

1.7 Interagency and Public Involvement

The Intergovernmental Coordination Act and EO 12372, Intergovernmental Review of Federal Programs, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060 requires the USAF to implement a process known as Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), which is used for the purpose of agency coordination and implements scoping requirements (i.e., to determine the scope of issues to be addressed in detail in a NEPA document). PACAF initiated the IICEP process by notifying relevant Federal and regional agencies, elected officials, and other key stakeholders, of the Proposed Action and alternatives considered during the scoping process, as discussed in **Section 1.7.3**. Public notification and involvement are also discussed in **Section 1.7.3**. In addition, during review of the Draft EIS, agencies and other stakeholders have 45 days to provide comments on information specific to the Proposed Action.

1.7.1 Cooperating Agencies

A cooperating agency means any Federal agency other than a lead agency that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed action. According to CEQ regulations for implementing NEPA, upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency. In addition, any Federal agency that has special expertise with respect to any environmental issue that is addressed in the EIS may be a cooperating agency upon request of the lead agency. An agency may request the lead agency to designate it a cooperating agency.

The lead agency for this EIS is the Department of the Air Force. The EIS was prepared in compliance with NEPA of 1969 (42 U.S.C. § 4321 et seq.); the CEQ Regulations for Implementing the Procedural Provisions of NEPA (Title 40 CFR §§ 1500–1508). Cooperating agencies include the U.S. Navy, USMC, and the FAA.

1.7.2 Interagency Coordination and Consultation

The USAF has maintained oral and written communication, as required, with Divert EIS interested stakeholders and the public throughout the EIS development process. Stakeholders include Federal, state, territory, commonwealth, and local elected officials; regulatory representatives; and local nongovernmental organization stakeholder groups. Public involvement is addressed in **Section 1.7.3**. Ongoing coordination and consultation with these stakeholders is a key component in maintaining an open dialogue with interested or affected officials, agencies, or individuals. Other formal coordination and consultation that might be required during the course of the Divert EIS development process is summarized in the following paragraphs. In addition to the potentially required coordination and

consultations listed in the following paragraphs, USAF will also continue to coordinate with local agencies that are relevant to the Proposed Action, such as the Commonwealth Ports Authority (CPA), which has jurisdiction over the sea and airports within the CNMI. See **Table 1.5-1** for a summary of environmental compliance for the Proposed Action, including the status of coordination and consultations.

Endangered Species Act. The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the USFWS maintains the list, available at http://www.fws.gov/endangered/species/us-species.html. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States, territories, or commonwealths might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate state fish and wildlife office. Under the ESA, Federal agencies are required to provide documentation that ensures that agency actions will not adversely affect the existence of any federally threatened or endangered species. The ESA requires that all Federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with concurrence on a determination of the risk of jeopardy from a Federal agency project. Materials related to ESA Section 7 consultation with the USFWS are in **Appendix B**.

Coastal Zone Management Act. The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop and, where possible, restore or enhance the resources of the nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. The CZMA encourages states to exercise their full authority over the coastal zone through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone must ensure the project is, to the maximum extent practicable, consistent with the enforceable policies of the state's coastal zone management program. PACAF will coordinate with Coastal Resource Management Offices, as appropriate, regarding CZMA compliance. Materials related to CZMA compliance are in **Appendix C**.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess; offer to or sell, barter, purchase, or deliver; or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport, or carry from one state, territory, or district to another; or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA. Correspondence with USFWS addressing migratory birds and the MBTA will be conducted as necessary.

National Historic Preservation Act. The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

As appropriate, PACAF will develop a comprehensive Section 106 agreement document with the CNMI HPO, National Park Service (NPS), and other parties as appropriate. The agreement would take the form of either a programmatic agreement (PA) or a memorandum of agreement (MOA) with a goal of streamlining the Section 106 process and providing the legal framework under which adverse effects can be assessed and avoided or mitigated. The effort shall include identifying the undertakings to be included in the agreement document, determining appropriate alternate procedures to fulfill obligations under Section 106 of the NHPA, and identifying and engaging interested and consulting parties and signatories. Materials related to NHPA Section 106 compliance are in **Appendix D**.

Clean Water Act. The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by the U.S. Environmental Protection Agency (USEPA), and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation. Section 401 of the CWA requires that any Federal license or permit to conduct an activity that could result in a discharge to waters of the United States must first receive a water quality certification from the state in which the activity will occur.

To fulfill the requirements of Section 404 of the CWA, a jurisdictional determination would be required if there is potential to affect wetlands at the preferred alternative sites for the Proposed Action. PACAF would complete the steps necessary to identify wetlands and other aquatic resources occurring in the project areas on the alternative sites. Formal wetland and other waters of the United States delineations would be conducted and jurisdictional determinations would be obtained from the USACE Honolulu District.

Airport Operations and Airspace Requirements. Civilian airports in the United States are operated under 14 CFR 139 certification and under a security program approved by the Transportation Security

Administration (TSA). When the FAA issues construction grants to civilian airports, the airport signs a grant agreement that contains standard grant assurances that becomes a binding contract between the airport authority and the U.S. Government. Several of these grant assurances are applicable to the desire of the USAF to use portions of civilian airports for military activities.

Space for military improvements, such as aprons, and special use areas, such as hazardous cargo pads (also referred to as "hot" cargo pads), will need to be negotiated through agreements with the authority operating the airport and might differ between airports because of existing real estate agreements. Runway or runway safety area extensions (common use areas) would be constructed under a mutual use agreement, and any additional costs for construction or ongoing maintenance to the operating authority would be addressed in the mutual use agreement.

For example, 14 CFR 139 requires the airport to provide Airport Rescue and Fire Fighting (ARFF). This requirement includes a certain number of fire trucks and recurrent training for personnel. The addition of USAF aircraft could change the ARFF index and increase response requirements. These increased requirements can be met through negotiated agreements between USAF and the operating authority and could include direct or financial support for additional equipment, training, or personnel.

Military personnel working on the airport might need to meet TSA security program requirements. A sudden influx of military personnel for an exercise or natural disaster response could easily overwhelm the existing security system. These increased requirements can be met through negotiated agreements between USAF and the operating authority and include direct or financial support for additional equipment, training, or personnel needed to support any surge of personnel.

1.7.3 Public Involvement

NEPA requirements also help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if Federal proponents of an action provide information to state and local governments and the public and involve them in the planning process. An EIS is a public document and public involvement is a vital component of the NEPA process. Guidance for implementing public involvement is codified in 40 CFR Part 1506.6, thereby ensuring that Federal agencies make a diligent effort to involve the public in preparing NEPA documents and prescribing public involvement during various stages of the environmental review process. The USAF NEPA procedures in Title 32 CFR Part 989 include guidance on the public involvement process. In addition, the CEQ Memorandum on Scoping Guidance[1] provides guidance for public involvement and participation.

For this EIS, outreach is defined as the process of communicating the military mission and Proposed Action, and developing and maintaining stakeholder partnerships. Throughout the EIS process, outreach is necessary to garner and maintain positive partnerships among the stakeholders. The USAF intends to continue involving elected officials, government and regulatory agencies, nongovernmental organizations, the general public, and the media throughout the EIS process.

Numerous opportunities exist for public involvement throughout the EIS development process. In addition, PACAF maintains a dedicated project Web site that provides public access to documents available for review, announces meeting dates and times, announces the availability of documents for review and comment, accepts comments during open comment periods, and provides fact sheets and other project-related information (see http://www.PacafDivertMarianasEIS.com).

[1] CEQ. *Memorandum for General Counsels, NEPA Liaisons and Participants in Scoping*, Nicholas C. Yost, General Counsel, April 30, 1981.

The following summarizes the formal NEPA process-related opportunities, in compliance with CEQ regulations, for public involvement and input into the EIS process:

Pre-Notice of Intent Briefings. Prior to issuing the Notice of Intent (NOI) that formally started the EIS process, PACAF and U.S. Pacific Fleet, representing the cooperating agency the U.S. Navy, provided pre-NOI briefings to senior-level stakeholders in Guam and CNMI concerning this and other ongoing military-sponsored environmental impact studies in the region. The briefing team conducted pre-NOI briefings and question and answer sessions to provide early information about the Proposed Action and alternatives to regional political leadership. The pre-NOI briefings included briefings in Guam to the Guam legislature and Governor's office and to the office of the Guam Congressional Delegate. Briefings in Saipan, CNMI, were presented to the Military Integration Management Committee (MIMC) (which consists of the Governor; members of Legislature; and Mayors of Tinian, Rota and Saipan) and to the office of the CNMI Congressional Delegate. One briefing was presented in Honolulu, Hawai'i, to the USFWS.

Scoping. Formal public scoping began with the issuance of an NOI in the *Federal Register* on September 27, 2011. PACAF also issued notices in local media on September 28, October 3, October 10, October 11, October 12, October 14, October 17, and October 18, 2011, that announced schedules and locations for public scoping meetings. PACAF welcomed public comments on the Proposed Action and alternatives during the open public scoping period, which began with publication of the NOI. Comments were accepted at two public scoping meetings in Guam, one public scoping meeting in Saipan, one public scoping meeting in Tinian, and one public scoping meeting in Rota. Comments were also accepted via the project Web site (http://www.PACAFDivertMarianasEIS.com), postal service, and telephone recording system. Once the scoping period was completed, the scoping comments received were summarized in a scoping comment report, and comments were considered during the development of the Draft EIS.

Post-NOI Briefings. During the public scoping period, PACAF project team members provided post-NOI briefings to senior-level stakeholders in Guam and CNMI. The briefings were an updated and expanded version of the pre-NOI briefings, and were offered to a wider audience of stakeholders. The purpose of the briefings was to provide ongoing communication with local stakeholders, and to inform the stakeholders of up-to-date information regarding the Proposed Action and alternatives. The post-NOI briefings were conducted to coincide with public scoping meetings and were provided to the following stakeholder offices:

- USFWS
- U.S. Coast Guard, Marianas Sector
- FAA Center Radar Approach Control (CERAP) Guam
- FAA Facilities Honolulu
- Guam Governor
- Guam Legislature
- Guam Congressional Delegate
- Guam Mayors Council
- Guam Division of Aquatic and Wildlife Resources (DAWR)
- Guam Environmental Protection Agency (GEPA)
- Guam Chamber of Commerce
- CNMI Port Authority Board of Directors
- Tinian Mayor and Municipal Council
- Tinian Chamber of Commerce
- Rota Mayor and Rota Municipal Council

- CNMI MIMC
- CNMI Department of Environmental Quality (DEQ)
- CNMI Department of Lands and Natural Resources (DLNR)
- CNMI Division of Fish and Wildlife.

Draft EIS Public Review. This Draft EIS is the first public version of the EIS. This Draft EIS was distributed to selected Federal, state, territory, commonwealth, regional, and local agencies; private citizens; and organizations that requested copies. The Draft EIS was also made available at 10 different information repositories and on the project Web site (http://www.PACAFDivertMarianasEIS.com). USAF provided a 45-day public review period for the Draft EIS (40 CFR 1506.10). The public review period was initiated through the publication of a Notice of Availability (NOA) in the *Federal Register* on June 8, 2012, and was also advertised in local media. The USAF requested public input on the Draft EIS, including the Proposed Action, potential environmental impacts, and alternatives for the Proposed Action. Comments on the Draft EIS were accepted at the public hearings, on the project Web site (http://www.PACAFDivertMarianasEIS.com), via postal service, or via telephone recording system. Details about how to make comments were advertised notices published in local media. Comments received on the Draft EIS during the 45-day public review period will be considered in preparation of the Final EIS and responded to appropriately.

Post-NOA Briefings. During the public review period for the Draft EIS, PACAF project team members provided post-NOA briefings to senior-level stakeholders in Guam and CNMI. The briefings were an updated version of the post-NOI briefings, and were offered to an audience of stakeholders within the region of the Proposed Action and affiliated with the alternative locations. The purpose of the briefings was to provide ongoing coordination and communication with local stakeholders, and to inform the stakeholders of up-to-date information regarding the Proposed Action and alternatives. The post-NOA briefings were conducted to coincide with public hearings.

Final EIS and Record of Decision Public Review. Prior to implementing any proposed action described in the EIS, a FEIS NOA will be issued in the *Federal Register*. USAF will issue A Record of Decision (ROD) no sooner than 30 days after the NOA for the FEIS has been released. Public outreach efforts will include the NOA *Federal Register* notice, advertising the notice in local newspapers, mailing a notice to individuals and groups that commented on the Draft EIS, and posting notification on the project Web site. The signed ROD will be posted on the project Web site. An NOA for the ROD will also be published in the *Federal Register* and local newspapers.

1.8 EIS Organization

The EIS is organized into seven sections, plus appendices, as follows:

- **Section 1** provides the background information, project location, and purpose of and need for the Proposed Action.
- **Section 2** contains a description of the Proposed Action and alternatives, including the No Action Alternative.
- **Section 3** contains a description of the environmental resources and baseline conditions that could be affected by the Proposed Action and alternatives.
- **Section 4** presents an analysis of the potential environmental consequences of implementing the Proposed Action and alternatives, including the No Action Alternative.
- **Section 5** includes an analysis of the potential cumulative and other impacts.

- **Section 6** lists the preparers of the document.
- **Section 7** lists the references used in the preparation of the EIS.
- **Appendices:**
    - **Appendix A** includes cooperating agency requests and acceptance letters
    - **Appendix B** contains all materials related to ESA Section 7 Consultation.
    - **Appendix C** contains all materials related to CZMA compliance.
    - **Appendix D** contains all materials related to NHPA Section 106 Consultation.
    - **Appendix E** contains air quality calculations and modeling.

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2. Description of the Proposed Action and Alternatives

This section describes the Proposed Action and alternatives PACAF is considering in fulfilling its purpose of and need for action. As discussed in **Section 1.5.1**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, as defined in **Section 1.3**. In addition, CEQ regulations specify the inclusion of a No Action Alternative against which potential impacts can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations. **Section 2.5** discusses the decisionmaking process and identification of the Preferred Alternative.

2.1 Proposed Action

The USAF proposes to improve an existing airport or airports and associated infrastructure in the Mariana Islands in support of expanding mission requirements and to achieve divert capabilities in the western Pacific. Under the Proposed Action, the USAF would develop and construct facilities and infrastructure to support a combination of USAF and joint cargo, fighter, and tanker aircraft and associated support personnel for divert landings, periodic exercises, and humanitarian assistance and disaster relief. Unplanned divert landings and humanitarian assistance and disaster relief would occur at the airport or airports proposed for improvements as required. The USAF proposes to exercise divert activities and humanitarian airlift staging at the airport or airports proposed for improvements; exercising to these capabilities will be analyzed in this EIS. The USAF proposes to improve these facilities either at a single airport, or a combination of airports, depending on the existing capabilities of the airports being considered. Proposed expanded facilities would be used on an as-needed basis and would not be used as a permanent full-time beddown or installation location.

In summary, the Proposed Action consists of meeting USAF divert activities requirements through development of airfield operational capabilities, exercising divert and humanitarian airlift staging capabilities, conducting joint military exercises, fueling and fuel storage, and development of billeting and other personnel support requirements for temporary support personnel. To facilitate analysis and organization in the EIS, the elements of the Proposed Action are divided into a construction phase (development of the facilities) and an implementation phase (activities related to joint military exercises). The construction phase includes the development or improvement of infrastructure to support the implementation phase of the Proposed Action. A general description of the elements of the Proposed Action is provided in **Sections 2.1.1** through **2.1.2.** Detailed descriptions of the alternatives are provided in **Section 2.3.**

2.1.1 Construction Phase

The Proposed Action is based on accommodating a combination of joint military cargo, fighter, and tanker aircraft and associated support personnel. In order to accommodate these aircraft and achieve divert capabilities, supporting infrastructure would be needed to meet airfield operational requirements. Proposed infrastructure includes an expanded runway; associated pavement markings and lighting; parking aprons; a temporary munitions storage area; a hazardous cargo pad; an arm/disarm pad; an aircraft hangar; a maintenance facility; a jet fuel receiving, storage, and distribution system; and navigational aids. The projected timeline for the construction phase is 24 to 36 months. However, construction would depend on the completion of a Safety Management Plan and agreement by FAA, CPA, and commercial carriers. Specific construction requirements under the Proposed Action are outlined in **Sections 2.1.1.1** through **2.1.1.5**.

The KC-135 Stratotanker (KC-135) aircraft is indicative of tanker or cargo aircraft used by the USAF in the western Pacific. The KC-135 aircraft is being used as the design aircraft for cargo and tanker aircraft in this EIS; the KC-135 dimensions will be used to develop size and space requirements for facilities and infrastructure to support cargo and tanker aircraft under the Proposed Action. In addition, joint U.S. and foreign military cargo, tanker, and other multi-engine aircraft would use the improved facilities and infrastructure. These could include, but would not be limited to, the C-17 Globemaster (C-17), military chartered cargo planes, and military variations of civilian aircraft such as maritime patrol aircraft including the P-3 Orion (P-3) and P-8 Poseidon (P-8). It is assumed that the space to accommodate a KC-135 is roughly twice as large as the space to accommodate most tactical or fighter aircraft. A size ratio of 1 to 2 is assumed for heavy lift cargo aircraft to fighter and tactical aircraft. Fighter aircraft that might use the improved facilities and infrastructure include, but would not be limited to, the F-22 Raptor (F-22), the F-18 Hornet (F-18), F-16 Fighting Falcon (F-16), Japanese Defense Force (JDF) F-2, and Joint Strike Fighter (JSF) F-35.

2.1.1.1 Runway and Parking Apron

Runway. Operational takeoff and landing requirements for a KC-135, per AFI 11-2KC-135 V.C., indicate that an operational runway should be 10,500 feet long, and at least 150 feet wide with 25-foot-wide paved shoulders. Operational takeoff and landing calculations provided by PACAF A5U indicate that the optimal runway length is 10,000 feet as runways less than this length reduce the load capability for a KC-135 aircraft. Per Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*, a Class B operational runway should also be at least 150 feet wide with 25-foot-wide paved shoulders, and is appropriate for the KC-135 (the design aircraft) and other potential aircraft (AFCEE/PACAF 2010).

Under the Proposed Action, the EIS will analyze the potential extension of the runway up to 10,000 feet at the airport or airports chosen for improvements in order to meet optimal KC-135 requirements as identified by PACAF A5U and as previously described. However, PACAF will also analyze options that would expand the runway at the airport or airports chosen for improvements to less than 10,000 feet, or not at all. Under these options, the location could still support divert, exercise, and humanitarian relief activities, but the KC-135 would operate at a reduced load capacity.

Parking Apron. The operational requirement for parking aprons is assumed to include one refueling hydrant per KC-135 parking spot (apron). Per UFC 3-260-01, the length and width of the design aircraft determine the area required for each parking spot. The length of the KC-135 is 136.2 feet and the width is 130.8 feet. Under the Proposed Action, the parking aprons at the airport selected for expansion would need to meet design requirements for KC-135 aircraft.

Pavement Markings, Lighting, and Navigational Aids. Under the Proposed Action, all pavement markings, lighting, and navigational aids would be installed, upgraded, or relocated, as appropriate. All published terminal instrument and departures procedures would be updated due to changes in airfield touchdown zone and navigational aids relocation per FAA Order 8260.3B

2.1.1.2 Temporary Munitions Storage Area

Ideally, one standard 7-Bar Earth Covered Magazine (ECM) capable of storing up to 500,000 pounds Net Explosive Weight (NEW) of Class/Division 1.1 (Mass-Detonating) explosives, or an equivalent munitions storage capability, would be needed at the airport or airports chosen for improvements to support airfield activities under the Proposed Action (AFCEE/PACAF 2010). The temporary munitions storage area would mainly be used to store munitions safely from diverted aircraft until the aircraft could return to its place of origin, or planned destination.

Per Air Force manual (AFMAN) 91-201, Explosive Safety Standards and in compliance with DOD Manual 6055.09-M, *Ammunition and Explosives Safety Standards*, the following safety Quantity-Distance (QD) standoff distances apply for a standard 7-Bar ECM storing Class/Division 1.1 explosives with a NEW of 500,000 pounds:

- Inhabited Building Distance (IBD)—3,969 feet
- Public Traffic Route (PTR)—2,381 feet.

IBD is the minimum distance required to protect non-explosives-related facilities and personnel. PTR is the minimum permissible distance between potential explosion sites and public highways or railroad lines. Per AFMAN 91-201, PTR distance applies to taxiways serving both DOD and commercial aircraft. When IBD or PTR distances decrease, the amount of munitions that can be stored also decreases. Only trained and designated ordnance personnel are permitted to work within the IBD arc.

2.1.1.3 Hazardous Cargo Pad

A hazardous cargo aircraft parking spot (hazardous cargo pad) would be required under the Proposed Action at the airport or airports selected for improvements in compliance with FAA and AMC requirements (AFCEE/PACAF 2010). The hazardous cargo pad would mainly be used to safely handle munitions or other hazardous cargo from diverted aircraft until the aircraft could return to its place of origin, or planned destination.

Per AFMAN 91-201, Explosive Safety Standards, the following safety QD standoffs apply for a standard hazardous cargo pad with class/Division 1.1 explosives with a NEW of 50,000 pounds:

- Aircraft standoff distance—1,842 feet
- PTR—1,105 feet.

2.1.1.4 Arm/Disarm Pad

An arm/disarm pad would be needed under the Proposed Action at the airport or airports selected for improvements. The arm/disarm pad would be used to perform final safety checks on aircraft before takeoff by aircraft maintenance personnel. The arm/disarm pad would also be used to perform initial safety checks on aircraft after landing. The arm/disarm pad would also be used for arming aircraft immediately before takeoff and for disarming (safing) weapons retained or not expended upon their return. The hazardous cargo pad could be designed and constructed to double as an arm/disarm pad.

2.1.1.5 Aircraft Hangar

One aircraft hangar would be needed for operations under the Proposed Action at the airport or airports selected for improvements. The hangar would be a closed structure to store aircraft awaiting maintenance or being repaired. The hangar would be approximately 180 feet by 195 feet.

2.1.1.6 Maintenance Facility

A 6,000-square-foot maintenance facility would be needed under the Proposed Action at the airport or airports selected for improvements and would be used as an Aircraft Maintenance Unit/Aircraft Spares Management and for storage to assist aircraft at the proposed airfield. When not in use, the facility would be used to store pre-positioned equipment and materials needed for maintenance of aircraft used in exercises and humanitarian relief efforts, including Aerospace Ground Equipment (AGE) and vehicles.

2.1.1.7 Jet Fuel Receiving, Storage, and Distribution

An adequate on-island supply of jet fuel would be required as part of the Proposed Action in support of aircraft operations discussed in **Sections 2.1.2.1, 2.1.2.2,** and **2.1.2.4.** The USAF proposes to maintain a 30-day supply of jet fuel to be able to provide fuel to aircraft through a hydrant system. In order to maintain the 30-day supply of jet fuel, a combination of fuel tanks including bulk storage and smaller operating tanks would be required, depending on the alternative options selected. PACAF determined that in order to store and use the 30-day equivalent of fuel for proposed activities, 200,000-barrels (bbls) (8.4-million-gallons) total capacity of bulk fuel storage would be required. In addition, two 10,000-bbl (420,000-gallon) operating tanks would also be required to supply the hydrant system, for a total jet fuel capacity of 220,000 bbl (9,240,000 gallons).

The operational requirement would consist of one refueling hydrant for each of the proposed KC-135 parking spots (see **Section 2.1.1.1**) on the apron. Fuel storage requirements are based on the aircraft fuel needs during joint military exercises. The proposed fuel delivery system would be equivalent to a standard DOD 2,400 gallons per minute (gpm) Type III Hydrant Refueling System supporting the parking apron. Connection to the existing commercial hydrant system would support the potential for the additional fuel to be utilized for commercial purposes when not needed to support the Proposed Action. Fighter jets would be fueled with tank trucks that would be filled from fill stands located near proposed operating tanks at the airport. The ability to receive jet fuel on the island and ability to transfer it to the airfield would also be required.

2.1.1.8 Billeting

Under the Proposed Action, temporary billeting, including medical, transportation, and dining services, would be required for the personnel supporting aircraft operations during a divert landing, humanitarian airlift, or joint military exercise event. Depending on the type of billeting selected, construction could be required.

2.1.2 Implementation Phase

Under the Proposed Action, aircraft would engage in ground and air activities, aircraft support activities, and other airfield ground activities. It is assumed that any mix of joint fighter, cargo, and tanker aircraft, not to exceed the design capabilities of the airport, could be diverted to or exercised from the airport or airports selected for improvements simultaneously for any element of the Proposed Action. Therefore, a mix of joint cargo, tanker, and fighter aircraft is assumed for the proposed implementation of the divert capability and exercises that might include, but not be limited to, divert landings and take-offs, joint military exercises, jet fueling and storage, humanitarian airlift staging including non-combatant evacuation operations (NEOs), and billeting. KC-135s would remain the design aircraft for the implementation phase. Specific elements of the implementation phase under the Proposed Action are outlined in **Sections 2.1.2.1** through **2.1.2.5**. Representative scenarios of possible aircraft mixes are used in Chapter 4 to analyze potential environmental consequences. While the actual type and number of aircraft would not exceed the design capabilities, the precise mixture of aircraft during implementation may vary depending upon mission requirements.

The Joint Region Marianas Regional Engineer (J4) staff would use existing processes to review specific actions during the planning phase to ensure the proposed use would remain within the scope of activities analyzed in this or other applicable environmental planning documents. For example, when planning for an operational activity at the selected alternative, J4 would run noise models and verify it falls within the scope of what was previously analyzed. Existing processes require Commanding Officers/Officers-in-Charge of training units to comply with the mandatory regulations and guidance,

when requesting and conducting training in the Mariana Islands. They must ensure operational training is conducted in full compliance with appropriate service component directives, orders, standards, and procedures.

2.1.2.1 Divert Landings

Unscheduled aircraft landings, also known as "divert" landings would occur at the airport or airports selected for improvements; divert landings would occur at these airports if other locations in the western Pacific, for example Andersen AFB, are unavailable for landing, such as during emergencies or natural disasters. Two types of unscheduled landings could occur at the airport or airports selected for improvements: diverts resulting from malfunctioning aircraft or similar emergency situations in the air, and diverts caused by natural or man-made disasters or activities at the airfield on the ground. Emergency divert landings, in accordance with the 36th Wing Instruction 13-204, would occur on an as-needed basis when an aircraft has malfunctioned or needs to land immediately due to an emergency. Other unscheduled diverts would occur when the scheduled or planned location for landing is no longer accessible or operational, such as during typhoons, earthquakes, or other natural or man-made disasters. During a divert event when the scheduled or planned location for landing is no longer accessible or operational, the aircraft could continue to operate from the divert airport for up to 30 days until a more permanent home base is established. It is assumed that aircraft conducting divert landings at the airfield at any given time would require refueling, maintenance, temporary munitions download and storage, and billeting support.

As stated in **Section 2.1**, this EIS analyzes joint military exercises to support divert capability. Exercises are discussed in **Section 2.1.2.3**.

2.1.2.2 Humanitarian Airlift Staging

Humanitarian airlift staging, including NEOs, would also occur at the airport or airports proposed for improvements as part of the Proposed Action in the event of an emergency or disaster. Examples of this type of operation include Operation Tomodachi, the DOD relief effort implemented following the 2011 earthquake and tsunami in Japan and Operation Fiery Vigil following the 1991 eruption of Mount Pinatubo in the Philippines resulting in the evacuation of 20,000 people. For Operation Tomodachi, DOD officials reported that at least 20 U.S. naval ships, 140 aircraft, and approximately 20,000 Airmen, sailors and Marines were involved in humanitarian assistance and disaster relief efforts in and around Japan. At least 227 tons of relief supplies and humanitarian supplies were delivered to Japan (CRS 2011). For Operation Fiery Vigil, Clark AFB was evacuated, and more than 20 U.S. Naval ships and their personnel sortied from Subic Bay Naval Base to evacuate more than 20,000 personnel to Andersen AFB for further transport to safe havens. This operation included around-the-clock arrivals from the Philippines, processing through U.S. Immigration screening, and around-the-clock departures to cities of safe haven.

Emergency responses to natural disasters of this nature require pre-planning and exercising for the potential contingency. As stated in **Section 2.1**, this EIS analyzes the joint military exercises required to execute humanitarian airlift and disaster relief missions in real world situations. Military exercises are discussed in **Section 2.1.2.3**.

2.1.2.3 Joint Military Exercises

A limited number of scheduled joint, combined, and unit-level military training activities and exercises, as described and analyzed in the MIRC EIS, for which a ROD was issued on July 20, 2010, would occur under the Proposed Action at the airport or airports selected for improvements (DON 2010 a). Exercises

focus on real-world proficiency in sustaining joint forces and detecting, tracking, and engaging units at sea, in the air, and on land in response to a wide range of missions.

Joint military exercises are an important opportunity to bring together multi-service and multi-national platforms that do not always have the opportunity to train or exercise collectively. The U.S. Navy, USAF, USMC, and military from other countries operate a variety of combat and combat-support aircraft designed to meet joint and multi-national training objectives for many exercises. These joint and multi-national exercises are commonly referred to as joint-combined exercises. The United States routinely deploys forces to train in the western Pacific. Joint and combined exercises and training maintain a stabilizing presence in the region, while allowing U.S. forces and other nations to practice joint-combined skills in peacetime to prepare for success during a contingency (DON 2006). Examples of typical combined exercises include Valiant Shield and Cope North. Valiant Shield occurs biannually and usually takes place in September. This exercise involves land and maritime forces from U.S. Navy, USAF, and USMC, combined with multi-national forces, including observers from the Pacific Rim nations. Cope North occurs annually and typically takes place in mid-February and also might include multi-national forces.

In addition to joint military exercises, unit-level training would also occur at the airport or airports selected for improvements. Unit-level training would include exercising the capability to conduct divert landings and humanitarian airlift staging, as discussed in **Sections 2.1.2.1** and **2.1.2.2.**

For the purpose of analysis in this EIS, it is assumed that both unit-level training and Cope North- and Valiant Shield-type exercises would each take place annually for a combined total of 60 days per year at the airport or airports selected for improvement. This EIS addresses only the ground movements and immediate approaches and departures at the airport or airports selected for development (e.g., take-offs and landings) during unit-level training and exercises. Actual air warfare and air logistics training (i.e., above 10,000 feet) are addressed by the MIRC EIS, for which a ROD was issued on July 20, 2010 (DON 2010a). In summary, this EIS does not propose or analyze increased air operations beyond what is addressed by the MIRC EIS; this EIS analyzes the shift of some of the aircraft operating during these exercises to the airport or airports proposed for improvements (DON 2010a).

2.1.2.4 Jet Fuel Receiving, Storage, and Distribution

As stated in **Section 2.1.1.5,** one refueling hydrant for each KC-135 parking spot, (see **Section 2.1.1**), a fuel delivery system equivalent to a standard DOD 2,400 gpm Type III Hydrant Refueling System, jet fuel storage, and means of fuel resupply would be required for the airport or airports selected for improvements under the Proposed Action. Each proposed location has existing commercial fuel-receiving capability as part of the CPA marine ports. Therefore, it is assumed that no harbor or port improvements would be required to support jet fuel receipt ship to shore. The receipt of fuel would be through the existing CPA commercial facilities. The ability to store fuel and transfer fuel from the receiving port to the airfield would need to be developed because the existing fuel transport and storage capacity at the alternative locations is not sufficient to support the Proposed Action. Once these elements are constructed, as discussed in **Section 2.1.1.5**, they will be operated in support of divert landings, military exercises, and humanitarian relief and disaster relief efforts.

Fuel operations are based on the estimated aircraft fuel needs for divert activities and exercises. Divert operations under this EIS are assumed to require approximately 300,000 gallons per day for 60 days.

2.1.2.5 Billeting

Under the Proposed Action, temporary billeting, including medical, transportation, and dining services, would be required for the personnel supporting aircraft operations during a divert landing, humanitarian airlift, or military exercise events.

2.2 Selection of Site Alternatives to the Proposed Action for the EIS

Considering alternatives helps to avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be suitable for decisionmaking, capable of implementation, and sufficiently satisfactory with respect to meeting the purpose of and need for the action. CEQ regulations define reasonable alternatives as those that are economically and technically feasible, and that show evidence of common sense. During the scoping process for this EIS, PACAF considered several existing FAA-regulated airports in the Marianas for developments and improvements to support expanding mission requirements in the western Pacific. GSN, Saipan; TNI, Tinian; and Rota International Airport (GRO), Rota, in CNMI; and GUM, Guam were identified during initial scoping as potential locations for the airport improvements because of their locations in the western Pacific and proximity to the Philippine Sea. Additionally, all of these locations, with the exception of TNI, are currently listed in the 36th Air Wing Instruction (AWI) 13-204 as locations for emergency divert landings in the western Pacific.

2.2.1 Selection Standards for Location Alternatives

Certain facility, operational, and mission requirements must be present or reasonably attainable to meet the purpose of and need for the Proposed Action. There are many potential divert airfield locations across the Pacific Rim, but fall too far outside USAF-established selection standards for consideration in this EIS. For this reason, the following locations were considered and dismissed from analysis during the development of the Proposed Action and will not be addressed in this EIS: Kwajalein Atoll, Midway, Hawai'i, Wake Island Airfield, and the Aleutian Islands.

The following selection standards were developed based on USAF operational requirements for proposed airfield improvements and flight operations. The selection standards were then applied to the possible site alternatives identified during scoping to select those alternatives considered reasonable for implementing the Proposed Action and carried forward for detailed analysis in this EIS. Following are the selection standards required for the airfield:

- Be located in a U.S. territory
- Not be located within the average diameter of the eye of a typhoon having damaging winds affecting Andersen AFB (storm radius)
- Provide existing land and infrastructure with expansion capabilities
- Be located within the MIRC training area
- Provide existing fuel-receiving capabilities at the port of debarkation.

These selection standards are described in **Sections 2.2.1.1** through **2.2.1.5.**

Section 2.2.2 provides an analysis of these alternatives screened against these selection standards.

2.2.1.1 U.S. Territory

The USAF, operating from U.S. territories, is free of the political encumbrances that sometimes inhibit and can limit the scope of land-based operations in foreign territories and countries. Therefore, in order to meet the need to provide strategic capabilities of U.S. forces and humanitarian airlift in times of natural disasters, the airfield selected for development must be located on U.S. territory (see **Section 1.3**, Purpose and Need).

2.2.1.2 Storm Radius

As described in **Section 1.3**, the purpose of the Proposed Action is to achieve and maintain USAF readiness by establishing additional divert capabilities to support and conduct current, emerging, and future training activities, while ensuring the capability to meet mission requirements should access to Andersen AFB be limited or denied, such as during Typhoon Pongsona in 2002. Additionally, the Proposed Action is needed to enable the USAF to meet the statutory responsibility to organize, train, equip, and maintain combat-ready air forces and to successfully fulfill their current and future global mission of winning wars, deterring aggression, and maintaining stability in the western Pacific even if access to Andersen AFB is limited (e.g., during a training event or humanitarian relief) or denied (e.g., due to natural or man-made disaster). This EIS focuses on ensuring that the USAF can achieve its mission mandated by Title 10 U.S.C. § 8062 in the event of a disruption of operational capabilities at Andersen AFB. In the event of a natural or man-made disaster (e.g., earthquake, typhoon) that closes Andersen AFB, it is likely that other locations in close proximity to Andersen AFB would also be affected. The average diameter of a tropical cyclone (including typhoons) is 30 to 45 NM and, therefore, the airport or airports selected for improvements should be located more than 45 NM from Andersen AFB (Joint Typhoon Warning Center 1997).

2.2.1.3 Land and Infrastructure with Expansion Capabilities

In order to meet the purpose of the Proposed Action to achieve and maintain USAF readiness by establishing additional divert capabilities to support and conduct current, emerging, and future training activities, while ensuring the capability to meet mission requirements, the airfield selected for development must have the capacity to expand its existing land and infrastructure. Certain airfield operational requirements must be implemented to meet the mission to conduct divert landings and future training activities that are not standard at FAA-regulated airports (e.g., hazardous cargo pad). Additionally, land and infrastructure expansion must be done within the confines of DOD Instruction 4165.71 Real Property Acquisition, which limits the approvals for major land acquisitions. Therefore, the airfield selected for development must have adequate land and infrastructure with expansion capabilities to accommodate airfield operational requirements needed to conduct divert landings and exercises.

2.2.1.4 Within MIRC

One element of the Proposed Action is to conduct divert landings (see **Section 2.1.2.1**) and to exercise in accordance with the need to achieve and maintain USAF military readiness. The MIRC, the only U.S.-controlled training complex in the western Pacific, is the location where U.S. forces, including USAF units, train in the Marianas. The range complex includes FDM, an air-to-ground strike range, and SUA designed for military activities. The airport or airports selected for improvements should be in close proximity to these training locations in case of emergency and to provide access to divert capabilities to support and conduct current, emerging, and future training activities. An additional airfield within the existing MIRC would ensure the capability to meet mission and training requirements should access to Andersen AFB be limited (e.g., during an operational event) or denied (e.g., due to natural or man-made disaster). Therefore, the airfield selected for development should be within the MIRC.

Improving an additional airfield within the MIRC would provide an alternative location to Andersen AFB, within the training complex in emergency situations. The ability to have a designed and designated divert location within reasonable flying time to the air-to-ground strike range at FDM, or other air-to-air training locations within designated airspace is essential to training safety.

2.2.1.5 Fuel-Receiving Capabilities

The airfield selected for development must be within close proximity to a harbor or port that provides fuel tankers access to the island to replenish the supply of jet fuel in the jet fuel storage system (see **Section 2.1.2.3**). Jet fuel will be needed, as described in **Sections 2.1.1.5** and **2.1.2.3**, in support of divert landings, exercises, and humanitarian airlift staging to meet expanding mission requirements and to meet the purpose of and need for the Proposed Action. Additionally, harbors or ports currently providing access to fuel vessels would already be permitted under the Oil Pollution Act (OPA) of 1990 and the permit would require only revisions; the construction or expansion of a harbor or port to allow access of fuel vessels would require permitting under the OPA of 1990.

2.2.2 Evaluation and Selection of Alternatives

GSN, Saipan; TNI, Tinian; and GRO, Rota, in CNMI; and GUM, Guam, were identified during scoping as potential locations for the airport improvements because of their location in the western Pacific and proximity to the Philippine Sea. These possible alternatives were evaluated against the alternative selection standards described in **Section 2.2.1.** The detailed evaluation of each alternative is provided in **Sections 2.2.1.1** through **2.2.2.4**. A summary of the evaluation and selection of alternatives for analysis in the EIS is provided in **Section 2.2.3.**

2.2.2.1 GUM, Guam

U.S. Territory. GUM is on the Island of Guam, which is a U.S. territory. Therefore, GUM meets the requirements of the U.S. territory selection standard.

Storm Radius. GUM is approximately 10 NM from Andersen AFB; it is likely that in the event of a natural or man-made disaster that closes Andersen AFB, GUM would also be affected. Therefore, GUM does not meet the requirements of this selection standard.

Additionally, during the public scoping period for this EIS, comments were received concerning the proximity of GUM to Andersen AFB. Comments included, "The Guam International Airport is too close to Andersen AFB to be viable as a divert field. Any typhoon or earthquake that disables Andersen will more than likely also disable Guam International Airport. Therefore, it is desirable for the civilian airport in Guam to also have a divert field that is located on Rota, Tinian, or Saipan. We cannot rely upon Andersen to be a divert field for the Guam civilian airport."

Land and Infrastructure Expansion Capacity. GUM has adequate capabilities but limited ability to expand existing infrastructure because of limited space; the existing parking aprons and facilities are fully used by commercial aircraft. Therefore, GUM meets the requirements of this selection standard to a limited extent.

Within MIRC. GUM is located within the MIRC. Therefore, it meets the requirements of this selection standard.

Access for Fuel Vessels. GUM is within close proximity to a harbor that currently provides access to large fuel vessels. Therefore, GUM meets the requirements of this selection standard.

2.2.2.2 GRO, Rota

U.S. Territory. GRO is on the Island of Rota within the CNMI, which is a U.S. territory. Therefore, it meets the requirements of this selection standard.

Storm Radius. GRO is located approximately 40 NM from Andersen AFB. Therefore, GRO is within the average diameter of a typhoon eye from Andersen AFB. Therefore it does not meet the requirements of this selection standard.

Land and Infrastructure Expansion Capacity. GRO has limited capacity to expand facilities because of topography of the island and proximity to existing critical habitat for threatened and endangered species. Therefore, GRO meets the requirements of this selection standard to a limited extent.

Within MIRC. GRO is located within the MIRC. Therefore, GRO meets the requirements of this selection standard.

Access for Fuel Vessels. The Island of Rota has two harbors with the West Harbor serving as the primary harbor. However, the West Harbor would require revetment repair, significant improvements, and maintenance dredging in order to provide access to fuel tankers to meet the fuel requirements under the Proposed Action. Therefore, there is no harbor on the Island of Rota that currently provides the required fuel vessel access, and thus Rota does not meet the requirements of this selection standard.

2.2.2.3 TNI, Tinian

U.S. Territory. TNI is on the Island of Tinian within the CNMI, which is a U.S. territory. Therefore, it meets the requirements of this selection standard.

Storm Radius. TNI is located on the Island of Tinian which is approximately 94 NM from Andersen AFB. Therefore, it meets the requirements of this selection standard.

Land and Infrastructure Expansion Capacity. TNI has adequate capacity to expand into existing military-leased areas to the north. However, expansion to the west of the airport is limited by island topography. Expansion to the east of the airport is limited by an existing roadway. Therefore, it meets the requirements of this selection standard to a limited extent.

Within MIRC. TNI is located within the MIRC and, therefore, TNI meets the requirements of this selection standard.

Access for Fuel Vessels. Tinian Harbor is currently in disrepair but does support limited shipping, including shallow draft (i.e., small size) cargo ships, fuel vessels, and passenger ships. Tinian has a limited capability to accept fuel shipments at the port and meets the requirements of this selection standard to a limited extent.

2.2.2.4 GSN, Saipan

U.S. Territory. GSN is on the Island of Saipan within the CNMI, which is a U.S. territory. Therefore, it meets the requirements of this selection standard.

Storm Radius. GSN is located 103 NM from Andersen AFB. Therefore, it meets the requirements of this selection standard.

Land and Infrastructure Expansion Capacity. GSN has limited land on which to expand its infrastructure and capabilities because of island topography (i.e., the island is a plateau), critical habitat (i.e., nightingale reed warbler habitat), and historic resources (i.e., World War II bunkers). Approval from the FAA for a non-standard runway would be needed for development. Therefore, GSN meets the requirements of this selection standard to a limited extent.

Within MIRC. GSN is located within the MIRC. Therefore, it meets the requirements of this selection standard.

Access for Vessels. The Saipan harbor currently accepts fuel tankers and it is presumed that the same tankers that currently supply Saipan with jet fuel would continue to do so under this alternative and no port improvements would be needed to meet the fuel shipping requirements under the Proposed Action. Therefore, GSN meets the requirements of this selection standard.

2.2.3 Summary of Alternatives Evaluation

The evaluation of possible site alternatives identified only two site alternatives that meet, or have the ability to meet, each selection standard. Accordingly, TNI and GSN are able to meet the purpose of and need for the Proposed Action and will be considered in the analysis as alternatives. A potential site alternative with red in the matrix below cannot meet the stated purpose and need, and will not be considered in detail in the EIS. See **Table 2.2-1** for a summary of each site alternative evaluated against the selection standards.

Table 2.2-1. Evaluation of Alternatives Against Selection Standards

Selection Standard	GUM	GRO	TNI	GSN
U.S. Territory				
Storm radius				
Adequate land and existing infrastructure with expansion potential to satisfy Proposed Action requirements				
Provide a secondary airfield within MIRC (average approximate 30-minute flight time)				
Access to fuel vessels				

Key:
Green = meets selection standard
Yellow = limited capability to meet selection standard, or can be brought to standard
Red = does not meet selection standard and cannot be brought or made to meet standard

2.3 Alternatives to the Proposed Action Carried Forward for Analysis

2.3.1 Alternative 1 – GSN

As described in **Section 2.1**, the Proposed Action includes supporting joint military cargo, fighter, and tanker aircraft. In this EIS, the KC-135 aircraft represents the design aircraft for each element of the Proposed Action in order to develop size and space requirements for facilities and infrastructure, and to conduct the analysis of potential impacts. The USAF proposes to divert and exercise other USAF and joint military aircraft including cargo, fighter, and tanker aircraft, in accordance with typical operational scenarios.

Under Alternative 1, GSN would be improved to an airfield design that could accommodate 12 KC-135 aircraft to meet the purpose of and need for the Proposed Action. This airfield design would also accommodate other military logistics and tactical aircraft. The airfield design assumes that the KC-135 aircraft represents large logistics (or heavy lift cargo) aircraft and it is assumed that the space to accommodate a KC-135 is roughly twice as large as the space to accommodate most tactical or fighter aircraft. A size ratio of 1 to 2 is assumed for heavy lift cargo aircraft to fighter and tactical aircraft; therefore, 24 fighter or tactical aircraft could be diverted to or exercised from GSN simultaneously for any element of the Proposed Action, not to exceed the capabilities of the proposed design. Finally, it is also assumed that a mix of fighter, tactical, and large logistics aircraft (e.g., 10 large logistics aircraft and 4 fighters) could be diverted to or exercised from GSN simultaneously for any element of the Proposed Action as long as the mix does not exceed airfield design capabilities. The temporary support personnel population accompanying the aircraft under Alternative 1 would not exceed 700, regardless of what mix of aircraft is diverted to or exercised from GSN. Specific elements of Alternative 1, the GSN Alternative, are described in **Sections 2.3.1.1** and **2.3.1.2**. The potential numbers of aircraft represent the highest or "worst-case" scenario under the Proposed Action.

In order to reduce strain on existing airport and commercial facilities and infrastructure, the USAF proposes to construct and expand new facilities, rather than fully utilize existing facilities in both the Construction and Implementation Phase of Alternative 1.

2.3.1.1 Alternative 1 – Construction Phase

Runway and Parking Apron

Runway. To meet minimum operational requirements identified by PACAF and described in **Section 2.1.1.1**, a 10,000-foot-long runway surface is required for the KC-135. Under Alternative 1, the USAF would expand the existing 8,700-foot-long GSN runway on the east and west ends to 10,075 feet long by 150 feet wide (plus 50 feet of paved shoulders); or on the east end only to 9,350 feet long by 150 feet wide (plus 50 feet of paved shoulders), or would not expand the existing runway at all. The 10,075-foot runway is optimal, but might not be feasible due to airport boundary constraints, and topography. **Figure 2.3-1** includes a schematic site plan of the proposed expansion for the 10,075-foot runway to the east and west. For the 9,350-foot runway option, the west end extension depicted on **Figure 2.3-1** would not be constructed. For the no extension option, neither the west end or east end extension depicted on **Figure 2.3-1** would be constructed.

Option A- 10,075-foot-long Runway Option. The existing runway is positioned roughly east to west, is 8,700 feet long by 150 feet wide, and has two 25-foot paved shoulders. If the 10,075-foot-long runway was constructed under Alternative 1, the existing runway would be expanded to the east and west. Therefore, the existing runway at GSN would be extended by a total of 1,375 feet under Alternative 1. It is proposed that the west end of runway 07 would be extended by 725 feet by 150 feet wide (plus 50 feet of paved shoulders). It is also proposed that the east end of runway 07 would be extended by 650 feet by 150 feet wide (plus 50 feet of paved shoulders). The runway extensions would only be used for emergency take-offs and landings and would be striped (and marked) as "unusable" by all commercial (on a daily basis) and military aircraft (during exercises). The design strength would require a 12-inch base with 14 inches of concrete. A significant amount of structural fill (approximately 655,000 cubic yards [yds^3]) would be required for the runway extension; structural fill would be obtained from existing quarries or borrow pits on the island, approximately 4 miles from the airfield.

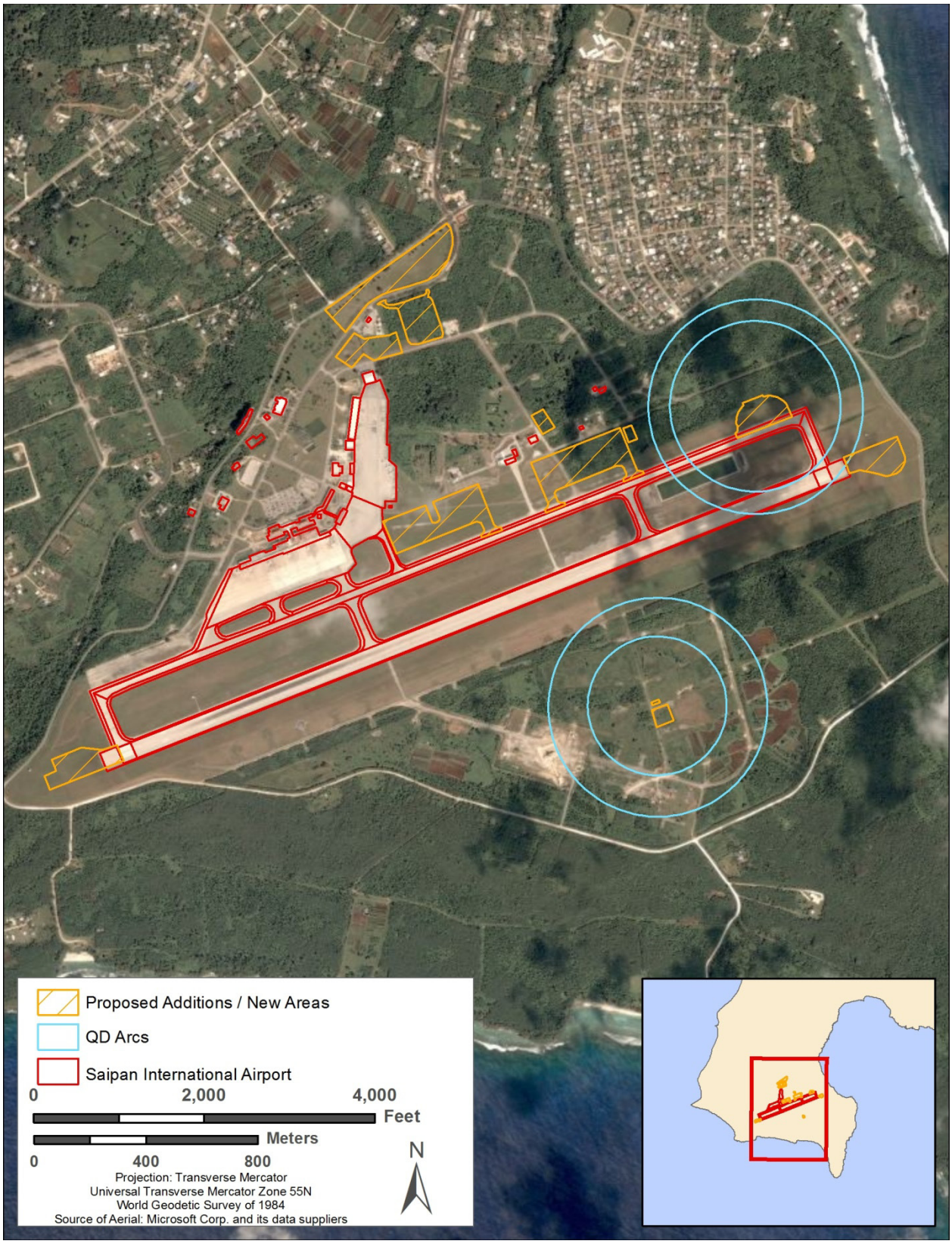


Figure 2.3-1. Overview of Proposed Action Areas at GSN

Option B- 9,350-foot-long Runway Option. The USAF could also lengthen the existing GSN runway to 9,350 feet instead of 10,075 feet; the shorter runway under this option would result in a reduced load capability for a KC-135 aircraft but could still support basic exercise, divert, and humanitarian activities. Construction of the 9,350 feet or less runway would result in a total maximum addition to the existing GSN runway of 650 feet. Under this option, it is proposed that only the east end of runway 07 would be extended by 650 feet by 150 feet wide (plus 50 feet of paved shoulders). The design strength would require a 12-inch base with 14 inches of concrete. A significant amount of structural fill (approximately 315,000 yds^3) would be required for the runway extension; structural fill would be obtained from existing quarries or borrow pits on the island approximately 4 miles from the airfield.

Option C- No Extension Option. The USAF could also decide not to lengthen the existing GSN runway; the shorter existing runway of 8,700 feet long under this option would result in a reduced load capability for a KC-135 aircraft, but could still support basic exercise, divert, and humanitarian activities. No structural fill would be required under this option.

Pavement Markings, Lighting, and Navigational Aids. To accommodate the proposed runway extension, the existing Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) would be replaced with a 2,400-foot approach lighting system with sequenced flashing- (ALSF) 1 on the runway 07 west end per UFC 3-260-01. It is proposed that the distance remaining markers and Runway End Identifier Lights (REIL) systems all be replaced. The middle marker and nondirectional beacon might need to be relocated as well. In addition, the glideslope and localizer would be relocated if the threshold locations were changed. The existing runway edge lights are proposed to be extended the length of the proposed runway addition. All proposed lighting system improvements are in accordance with UFC 3-535-01 Visual Air Navigation Facilities.

Parking Aprons. To meet operational requirements, ramp area is required for 12 KC-135 aircraft under Alternative 1. Under Alternative 1, the proposed new parking apron would be constructed along the existing GSN runway.

In order to avoid existing cultural resources on the GSN property, two separate parking aprons would be constructed adjacent to each other on the north side of the existing runway, with up to six KC-135 parking spots each. The total area of the proposed new apron area is approximately 17.07 acres, or 899,547 square feet (ft^2). The design strength would require a 12-inch base with 14 inches of concrete for the entire ramp expansion. Ballfield-type lighting is proposed on the northeastern boundary to provide adequate security and operational lighting for night operations. Airfield lighting systems would include only the lighting facilities required for support of aircraft operational areas. Controls and equipment vault facilities would be included as necessary to provide a complete and usable system. Design and equipment would conform to criteria contained in UFC 3-535-01. **Figure 2.3-2** presents proposed parking apron areas.

Temporary Munitions Storage Area

Under Alternative 1, the ECM would be sited approximately 1,750 feet south of the centerline of the runway and approximately 1,160 feet east of the Aircraft Rescue Training Area (ARTA). To adhere to minimum safety criteria and standoff distances in compliance with DOD Manual 6055.09-M, *Ammunition and Explosives Safety Standards*, and based on the limitation of the 1,750-foot distance between the proposed ECM location and the IBD (considered to be the runway centerline), the maximum NEW, 1.1 Mass-Detonating quantity that could be stored in the ECM would be approximately 83,000 pounds NEW. The standoff distances limit the potential location of the ECM to the south of the existing runway.

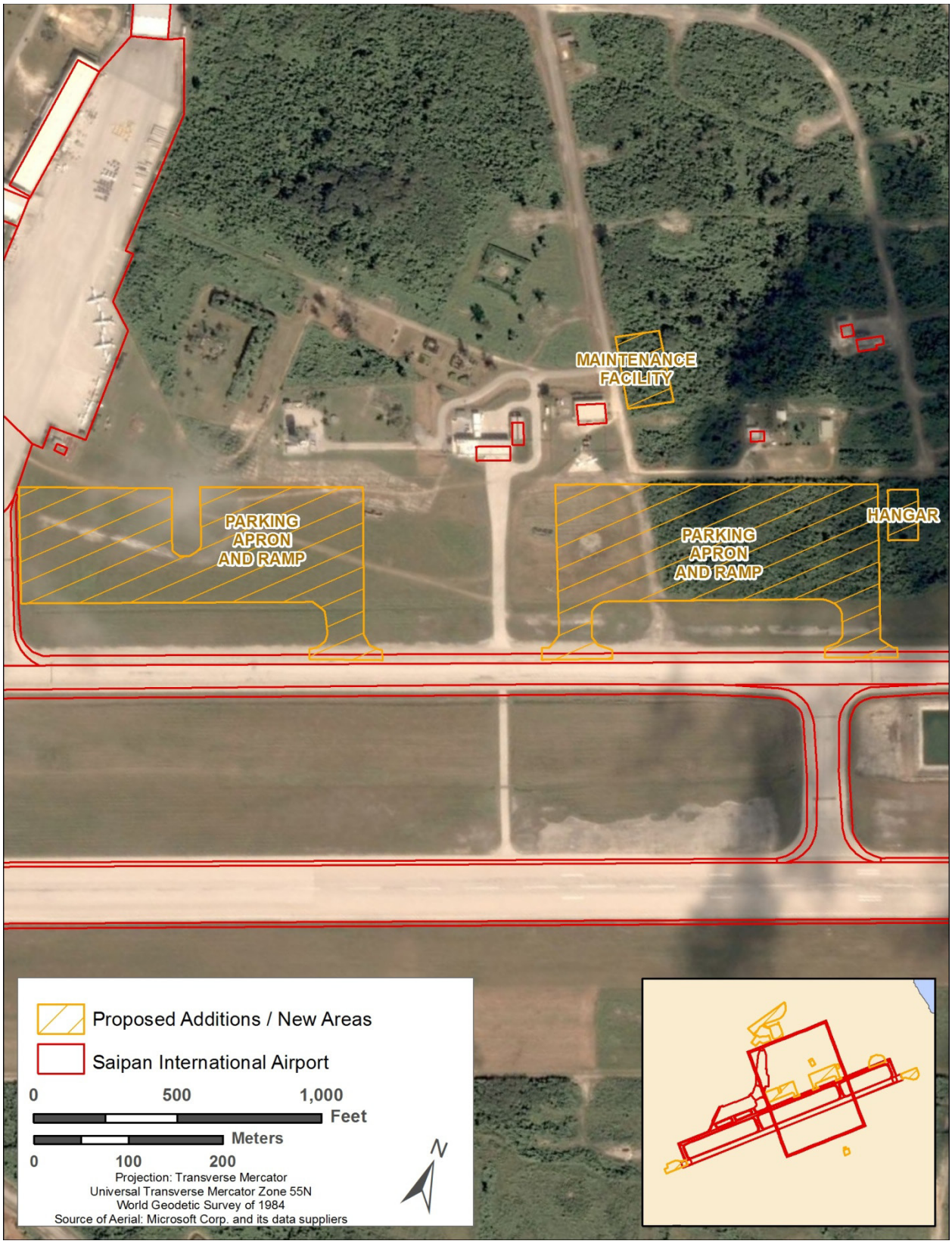


Figure 2.3-2. Proposed Parking Aprons, Hangar and Maintenance Facility at GSN

For the primary munitions hauling route, the existing road infrastructure that connects the ARTA to the runway would be used. No inhabited facilities are within the IBD 1,750-foot QD standoff distance at this location. A multi-cube magazine would also be constructed as part of the temporary munitions storage area under Alternative 1. The magazine would be collocated with the ECM and would be covered by the QD arc for the ECM. The total storage capacity of these proposed munitions storage facilities would not exceed 83,000 pounds NEW.

The ECM would be approximately 95 feet by 35 feet and the multi-cube would be adjacent to the ECM with a size of approximately 205 feet by 207 feet. **Figure 2.3-3** includes a schematic site plan for the temporary munitions storage area.

Hazardous Cargo Pad and Arm/Disarm Pad

To meet operational requirements and to adhere to minimum safety criteria and standoff distances in compliance with DOD Manual 6055.09-M, DOD Ammunition and Explosives Safety Standards, the hazardous cargo pad under Alternative 1 would be located on the eastern portion of the taxiway connecting back into the runway. The proposed layout is a flow-through horseshoe design that would allow aircraft to taxi onto the hazardous cargo pad and then taxi off the pad and connect back to the taxiway and runway. The hazardous cargo pad would be approximately 670 feet by 370 feet. The hazardous cargo pad was previously a drive-through taxi lane and would be filled with concrete to create the hazardous cargo pad. The design strength would require a 12-inch base with 14 inches of concrete. The concrete filled hazardous cargo pad would also function as an arm/disarm pad. The proposed location complies with all airfield criteria. The maximum NEW for the joint hazardous cargo pad and arm/disarm pad is based on the distance to the centerline of runway, which is the closest object that needs to meet an IBD. The distance to the joint hazardous cargo pad and arm/disarm pad is 913 feet; therefore the maximum NEW of class/Division 1.1 explosives for the joint hazardous cargo pad and arm/disarm pad is 11,891 NEW. No inhabited facilities or aircraft are within the standoff distance at this location.

Figure 2.3-4 includes a schematic site plan for the arm/disarm pad and hazardous cargo pad.

Aircraft Hangar

Under Alternative 1, one aircraft hangar would be constructed at GSN. The hangar would be approximately 180 feet by 195 feet, or approximately 35,100 ft^2, and would be located adjacent to the parking ramp and apron. **Figure 2.3-2** includes a schematic site plan for the hangar.

Maintenance Facility

A maintenance facility would be constructed north of the apron near the pre-engineered building last used for commercial skydiving under Alternative 1. The maintenance facility would be approximately 6,000 ft^2. **Figure 2.3-5** includes a schematic site plan for the maintenance facility.

Jet Fuel Receiving, Storage, and Distribution

Due to the geographic location and current limited jet fuel receipt, storage, and dispensing capability on Saipan, it was determined that fuel support under the Proposed Action would be impossible to sustain without infrastructure investments. In order to sustain fuel operations under Alternative 1, fuel tanks would be installed at GSN and at the seaport on Saipan (AFCEE/PACAF 2010).

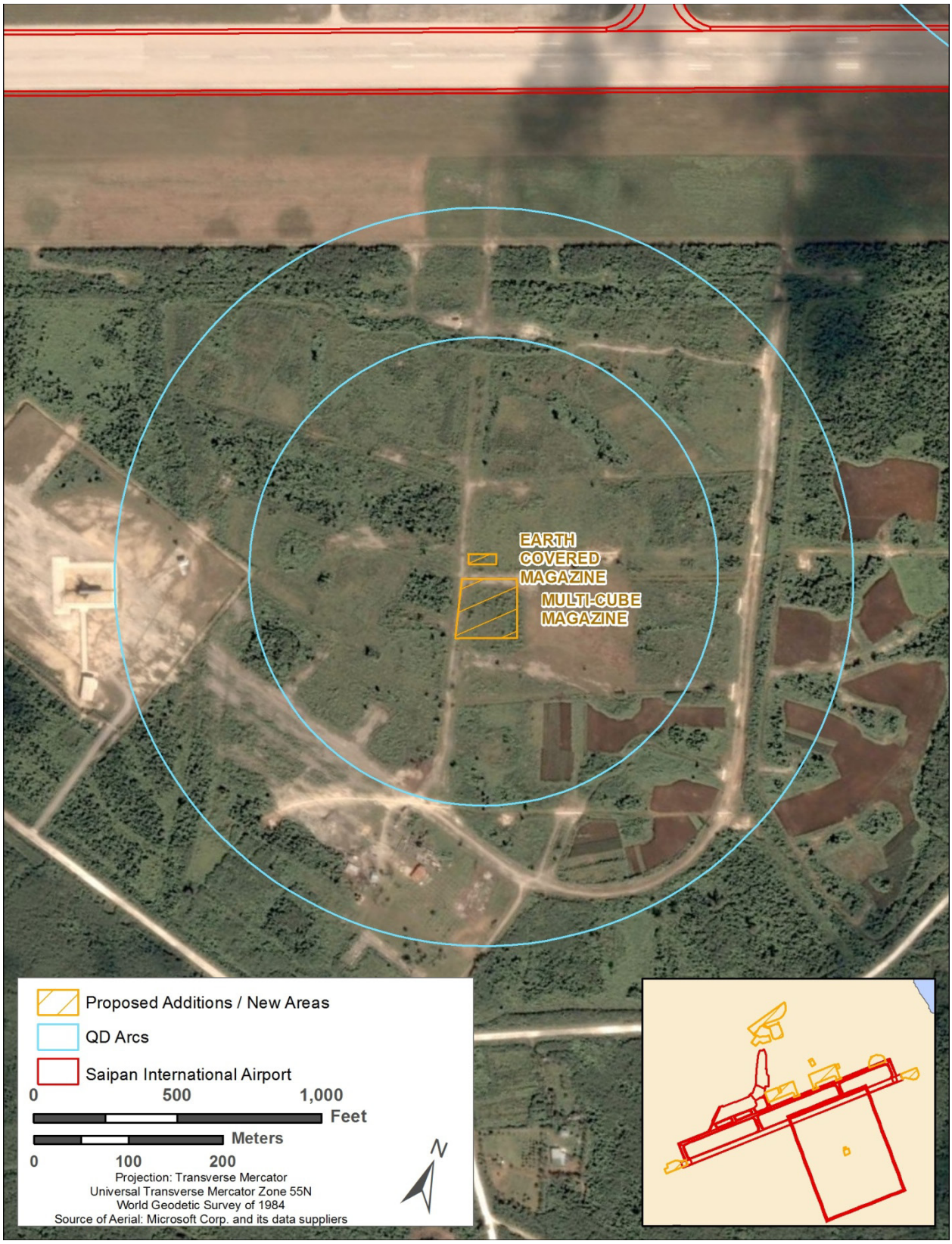


Figure 2.3-3. Schematic Site Plan for Temporary Munitions Storage Area

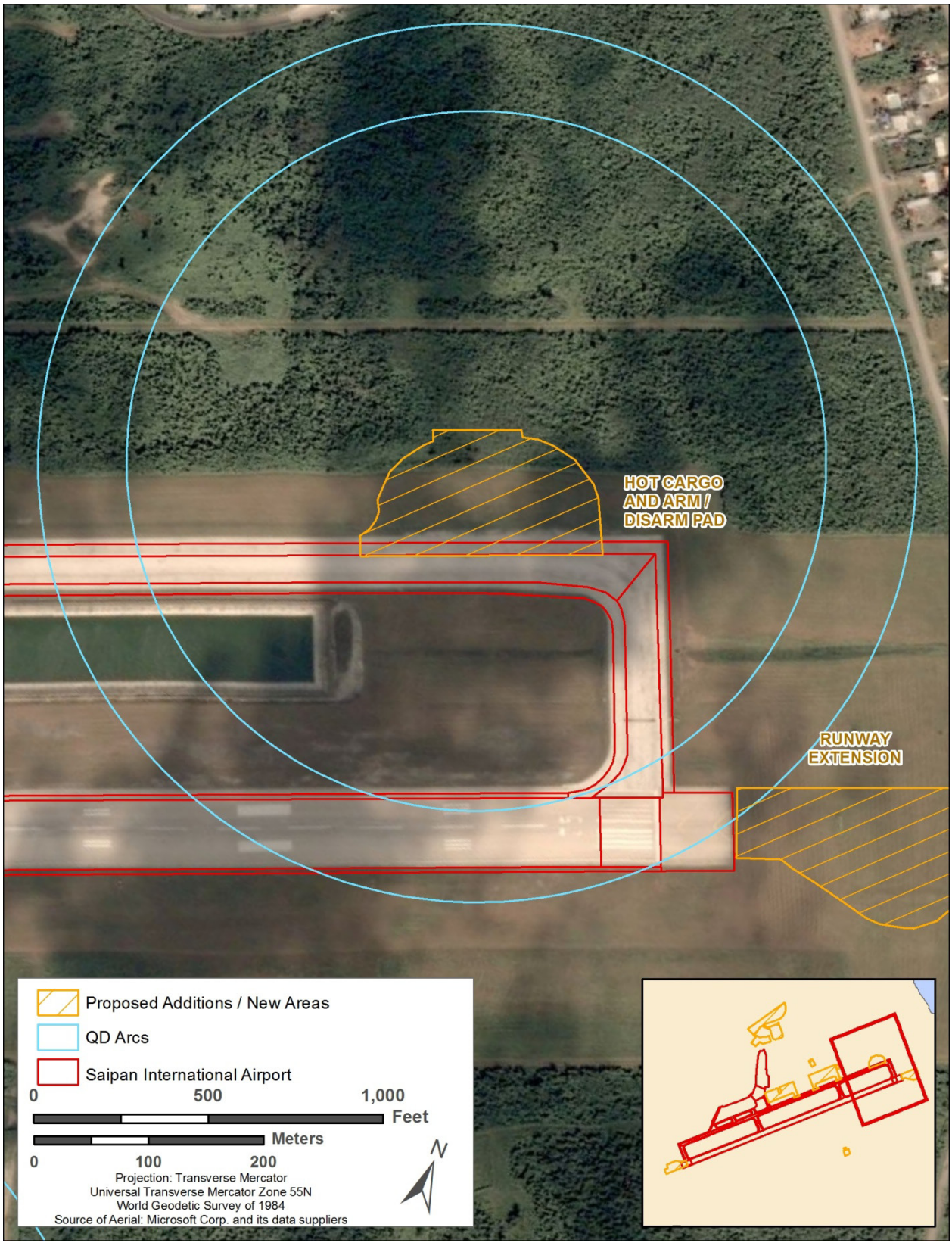


Figure 2.3-4. Schematic Site Plan for Hazardous Cargo Pad and Arm/Disarm Pad



Figure 2.3-5. Schematic Site Plan for Maintenance Facility

Under Alternative 1, jet aircraft refueling capability would be provided at the airport by using a combination of current capability and installing a standard DOD-designed 2,400 gpm Type III Hydrant Refueling System adjacent to the new ramp that would be constructed. This refueling system would also tie into the existing parking ramp (with minimum disruption to commercial aircraft operations during construction periods) and the proposed parking apron expansion. This option would include constructing two 10,000-bbl, aboveground operating tanks that would be located near the new 100,000-bbl bulk storage tank. Additional fuels related infrastructure would include two truck fill tanks, an emergency generator, transfer pumphouse, pumps, piping, filtration, valves, and a Pantograph/Hydrant Servicing Vehicle (HSV) Test Station. This option would meet PACAF's operational need to support 12 primary assigned aircraft parking/refueling requirement. Special considerations were given to ensure current capability would be maximized to reduce fueling infrastructure costs. In order to sustain potential aircraft activity on the island, it was determined that one DOD Standard Design 100,000-bbl (4.2-million-gallon), aboveground tank would be required for aviation fuel bulk storage capability and located on airport property. This system would include tanks, pumps, valves, filtration systems, emergency generator, and concrete work. In addition, two aboveground 50,000-bbl (2.1-million-gallon) tanks with pump, filter, issue fillstand with two positions, and associated piping would be constructed near the seaport on existing federally leased land. The proposed location is adjacent to the U.S. Army Reserve Center between Beach Road and Middle Road, inland from the existing commercial fuel storage area.

Figures 2.3-6 and **2.3-7** include schematic site plans for one bulk fuel tank and two operational tanks at the airport, and two bulk fuel tanks at the seaport, respectively.

Billeting

Under Alternative 1, temporary billeting would be required for up to 700 personnel at GSN that would support aircraft operations during a divert landing, humanitarian airlift, or military exercise event. The USAF proposes to accommodate support personnel either by using commercial lodging on the Island of Saipan or a Basic Expeditionary Airfield Resources (BEAR) 550 Initial Housekeeping Set (XFB1H) kit (BEAR kit).

Commercial Lodging Option. If the USAF were to use commercial lodging, no additional construction or improvements at GSN would be needed.

BEAR Kit Option. If the USAF were to use a BEAR kit for billeting, the BEAR kit would be established at GSN in accordance with Air Force Handbook (AFH) 10-222 Volume 2 *Guide to Bare Base Assets.* The proposed area for the BEAR kit is approximately 12.3 acres and would require minimal vegetation clearing as it is located in a previously cleared and disturbed field. Electricity would be supplied from the local grid by tying into existing electrical lines that are already on site. **Figure 2.3-6** shows the location of the proposed BEAR kit area.

Construction Materials

In order to construct the elements proposed under the construction phases of Alternative 1, concrete would be needed. Under Alternative 1, concrete would be mixed at existing locally contracted commercial facilities which operate concrete batch plants. Dry cement would be barged to Saipan using the supplier's existing supply chain, and then trucked from the Port of Saipan to the commercial concrete facility where the concrete would be mixed. Mixed concrete would be trucked from the commercial concrete batch facility to GSN. Assumptions are based on total volume of concrete needed for construction, phased over 3 years. **Figure 2.3-8** shows the proposed cement and concrete truck routes on Saipan.

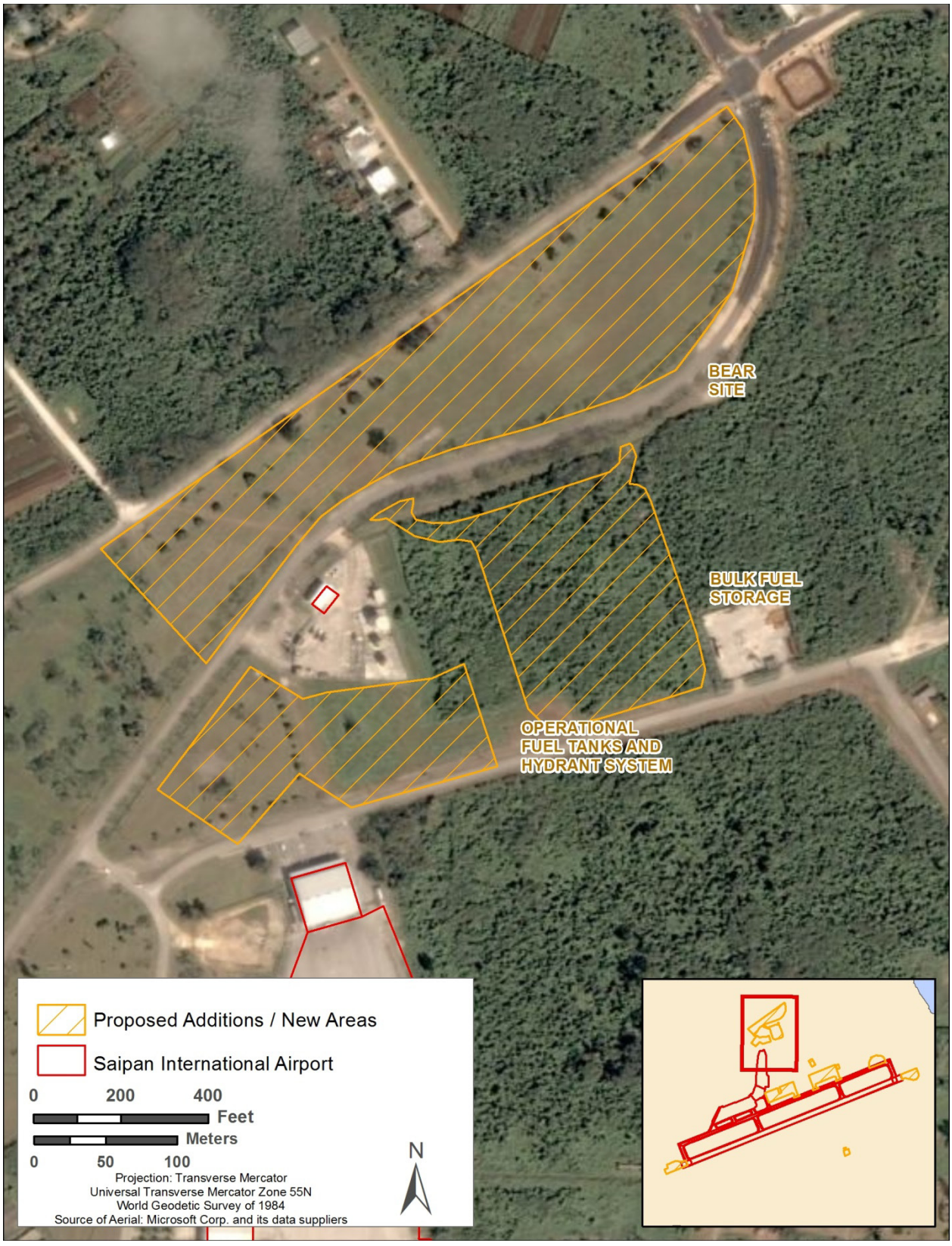


Figure 2.3-6. Schematic Site Plan for Fuel Tanks and BEAR Site at GSN

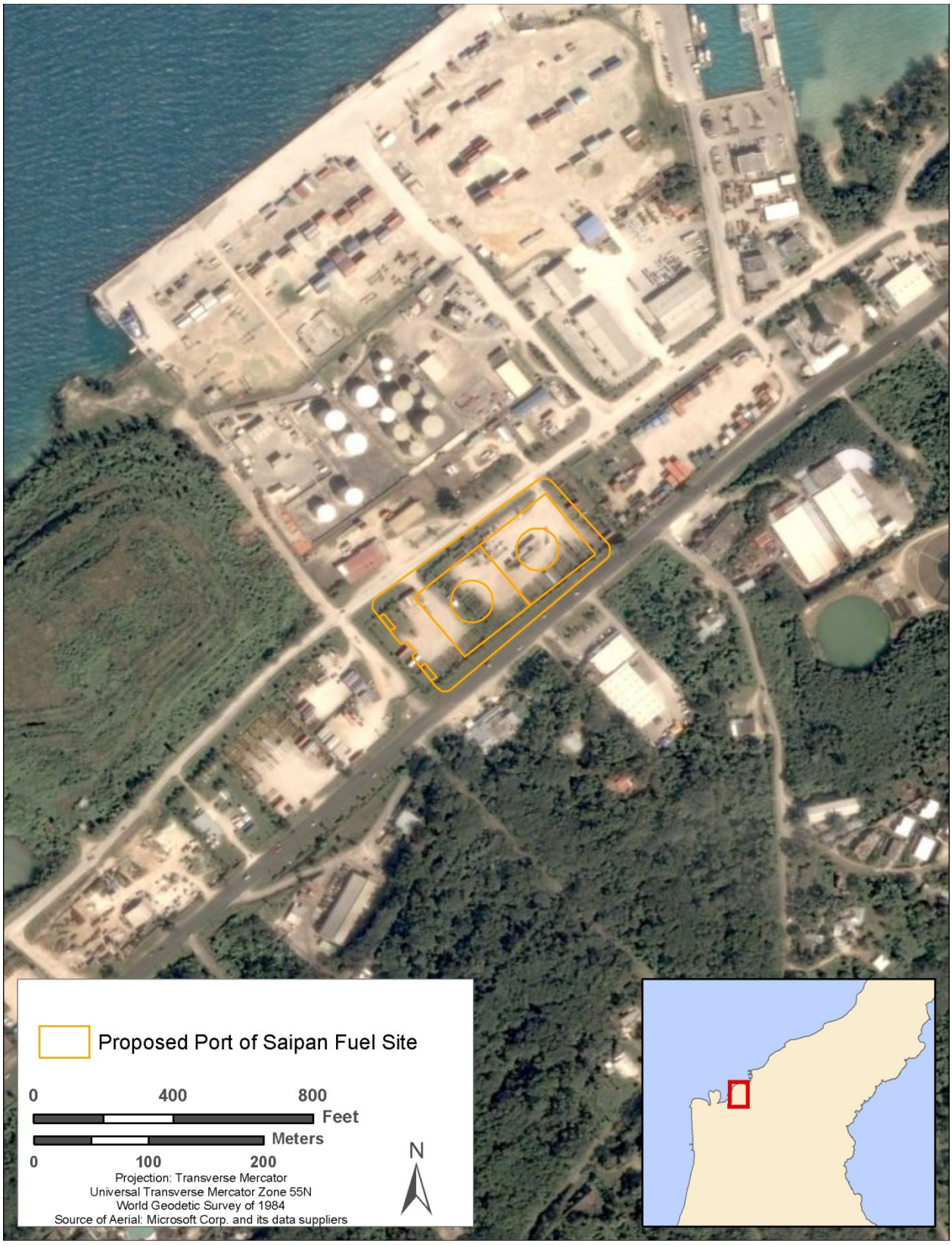


Figure 2.3-7. Site Plan for Two Fuel Tanks at the Port of Saipan

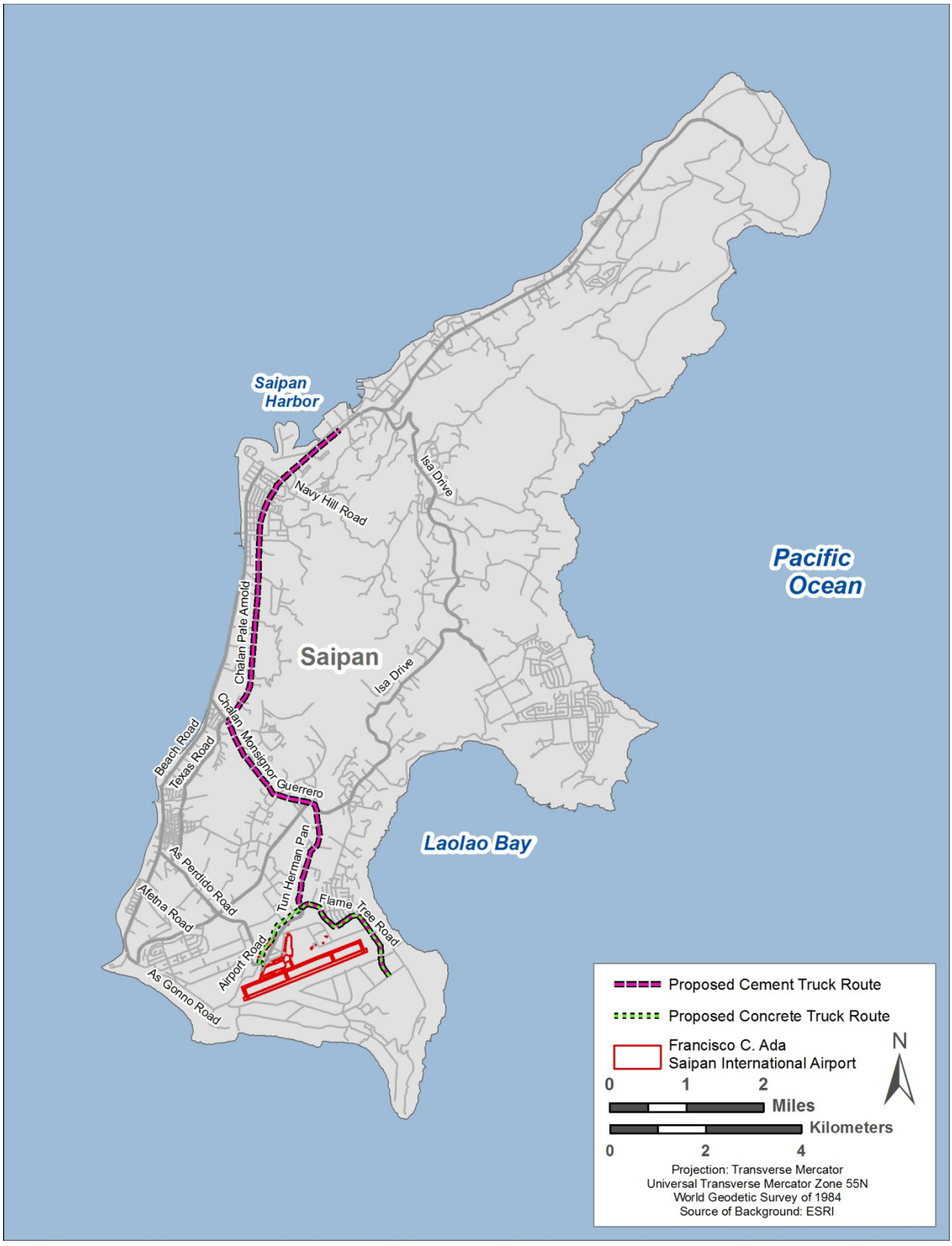


Figure 2.3-8. Proposed Cement and Concrete Truck Routes on Saipan

Cement Trucking from the Port of Saipan to Commercial Concrete Supply Company. Dry cement would be trucked in dump trucks from the Port of Saipan to the commercial concrete supply company in Obyan, Saipan, a distance of approximately 7 miles. The trucks would likely travel on Chalan Pale Arnold, Chalan Monsignor Guerrero, Airport Road, and Flame Tree Road. Due to construction phasing over 3 years, a total of 1,674 yd^3 of cement per year would need to be trucked from the Port of Saipan to the commercial concrete supply company. This equates to 5 dump trucks, making 3 trips per day from the Port of Saipan to the commercial concrete supply company, 10 days per year; or 150 total truck trips per year.

Concrete Trucking from Commercial Concrete Supply Company to GSN. Concrete would be mixed at the commercial concrete supply company and trucked in a cement mixer from the commercial concrete supply company in Obyan, Saipan, to GSN, a distance of approximately 2 miles. The trucks would likely travel mainly on Flame Tree Road. Due to construction phasing over 3 years, a total of 26,797 yd^3 of concrete per year would need to be trucked from the commercial concrete supply company to GSN. This equates to 10 cement mixer trucks, making 5 trips per day from the commercial concrete supply company to GSN, 54 days per year; or a total of 2,679 trips per year. A negligible percentage of the overall concrete would be trucked from the commercial concrete supply company to the harbor for fuel tank-related construction.

Summary

In summary, implementing the construction phase under Alternative 1 at GSN would result in an increase of impervious surface by 2,392,200 ft^2. **Table-2.3-1** provides a summary of each construction element and proposed square footage.

Table 2.3-1. Summary of Construction Elements under the GSN Alternative

Construction Element	Approximate Size (ft^2)	Increase in Impervious Surface (ft^2)
Maximum Runway Extension*	275,000	275,000
Parking Apron	900,000	900,000
Temporary Munitions Storage Area (ECM and Multi-cube)	43,700	43,700
Hazardous Cargo Pad and Arm/Disarm Pad	195,000	195,000
Aircraft Hangar	35,100	35,100
Maintenance Facility	6,000	6,000
Jet Fuel System (Operational, Bulk, and at the Port of Saipan)	400,400	400,400
Billeting†	537,000	537,000
Total	**2,392,200**	**2,392,200**

Notes:

* Runway extension size and impervious surface is based on Option A and is considered the "worst-case" scenario.

† Billeting size and impervious surface is based on the BEAR kit option and is considered the "worst-case" scenario.

2.3.1.2 Alternative 1 – Implementation Phase

Divert Landings

Under Alternative 1, GSN would be used as an unscheduled alternative location to operate aircraft when other locations in the western Pacific are temporarily unavailable. As stated in **Sections 2.1** and **2.1.2.1**, this EIS analyzes exercises and training to support the divert capability. Training to divert capabilities under Alternative 1 at GSN is discussed in **Section 2.3.1.2** under military exercises.

Humanitarian Airlift Staging

Under Alternative 1, GSN would be used for unplanned humanitarian airlift staging in response to a natural or man-made disaster, when needed. As stated in **Sections 2.1** and **2.1.2.2**, exercises and the training required to execute humanitarian airlift and disaster relief missions would occur at GSN under Alternative 1 and are analyzed in this EIS. Humanitarian airlift and disaster relief exercises are discussed in **Section 2.3.1.2** under military exercises.

Military Exercises

Under Alternative 1, military exercises as described under the Proposed Action would occur at GSN. It is assumed that no more than two annual joint military exercises lasting 2 weeks per exercise (a total of 4 weeks of exercises) would occur at GSN with other periodic unit-level training, to include divert and humanitarian airlift staging training (an additional 4 weeks of exercises) occurring throughout the year as analyzed in the MIRC EIS; exercises would occur approximately 8 weeks per year. Aircraft operations during the approximate 8 weeks of exercises that would occur at GSN under Alternative 1 are based on aircraft operations that occurred during both Valiant Shield and Cope North as analyzed in the MIRC EIS (DON 2010a). It is assumed that each aircraft would take off and land twice each day during exercises and individual units would periodically land and take off to become familiar with the airfield while in the area of responsibility (AOR). During exercises, the normal flying window is approximately 6 to 8 hours during a 12- to 16-hour timeframe. No more than 700 personnel would participate in exercises at GSN at any given time, with a typical exercise population being a 12-ship fighter package of 145 to 170 personnel.

Jet Fuel Receiving, Storage, and Distribution

Under the Proposed Action, operational mandates require a 30-day supply of jet fuel storage and a means of delivering the fuel to aircraft for high-volume tanker operations.

As described in **Section 2.3.1.1,** jet aircraft refueling capability under Alternative 1 would be provided by using a combination of current capability and installing a standard DOD-designed 2,400 gpm Type III Hydrant Refueling System adjacent to the proposed ramp to be constructed. It would provide a sustained capability of simultaneously refueling four aircraft at a flow rate of 600 gpm. Additionally, one DOD Standard Design 100,000-bbl, aboveground tank would be used for aviation fuel bulk storage capability on the airport property. This system would include tanks, pumps, valves, filtration systems, emergency generator, oil/water separator, and concrete. Two 50,000-bbl bulk fuel tanks with pumps, filters, fillstands, and associated piping would also be used in fuel operations near the seaport adjacent to the existing commercial fuel facility on existing federally leased property.

Jet fuel would be offloaded at the existing fuel offloading facility at the seaport from vessels that are capable of navigating the existing harbor. Fuel would be offloaded into the two 50,000-bbl bulk storage tanks adjacent to the seaport (see **Section 2.3.1.1** and **Figure 2.3-7**). In order to transfer fuel to the

100,000-bbl bulk storage tank at the airport, standard fuel transfer tank trucks would be used. It would take six tank trucks (10,000 gallons each) 14 days working approximately 10 hours per day to initially fill the bulk storage tank at the airport. During scheduled joint military exercises, bulk jet fuel at the airport bulk tank would be transferred to one of two operating tanks adjacent to the parking apron. The fuel would then be transferred to fuel tankers or other aircraft taking part in the exercises. In order to maintain the airport tank fuel supply for operations exceeding 14 days, fuel trucks would need to transport fuel over surface roads. It is assumed that up to six trucks operating 10 hours per day for the duration of the operation would be required. Because it is assumed that approximately 8 weeks per year of joint military or unit-level exercises could take place at the selected alternative location, it is anticipated that fuel transfer activity would also last approximately 8 weeks per year. The proposed fuel truck routes under Alternative 1 are presented in **Figures 2.3-9**, **2.3-10**, and **2.3-11.**

Billeting

Under Alternative 1, temporary billeting would be required for up to 700 personnel at GSN that would support aircraft operations during a divert landing, humanitarian airlift, or military exercise event. The USAF proposes to accommodate support personnel either by using commercial lodging on the Island of Saipan or a BEAR 550 Initial Housekeeping Set (XFB1H) kit (BEAR kit).

Commercial Lodging Option. If the USAF were to use commercial lodging, the USAF and PACAF would enter into agreements with local hotels to accommodate personnel in commercial lodging during planned activities such as exercises. Medical care would continue to be provided by military personnel, and would occur at Saipan Hospital under agreement with the hospital. This would require military personnel to receive validation of their credentials before practicing at a civilian hospital. Additionally, up to 700 support personnel would use local facilities and modular trailers to conduct airfield support activities, such as administrative functions. The support personnel would be fed by food purchased from local commercial vendors on Saipan and personnel would be transported using vehicles rented from commercial retailers on Saipan. It is assumed that commercial buses would be used to transport a maximum of 700 personnel to and from commercial lodging and the airfield. Buses would transport approximately 50 personnel per bus, or approximately 56 trips per day. This equates to 14 buses making 4 trips each to and from the airfield.

BEAR Kit Option. If the USAF were to use a BEAR kit for billeting, the BEAR kit would be established at GSN in accordance with AFH 10-222 Volume 2 *Guide to Bare Base Assets*. AFH 10-222 Volume 2 describes the BEAR and legacy Harvest Falcon (HF) and Harvest Eagle (HE) assets that USAF civil engineers are likely to site, install, and operate in an expeditionary environment.

The BEAR set would include 45 billet tents, showers, latrines, 12 administrative shelters, 2 Power Pro shelters, an alert shelter, and a mortuary. A 920-kilowatt (kW) generator set and fuel bladders for the generators would also be installed (AFCEE/PACAF 2010). The BEAR kit would be installed away from the existing taxiway and the future ramp, reducing the noise level at the bare base but close enough to service and support the operation. The proposed area is approximately 12.3 acres. Access to the bare base would be through the service road used to monitor and maintain the water wells in the area. A perimeter fence with two vehicular gates and a pedestrian gate would surround the cantonment. A semi-dispersed layout of the billeting was used per AFH 10-222 Volume 2 Figure A2.15. An existing water source at the intersection of Flame Tree Road and Airport Access Road would be used. At a minimum, a 2-inch waterline would be installed to support the BEAR base from this location. An 8-inch sewer line with manholes spaced 350 feet apart would be installed from the BEAR base to the sewer main line at the intersection of Flame Tree Road and Airport Access Road. An 8-inch line would be required due to the 0.5 percent slope from the BEAR base to manhole #23.

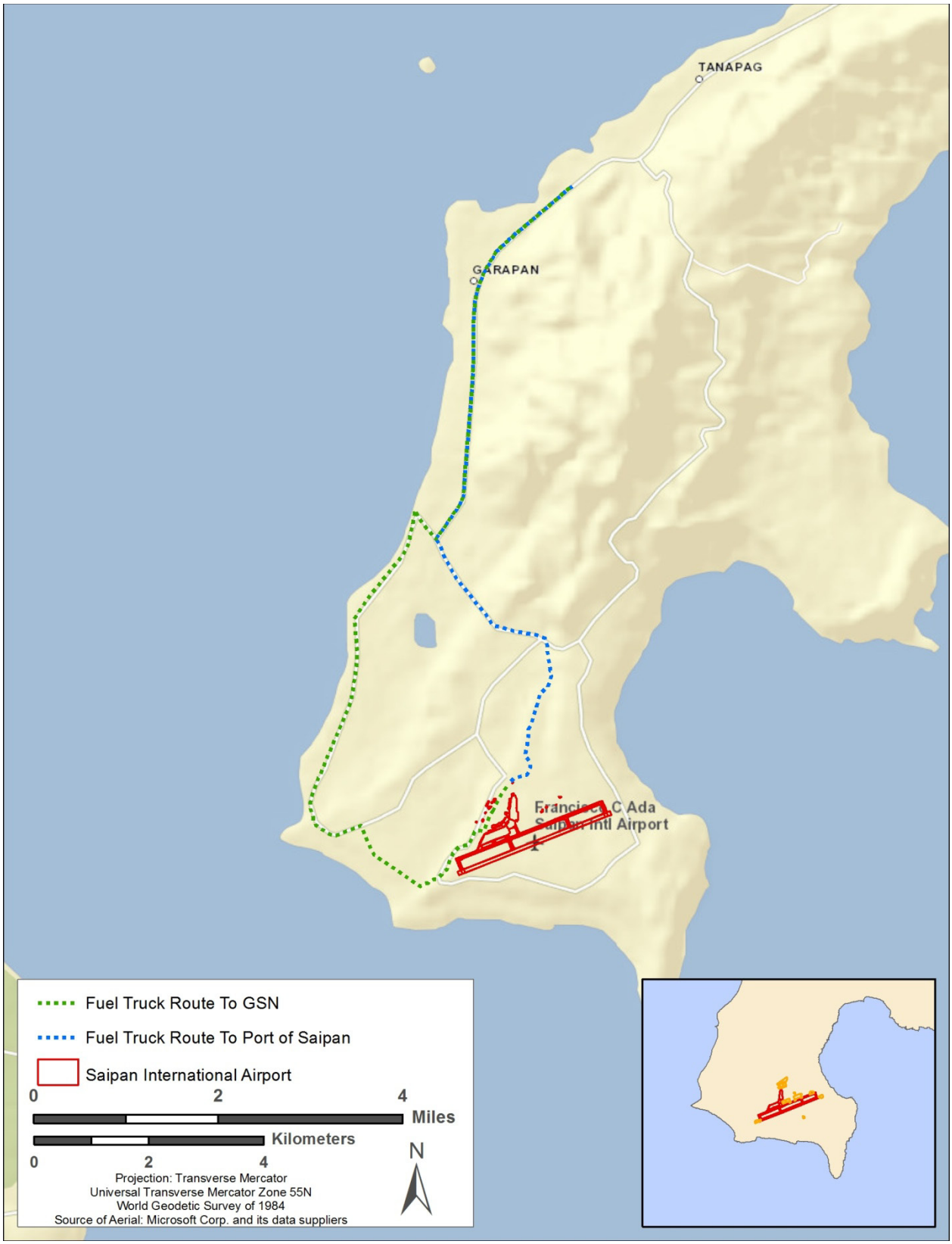


Figure 2.3-9. Fuel Truck Routes - Port of Saipan and GSN

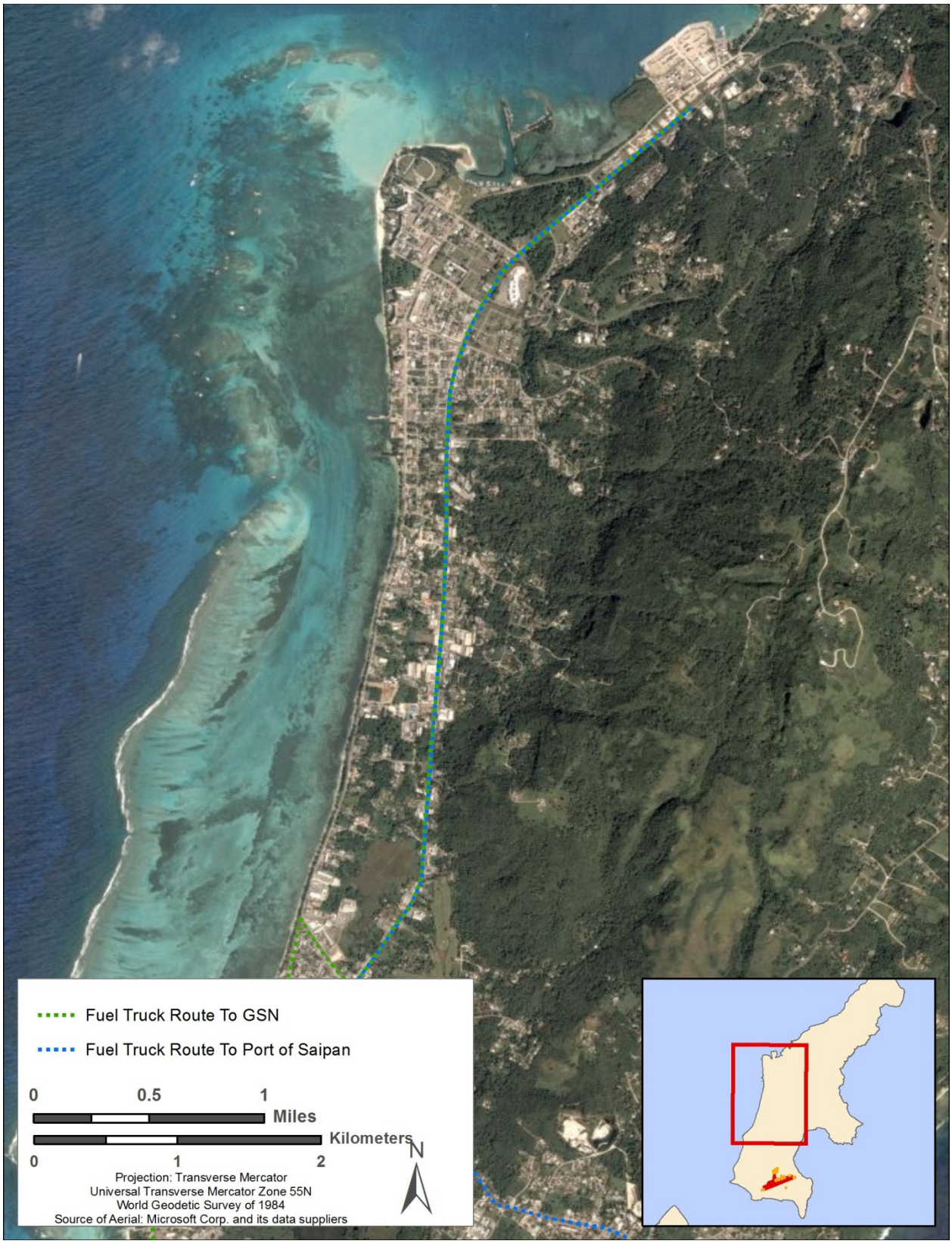


Figure 2.3-10. Fuel Truck Routes - Port of Saipan and GSN (North)

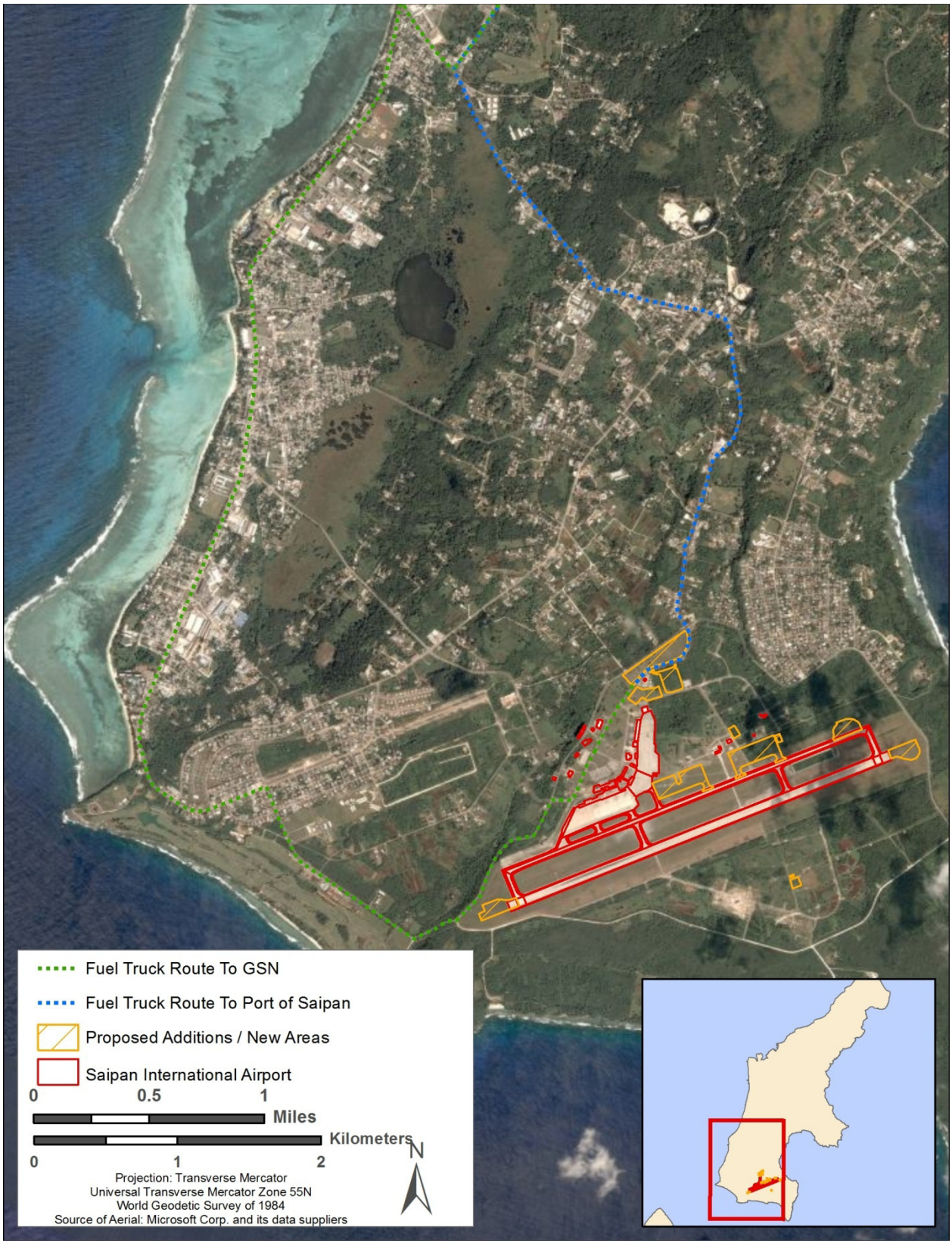


Figure 2.3-11. Fuel Truck Routes - Port of Saipan and GSN (South)

To operate the BEAR base on commercial power, a 1,200-kilovolt-ampere (kVA), 13.8-kilovolt (kV) to 4.16/2.4-kV, pad-mounted transformer would be installed. Primary service to the transformer would require 3-phase, 15-kV cable from the nearest overhead utility to the pad-mounted transformer. Power distribution in the BEAR base would be provided using equipment included in the BEAR kit (AFH10-222V2, Table A3.8). The power distribution equipment in the BEAR kit would include 10 Secondary Distribution Centers (SDCs) to transform 4.16-kV power to 208/120-V power, Generation Equipment, 5-kV distribution cables, secondary distribution cables, and other electric system assets to provide a complete distribution system.

Based on the U.S. Geological Survey (USGS) topography maps, grading would be kept to a minimum because the natural grade flows from the south to the north at less than 2 percent. Drywells would be installed at all Environmental Control Units (ECUs) to prevent muddy and unsafe working conditions around the construction tents. In addition, rain barrels, cisterns, or other collection devices would be used at the larger tents to recycle rainwater. **Figure 2.3-6** includes a site plan and proposed location for the BEAR kit.

2.3.2 Alternative 2 – TNI

As described in **Section 2.1**, the Proposed Action includes supporting cargo, fighter, and tanker aircraft. In this EIS, the KC-135 aircraft represents the design aircraft for each element of the Proposed Action in order to develop size and space requirements for facilities and infrastructure and perform the analysis of potential impacts. The USAF proposes to divert and exercise other USAF and joint military aircraft including cargo, fighter, and tanker aircraft, in accordance with typical operational scenarios.

Under Alternative 2, TNI would be improved to an airfield design that could accommodate 12 KC-135 aircraft to meet the purpose of and need for the Proposed Action. This airfield design would also accommodate other military logistics and tactical aircraft. The airfield design assumes that the KC-135 aircraft represents large logistics (heavy lift cargo) aircraft and it is assumed that the space to accommodate a KC-135 is roughly twice as large as the space to accommodate most tactical or fighter aircraft. A size ratio of 1 to 2 is assumed for heavy lift cargo aircraft to fighter and tactical aircraft; therefore, 24 fighter or tactical aircraft could be diverted to or exercised from TNI simultaneously for any element of the Proposed Action, not to exceed the capabilities of the proposed design. Finally, it is also assumed that a mix of fighter, tactical, and large logistics aircraft (e.g., 10 large logistics aircraft and 4 fighters), could be diverted to or exercised from TNI simultaneously for any element of the Proposed Action as long as the mix does not exceed airfield design capabilities. The temporary support personnel population accompanying the aircraft under Alternative 2 would not exceed 700, regardless of what mix of aircraft is diverted to or exercised from TNI. Specific elements of Alternative 2, the TNI alternative, are described in **Sections 2.3.2.1** and **2.3.2.2**. The potential numbers of aircraft represent the highest or "worst-case" scenario under the Proposed Action.

In order to reduce strain on existing airport and commercial facilities and infrastructure, the USAF proposes to construct and expand new facilities, rather than fully utilize existing facilities in both the Construction and Implementation Phases of Alternative 2.

2.3.2.1 Alternative 2 – Construction Phase

Runway and Parking Apron

Runway. To meet minimum operational requirements identified by PACAF and described in **Section 2.1.1.1**, a 10,000-foot-long runway surface is required for the KC-135. Under Alternative 2, the USAF would expand the existing 8,600-foot-long TNI runway to 10,000 feet long by 150 feet wide (plus

50 feet of paved shoulders) or would not extend the runway at all. **Figure 2.3-12** includes a schematic site plan of the proposed expansion for the 10,000-foot runway to the east. For the no extension option, the east end extension depicted on **Figure 2.3-12** would not be constructed.

Option A- 10,000-foot-long Runway Option. The existing runway is positioned roughly east to west, is 8,600 feet long by 150 feet wide, and has two 25-foot paved shoulders. Under Alternative 2, the existing runway would be expanded to the east by 1,400 feet to include a turnaround and a 1,000-foot Runway Safety Area (RSA). Pavement would be extended by a total of 2,400 feet. The design strength would require a 12-inch base with 14 inches of concrete. A significant amount of structural fill (598,000 yds^3) would be required to meet airfield slope criteria for the runway extension; structural fill would be obtained from existing quarries or borrow pits on the island. Under this option, the full extension would require the USAF to reroute Broadway Avenue to the east of the runway.

Option B- No Extension Option. The USAF could also decide to not lengthen the existing TNI runway; the shorter existing runway of 8,600 feet long under this option would result in a reduced load capability for a KC-135 aircraft but could still support basic exercise, divert, and humanitarian activities. No structural fill would be required under this option.

Parking Aprons. To meet operational requirements for 12 KC-135s, the parking apron at TNI would be expanded. The parking apron would be approximately 1,660,000 ft^2 and located south of the runway. Ballfield-type lighting is proposed on the apron boundary to provide adequate security and operational lighting for night operations. Airfield lighting systems would include only the lighting facilities required for support of aircraft operational areas. Controls and equipment vault facilities would be included as necessary to provide a complete and usable system. Design and equipment would conform to criteria contained in UFC 3-535-01. **Figure 2.3-13** includes a schematic site plan for the TNI parking apron design.

Temporary Munitions Storage Area

To meet operational requirements and to adhere to minimum safety criteria and standoff distances in compliance with DOD Manual 6055.09-M, DOD Ammunition and Explosives Safety Standards, the ECM under Alternative 2 at Tinian would be within the military-leased area north of the airport. Based on the 1,550 feet distance between the proposed ECM and the IBD, the maximum NEW, 1.1 Mass Detonating quantity for the ECM is approximately 58,000 NEW. A multi-cube magazine would also be constructed as part of the temporary munitions storage area under Alternative 2. The magazine would be collocated with the ECM and would be covered by the QD arc for the ECM.

The ECM would be approximately 140 feet by 80 feet and the multi-cube would be adjacent to the ECM with a size of approximately 160 feet by 170 feet.

Figure 2.3-14 includes a schematic site plan for the temporary munitions storage area at TNI.

Hazardous Cargo Pad and Arm/Disarm Pad

To meet operational requirements and to adhere to safety criteria and standoff distances at TNI, the Hazardous Cargo Pad under Alternative 2 is proposed to be located on the southeast side of the runway, with a taxiway connecting back into the runway. This design would be a flow-through horseshoe that would allow aircraft to taxi onto the hazardous cargo pad and then taxi off the pad and connect back to the taxiway and runway. The hazardous cargo pad would be approximately 650 feet by 750 feet. The hazardous cargo pad would consist of a concrete surface; the design strength would require a 12-inch base

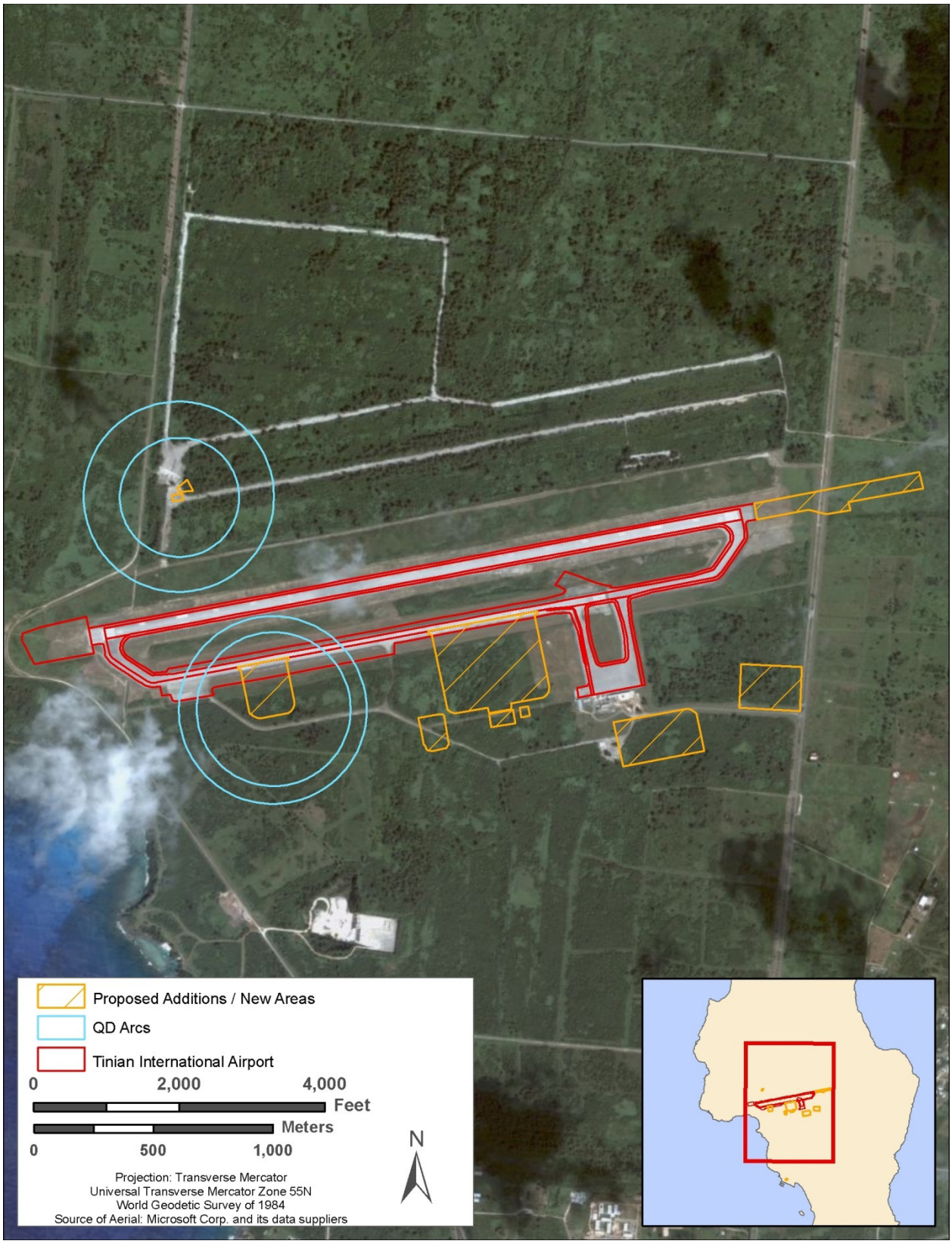


Figure 2.3-12. Overview of Proposed Action Areas at TNI

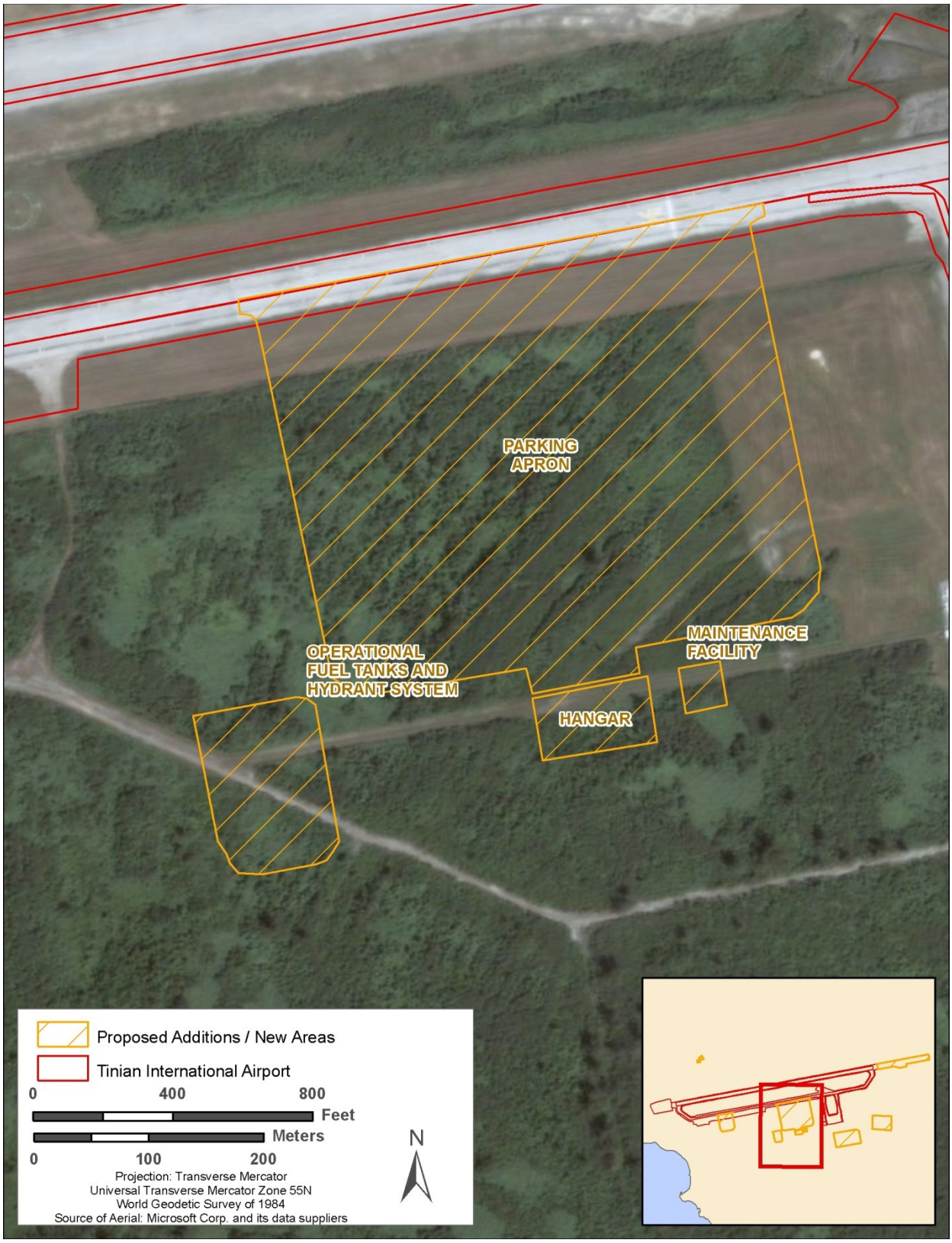


Figure 2.3-13. Schematic Site Plan for Parking Apron, Hangar, Maintenance Facility, and Operational Fuel Tanks at TNI

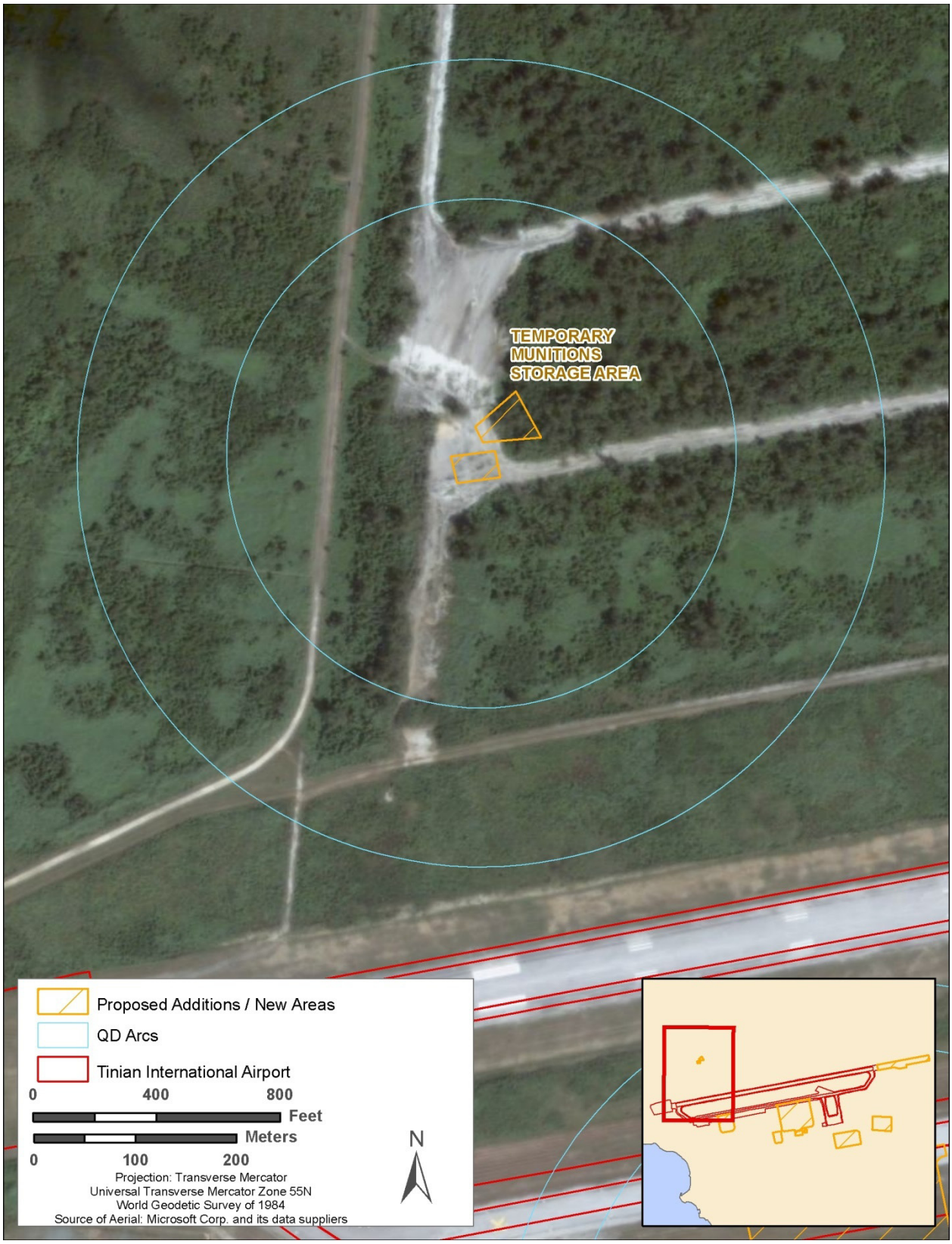


Figure 2.3-14. Schematic Site Plan for Temporary Munitions Storage Area at TNI

with 14 inches of concrete. The concrete-filled hazardous cargo pad would also function as an arm/disarm pad. The proposed location complies with all airfield criteria. The maximum NEW for the joint hazardous cargo pad and arm/disarm pad would be approximately 38,000 NEW, based on a 1,350-foot IBD. No inhabited facilities or aircraft are within the standoff distance at this location.

Figure 2.3-15 includes a schematic site plan for the hazardous cargo pad and arm/disarm pad at TNI.

Aircraft Hangar

Under Alternative 2, one aircraft hangar would be constructed at TNI. The hangar would be approximately 180 feet by 195 feet (approximately 35,100 ft^2) and located south of the proposed apron. **Figure 2.3-13** includes a schematic site plan for the hangar.

Maintenance Facility

A maintenance facility would be constructed at TNI under Alternative 2. The maintenance facility would be approximately 6,000 ft^2 and would be located adjacent to the proposed hangar, south of the proposed apron. **Figure 2.3-13** includes a schematic site plan for the maintenance facility.

Jet Fuel Receiving, Storage, and Distribution

Due to the geographic location and current limited aviation fuel receipt, storage, and dispensing capability on Tinian, and no current jet fuel capability, it was determined that fuel support under the Proposed Action would be impossible to sustain without infrastructure investments. In order to sustain jet fuel operations at the island under Alternative 2, fuel tanks would be installed at TNI and at the seaport on Tinian (AFCEE/PACAF 2010).

Under Alternative 2, jet aircraft refueling capability would be provided at the airport by using a combination of current capability and installing a standard DOD-designed 2,400 gpm Type III Hydrant Refueling System adjacent to the new ramp that would be constructed. This refueling system would also tie into the existing parking ramp (with minimum disruption to commercial aircraft operations during construction periods) and the proposed parking apron expansion. This option would include constructing two 10,000-bbl, aboveground operating tanks that would be located near the parking apron, emergency generator, transfer pumphouse, pumps, piping, filtration, valves, and a Pantograph/ HSV Test Station. This option would meet PACAF's operational need to support a 12 primary assigned aircraft parking/refueling requirement. Special considerations were given to ensure current capability would be maximized to reduce fueling infrastructure costs. In order to sustain potential aircraft activity on the island it was determined that one DOD Standard Design 100,000-bbl, aboveground tank would be required for aviation fuel bulk storage capability, to be located on airport property. This system would include tanks, pumps, valves, filtration systems, emergency generator, and concrete work. In addition, one aboveground 100,000-bbl tank with pump, filter, issue fillstand with two positions, and associated piping would be constructed near the seaport. The proposed location for the bulk storage tank is southeast of the runway and the operational tanks are adjacent to the proposed parking apron. **Figure 2.3-13** includes the schematic site plan for the two operational tanks at the airport, **Figure 2.3-16** includes the schematic site plan for one bulk fuel tank at the airport, and **Figure 2.3-17** includes the schematic site plan for one bulk fuel tank at the seaport.

Billeting

Under Alternative 2, temporary billeting would be required for up to 700 personnel at TNI that would support aircraft operations during a divert landing, humanitarian airlift, or military exercise event.

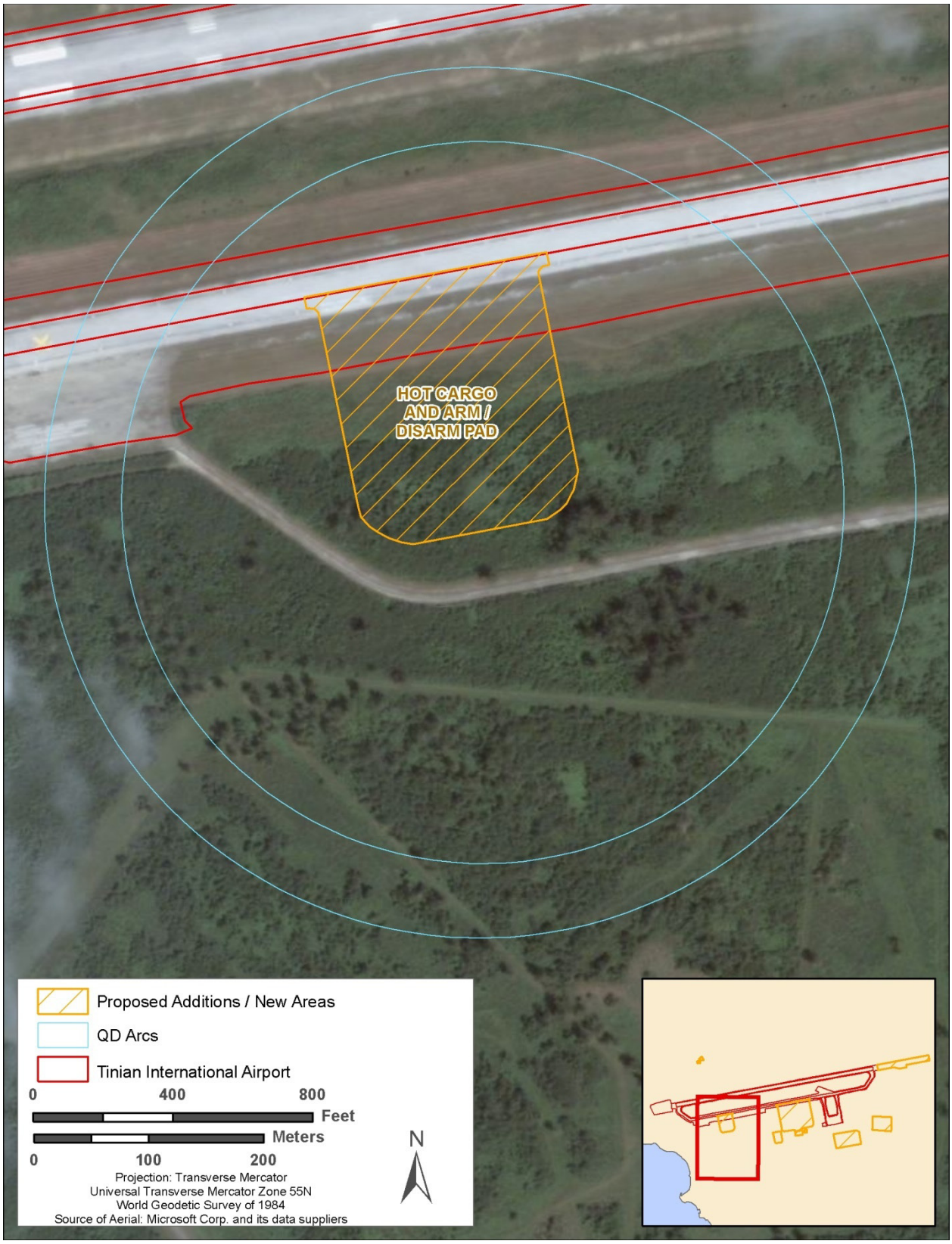


Figure 2.3-15. Schematic Site Plan for Hazardous Cargo Pad and Arm/Disarm Pad at TNI



Figure 2.3-16. Schematic Site Plan for Bulk Fuel Tank at TNI



Figure 2.3-17. Site Plan for One Fuel Tank at the Port of Tinian

Unlike on Saipan, the Island of Tinian does not have adequate commercial lodging to support the proposed 700 temporary personnel. Therefore, the USAF proposes to accommodate support personnel at TNI by using a BEAR kit. The BEAR kit would be established at TNI in accordance with AFH 10-222 Volume 2 *Guide to Bare Base Assets.* AFH 10-222 Volume 2 describes the BEAR and legacy Harvest Falcon (HF) and Harvest Eagle (HE) assets that USAF civil engineers are likely to site, install, and operate in an expeditionary environment.

The BEAR kit would include 45 billet tents, showers, latrines, 12 administrative shelters, 2 Power Pro shelters, an alert shelter, and a mortuary. A 920-kilowatt (kW) generator set and fuel bladders for backup generators would also be installed (AFCEE/PACAF 2010). The proposed area for the BEAR kit is approximately 17.8 acres and would require vegetation clearing at TNI. **Figure 2.3-18** includes a schematic site plan for the BEAR kit site at TNI.

To operate the BEAR base on commercial power, a 1,200-kilovolt-ampere (kVA), 13.8-kilovolt (kV) to 4.16/2.4-kV, pad-mounted transformer would be installed. Primary service to the transformer would require 3-phase, 15-kV cable from the nearest overhead utility to the pad-mounted transformer. Power distribution in the BEAR base would be provided using equipment included in the BEAR kit (AFH10-222V2, Table A3.8). The power distribution equipment in the BEAR kit would include 10 Secondary Distribution Centers (SDCs) to transform 4.16-kV power to 208/120-V power, Generation Equipment, 5-kV distribution cables, secondary distribution cables, and other electric system assets to provide a complete distribution system.

Construction Materials

In order to construct the elements proposed under the construction phases of Alternative 2, concrete would be needed. Under Alternative 2, concrete would be mixed at existing locally contracted commercial facilities which operate concrete batch plants. Dry cement would be barged to Tinian using the supplier's existing supply chain, and then trucked from the Port of Tinian to the commercial concrete facility where the concrete would be mixed. Mixed concrete would be trucked from the commercial concrete batch facility to Tinian. Assumptions are based on total volume of concrete needed for construction, phased over 3 years. **Figure 2.3-19** shows the proposed cement and concrete truck routes on Tinian.

Cement Trucking from the Port of Tinian to Commercial Concrete Supply Company. Dry cement would be transported in dump trucks from the Port of Tinian to the commercial concrete supply company on Tinian, a distance of approximately 1.7 miles. The trucks would likely travel on 8th Avenue and Broadway. Due to construction phasing over 3 years, a total of 3,089 yd^3 of cement per year would need to be trucked from the Port of Tinian to the commercial concrete supply company. This equates to 5 dump trucks, making 3 trips per day from the Port of Tinian to the commercial concrete supply company 19 days per year; or 280 total truck trips per year.

Concrete Trucking from Commercial Concrete Supply Company to TNI. Concrete would be mixed at the commercial concrete supply company and trucked in a cement mixer from the commercial a distance of approximately 2.3 miles. The trucks would likely travel mainly on Broadway. Due to construction phasing over 3 years, a total of 49,426 yd^3 of concrete per year would need to be trucked from the commercial concrete supply company to TNI. This equates to 10 cement mixer trucks, making 5 trips per day from the commercial concrete supply company, 99 days per year; or a total of 4,943 trips per year. A negligible percentage of the overall concrete would be trucked from the commercial concrete supply company to the harbor for fuel tank-related construction.

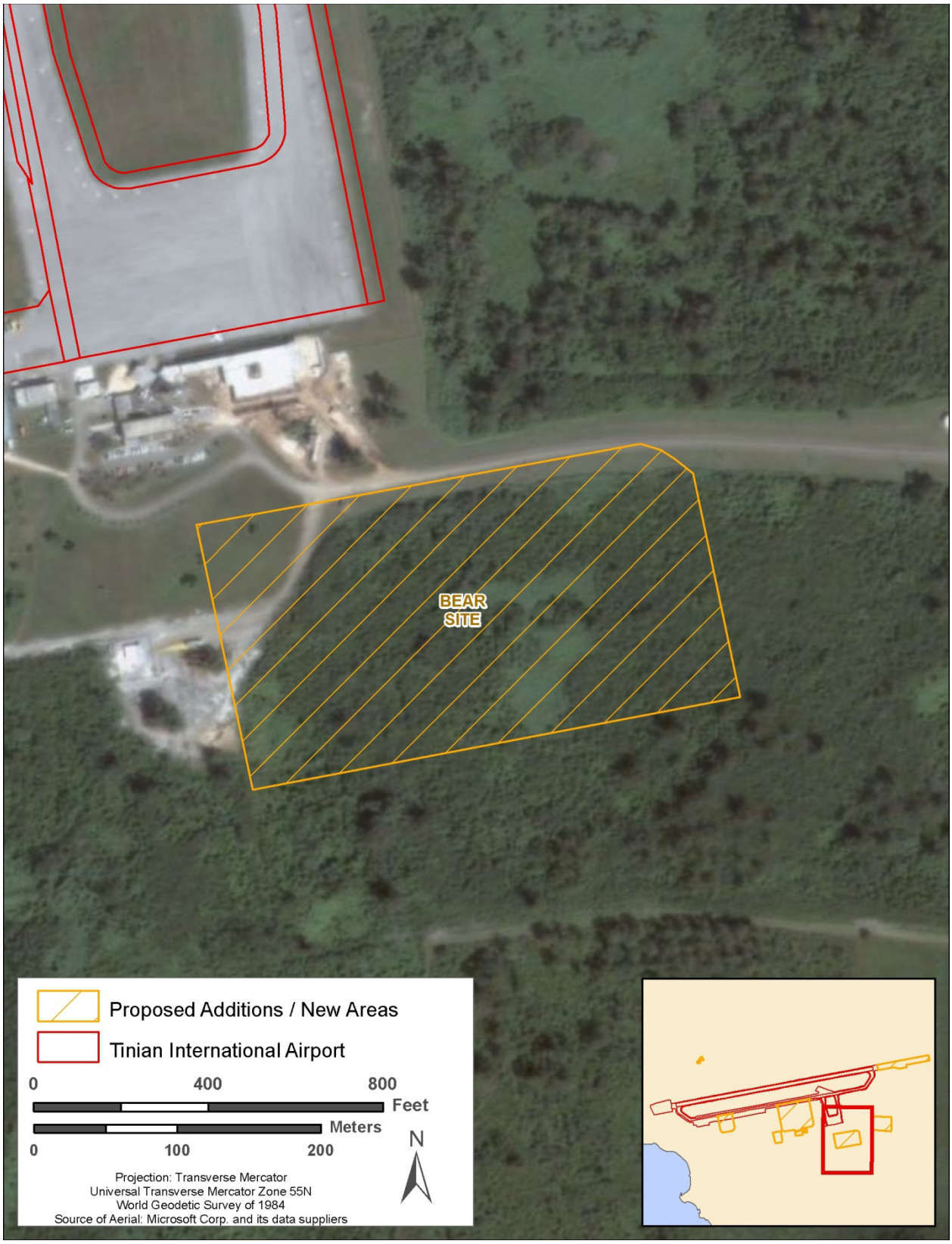


Figure 2.3-18. Schematic Site Plan for BEAR Site at TNI

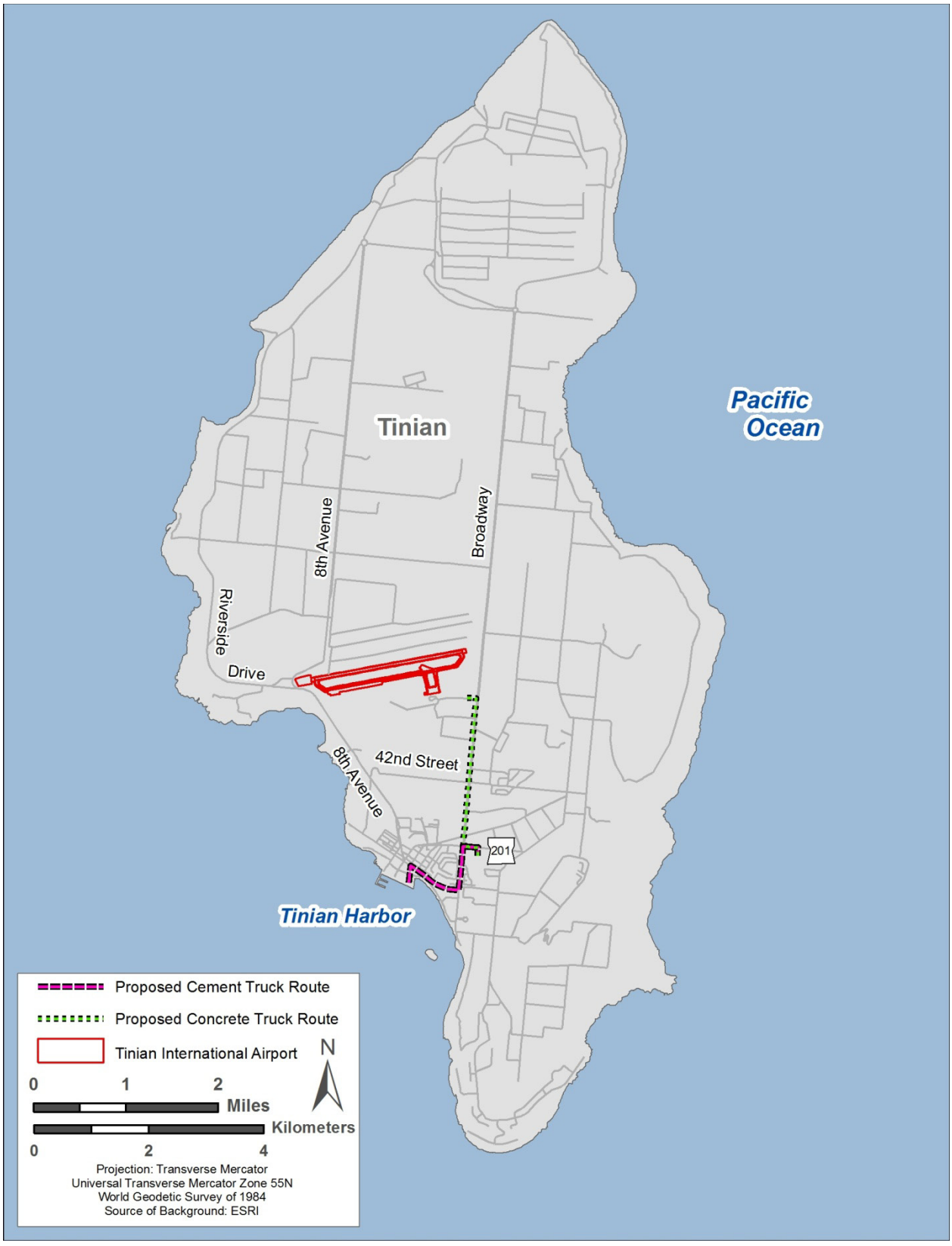


Figure 2.3-19. Proposed Cement and Concrete Truck Routes on Tinian

Summary

In summary, implementing the construction phase under Alternative 2 would result in an increase in impervious surface at TNI by a total of 4,090,800 ft^2. **Table 2.3-2** provides a summary of each construction element and proposed square footage.

Table 2.3-2. Summary of Construction Elements under the TNI Alternative

Construction Element	Approximate Size (ft^2)	Increase in Impervious Surface (ft^2)
Runway Extension*	555,000	555,000
Parking Apron	1,660,000	1,660,000
Temporary Munitions Storage Area (ECM and Multi-cube)	30,700	30,700
Hazardous Cargo Pad and Arm/Disarm Pad	455,000	455,000
Aircraft Hangar	35,100	35,100
Maintenance Facility	6,000	6,000
Jet Fuel System (Operational, Bulk, and at the Port of Tinian)	680,000	680,000
Billeting	669,000	669,000
Total	**4,090,800**	**4,090,800**

Source: HDR

Note: *Runway extension size and impervious surface is based on Option A and is considered the "worst-case" scenario.

2.3.2.2 Alternative 2 – Implementation Phase

Divert Landings

Under Alternative 2, TNI would be used as an unscheduled alternative location to operate aircraft when other locations in the western Pacific are temporarily unavailable. As stated in **Sections 2.1** and **2.1.2.1**, this EIS analyzes exercises and training to support the divert capability. Training to divert capabilities under Alternative 2 at TNI is discussed in **Section 2.3.2.2** under military exercises.

Humanitarian Airlift Staging

Under Alternative 2, TNI would be used for unplanned humanitarian airlift staging in response to a natural or man-made disaster, when needed. As stated in **Sections 2.1** and **2.1.2.2**, exercises and the training required to execute humanitarian airlift and disaster relief missions would occur at TNI under Alternative 2 and are analyzed in this EIS. Humanitarian airlift and disaster relief exercises are discussed in **Section 2.3.2.2** under military exercises.

Military Exercises

Under Alternative 2, military exercises as described under the Proposed Action would occur at TNI. It is assumed that no more than two annual exercises lasting 2 weeks per exercise (a total of 4 weeks of exercises) would occur at TNI with other periodic unit-level training, to include divert and humanitarian airlift staging training (an additional 4 weeks of exercises) occurring throughout the year as analyzed in the MIRC EIS; exercises would occur approximately 8 weeks per year. Aircraft operations during the approximate 8 weeks of exercises that would occur at GSN under Alternative 1 are based on aircraft

operations that occurred during both Valiant Shield and Cope North as analyzed in the MIRC EIS (DON 2010a). It is assumed that each aircraft would take off and land twice a day during exercises and individual units would periodically land and take off to become familiar with the airfield while in the AOR. During exercises, the normal flying window is approximately six to eight hours during a 12- to 16-hour timeframe. No more than 700 personnel would participate in exercises at TNI at any given time, with a typical exercise population being a 12-ship fighter package of 145 to 170 personnel.

Jet Fuel Receiving, Storage, and Distribution

Under the Proposed Action, operational mandates require a 30-day supply of jet fuel storage and a means of delivering the fuel to aircraft for high-volume tanker operations.

As described in **Section 2.3.2.1,** jet aircraft refueling capability under Alternative 2 would be provided by using a combination of current capability and installing a standard DOD-designed 2,400 gpm Type III Hydrant Refueling System adjacent to the proposed ramp to be constructed. It would provide a sustained capability of simultaneously refueling four aircraft at a flow rate of 600 gpm. Additionally, one DOD Standard Design 100,000-bbl, aboveground tank would be used for aviation fuel bulk storage capability on the airport property. This system would include tanks, pumps, valves, filtration systems, emergency generator, oil/water separator, and concrete. One 100,000-bbl bulk fuel tank with pumps, filters, fillstands, and associated piping would also be used in fuel operations near the seaport.

Jet fuel would be received at the current port in Tinian from a shallow draft tanker; shallow draft tankers currently dock at the Tinian port and it is assumed that no improvements to the harbor would need to be made. A small ocean tanker with approximately 57,000-bbl capacity, would deliver jet fuel to the port. The tanker would dock at the Tinian wharf and tie into the Tinian port valve box. Jet fuel would be delivered via a new 10-inch valve compatible with jet fuel, and piped to the new 100,000-bbl tank (see **Section 2.3.2.1** and **Figure 2.3-17**). Standard fuel transfer tank trucks would be used to transfer fuel from the Tinian port to the 100,000-bbl bulk storage tank at the airport. It would take six tank trucks (10,000 gallons each) 14 days working approximately 10 hours per day to fill the bulk storage tank at the airport.

During scheduled joint military exercises, bulk jet fuel at the airport bulk tank would be transferred to one of two operating tanks adjacent to the parking apron. The fuel would then be transferred to fuel tankers or other aircraft taking part in the exercises. In order to maintain the airport tank fuel supply for operations exceeding 14 days, fuel trucks will need to transport fuel over surface roads. It is assumed that up to six trucks operating 10 hours per day for the duration of the operation would be required. Because it is assumed that approximately 8 weeks per year of joint military or unit-level exercises could take place at the selected alternative location, it is anticipated that fuel transfer activity would also last approximately 8 weeks per year. The proposed fuel truck routes under Alternative 2 are presented in **Figures 2.3-20** and **2.3-21.**

Billeting

Under Alternative 2, billeting would occur at TNI. Unlike on Saipan, the Island of Tinian does not have adequate commercial lodging to support the proposed 700 temporary personnel. Therefore, the 700 support personnel at TNI would be accommodated using a BEAR kit as described under Alternative 1 in **Section 2.3.1.2**. The BEAR kit would be established at TNI in accordance with AFH 10-222 Volume 2 *Guide to Bare Base Assets.* AFH 10-222 Volume 2 describes the BEAR and legacy HF and HE assets that USAF civil engineers are likely to site, install, and operate in an expeditionary environment.

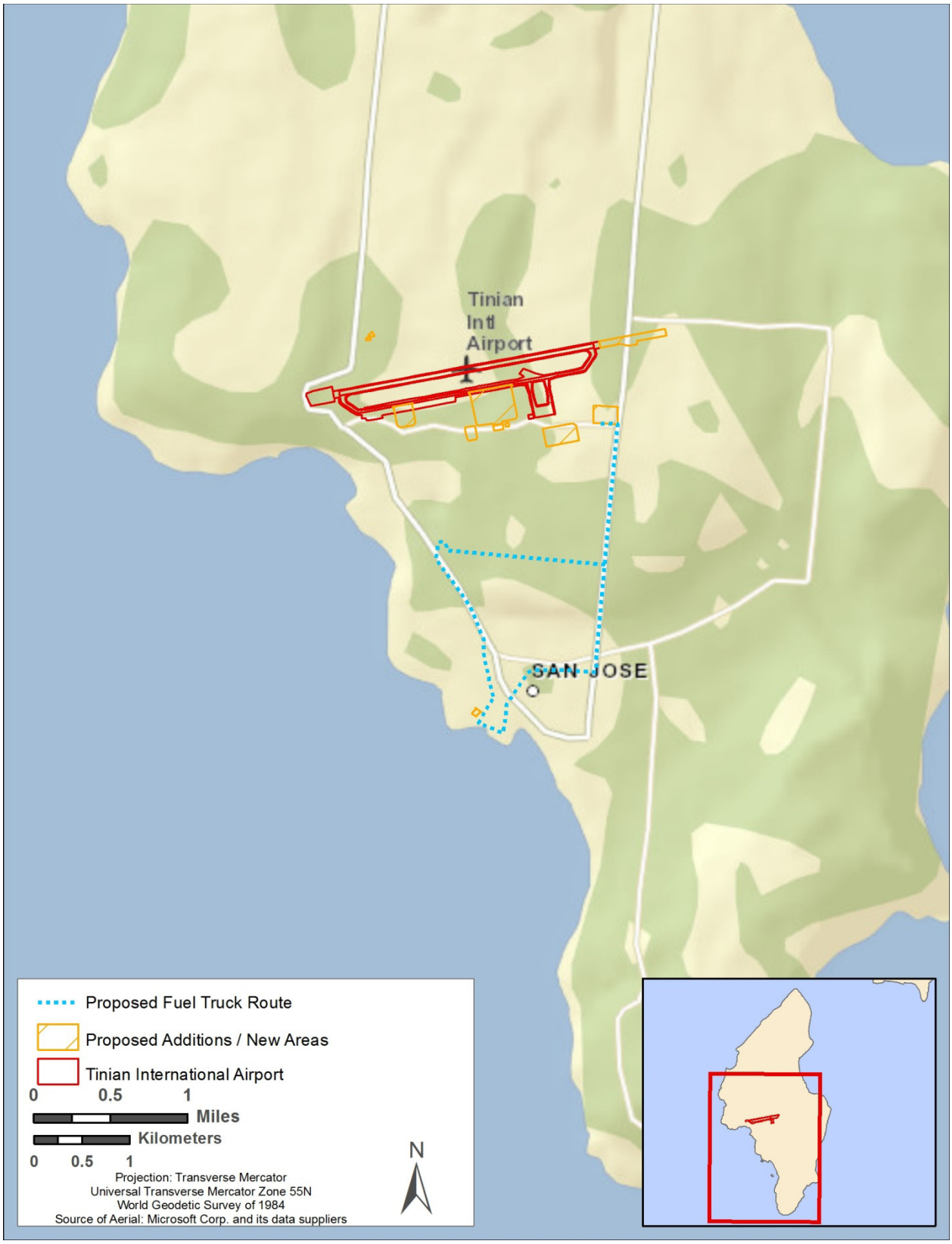


Figure 2.3-20. Fuel Truck Routes - Port of Tinian and TNI

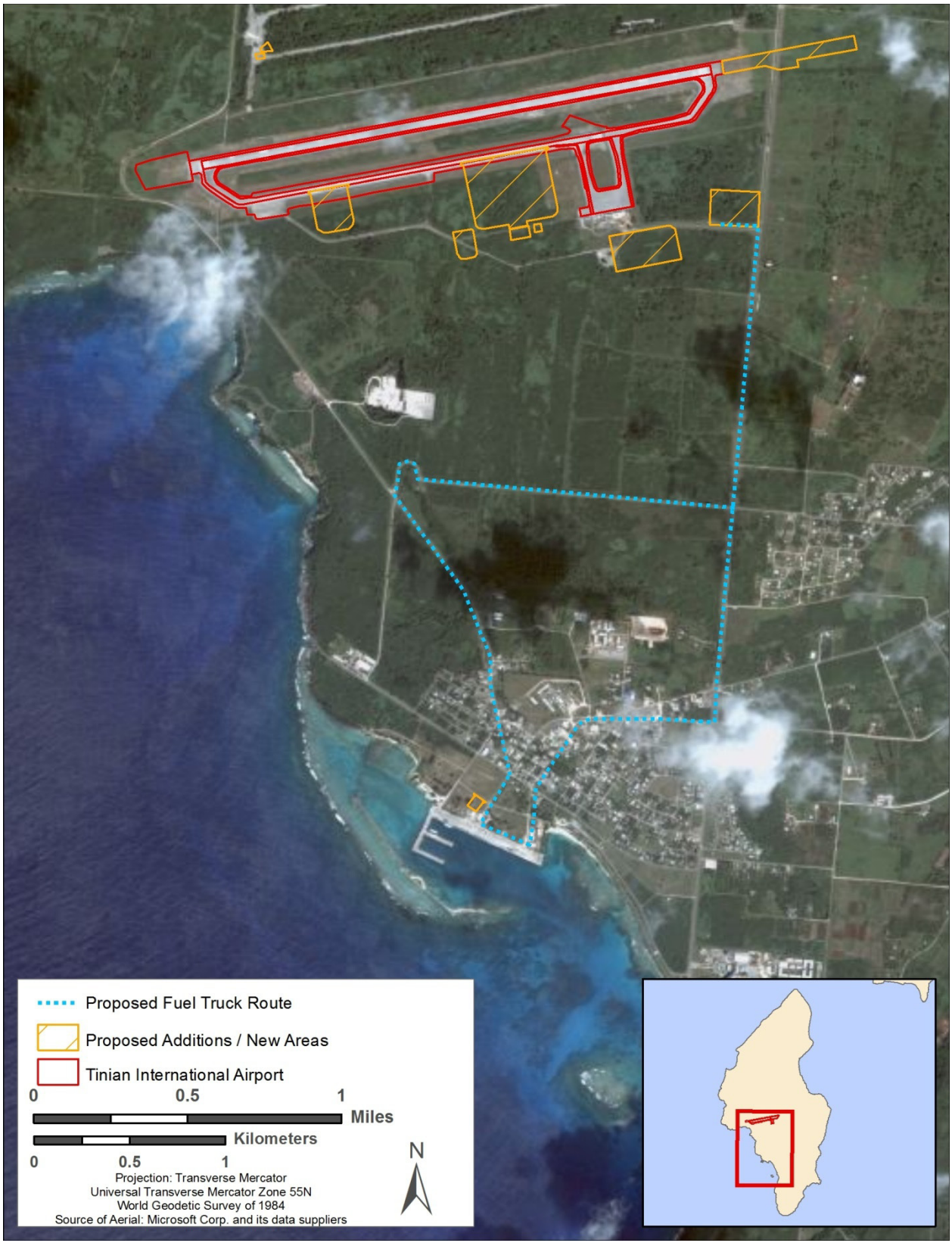


Figure 2.3-21. Fuel Truck Routes - Port of Tinian and TNI

The BEAR set would include 45 billet tents, showers, latrines, 12 administrative shelters, 2 Power Pro shelters, an alert shelter, and a mortuary. A 920-kW generator set and fuel bladders would also be installed (AFCEE/PACAF 2010). The BEAR kit would be installed southeast of the runway.

To operate the bare base on commercial power, a 1,200-kVA, 13.8-kV to 4.16/2.4-kV, pad-mounted transformer would need to be installed. Primary service to the transformer would require approximately 200 feet of 3-phase, 15-kV cable. Power distribution in the BEAR base would be provided using equipment included in the BEAR 550 Initial Housekeeping Set (AFH10-222V2, Table A3.8). The power distribution equipment in the BEAR 550 Housekeeping set includes 10 SDCs to transform 4.16-kV power to 208/120-V power, Generation Equipment, 5-kV distribution cables, secondary distribution cables, and other electric system assets to provide a complete distribution system. A lack of potable water on the island will require the temporary base camp to produce potable water using potable water production facilities, or reverse osmosis purification units, (ROPU) and to dispose of any "brackish" backwash water in accordance with agreements from CNMI DEQ. Rain barrels, a cistern, or other collection devices would be used at the larger tents, along with tapping into existing wells, to provide a source for the potable water production. Because of a lack of municipal solid waste facilities, all solid waste would be collected and transported off the Island of Tinian using commercial solid waste haulers and commercial barges or ships until a permitted municipal solid waste facility was constructed. Wastewater processing would require development of a potable wastewater treatment facility to process wastewater before being discharged until a municipal wastewater treatment facility is developed and utilized.

2.4 No Action Alternative

The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be evaluated. Under the No Action Alternative, the USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific.

Divert Landings. Currently in the Mariana Islands, emergency divert landings occur at GUM, Guam; GSN, Saipan; and GRO, Rota, in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*. Under the No Action Alternative, emergency divert landings would continue to occur at these locations as required. However, none of these facilities are currently equipped to support a combination of cargo, fighter, and tanker aircraft and associated support personnel and still remain open for commercial use. Under the No Action Alternative, PACAF's ability to achieve and maintain military readiness for deployed military forces to conduct and support current, emerging, and future military operations would be hindered. The PACAF mission to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war might not be fully achievable.

Joint Military Exercises. Currently, planned joint military exercises occur within the MIRC and Mariana Islands. Under the No Action Alternative, these planned exercises would continue to take place, using Andersen AFB and surrounding airspace and range area. However, under the No Action Alternative, an additional designed and designated divert airfield would not be developed. Aircraft taking part in planned joint military exercises would continue to be confined to the same operating airfields at Andersen AFB as addressed in other NEPA documents (see **Section 1.5.3**). Should emergencies arise during military exercises, there would be no designed and designated alternative airfield to divert aircraft if needed, or to support continued operations.

Humanitarian Airlift Staging. Currently, humanitarian airlift staging can occur at Andersen AFB or GUM, Guam, to support natural disaster and humanitarian assistance response in the western Pacific.

However, humanitarian efforts from these locations are limited due to lack of infrastructure such as parking areas, refueling capabilities, and billeting. Under the No Action Alternative, USAF humanitarian response in the western Pacific would likely use existing fully functional airfields, such as Andersen AFB or GUM, Guam. However, if a natural disaster affected Andersen AFB and GUM, Guam, there would be no alternative for humanitarian airlift staging. In addition, conducting humanitarian airlift staging at Andersen AFB or GUM, Guam, could limit the ability of Andersen AFB to carry out its other missions, or limit existing commercial air traffic at GUM, Guam.

2.5 Decisionmaking Process and Identification of Preferred Alternative

According to CEQ guidelines, an agency's preferred alternative is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors (CEQ 1981). CEQ regulations require the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement…" This means that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS (CEQ 1981).

The USAF preferred alternative would be to implement the Proposed Action on the Island of Saipan within the CNMI, as described in **Section 2.3.1**. Under the preferred alternative, there are two proposed runway extension scenarios that are considered in the analysis of impacts in this EIS, and one scenario in which the runway would not be extended. No determination has been made regarding which of these three options would be the preferred option at this time. The analysis of impacts in the EIS also includes the alternative of implementing the Proposed Action on the Island of Tinian as outlined in **Section 2.3.2**, and the No Action Alternative as described in **Section 2.4**. The USAF is identifying the preferred alternative at this time pursuant to 40 CFR § 1502.14(e); however, no final decision selecting a particular alternative for implementation has been made. Upon completion of the EIS, the USAF decisionmaker will use the EIS to support the decision about how best to satisfy the stated purpose and need within mission constraints. The final decision will be documented in the ROD.

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3. Affected Environment

Throughout the EIS, the affected environment on both Saipan and Tinian will be referred to as the "Project Area." The term "Project Area" encompasses those locations described under Alternative 1 and Alterative 2 in **Sections 2.3.1** and **2.3.2**, respectively. Specifically, the Project Area on both Saipan and Tinian includes the airport and associated infrastructure proposed for construction or improvements, and the surrounding area, when applicable. The Project Area also includes locations at the harbor proposed for construction or improvements, and the proposed fuel truck routes and surrounding areas, as depicted in **Figures 2.3-1** and **2.3-11**.

3.1 Noise

3.1.1 Definition of Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on a rooftop. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or as annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations. Although human response to noise varies, measurements can be calculated with instruments that record instantaneous sound levels in decibels. A-weighted decibel (dBA) is used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA 1981b). **Table 3.1-1** compares common sounds and shows how they rank in terms of the effects of hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981a).

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed to 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

Sound levels, resulting from multiple single events, are used to characterize noise effects from aircraft or vehicle activity and are measured in Day-Night Average Sound Level (DNL). The DNL noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. DNL is the

Table 3.1-1. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible*
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying*
110	Pile drivers	Strained vocal effort*
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981a and *HDR extrapolation

energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure levels over a given 24-hour period. DNL is the designated noise metric of the FAA, U.S. Department of Housing and Urban Development (HUD), USEPA, and DOD for modeling airport environments.

According to the USAF, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses within or above the 65 dBA DNL contour are considered to be within areas of high noise exposure. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of a DNL sound level (FICON 1992). For outdoor activities, the USEPA recommends 55 dBA DNL as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (1974).

Aircraft Sound Levels. For this analysis, the NOISEMAP noise modeling program was used. NOISEMAP is a DOD-approved computer modeling program used to define noise levels in areas near USAF installations. An analysis of existing and proposed conditions was estimated from the flying operations including types of aircraft, flight patterns, variations in altitude, power settings, number of operations, and hours of operation. This information was used to develop the noise contours contained in this document.

Ambient Sound Levels. Noise levels vary depending on the housing density and proximity to parks and open space, major traffic areas, or airports. As shown on **Table 3.1-2**, the noise level in a normal suburban area is about 55 dBA DNL, which increases to 60 dBA for an urban residential area, and to 80 dBA in the downtown section of a city (USEPA 1974). Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis.

Construction Sound Levels. Building demolition and construction work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, pavers, and other work equipment. **Table 3.1-3** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3.1-2. Typical Outdoor Noise Levels

dBA DNL	Location
50	Residential area in a small town or quiet suburban area
55	Suburban residential area
60	Urban residential area
65	Noisy urban residential area
70	Very noisy urban residential area
80	City noise (downtown of major metropolitan area)
88	3rd floor apartment in a major city next to a freeway

Source: USEPA 1974

Table 3.1-3. Predicted Noise Levels for Construction Equipment

Construction Equipment	Predicted Noise Level at 50 feet (dBA)
Backhoe	72–93
Concrete mixer	74–88
Crane	75–87
Front loader	72–83
Grader	80–93
Jackhammer	81–98
Paver	86–88
Pile driver	95–105
Roller	73–75
Truck	83–94

Source: USEPA 1971

3.1.2 Existing Conditions

The noise analysis contained in the Draft EIS is based upon readily available background information and data that were current at the time of the analysis. Refinement of the noise analysis is an ongoing process and will be finalized based on Draft EIS comments prior to the Final EIS.

3.1.2.1 Alternative 1 – GSN

The area around GSN is mainly rural; however, there are a few major noise sources. These sources include vehicle traffic, an adjacent quarry, and aircraft operations. Major roadways adjacent to GSN include Flame Tree Road, Airport Road, As Perdido Road, and Naftan Road. However, the dominant sources of noise come from quarry and airport operations. Hawaiian Rock Quarry is approximately 0.75 miles southeast of the runway and 1 mile south of Dandan. This company supplies asphalt, concrete, and aggregates. The facility near GSN includes a quarry and main concrete plant.

Annual aircraft operations for the Baseline Scenario were obtained from FAA Air Traffic Activity System database (FAA 2011). Daily operations at GSN are shown in **Table 3.1-4**. An operation is defined as an aircraft arrival or an aircraft departure; therefore, the landing and takeoff of the same aircraft would count as two operations. It was assumed that aircraft fly out of GSN 365 days a year. The number of annual operations from the FAA Air Traffic Activity System database was divided by the number of flying days per year to obtain the number of average daily operations.

Table 3.1-4. Baseline Scenario Aircraft Operations at GSN

Aircraft Category[1]	Aircraft[2]	Average Daily Operations[1]
Air Carrier	747-200	6.39
	767-300	6.39
Air Taxi/ General Aviation	Piper Cherokee	113.24
	Cessna 441	13.33
Military	C-130H	0.57
	F-16C	0.28
Total		**140.20**

Source: FAA 2011[1] and HDR[2]

The majority of operations are flown with a Piper Cherokee, which is a single-engine aircraft, and the Cessna 441, which is a turboprop. It was estimated that approximately 40 percent (5.45 operations) of the air carrier and military operations occur between the hours of 10 p.m. and 7 a.m. and 2 operations occur between those hours with the air taxi and general aviation aircraft. Aircraft use Runway 07 approximately 85 percent of the time and Runway 25 approximately 15 percent of the time. Arrival and departure flight tracks head in various directions, with the majority of single engine aircraft flying to TNI and the turboprop aircraft flying to the south. Flight tracks for air carrier and military aircraft were modeled to the north and straight out from the runway.

Figure 3.1-1 shows the Baseline Scenario noise contours at GSN. The noise contours extend out from the runway ends. Since aircraft use Runway 07 the majority of the time, the noise contours extend mainly to the northeast. The 65 dBA DNL noise contour extends off airport property over the Pacific Ocean. To the southwest, portions of the Coral Ocean Point Golf Course are within the 65 dBA DNL contour. The 70 to 80 dBA DNL noise contours encompass airport property and vacant land.

Table 3.1-5 shows the acreage within the noise contours under the Baseline Scenario. The total number of acres within the 65 to 80+ dBA DNL noise contours is 834 with 428 acres encompassing non-airport property. As expected, the largest number of acres is within the 65 to 69 dBA DNL noise contours. The number of acres decreases as the noise levels increase.

Noise levels were calculated for noise-sensitive locations around GSN. Most of the population around the airport is north of GSN. As shown in **Table 3.1-6**, there are numerous noise-sensitive land uses around GSN including residences, schools, and recreation areas. Under the Baseline Scenario, none of these land uses are within the 65 dBA DNL noise contour.

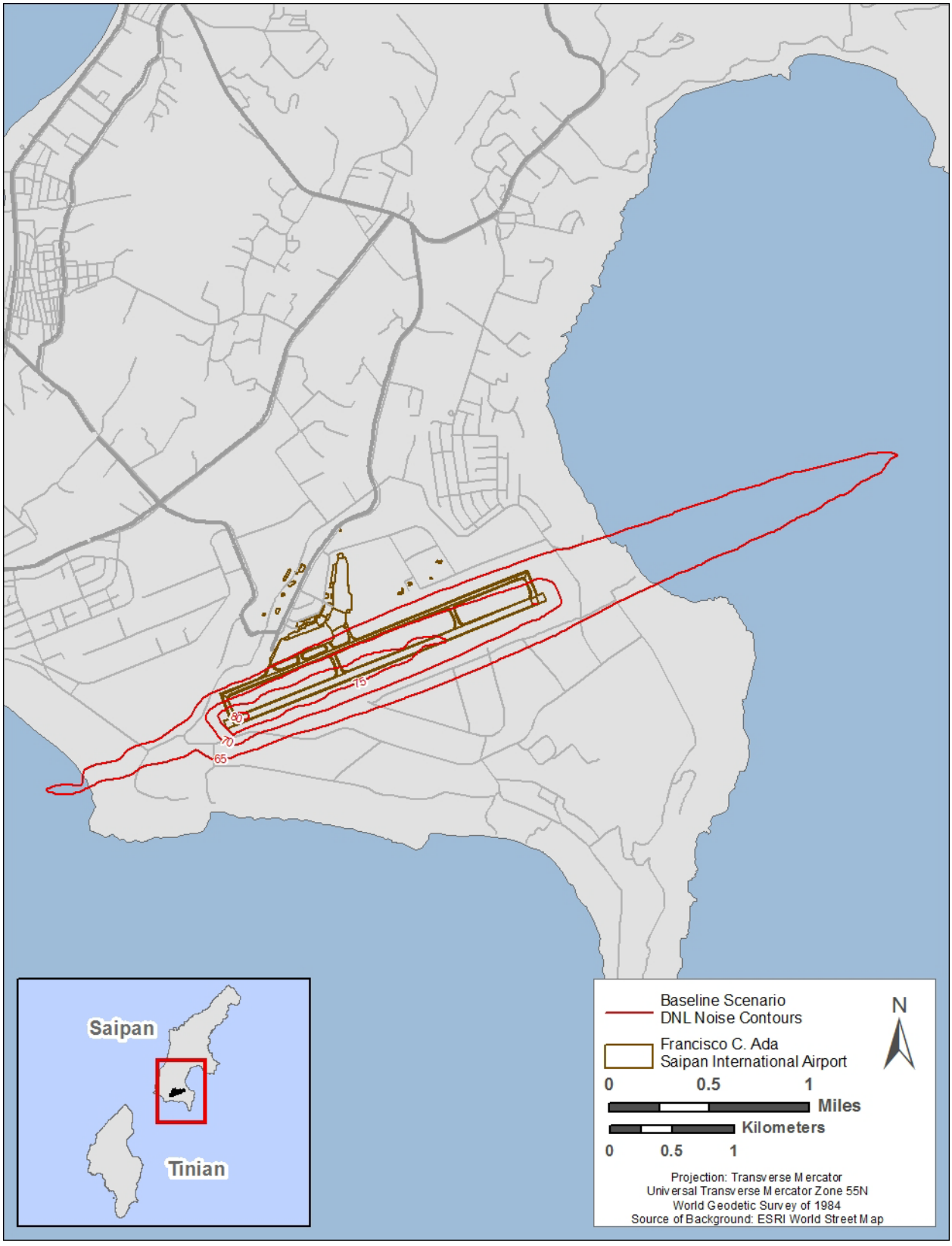


Figure 3.1-1. Baseline Scenario Noise Contours at GSN

Table 3.1-5. Baseline Scenario Noise Contour Acreage at GSN

Noise Contours	Baseline Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	424	144	569
70–74 dBA DNL	4	184	188
75–79 dBA DNL	0	75	75
80+ dBA DNL	0	2	2
Total	**428**	**405**	**834**

Source: HDR

Table 3.1-6. Baseline Scenario Noise Levels at Noise Sensitive Locations around GSN

Land Use	DNL Noise Level
Coral Ocean Point Golf Course	63 dBA
Residential, Dandan	50 dBA
Dandan Elementary School	46 dBA
Residential, Koblerville	46 dBA
Koblerville Elementary School	50 dBA
Saipan Southern High School	49 dBA
Saipan International School	42 dBA
Lao Lao Bay Golf Course	44 dBA
Ladder Beach	56 dBA
Babui Beach on Tinian	52 dBA
Unai Chulu Beach on Tinian	52 dBA

3.1.2.2 Alternative 2 – TNI

Major sources of noise adjacent to TNI include aviation and ground-training activities that occur at the Tinian Military Lease Area, private heliports, and the aircraft operations at TNI. The Military Lease Area (MLA) encompasses 15,353 acres and consists of two regions. The EMUA includes 7,574 acres on the northern third of Tinian and the Leaseback Area (LBA) includes 7,779 acres of the middle of the island. The MLA supports small unit-level through large field exercises and expeditionary warfare training. The LBA, which is north of TNI, is used for ground training such as military operations in urban terrain-type training, vehicle land navigation, convoy training, and other field activities (DON 2010b).

Military training on Tinian includes small arms firing; consequently, there are several small arms firing ranges in the LBA. When firing occurs, peak noise levels extend from the range in the LBA to the northern edge of TNI property (DON 2010b). However, only a small portion of non-military land is within peak noise levels, and there are no noise-sensitive receptors in this area.

Military helicopters operate out of the MLA approximately one week per month. Populations outside of the MLA experience noise from overhead flights approximately 2 days per month when military personnel are transported to and from Tinian.

Daily aircraft operations for the Baseline Scenario at TNI were estimated based on the approximate number of air taxi flights. The operations were modeled with a single-engine aircraft, the Piper Cherokee. It was assumed that aircraft fly in and out of TNI 365 days a year, resulting in an average of approximately 113 daily operations (FAA 2011), as shown in **Table 3.1-7.** Two of those operations were estimated to occur between the hours of 10 p.m. and 7 a.m. Aircraft use Runway 08 approximately 85 percent of the time and Runway 26 approximately 15 percent of the time.

Table 3.1-7. Baseline Scenario Aircraft Operations at TNI

Aircraft	Daily Operations
Piper Cherokee	113.24
Total	**113.24**

Source: FAA 2011

The 65 dBA DNL noise contour under the Baseline Scenario does not include any acreage; therefore it is not shown on a map.

Noise levels were calculated for noise-sensitive locations around TNI. Since the land north of the airport is leased for military use, the areas on Tinian that are sensitive to noise are south of TNI. As shown in **Table 3.1-8**, the residential area, Marpo Heights, and the Old San Jose Bell Tower are currently exposed to very low noise levels from aircraft operations. The noise level at Marpo Heights is 28 dBA DNL. At the Old San Jose Bell Tower the noise level is 21 dBA DNL.

Table 3.1-8. Baseline Scenario Noise Levels at Noise-Sensitive Locations around TNI

Land Use	DNL Noise Level
Marpo Heights–Residential	28 dBA
Old San Jose Bell Tower	21 dBA

Source: HDR

Major roadways adjacent to TNI include Broadway and 8th Avenue, although traffic activity is likely negligible due to the low population density on the island. TNI is surrounded mostly by vegetation. There are two small residential developments in the vicinity of TNI, Marpo Heights, which is southeast of the airfield and San Jose, which is south.

3.2 Air Quality

3.2.1 Definition of Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of

the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

Ambient Air Quality Standards. The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants under 40 CFR 50: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. The CAA also gives the authority to states, territories, and commonwealths to establish air quality rules and regulations. The CNMI has adopted the NAAQS. **Table 3.2-1** presents the primary and secondary USEPA NAAQS.

Although O_3 is considered a criteria pollutant and is measureable in the atmosphere, it is not often considered a regulated pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or O_3 precursors. The O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling NO_x and VOC pollutants.

Attainment and General Conformity. The USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment. USEPA has delegated the authority for ensuring compliance with the NAAQS in the CNMI to the CNMI DEQ. The CNMI DEQ's air pollution control regulations can be found in the FR (52 FR 43574). In accordance with the CAA, each state or commonwealth must develop a State Implementation Plan (SIP), which is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state or commonwealth into compliance with all NAAQS.

The General Conformity Rule applies only to significant actions in nonattainment or maintenance areas. This rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

Table 3.2-1. National and Commonwealth Ambient Air Quality Standards, Current as of October 2011

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	Commonwealth	
CO	8-hour (5)	9 ppm (10 mg/m^3)	Same	None
	1-hour (5)	35 ppm (40 mg/m^3)	Same	None
Pb	Rolling 3-Month Average(6)	0.15 µg/m^3 (1)	Same	Same as Primary
NO_2	Annual(7)	53 ppb (2)	Same	Same as Primary
	1-hour(8)	100 ppb	Same	None
PM_{10}	24-hour(9)	150 µg/m^3	Same	Same as Primary
$PM_{2.5}$	Annual(10)	15 µg/m^3	Same	Same as Primary
	24-hour (8)	35 µg/m^3	Same	Same as Primary
O_3	8-hour (11)	0.075 ppm(3)	Same	Same as Primary
SO_2	1-hour(12)	75 ppb (4)	Same	None
	3-hour(5)	--	Same	0.5 ppm

Sources: USEPA 2011a, CNMI DEQ 2004a, CNMI 2012

Notes: Parenthetical values are approximate equivalent concentrations.

1. Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
2. The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
3. Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
4. Final rule signed June 2, 2010. The 1971 annual (0.3 ppm) and 24-hour (0.14 ppm) SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.
5. Not to be exceeded more than once per year.
6. Not to be exceeded.
7. Annual mean.
8. 98th percentile, averaged over 3 years.
9. Not to be exceeded more than once per year on average over 3 years.
10. Annual mean, averaged over 3 years.
11. Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
12. 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

Key: ppm = parts per million; ppb = parts per billion; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter

Federal Prevention of Significant Deterioration. Federal Prevention of Significant Deterioration (PSD) regulations apply in attainment areas to major stationary sources (e.g., sources with the potential to emit 250 tons per year [tpy] of regulated pollutants) and significant modifications to major stationary sources (e.g., change that adds 0.6 tpy for Pb, or 10 tpy to 100 tpy depending on the regulated pollutant, to the facility's potential to emit). Additional PSD permitting thresholds apply to increases in stationary source

greenhouse gas (GHG) emissions. PSD permitting can also apply to a proposed project if all three of the following conditions exist: (1) the proposed project is a modification with a net emissions increase to an existing PSD major source, and (2) the proposed project is within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas), and (3) regulated stationary source pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's Class designation (40 CFR 52.21[c]).

There are no Class I areas identified in the CNMI. Therefore, there is no Class I area affected by the Proposed Action. Because the CNMI is not located within 10 kilometers of a Class I area, the existing facilities are not an existing PSD major source, and there are only minor stationary source emissions increases under the Proposed Action, PSD regulations do not apply and are not discussed further in this EIS (40 CFR 81 2012).

Greenhouse Gas Emissions. GHGs are gaseous emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane, and nitrous oxide. On 22 September 2009, the USEPA issued a final rule for mandatory GHG reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on CO_2 and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tonnes or more of CO_2 equivalent emissions per year but excludes mobile source emissions. The White House Council on Environmental Quality issued draft NEPA guidance in February 2010 regarding the inclusion of analysis of GHG emissions in NEPA documents. The guidance indicates 25,000 metric tonnes of direct CO_2-equivalent GHG emissions can provide a useful, presumptive, threshold for discussion and disclosure of GHG emissions. However, the guidance does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that might warrant some description in the appropriate NEPA analysis involving direct emissions of GHGs. GHG emissions are also factors in PSD and Title V permitting and reporting, according to a USEPA rulemaking issued on 3 June 2010 (75 FR 31514). GHG emissions thresholds of significance for permitting of stationary sources are 75,000 tons CO_2 equivalent per year and 100,000 tons CO_2 equivalent per year under these permit programs.

3.2.2 Existing Conditions

3.2.2.1 Alternative 1 – GSN (Preferred Alternative)

The site of Alternative 1 under the Proposed Action is the Island of Saipan located in the CNMI, which is within the USEPA Pacific Southwest Region 9 (USEPA 2011b). As defined in 40 CFR 81.354, due to lack of monitoring, the CNMI, is designated as attainment/unclassifiable for all criteria pollutants (USEPA 2012a). The USEPA has not designated an AQCR that encompasses the CNMI. In addition, no emissions inventories or monitoring data are available locally or regionally for the CNMI.

The U.S. Department of Energy, Energy Information Administration, does not provide estimates for gross CO_2 emissions for the CNMI.

The CNMI DEQ regulates air quality air permits for stationary air pollution sources in the CNMI. There are currently no USAF operations conducted at TNI or GSN. The CNMI DEQ requires all air permit application submissions to include dispersion modeling (conservative or refined), which is evaluated thoroughly and compared against the national ambient air quality standards for compliance.

Over the course of a typical year, average daily windspeeds in Saipan range from 8 mph in September to 13 mph in February. Wind typically blows east to west or northeast to southwest (Weatherspark 2012a). Due to its location relative to an area of cyclonic development in the Pacific Ocean, Saipan is always under weather condition 4, which means that 40 mph winds are possible within 72 hours (Pacific RISA Undated).

3.2.2.2 Alternative 2 – TNI

The site of Alternative 2 under the Proposed Action is the Island of Tinian located in the CNMI, which is within the USEPA Pacific Southwest Region 9 (USEPA 2011b). As defined in 40 CFR 81.354, due to lack of monitoring, the CNMI is designated as attainment/unclassifiable for all criteria pollutants (USEPA 2012a). The USEPA has not designated an AQCR that encompasses the CNMI. In addition, no emissions inventories or monitoring data are available locally or regionally for the CNMI.

The U.S. Department of Energy, Energy Information Administration, does not provide estimates for gross CO_2 emissions for the CNMI.

The CNMI DEQ regulates air quality air permits for stationary air pollution sources in the CNMI. There are currently no USAF operations conducted at TNI or GSN. The CNMI DEQ requires all air permit application submissions to include dispersion modeling (conservative or refined), which is evaluated thoroughly and compared against the national ambient air quality standards for compliance.

Over the course of a typical year, average daily windspeeds in Tinian range from 7 mph in August to 15 mph in January. Wind typically blows east to west or northeast to southwest (Weatherspark 2012b). Due to its location relative to an area of cyclonic development in the Pacific Ocean, Tinian is always under weather condition 4, which means that 40 mph winds are possible within 72 hours (Pacific RISA Undated).

3.3 Airspace/Airfield Environment

This section presents the existing airspace/airfield environment for alternatives being considered in this EIS. To readily identify and understand the affected airspace environment, this section includes a brief overview of PACAF's airspace/airfield requirements to support exercises, contingency operations, and humanitarian mission in the Pacific and the definitions of select aeronautical terms that are important to the analysis.

3.3.1 Definition of Resource

The airports proposed for improvements to support divert capabilities require suitable airspace and airfields capable of handling required classes of aircraft during emergencies, joint military exercises, and humanitarian operations within the MIRC. The designated airfields should have the capabilities, services and facilities to safely support the selected aircraft and the airspace to provide assurance of safe transition from and to the airfield. The airports proposed for improvements are GSN and TNI, both located in the CNMI.

PACAF proposes to improve GSN or TNI, both existing FAA-regulated airports in the Mariana Islands, to support emergency divert landings, periodic joint military exercises, and humanitarian missions in the western Pacific. The following airspace and airfield requirements are necessary to successfully support these missions: airfield accessibility if access to Andersen AFB or other western Pacific airfields is limited or denied, ability to execute contingency operations to include humanitarian relief efforts, and ability to accommodate joint military exercises required to ensure readiness in accordance with service

requirements under Title 10 U.S.C. The KC-135 aircraft has been identified as the design aircraft for cargo and tanker aircraft, while F-16, F-18, and F-22 have been designated as representative of other tactical aircraft that might require use of the proposed location. PACAF has identified the following airspace and airfield criteria for the proposed location:

Class B Runway. A runway is considered a strip of level paved surface where planes can depart and land. PACAF requires a Class B runway to support KC-135 operations. Class B runways are designed for use by high-performance and large, heavy aircraft but can also be used by other aircraft requiring less stringent runway design standards. UFC 3-260-01, *Airfield and Heliport Planning and Design*, provides the design criteria for a Class B operational runway, which can accommodate a KC-135 and other logistical and tactical aircraft. The runway design would optimally be at least 150 feet wide with 25-foot-wide paved shoulders, for total paved width of 200 feet; taxiways and taxi lanes connecting runways and other ground areas would optimally be at least 75 feet wide, with a minimum paved shoulder width of 25 feet, and an unpaved shoulder width of 25 feet, for a total paved and unpaved taxiway width of 125 feet.

FAA Obstacle Free Zone (OFZ). According to the September 2011 *FAA Airport Design Advisory Circular AC: 150/5300-13,* the runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function. The runway OFZ extends 200 feet (60 m) beyond each end of the runway. Its width is as follows: (1) for runways serving small airplanes exclusively (a) 300 feet (90 m) for runways shorter than 3/4 statute mile (1,200 m) approach visibility minimums, (b) 250 feet (75 m) for other runways serving small airplanes with approach speeds of 50 knots or more, (c) 120 feet (36 m) for other runways serving small airplanes with approach speeds of less than 50 knots; and (2) for runways serving large airplanes, 400 feet (120 m).

FAA Runway Safety Area (RSA). According to the September 2011 *FAA Airport Design Advisory Circular AC: 150/5300-13,* an RSA is a defined surface, (1,000 feet from runway end, 500 feet from runway edge), surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

FAA Runway Protection Zone (RPZ). According to the September 2011 *FAA Airport Design Advisory Circular AC: 150/5300-13,* the RPZ's function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ, and is used for the largest aircraft, 1,700 feet long and 500 feet wide.

Parking Apron. The parking apron, also known as a "ramp," is the paved or hard-surfaced area around the hangers and terminal buildings of an airport used to park aircraft. The ramp is also used to unload or load passengers and cargo, and to refuel and maintain aircraft. UFC 3-260-01 provides operational requirements for parking aprons, which are determined by the length and width of the design aircraft, which for this EIS is the KC-135. The KC-135 is 136.2 feet long and 130.8 feet wide. The minimum wing-tip clearance requirement between each aircraft is 50 feet, primarily to support aircraft refueling operations.

Hours of Operation. Hours of operation refers to the open and closed schedule that the airfield determines it is available to accept aircraft desiring to land and depart the airfield on a routine basis. The USAF is equipped to support operations 24 hours per day, 365 days a year. PACAF might require that the airfield have the capability to support potential around-the-clock operations, since exercises,

emergency landings, and humanitarian or contingency operations could occur at anytime. Generally, training would be scheduled for the daylight hours at the proposed location while other activities would be defined by the national command authority based upon the global issues that USAF is called upon to support in the western Pacific.

Instrument Flight Rules (IFR) Capabilities. Because the proposed locations are existing commercial FAA-approved airfields, all locations have existing IFR capabilities including navigational aids (NAVAIDS). The proposed locations, GSN and TNI, have different IFR capabilities and NAVAIDS because of the type and quantity of commercial aviation each location presently supports. These differences are discussed in more detail below.

IFR capability means the airfield has the ability to assist aircraft arriving and departing in bad weather using instrumentation. These capabilities include but are not limited to NAVAIDS, airfield lighting, terminal instrument procedures (TERPS), and air traffic control (ATC) services. DOD pilots are IFR qualified.

NAVAIDS are any system used in aid of air navigation, including lights, equipment for disseminating weather information, signaling, radio direction finding, radio or other electronic communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing or take-off of aircraft (FAA undated). Examples of NAVAIDs are a Non-Directional Beacon (NDB) and an Instrument Landing System (ILS). An NDB is a radio beacon transmitting non-directional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and "home" on or track to or from the station. An ILS system provides the aircraft the lateral and longitudinal (localizer) and vertical electronic guidance necessary for an instrument landing. A precision instrument approach system normally consists of the following electronic components and visual aids: a localizer which provides course guidance to the runway; a glide slope which provides vertical guidance for aircraft during approach and landing; and approach lights (FAA 2012a). TERPS is a series of predetermined maneuvers for the orderly transfer of an aircraft under IFR to initiate an approach to an airport/airfield to a landing, or to a point from which a landing can be visually made. The two main classifications of approach procedures include precision and non-precision. Precision approaches use both lateral and vertical guidance. Non-precision approaches provide lateral course information only. The publications depicting instrument approach procedures are called terminal procedures, but are commonly referred to by pilots as approach plates. These documents graphically depict the specific procedure to be followed by a pilot for a particular type of approach to a given runway. They depict prescribed altitudes and headings to be flown; and obstacles, terrain, and potentially conflicting airspace (FAA 2002).

Airfield Obstructions. Because the proposed locations are existing commercial FAA-approved airfields, all locations have previously been examined and approved by FAA for airfield obstructions. Airfield obstructions are objects that could affect navigable surfaces (approach/departure procedures), aircraft movement areas (runways, taxiways, and aprons), and NAVAIDS in the airfield vicinity. Airfield obstructions are considered hazards to flight safety for the purposes of FAA airfield certifications. Although both GSN and TNI have their own unique airfield obstructions surrounding the airfield, both have previously been certified for commercial aviation. The procedures and guidance issued by FAA for each airfield would be followed by military aircraft during divert activities at each location.

Hazardous Cargo, Arm/Disarm Areas. Military aircraft can contain or be carrying hazardous cargo, weapons, or other material, especially in emergency situations. Hazardous cargo and weapons are carried in accordance with strict DOD safety precautions. Military weapons are only armed when they can be fired in a safe manner, typically within restricted airspace at ranges designated for training, such as the MIRC. Military munitions would not be brought to GSN or TNI during joint military exercises; however,

there is the possibility that an aircraft making an emergency divert landing could be transporting munitions. Per UFC 3-260-1, *Hazardous Cargo Pads*, hazardous cargo pads are paved areas for loading and unloading explosives and other hazardous cargo from aircraft. Hazardous cargo pads are required at facilities where the existing aprons cannot be used for loading and unloading hazardous cargo. Hazardous cargo pads, including taxiways to these facilities, must be sited in accordance with DOD Explosive Safety Board (DDESB) criteria and are regularly reviewed for compliance with all DDESB regulations.

Arm/disarm pads are used for arming and disarming aircraft by ground crews before they depart or return to their parking area. Arm/disarm pads and taxiways to these facilities are sited in accordance with DDESB criteria and are regularly reviewed for compliance with all DDESB regulations. Per UFC 3-260-1, paragraph 6-10.4, *Arm/disarm Pad Size,* each arm/disarm pad should be based on the length, wingspan, and turning radius of the aircraft to be served. Jet blast must also be taken into account. Design criteria should also take into account the number of aircraft likely to require use of this facility.

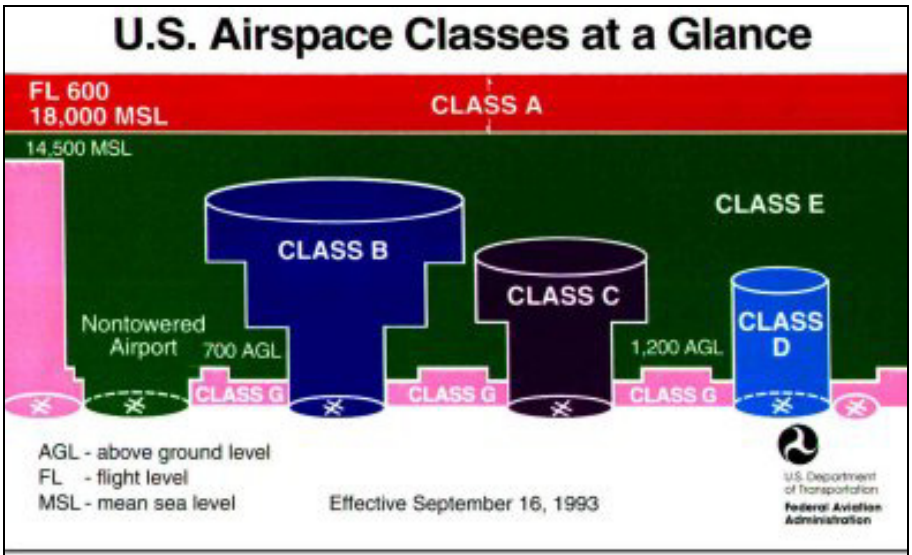
Aircraft Fueling. An aircraft fueling service is required to transfer flammable/combustible liquid fuel between a bulk storage system and the fuel tanks of an aircraft. At the proposed locations, the proposed method for transferring fuel is DOD's 2,400 gpm Type III Hydrant Refueling System. This system provides a means to safely transfer a large volume of flammable fuel. The fixed hydrant system provides a safer means of fueling aircraft than using large refueling trucks that would need to negotiate congested aircraft parking aprons. At GSN, it is proposed to connect with and improve the existing hydrant system at the airport; at TNI a complete new system would need to be constructed.

Temporary Munitions Storage Area. In accordance with DDESB criteria, as stated in **Section 2.1.1.2**, a temporary munitions storage area would be constructed to safely store munitions from diverted aircraft until the aircraft can return to its place of origin, or planned destination. One standard 7-Bar Earth Covered Magazine (ECM) capable of storing up to 500,000 pounds Net Explosive Weight (NEW) of Class/Division 1.1 (Mass-Detonating) explosives, or an equivalent munitions storage capability, would be preferred at the proposed location and cited in compliance with DDESB regulations. Transferring of munitions to and from the temporary munitions storage area would be in compliance with DOD and Department of Transportation (DOT) regulations for transferring Class 1.1 explosives along public thoroughfares. Compliance with these regulations is mandatory for military munitions transfers.

Arresting System. Arresting systems provide an additional level of safety for aircraft unable to stop without emergency procedures. The systems are used to rapidly decelerate aircraft, usually tactical aircraft, during emergency situations**.** An arresting system is needed to support joint military exercises in the MIRC because of the potential for tactical aircraft to overshoot the runway during emergency situations. Arresting systems are installed on nearly all U.S. military airfields and civilian airfields where fighter-type aircraft are present, and are similar to the arresting gear used on U.S. Navy aircraft carriers since before World War II.

ATC Services. ATC services are provided by an approved authority for the purpose of safely transiting aircraft to and from airfields, through controlled airspace, maneuvering aircraft within close proximity to each other and obstructions, and maintaining an orderly flow of air traffic (FAA 2012a). ATC services within the MIRC are provided by FAA Center Radar Approach Control (CERAP) and contract ground-control activities in Guam and Saipan. The MIRC contains more than 500,000 square miles (mi^2) of airspace used either exclusively by the military or used by both civilian and commercial aircraft. Some of this airspace is SUA designated by FAA as Warning Area, Restricted Area, or ATCAA. Specifically, the MIRC contains 14,000 NM^2 of Warning Area; 28 NM^2 of Restricted Area; and 63,000 NM^2 of ATCAA. The remainder of the airspace within the MIRC is uncontrolled airspace but contains transoceanic routes, most of which are more than 30,000 feet above ground level (AGL). Controlled airspace within the MIRC includes Class A, B, C, D, and E airspace within which the FAA, military, or

designated contractors provides ATC services. The U.S. airspace system's classification scheme is designed to provide maximum pilot flexibility within acceptable levels of risk appropriate to the type of operation and traffic density within that class of airspace. In particular, the U.S. airspace system provides separation and active control in areas of dense or high-speed flight operations. All airspace classes except Class G require ATC clearance for IFR operations. For example, two-way communication with ATC must be established before entering Class D airspace. Controlled airspace within the MIRC exists in the immediate vicinity of airports where aircraft used in commercial air transport flights are climbing out from or making an approach to the airport, at higher levels where air transport flights would cruise, and in areas where hazardous activities could occur including some military exercises and live fire air-to-ground bombing at the FDM range. All air activities must be approved by the controlling agency. **Figure 3.3-1** provides a graphic summary of U.S. airspace classifications.



Airspace Classes	Communications	Entry Requirements	Separation	Special VFR in Surface Area
A	Required	ATC clearance	All	N/A
B	Required	ATC clearance	All	Yes
C	Required	Two-way communications prior to entry	VFR/IFR	Yes
D	Required	Two-way communication prior to entry	Runway operations	Yes
E	Not required for VFR	None for VFR	None for VFR	Yes
G	Not required	None	None	N/A

Source: FAA 2012d

Figure 3.3-1. FAA Airspace Classification

3.3.2 Existing Conditions

3.3.2.1 Alternative 1 – GSN (Preferred Alternative)

GSN is a public airport located on the Island of Saipan within CNMI (see **Figure 3.3-2**) and is owned by the CPA. Though the islands of Rota, Tinian, and Saipan are all considered immigration ports of entry into the United States, Saipan is considered the gateway to the CNMI because of its infrastructure. GSN is also designated as the commercial aviation divert airfield location for eastbound flights originating in western Asia and for all flights bound for Guam. The GSN main terminal accommodates international passengers with six jetways that lead to immigration and customs processing. There are six major airlines operating at GSN: Delta Airlines, Asiana Airlines, Shanghai Airlines, Sichuan Airlines, China Eastern, and Fly Guam. GSN has scheduled direct flights from cities in Russia, Japan, Korea, China, and Guam with the capability to increase direct flights to Republic of Palau, Federated States of Micronesia, Australia, and other Oceanic destinations. The commuter terminal at GSN serves as a general aviation terminal and as the terminal for two feeder or air taxi services that service Tinian and Rota using single-engine aircraft and dual-engine short take-off aircraft (CPA 2005).



Figure 3.3-2. Aerial View of GSN

GSN has one FAA-compliant runway, Runway 07/25, which is 8,700 feet long, 150 feet wide, and has 25-foot paved shoulders. Runway 07/25 was resurfaced in 2011 and has paved blast pads and 1,000-foot nonpaved overruns at each end of the runway, but does not have an arm/disarm pad or hazardous cargo pad (see **Table 3.3-1**). The runway is designed to accommodate aircraft up to the size and dimensions of a Boeing 747-400. The lighting along the runway consists of a MALSR, distance remaining markers, Runway End Identifier Lights (REIL), 12 precision approach path indicator (PAPI) systems, a middle marker, a NDB, a glidescope, a localizer, and edge lights (AFCEE/PACAF 2010).

Table 3.3-1. GSN Capabilities

Runway	Length	Lights	Hours of Operation	IFR Capability (NAVAIDS/TERPS)	Aircraft Fueling	ATC Services
RWY 07/25	8,700 feet x 200 feet	VASI, REILS on RWY 25 and MALSR in first 1,400 feet' of RWY 07	Open 24/7	NAVAIDS: NDB and ILS with associated localizer. TERPS: ILS or LOC/DME RWY 07, RNAV (GPS) RWY 07, NDB/DME RWY 07, NDB RWY 07, RNAV (GPS) RWY 25, and NDB/DME RWY 25	AVGAS 100 (green), AVGAS 100LL (blue), and Jet A-1+	FAA Air Traffic Control Tower and GUAM ARTCC
RWY 06/24	7,001 feet x 100 feet	PVASI	RWY 6/24 serves as a runway and as a taxiway predicated on the time of day and controlled by Notice to Airmen (NOTAM).	NAVAID: NDB TERPS: NONE	Same as above	Same as above

Source: HDR

Key: DME = Distance Measuring Equipment, LOC = Localizer, PVASI = Pulsating Visual Approach Slope Indicator, VASI = Visual Approach Slope Indicator

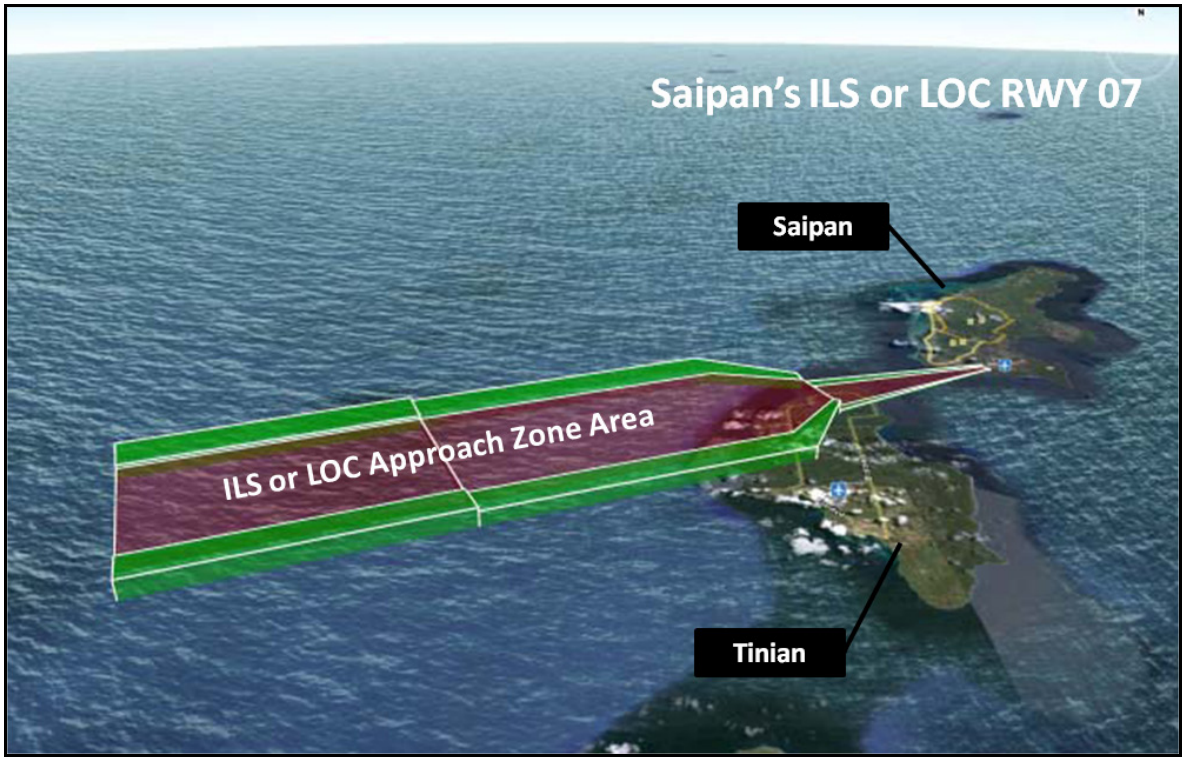
GSN has eight taxiways located throughout the airfield. The taxiways are 70 feet wide with 35-foot wide shoulders. The design criteria for a Class B runway requires 75-foot-wide taxiways but only 25-foot-wide shoulders; therefore, there is ample room to improve the width of the taxiway onto the existing shoulders and meet UFC criteria for the taxiways without interference into other airport ground operations if required. The existing GSN 1,498,464-ft^2 parking apron has a commercial hydrant fueling system and parking capacity for six 747 aircraft. The concrete portion of the parking apron is adjacent to the main terminal building. Under Alternative 1, a new parking apron would be constructed at GSN to support up to 12 KC-135s in addition to existing commercial aircraft at GSN. The UFC 3-260-01 requirement for parking aprons is determined by the length and width of the design aircraft. The design aircraft in this EIS is the KC-135, which is 136.2 feet long and 130.8 feet wide. The minimum wing-tip clearance requirement between each aircraft is 50 feet, primarily to support aircraft refueling operations. The proposed parking apron would be developed adjacent to the existing ramp. The asphalt portion of the existing parking apron is adjacent to the cargo-handling area and does not have adequate width for most large frame aircraft.

Runway 07/25 and Runway 06/24. Saipan has two runways, RWY 07/25 and RWY 06/24. RWY 07/25 is 8,700 feet long and 200 feet wide, and is the only active runway at GSN. RWY 06/24 is 7,001 feet long and 100 feet wide, but is currently closed and used as a taxiway. RWY 07/25 has four taxiways on which aircraft can transit to and from the parking aprons. RWY 07/25 is also equipped with Runway Edge lights, High Intensity (HIRL), that outline the edges of runways during periods of darkness or restricted visibility conditions. RWY 07 has an REILS, which consists of has two lighting units that flash simultaneously. RWY 25 is also equipped with a MALSR, which consists of a combination of threshold lamps, and steady burning light bars and flashers. The MALSR provides visual information to pilots on

runway alignment, height perception, role guidance, and horizontal references for Category I Precision Approaches (FAA 2012a). RWY 07/25 has a Visual Approach Slope Indicator (VASI), which is a system of lights arranged to provide visual descent guidance information during the approach to a runway (FAA 2012a). RWY 06/24 has a Pulsating Visual Approach Slope Indicator (PVASI). This is a single box which produces a solid white light when aircraft are established on the proper descent profile and solid red light when they are below the proper descent profile (FAA 2012a). Figures of the FAA RSA, OFZ, and RPZ as overlaid on the existing runway and proposed Runway Option A of runways at GSN are being incorporated into an Aeronautical Study and will be provided in the Final EIS**.**

Hours of Operation. Runway 07/25 is open 24 hours per day, 7 days per week (SkyVector 2012). Runway 06/24 serves as a runway and as a taxiway predicated on the time of day and controlled by NOTAM.

Instrument Flight Rules Capabilities. There are two NAVAIDS located on GSN's airfield, a NDB and an ILS. The following instrument approach procedures are published to Runway 07/25: ILS or Localizer (LOC)/Distance Measuring Equipment (DME) RWY 07(see **Figure 3.3-3**); Area Navigation (RNAV) (GPS) RWY 07; NDB/DME RWY 07; NDB RWY 07; RNAV (GPS) RWY 25; and NDB/DME RWY 25. There are no instrument procedures published to Runway 06/24. The published instrument approach procedures for GSN are being incorporated into an Aeronautical Study and will be provided in the Final EIS.



Source: HDR

Figure 3.3-3. Depiction of Saipan's ILS or LOC Approach Zone Area

Airfield Obstructions. There are no obstructions within GSN's approach surfaces. According to FAR Part 77.25(d), the approach surface is longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

Aircraft Fueling. All fueling and defueling of aircraft is conducted from fuel systems and fuel trucks approved by the CPA. Only airlines, the fuel system operator, and fixed based operators are authorized to perform into-plane fueling services. Fueling and refueling operators are responsible for compliance with all codes, regulations and laws associated with the process. GSN provides three types of aviation fuel Avgas 100 (green), Avgas 100LL (blue), and Jet A-1+. Avgas 100 (green) and 100LL (blue) is gasoline fuel for reciprocating piston engine aircraft. Jet A-1 is a kerosene grade of fuel suitable for most turbine engine aircraft.

Air Traffic Control Services. FAA operates the ATC Tower at GSN. The ATC tower is responsible for the separation and efficient movement of aircraft and vehicles operating on the taxiways and runways of the airport itself, and the aircraft within Saipan's Class D Airspace. Class D Airspace is generally a 5-NM radius from the airport reference point, surface to 2,500 feet AGL. However, Class D airspace is also tailored to meet the needs of the airport. GSN's Class D Airspace encompasses a 4.3-mile radius, surface to 2,700 feet AGL as shown in **Figure 3.3-4**. Class D airspace only surrounds airports that have an operational control tower. Pilots are required to establish and maintain two-way radio communications with GSN's ATC tower prior to entering the airspace.

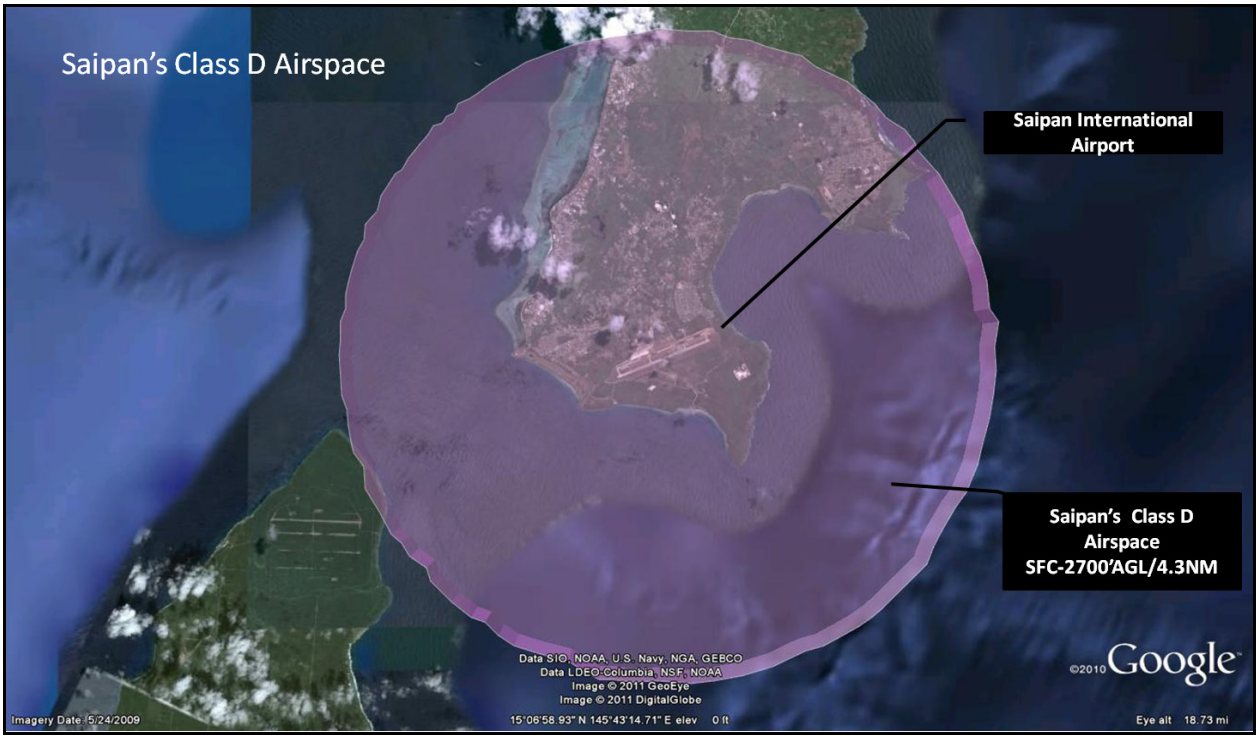


Figure 3.3-4. Saipan's Class D Airspace

The Island of Saipan is within FAA's Guam Center Air Route Traffic Control Center (ARTCC) Flight Information Region (FIR). Guam ARTCC is responsible for controlling aircraft en route to, transiting within, and arriving at or departing from the airports within their FIR. Guam ARTCC radar coverage and service begins at 3,500 feet above Mean Sea Level (MSL) above the airport. Guam ARTCC provides approach and departure service for GSN.

Between Saipan's Class D Airspace and Guam ARTCC FIR is Class G Airspace. Class G Airspace is uncontrolled airspace.

Commonwealth Port Authority Services. GSN has an ARFF department with approximately 35 personnel. The department manages two 24-hour shifts with approximately15 personnel assigned to each shift, and an average of 8 personnel on duty per shift daily. A fire captain is in charge of each shift. The fire department has four fire trucks, a Rescue Vehicle, a Tanker, and a Command Vehicle. The CPA Police Department is responsible for airport security (CPA 2005).

Commercial Aircraft Usage. A summary of commercial aircraft usage at GSN is presented in **Table 3.3-2**. The combination of air carrier, air taxi, and general aviation operations compose the majority of air traffic using GSN. Approximately 391 annual military operations occur at GSN per year, or less than one percent of all annual operations according to available data.

Table 3.3-2. GSN ATADS: Standard Report from January through December 2011

Itinerant Air Carrier	Itinerant Air Taxi	Itinerant General Aviation	Itinerant Military	Local Civil	Local Military	Total Operations
4,667	36,469	9,726	311	108	80	51,361

Source: FAA 2011

Bird/Aircraft Strike Hazard (BASH) Plan. A BASH Plan is a DOD plan implemented on DOD installations that is used to help prevent or reduce bird strikes by aircraft. FAA-certified airports refer to this type of initiative and plan as a Wildlife Hazard Management Plan. The plan typically includes defining the nature and extent of wildlife hazards and procedures for implementing the plan. Plan implementation might require environmental controls and changes to bird/wildlife dispersal/removal techniques and operational procedures. Cooperative agreements for managing fish and wildlife resources require coordination with DLNR and Federal conservation agencies prior to implementation. The plan must identify local procedures and permits for the proper collection, handling and disposal of wildlife carcasses and biological material discovered on the airfield and aircraft (USAF 2011).

According to the FAA Wildlife Strike Database, there have been 22 reported strikes from October 2004 through December 2011 (FAA 2012c) at GSN. Twelve of the 22 reported incidents occurred in 2010 and 2011. It is important to note that not all bird/aircraft strikes are reported. None of the reported strikes resulted in damage to the aircraft. Given the number of movements at GSN and the density of birds using the airfield, it is likely the strike frequency is substantially greater than the documented events. The majority of movements at GSN are air taxis that primarily service the Island of Tinian with turboprop aircraft, larger jet aircraft, and general aviation constituting the remaining movements. Military aircraft occasionally use GSN for training operations. A fairy tern was identified in one of the strikes; species identification was not reported for any other incident. Birds seen and subsequently struck involved individual birds or small flocks (two to ten individuals). Strikes occurred in various phases of the flight including take-off, climb, approach, and landing roll, and in both clear and overcast/rainy weather conditions. **Section 4.3** analyzes BASH from the airspace/airfield safety perspective. Additional information regarding BASH impacts on wildlife can be found in **Section 3.6** and **4.6**.

3.3.2.2 Alternative 2 – TNI

TNI is primarily used for inter-island passenger traffic between the islands of Saipan, Rota, and Guam (see **Figure 3.3-5**). The airport is equipped for night operation and there are chartered night flights from Saipan and Guam that primarily serve a hotel/casino. Scheduled airline service currently operating out of TNI is provided by Freedom Air. Charter flights are also available through Star Marianas (CPA 2005).



Source: HDR

Figure 3.3-5. Aerial View of TNI

Runway 08/26. TNI has one runway, RWY 08/26, which is 8,600 feet long and 150 feet wide (see **Table 3.3-3**). RWY 08/26 has two taxiways, one at each end of the runway, in which aircraft can transit to and from the parking aprons. RWY 08/26 is equipped with Runway Edge Lights, Medium Intensity (MIRL), which are used to outline the edges of runways during periods of darkness or restricted visibility conditions. TNI also uses a PAPI system, which uses light units similar to the VASI but is installed in a single row of either two or four light units. In addition, TNI uses an REILS, which consists of two light units flashing simultaneously (FAA 2012a). Figures of the FAA RSA, OFZ, and RPZ as overlaid on the existing runway and proposed Runway Option A of runways at TNI are being incorporated into an Aeronautical Study and will be provided in the Final EIS**.**

Table 3.3-3. TNI Capabilities

Runway	Length	Lights	Hours of Operation	IFR Capability (NAVAIDS/TERPS)	Aircraft Fueling	ATC Services
RWY 08/26	8,600 feet x 150 feet	MIRL, REILS, and PAPIs	Open 0600–2000L. Prior Permission Required from CPA outside scheduled hours.	NAVAIDS: None. TERPS: RNAV (GPS) RWY 08, RNAV (GPS) RWY 26, and NDB/DME A	None	Guam ARTCC

Source: HDR

Hours of Operations. Runway 08/26 is open between the hours of 0600–2000 Chamorro Standard Time (ChST). Aircraft operating outside of the designated hours require prior permission from the CPA.

Instrument Flight Rules Capabilities. Navigation guidance approaching TNI is based on GSN's NDB. The following instrument approach procedures are published to Runway 08/26: RNAV (GPS) RWY 08; RNAV (GPS) RWY 26; and NDB/DME A. The published instrument approach procedures for TNI are being incorporated into an Aeronautical Study and will be provided in the Final EIS.

Airfield Obstructions. There is a 30-foot hill at the west end of the CPA property approximately 1,300 feet from the end of RWY 08 within the approach surface. Broadway Avenue, the main north-south thoroughfare on Tinian, is at the east end of CPA property approximately 1,500 feet from the end of the runway. According to FAR Part 77.25(d), the approach surface is longitudinally centered on the extended runway centerline and extends outward and upward from each end of the primary surface. The approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end. There are no obstructions within approach surfaces with the existing conditions at TNI.

Air Traffic Control Services. The airspace surrounding TNI is designated Class G Airspace. Class G Airspace is uncontrolled airspace which means all approaches are based upon visual flight rules (VFR). TNI operates without an ATC tower, Class D Airspace, or ground control. Aircraft provide courtesy notification to CPA operations and ATC in Saipan for approach and departure clearance. TNI is considered an uncontrolled airfield and pilots are responsible for their own separation, takeoffs, and landings. Uncontrolled airports use a universal communication (UNICOM) system or Common Traffic Advisory Frequency (CTAF) that pilots can use to transmit their intentions to other aircraft using the airport (FAA 2010).

Like Saipan, the Island of Tinian is within FAA's Guam ARTCC FIR. Guam ARTCC is responsible for controlling aircraft en route to, transiting within, and arriving or departing airports within their FIR. FIR is a region of airspace with specific dimensions, in which air traffic control and flight information services are provided. Guam ARTCC radar coverage and service begins 3,500 feet above MSL above the Island of Tinian. Air taxi service to and from Saipan and Tinian generally remain under 3,000 feet.

Commonwealth Port Authority Services. TNI ARFF department consists of approximately 10 personnel. Personnel have dual roles as ARFF and port police officers. The ARFF Operations run three 8-hour shifts per day with an average of two to three personnel on duty per shift daily. A fire/police captain runs the daily operations for both law enforcement and ARFF protection for the airport. The fire department has two full-size pickups capable of towing water (CPA 2005) but it has no crash-and-rescue or other firefighting equipment. Existing military operations require the military services to provide their own expeditionary airfield support requirements when using TNI for exercises, including bulk water carriers/tankers, and crash-and-rescue equipment.

Commercial Aircraft Usage. The best data available for current operations at TNI indicate that there are 113 operations per day (FAA 2011).

Bird Aircraft Strike Hazard Plan. A BASH Plan is a DOD plan implemented on DOD installations that is used to help prevent or reduce bird strikes by aircraft. FAA-certified airports refer to this type of initiative and plans as a Wildlife Hazard Management Plan. The plan typically includes defining the nature and extent of wildlife hazards and procedures for implementing the plan. TNI does not have a Wildlife Hazard Management Plan but does have a Wildlife Hazard Assessment. The development of a Wildlife Hazard Management Plan from the Wildlife Hazard Assessment could require environmental controls and changes to bird/wildlife dispersal/removal techniques and operational procedures. Cooperative agreements for managing fish and wildlife resources require coordination with DLNR and Federal conservation agencies prior to implementation. The plan must identify local procedures and permits for the proper collection, handling and disposal of wildlife carcasses and biological material

discovered on the airfield and aircraft (USAF 2011). Statistical documentation is not available to determine wildlife and aircraft collisions at TNI. Additional information regarding BASH impacts on wildlife can be found in **Sections 3.6** and **4.6**.

Table 3.3-4 presents a brief summary of the two airfields analyzed in this EIS compared to USAF criteria that would be required if the proposed action were implemented.

Table 3.3-4. PACAF Criteria Compared to GSN/TNI Airport Existing Capabilities

PACAF Criteria	GSN Alternative 1	TNI Alternative 2
Class B Runway which is at least 10,000 feet in length	Class B Runway, which is 8,700 feet in length, requires additional 1,800 feet	Class B Runway, which is 8,600 feet in length, requires additional 1,900 feet
Parking Apron capable of supporting 12 KC-135s	Due to civilian commercial operations, there is not sufficient parking, apron construction needed to meet requirement	Parking Apron size cannot support requirement, construction required
Airfield capable to support 24/7 operations	Open 24 hours per day, 7 days per week	Airfield open 0600–2000 ChST daily, agreement with CPA required for operations outside this time
IFR Capable airfield to support operations in inclement weather	NDB and ILS on airfield; Instrument approach procedures minimums RWY 07 = 415 – ½, RWY 25 = 600 – 1 1/8	No NAVAIDS on airfield; Instrument approach procedures minimums RWY 08 = 660 – 1 ¼, RWY 26 = 760 – 1 ½
Airfield Obstructions	None within approach/departure corridor	30-foot hill located1,300 feet from the end of RWY 08 within approach/departure corridor
Hazardous Cargo/Arm-disarm Areas	Not on airfield, location must be determined or constructed	Not on airfield, location must be determined or constructed
Jet Aircraft Hydrant Refueling System	Jet aircraft fueling available via fuel trucks, construction required for Hydrant Refueling System	No jet aircraft fueling capability, construction required for Hydrant Refueling System
Temporary Munitions Storage Area capable of storing 500,000 NEW of Class 1.1 explosives	No large Temporary Munitions Storage Area, construction required	No Temporary Munitions Storage Area, construction required
Arresting systems	Not on airfield, installation required	Not on airfield, installation required
ATC service for maintaining an orderly flow of air traffic	Terminal service available via Saipan's ATC tower; IFR service available from 3,500 feet MSL and above	IFR service available from 3,500 feet MSL and above; procedural control below 3,500 feet above MSL

Source: HDR

3.4 Geological Resources and Soils

3.4.1 Definition of Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards and paleontology.

Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981 and is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water.

Geologic hazards are defined as natural geologic events that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, volcanoes, landslides, rock falls, ground subsidence, and avalanches.

3.4.2 Existing Conditions

3.4.2.1 Alternative 1 – GSN (Preferred Alternative)

Regional Geology. The Mariana Islands formed from a curved line of stratovolcanoes that rise up from the ocean floor. These stratovolcanoes were created by subduction of the Pacific Plate beneath the Philippine Plate, which caused magma to rise up beneath the ocean's crust to form volcanoes that compose the islands. The volcanic activity that created these islands occurred approximately 45 to 10 million years ago, and volcanism is still active in the northern Mariana Islands (NPS 2006).

Geology of the islands in the CNMI is largely dependent on the degree of recent volcanism. The older (southern) islands, including Saipan and Tinian, are composed of a volcanic core covered by coralline limestone up to several hundred meters thick. When the original volcanoes subsided beneath the ocean surface, coral formations grew, which ultimately formed limestone caps. Limestone plateaus were elevated several hundred meters above sea level when the Philippine Plate was uplifted due to tectonic activity (DON 2010a, University of Hawaii 2010a). Volcanic activity now only occurs in the northern islands (DON 2010b). Saipan also has extensive reef flats extending seaward for hundreds of yards (DON 2010a).

Limestones and calcareous deposits compose about 90 percent of the surficial geology on Saipan, with volcanic rocks exposed on 10 percent of the land surface (from erosion and weathering). The limestones are considered to be very porous and with good permeability, which limits erosion potential (NPS 2006). Porosity (i.e., the volume of pore spaces in a rock) in the limestones is both primary and secondary. Primary porosity occurs during rock formation and is affected by the size, shape, and sorting of grains and particles. Secondary porosity can occur during alteration of rock, such as dissolution of limestone with rainwater or faulting (DON 2010b).

Limestones in Saipan are also highly permeable, which indicates the connectivity of pores within the rock. A rock with a higher permeability has a greater ability to transmit the flow of groundwater. Volcanic rocks on Saipan typically are poorly sorted and have undergone secondary alteration that inhibits the flow of groundwater. However, faults transect the island in a north-northeast direction, complicating the sequence and porosities/permeabilities of rock units (DON 2010b). Porosity, permeability, and groundwater are further discussed in **Section 3.5**.

Surficial geology at the airport site of the Proposed Action is mapped as Mariana limestone. The Mariana limestone is composed of clastic and reef limestone with argillaceous (clayey) rubbly sedimentary facies (USGS 2003). Surficial geology of the port area is mapped as Pleistocene and Holocene-aged emerged limey sand; beach, wetland, fill, and volcanic outwash materials. The truck routes would traverse through Mariana limestone, outwash deposits along the coast, and potentially pockets of Tagpochau or Tanapag limestones.

Based on the surficial geologic cross-section from Cloud et al. (1956) and modified by the USGS in 2003, the Mariana limestone is approximately 400 to 500 feet thick at the airport site of the Proposed Action and is underlain by approximately 100 feet of the Tagpochau limestone. It is unknown whether strata underlies the Tagpochau limestone at this location (USGS 2003). Bedrock geology underlying the airport site of the Proposed Action on Saipan is primarily composed of bioclastic to reefy limestone and granular clastic limestone (PACAF undated b).

Physiography and Topography. The surface terrain of Saipan is dominated by horizontal to gently undulating limestone plateaus and terraces separated by steep scarps. Limestone cliffs of varying relief are separated intermittently by small beaches and coves along the eastern, southern, and northern coasts. The western coast is formed by a narrow coastal plain of limestone-derived, sand-sized particles. Toward the southern end of the coastal plain is a small brackish lake, Lake Susupe, surrounded by an extensive marshy area (Susupe Marsh). Seaward of the western coast are three shallow lagoons bordered by a barrier reef (USGS 2003).

The airport site of the Proposed Action would occur within the low limestone platforms physiographic province. The low limestone platforms physiographic province is bordered on the east and west by the low terraced benches physiographic province. Depending on the final site design, the Proposed Action could also occur within the low terraced benches physiographic province. The port on Saipan exists in the western coastal plain physiographic province. The fuel truck route would traverse through the low limestone platforms, western coastal plain, and the central uplands (USGS 2003).

The central uplands are bordered by low limestone platforms to the north and south and terraced benches to the east that form a terraced pattern downward to the sea. The limestone platforms are broad, flat areas at the southern, southeast-central, and northern margins of the central uplands (USGS 2003).

The western coastal plain is a narrow plain to the west of the central uplands, extending continuously from the beaches at San Roque in the north to Agingan Point in the south. The western coastal plain ranges in width from 650 feet to more than 1 mile. The western coastal plain rises gradually inland to

elevations generally not more than 15 to 20 feet above sea level and is predominately composed of emerged calcium carbonate sands. Part of the coastal plain contains wetland areas, including the brackish-water Lake Susupe in the south (see **Section 3.5**). Three shallow lagoons and barrier reefs exist along the west coast, which separate the island from the Philippine Sea (USGS 2003).

At the site of the proposed development within the airfield, land is generally flat. To the east and west of the airstrip, terrain is rough and the land slopes steeply towards the sea. The site of the bare base is a flat, open, grassy field. The land proposed for the fuel tanks has been graded, and some asphalt exists. The area proposed for the ECM is flat and adjacent to farm/grazing plots. An operational limestone quarry exists to the southeast of the airstrip.

Soils. Soils on Saipan developed on volcanic rock tend to be poorly drained clays, while soils developed on limestone are usually shallow and highly porous. The Island of Saipan consists of six soil orders with Mollisols dominating the limestone plateaus and uplands, where most of the airport development associated with the Proposed Action would occur. Mollisols are the dominant soil order on Saipan, and are soft, fertile soils rich in organic matter and nonacid cations (e.g., calcium, magnesium, potassium, and sodium) that develop under grassland landscapes. These soils are classified as very productive (University of Hawaii 2010a).

There is no prime and unique farmland in the areas proposed for development. All soils underlying sites proposed for development activities are previously disturbed. **Table 3.4-1** lists the soils associated with the Proposed Action. At the sites of the Proposed Action, soils are considered to be highly erodible (CNMI SWARS 2010).

Table 3.4-1. Characteristics of Soils Mapped at the Sites of the Proposed Action at Saipan

Mapping Unit	Texture	Location	Characteristics
Chinen-Urban Land	Urban land	Airstrip development and adjacent to airstrip	Shallow, well-drained, nearly level, and Urban land
Chinen-Takpochao	Clay	Southeast of airstrip, truck route	Very shallow and shallow, well-drained, nearly level to strongly sloping
Shioya	Loamy sand	Truck route, port	Very deep, excessively drained, level to nearly level soils
Mesei Variant	Peat	Truck route, port	Moderately deep, very poorly drained, level

Source: USDA NRCS 1988a

Geologic Hazards. In Saipan, the geologic hazards that could potentially endanger lives or threaten property include tsunamis, earthquakes, mass wasting, sinkholes, and volcanoes. Erosion is another hazard that occurs on Saipan (CNMI CRMO 2011).

Because of the prominence of tectonic activity, the coastal areas of Saipan are considered to be at a high risk for earthquakes, tsunamis, and volcanic eruptions. Seismic zones range from 0 (no chance of severe ground shaking) to 4 (10 percent chance of severe shaking in a 50-year interval). The CNMI are considered to be in Seismic Zone 3 (CNMI 1988).

Earthquakes often precede volcanic eruptions in the Mariana Islands. Geologic hazards associated with earthquakes and volcanic activity includes the generation of tsunamis, ash and steam, ejection of pyroclastic materials, and lahars (ash flows). Because Saipan is in a seismically active region, geothermal

energy projects are being assessed to determine if geothermal energy would be a suitable replacement for diesel or other forms of fuel (USGS 2010).

There is a substantial statistical correlation between earthquakes and typhoons at Guam; the close encounter of a typhoon with Guam doubles the probability of an earthquake with a magnitude of greater than 5.0 occurring on that same day (Lander et al. 2002). However, only a few tsunamis have hit the CNMI in the past 200 years. It is suggested by Lander et al. (2002) that because of the nature of the subsidence occurring within the Mariana Trench (referred to as decoupled), earthquakes with a magnitude range of 6 to 7 occur on average once every 10 years and earthquakes greater than 7 occur about once in 100 years. Earthquakes ranging from 5- to 6-magnitude occur approximately 5 to 8 times a year within 250 miles of Guam (DON 2010b).

However, four earthquakes with a magnitude greater than 6.5 on the Richter scale have occurred within 400 miles of CNMI within the past 20 years, including a 7.8-magnitude earthquake in 1993, a 7.1-magnitude earthquake in 2002, a 7.4-magnitude earthquake in 2007, and a 6.9-magnitude earthquake in 2010 (DON 2010a, DON 2010b). These earthquakes tend to precipitate from the shallower, southern region of the Mariana Trench.

In concert with earthquakes is the potential for tsunami generation. Three tsunamis, in 1849, 1892, and 1993 have caused damage. Due to the eastern location of the Mariana Trench, it is suggested by Lander et al. (2002) that the impacts of a local tsunami would most likely occur on Guam's east coast. Therefore, it can be extrapolated that tsunamis would generally impact the east coast of Saipan as well. If a tsunami has a southern origin, it could impact both the west and east coast of Saipan (USGS 2010).

Earthquakes can also affect areas beyond their origin, by inducing landslides. Slope failures and landslides on Saipan do occur, predominantly in limestone terrain. Slope destabilization and landslides occur when a slope is destabilized, such as during a seismic event. When destabilization is followed by heavy rainfall, the destabilized slope is saturated, and mudflows can result (PACAF undated b).

Because landslide hazards are dependent upon local surficial geologic factors, vulnerability can be assessed by analyzing the local geology, slope angle, groundwater elevations, rainfall, and geologic structures such as faults and joints. The overall likelihood for landslides to occur on Saipan is generally low because the consolidated nature of the limestone and volcanic units reduce the potential for slope failure. Areas with steeper slopes are at a higher risk for landslides (PACAF undated b). The Proposed Action on Saipan would be in relatively flat areas and would not be anticipated to be impacted by landslides.

Another effect associated with seismic activity is liquefaction. Liquefaction can occur when water-saturated sandy soils are subjected to ground shaking. In order for liquefaction to occur, two conditions must exist: the soil must be susceptible (loose, water-saturated, sandy soil, typically between 0 and 30 feet below the ground surface) and ground shaking must be strong enough to cause susceptible soils to liquefy. When soil liquefies, it loses strength and behaves as a liquid and begins to flow. This can cause structures to sink into the ground or tilt, empty buried tanks to rise to the ground surface, slopes to fail, nearly level ground to shift laterally tens of feet (lateral spreading), surface to subside, and ground to crack. Consolidated limestone and volcanic geologic units are not usually susceptible to liquefaction.

3.4.2.2 Alternative 2 – TNI

Regional Geology. Regional geology of Tinian is similar to that of Saipan (described in **Section 3.4.2.1**) as they are both in the southern Mariana Islands, and are both volcanic rock (tuff and breccias) covered in

coralline and algal limestone. Limestone rock predominates, while volcanic rock is only exposed in two small, isolated areas due to extensive weathering (DON 2010A).

Tinian has more than 95 percent carbonate rocks at the surface (University of Guam 2002). There are two main limestone formations on Tinian: the Mariana and Tagpochau limestones (see **Section 3.4.2.1**). The Mariana limestone was deposited in Pliocene and Pleistocene time and covers approximately 83 percent of the Tinian's surface. The Mariana limestone is composed of seven rock types, differentiated by the type of carbonate material contained within the limestone, which is, in general, either derived from coralline or algal materials. Argillaceous (clayey) and massive limestones are also present within the Mariana limestone formation (USGS 2003).

The Tagpochau limestone covers approximately 16 percent of Tinian's surface and is composed of three rock types: detritus (majority of the formation), clays, and sands, and is primarily biogenic calcium carbonate fragments and calcite cement derived from corals.

In the coastal regions, these deposits are overlain by Holocene limestone, developing sands and gravels, and reefs. Most of the shoreline on Tinian consists of limestone cliffs with sea-level caverns, cuts, notches, and slumped borders. Beach deposits are composed of medium- to coarse-grained calcareous sands, gravel, and rubble interspersed in exposed limestone. Reef development occurs primarily on the western coast, with minor fringing or apron reef development on the northern, eastern, and southern coasts (DON 2010A). There are no permanent streams for surface drainage on Tinian because all water evaporates or percolates through the highly permeable limestone. Water resources on Tinian are discussed in detail in **Section 3.5**.

The presence of limestone indicates that karst topography could be present. Limestone is a soluble rock primarily composed of calcium carbonate; on Tinian, the source of calcium carbonate is primarily from coral reef. Karst is a distinctive topography formed by dissolution of underlying soluble rocks by surface water or groundwater. Karst is characterized by caves, sinkholes, and subsurface drainage. These dissolution features are created when rainwater, which is slightly acidic, dissolves carbonate rocks, such as limestone. Although karst topography does exist on Tinian, no karst features were detected during site investigations for the Proposed Action on Tinian or were noted during geologic investigations by Gingerich and Yeatts in 2000 (University of Guam 2002).

At the sites of the Proposed Action, geology consists of the Mariana limestone (DON 2010b). In some areas within the sites of the Proposed Action, soils are very thin and a very hard limestone outcrops or is close to the ground surface. No volcanic rock or soils derived from volcanic parent material are present within the areas proposed for development; therefore, soils are all highly porous and permeable. At the site of the proposed parking area, an approximately 60-foot-deep borrow pit is covered with overgrowth.

Physiography and Topography. Tinian is composed of five limestone plateaus at varying elevations, separated by steep slopes and escarpments.

The Proposed Action at the airport would occur within the Central Plateau physiographic province; and the fuel truck route would occur within the Central Plateau and Median Valley physiographic provinces. Work within the port would occur in the Median Valley. The Central Plateau, found within the central portion of the island, is isolated by steep slopes and scarps associated with north-south trending faults. In the south- and east-central regions, the Median Valley is a broad depression with little relief, bounded by faults (University of Guam 2002).

At the sites of the Proposed Action, topography is relatively flat, and elevations range from approximately 61 to 100 feet above sea level (DON 2010b, USGS 1999). Elevation surrounding the airstrip drops towards the sea to the east and west.

A large depression, formerly used as a borrow pit, is present within the area proposed for parking lot development. This borrow pit is overgrown with vegetation and is not highly visible from the air-field. Large limestone boulders are present within the depression. A hard limestone gently sloping hill is also adjacent to the proposed parking area. Another depression exists between the taxiway and airstrip west of the terminal/apron area. The area is believed to have been excavated and used as a borrow pit.

Soils. Soil profiles on limestone regions are shallow and highly porous, and soils are similar to those described in **Section 3.4.2.1** for Saipan, as the soils formed under similar conditions (University of Guam 2002).

In addition to the Chinen-Urban Land, Chinen-Takpochao and Shioya described for the Proposed Action at Saipan, Tinian also has Dandan-Chinen and Saipan-Dandan mapped within the areas of the Proposed Action. The Dandan-Chinen mapping unit is shallow to moderately deep clayey to stoney loam that is slightly alkaline. The Saipan-Dandan soil is a moderately deep to very deep clayey loam that is slightly acidic (McCraken undated).

Soils mapped within the airstrip are Dandan-Chinen, Saipan-Dandan, and Chinen-Urban land. Soils mapped within the port area are Shioya loamy sands, and soils mapped within the truck routes include the Shioya sandy loam and the Chinen-Takpochao (described in **Section 3.4.2.1**). All soils within areas to be developed by the Proposed Action are previously disturbed and considered to be moderately to highly erodible (CNMI SWARS 2010). Soils at the sites of the Proposed Action are shown in **Table 3.4-2**.

Table 3.4-2. Characteristics of Soils Mapped at the Sites of the Proposed Action at Tinian

Mapping Unit	Texture	Location	Characteristics
Chinen-Takpochao	Clay	Truck route	Very shallow to shallow, well-drained, nearly level to steeply sloping
Dandan-Chinen	Clay	Airstrip	Shallow and moderately deep, well-drained, nearly level to strongly sloping soils
Shioya	Loamy sand	Truck route, port	Very deep, excessively drained, level to nearly level soils
Saipan-Dandan	Loam	Airstrip	Moderately deep and very deep, well-drained, nearly level to gently sloping
Chinen-Urban Land	Urban land	Airstrip	Shallow, well-drained, nearly level, and Urban land

Sources: USDA NRCS 1989, DON 2010b

Soils are shallow in many places, and as a result, productive areas for farming are limited (CNMI SWARS 2010). Erosion can be a problem in limestone areas, especially near roads or on recently cleared lands (CNMI SWARS 2010). No prime farmland soils exist at the site of the Proposed Action on Tinian (USDA NRCS 1989).

Geologic Hazards. Tinian has similar geologic hazards as Saipan (see **Section 3.4.2.1**), with the potential for earthquake activity, impacts from volcanoes, and tsunamis. Tinian is susceptible to tsunamis because of seismic activity associated with the active volcanoes to the north and the Marianas Trench to the east.

The band of coral reef that surrounds Tinian provides protection from tsunamis, and the steep slope of the ocean floor surrounding the island lowers the risk of significant wave run-up.

TNI is listed as an evacuation safe zone as designated by the CNMI Emergency Management Office (CNMI HS&EM 2012). The Pacific Tsunami Warning Center considers the tsunami evacuation safety zone to be above 30 feet above sea level and more than 100 feet inland. In addition, the National Weather Service has recognized Tinian as "Tsunami Ready" and "Storm Ready" because it has a 24-hour warning point and emergency operations center, monitors local weather and ocean conditions, has developed multiple methods to receive tsunami and severe warnings to alert the public quickly, has developed a hazard plan, and promotes public readiness through education (PACAF undated b).

The potential for landslides and liquefaction to occur within the site of the Proposed Action is considered to be low because rock is consolidated and no steep slopes are present.

3.5 Water Resources

3.5.1 Definition of Resource

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. Hydrology encompasses the occurrence, distribution, movement and properties of the Earth's waters through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Hydrology results primarily from temperature and total precipitation that determine evapotranspiration rates, topography that determines rate and direction of surface flow, and soil and geologic properties that determine rate of subsurface flow and recharge to the groundwater reservoir. Water resources relevant to Saipan and Tinian include groundwater, surface water, and floodplains.

Groundwater. Groundwater is water that exists in the pore spaces and fractures in rock and sediment beneath the Earth's surface within the zone of saturation. Groundwater features include depth from the surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations. Most of the available fresh groundwater on small oceanic islands is in a freshwater-saltwater coastal aquifer system where a lens-shaped body of fresh and brackish groundwater floats on denser salt water within the island (i.e., beneath the ground's surface). Fresh water is separated from salt water by a transition zone in which salinity grades from fresh water to salt water. Rainfall infiltrates and recharges the aquifer, where frictional resistance to flow causes the water to accumulate and form a lens. Fresh water flows by gravity to the shore, where it discharges as diffuse seepage and as springflow at shoreline and submarine springs. On small islands such as Saipan and Tinian, mixing in the transition zone results mainly from tidal fluctuations superimposed on the gravity-driven flow of fresh water toward the shore. Rainfall (i.e., recharge) is episodic and seasonal, causing lens volume to fluctuate. The lens discharges continuously throughout the year, but shrinks during dry periods when recharge diminishes or ceases. The lens expands during high recharge episodes, which commonly occur within a definable wet season.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. The 1986 amendments to the SDWA required the USEPA to establish maximum contaminant levels, maximum contaminant level goals, and best available technology treatment techniques for organic, inorganic, radioactive, and microbial contaminants, and turbidity in drinking water sources. The Federal Sole Source Aquifer regulations authorized under the SDWA protect aquifers that are critical to water supply.

Surface Water. Surface water resources generally consist of streams, rivers, lakes, and wetlands. The CWA of 1977 is administered by the USEPA and sets the basic structure for regulating discharges of

pollutants into U.S. waters. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA requires the USEPA to establish water quality standards for specified contaminants in surface waters. Section 402 of the CWA forbids the discharge of pollutants from a point source into navigable waters without a NPDES permit. The NPDES storm water program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more to obtain coverage under an NPDES permit for their storm water discharges. NPDES permits in the CNMI are issued by USEPA Region 9. Where the USEPA is the permitting authority, construction storm water discharges are almost all permitted under the USEPA's Construction General Permit (CGP). The CGP requires compliance with effluent limits and other permit requirements, such as the development of a site-specific Storm Water Pollution Prevention Plan (SWPPP). Construction or demolition that requires permit coverage requires preparation of an NOI certifying that the permit's eligibility conditions have been met and all activities will comply with the permit's effluent limits and other requirements.

The USEPA published the technology-based Final Effluent Limitations Guidelines (ELGs) and New Performance Standards for the Construction and Development point sources, known as the "Construction and Development (C&D) Rule," on December 1, 2009, to control the discharge of pollutants from construction sites. The C&D Rule became effective on February 1, 2010, and requires construction site operators to meet restrictions on erosion and sediment control, pollution prevention, and stabilization. The C&D Rule also included a numeric turbidity limit for certain larger construction sites, but effective January 4, 2011, the USEPA has suspended the numeric limitation for further evaluation. Therefore, the numeric turbidity limitation and monitoring requirements do not currently have to be incorporated into construction permits. The USEPA currently regulates large and small (greater than 1 acre) construction activities through the final 2012 CGP (February 16, 2012), which recently replaced the 2008 CGP. The 2012 CGP includes a number of modifications to the 2008 CGP, many of which are necessary to implement the new ELGs and New Source Performance Standards for C&D point sources. Permittees must select, install, and maintain effective erosion- and sedimentation-control measures as identified and as necessary to comply with the 2012 CGP, including the following:

- Minimize exposure of soils and control discharges from stockpiled sediment or soil
- Design storm water controls according to the amount, frequency, intensity, and duration of precipitation; the nature of storm water runoff and run-on at the site; and the range of soil particle sizes expected to be present on the site
- Direct discharges from storm water controls to vegetated areas to increase sediment removal and maximize storm water infiltration
- Complete installation of storm water controls by the time each phase of earth-disturbance has begun, unless infeasible
- Install sediment controls (e.g., sediment basins, sediment traps, silt fences, and vegetative buffer strips) along the perimeter of the construction site
- Regularly inspect and maintain all erosion and sediment controls
- Prevent discharges of petroleum products; soaps, solvents or detergents used in equipment washing; or other toxic or hazardous substances from a spill or other release
- Minimize sediment track-out and implement dust controls
- Minimize disturbance of steep slopes
- Preserve topsoil

- Minimize soil compaction
- Design storm water conveyance channels to avoid unstabilized areas on the site and to reduce erosion; minimize erosion of channels and their embankments, outlets, and downstream waters.

Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the USACE. Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

The CNMI DEQ is the administrative authority for CWA Section 401 Water Quality Certifications required for validation of CWA Section 402 NPDES permits. The CNMI administers a CWA Section 401 Water Quality Certification Program through provisions contained within the CNMI Water Quality Standards. Section 401 certification by the CNMI is required for every Federal permit that could result in a discharge of pollutants to waters of the CNMI, including the USEPA CGP.

Section 303(d) of the CWA requires states, territories, or commonwealths and the USEPA to identify waters not meeting state water quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water quality standards. After determining TMDLs for impaired waters, states, territories, and commonwealths are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state, territory, or commonwealth standards. Impaired (Category 5) waters are defined as those waters where available data or information indicate that at least one designated use (e.g., recreation, support of aquatic life and coral reef conservation, fishing and the consumption of fish and shellfish, aesthetic enjoyment, and availability as potable water supplies in the case of fresh waters) is not being supported or is threatened, and a TMDL is needed.

Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. § 17094) established new storm water design requirements for Federal construction projects that disturb a footprint greater than 5,000 ft^2 of land. The project footprint consists of all horizontal hard surfaces and disturbed areas associated with the project development, including both building area and pavements such as roads, parking lots, and sidewalks. These requirements do not apply to resurfacing of existing pavements. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology will be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design will incorporate storm water retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses will be conducted to evaluate the effectiveness of the as-built storm water reduction features. As stated in a January 2010 DOD memorandum, these regulations will be incorporated into applicable DOD UFC (DOD 2010b). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

The CNMI DEQ has developed its own Water Quality Standards, which are promulgated in accordance with the Federal CWA, the Commonwealth Environmental Protection Act of 1982 (2 Commonwealth Code [CMC] §§3101 to 3134, Public Law [P.L.] 3-23), the Commonwealth Environmental Amendments Act of 1999 (P.L. 11-103), and the Commonwealth Groundwater Management and Protection Act of

1988 (2 CMC §§3311 to 3333, P.L. 6-12). The purpose of these authorities is to establish standards for water quality for all CNMI waters and groundwater in order to protect their use and value for propagation of fish and wildlife, recreation, public water supply use, and commerce.

The CNMI Water Quality Standards define two classes (AA and A) of marine water uses. The majority of the coastal marine waters are Class AA, meaning that these waters should remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-related source or actions. The uses protected in these waters are the support and propagation of marine life, conservation of coral reefs and wilderness areas, oceanographic research, and aesthetic enjoyment and compatible recreation inclusive of whole body contact and related activities. Class A waters are protected for their recreational use and aesthetic enjoyment; other uses are allowed as long as they are compatible with the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water is of a limited body contact nature.

Per the Northern Mariana Islands Administrative Code Chapter 65-30, Earthmoving and Erosion Control Regulations, no person shall commence or continue grading, filling, or vegetation-clearing activities without first obtaining a permit from the CNMI DEQ. All permits expire in one year unless otherwise specified in the permit; and permits are not granted for longer than a 2-year period. Extensions may be granted 30 days prior to permit expiration. The application for this permit must include an erosion-and-sediment-control plan (ESCP) that meets the following requirements:

- Plans must be based on the 25-year, 24-hour duration storm event.
- Conveyance structures must be based on the 25-year, 24-hour duration storm event peak discharge.
- Sediment-control structures (e.g., ponding basins, sediment basins/traps) must be designed for the 25-year, 24-hour storm event. Designs can be based on either (1) minimum of 24-hour detention time including sediment storage volume or (2) sediment removal rate of not less than 75 percent.
- All earth-moving activities shall cease during storms. Extra measures and precautions must be taken to eliminate erosion during these periods.
- Extra measures and precautions must be taken to eliminate erosion during a 3-week period surrounding the annual coral spawning event (typically in June or July). These extra measures might include ceasing earth-moving activities in areas that are either highly erodible or near the coast. The actual date shall be determined by the Chief of CNMI DEQ.
- A slope stabilization and revegetation plan.
- A storm water-control plan for the project after construction is complete.

The CNMI DEQ and the GEPA developed a guidance manual in 2006 to assist the local engineering and development communities and local government agencies of Guam and CNMI in developing and implementing storm water- and erosion-control plans that adequately address nonpoint source pollution through the use of currently accepted Best Management Practices (BMPs). Volume I of the *Stormwater Management Manual* provides designers a general overview of local storm water issues, lists the storm water performance standards for the islands, and describes how to size and design BMPs to comply with those standards. Volume II of the Manual contains more detailed information on how to select, site, and construct BMP specifications (CNMI DEQ and GEPA 2006).

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. Floodplains are subject to periodic or infrequent inundation from rainfall. Risk of flooding typically depends on local topography, the frequency of precipitation events, and the size of the watershed

above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as an area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be in a 100-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities to reduce the risks to human health and safety.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. New construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

3.5.2 Existing Conditions

3.5.2.1 Alternative 1 – GSN (Preferred Alternative)

Precipitation. Saipan receives an average of 80 inches of rainfall per year and has distinctive wet and dry seasons. The months of July through November (the wet season) receive approximately 67 percent (53 inches) of the annual rainfall; January through May (the dry season) receive 21 percent (17 inches); and December and June (transitional months) receive 12 percent (10 inches) (CNMI DEQ and GEPA 2006). A significant portion of rainfall on Saipan is lost to evapotranspiration and a minor component is lost to surface runoff. The remaining portion is available as recharge to groundwater (CNMI DEQ and GEPA 2006).

Groundwater. Groundwater is the major source of water on Saipan. All fresh groundwater on Saipan originates as rainfall (USGS 2003). Saipan has an average groundwater recharge rate of 23 inches per year, which is approximately 28 percent of the annual rainfall of 80 inches (USGS 2003). The position of the volcanic basement rocks on Saipan relative to sea level and the overlying limestone affects the occurrence of groundwater. Most of the available fresh groundwater in Saipan, including at GSN, is within the Mariana Limestone Aquifer, which is a freshwater-saltwater coastal aquifer system where a lens-shaped body of fresh and brackish groundwater floats on denser salt water within limestone extending from the land surface to some distance below sea level. Rainwater infiltrates the highly permeable limestone and maintains a freshwater body within the island (i.e., beneath the ground's surface).

Some fraction of the fresh groundwater can be withdrawn by wells; however, fresh groundwater quality and availability can be affected by overpumping or sustained periods of dry weather (USGS 2003). The thickness of the freshwater lens in the coastal aquifer system on Saipan ranges from approximately 20 to 60 feet. Vertical sections through central and southern Saipan show that the freshwater lens is thicker towards the interior of the island and thins considerably toward the coasts (USGS 2003). The elevations of the top of the water table beneath GSN range from approximately 2 to 3 feet above sea level and the slope of the water table is nearly flat (USGS 2003). Groundwater flows from the central uplands, where the water table elevation is highest, towards the coast, where the water table elevation is lowest. Groundwater generally flows south across GSN; however, a large water table depression at the GSN well field indicates that groundwater withdrawal is causing groundwater flow patterns to change near some production wells on GSN. Drawdown from pumping diverts some of the oceanward groundwater flow to these wells (USGS 2003). The GSN area (Isley Field) has 35 pumped wells (USGS 2003). Groundwater management zones have been designated on the basis of groundwater quality for Saipan. GSN is within a

Class I groundwater management zone, which is an area deemed as having the highest quality, most valuable, and most vulnerable groundwater resources (CNMI DEQ and GEPA 2006). The proposed seaport fuel tank area is located in a Class III groundwater management zone (lowest water quality), and the fuel and personnel transport routes are located in Class II and Class III groundwater management zones.

Surface Water. Surface water on Saipan includes canyon drainages throughout the island. No natural streams occur on or within the vicinity of GSN or at the proposed Port of Saipan fuel site (CNMI DEQ and GEPA 2006). All surface water features at GSN are man-made and consist of storm water drainage ditches and swales and a large (approximately 100,000-ft^2) storm water retention basin that occurs approximately 1,000 feet north of the runway. The catchment water is mixed with well water from the wells at GSN and is used as an emergency backup water supply during power outages at GSN. A man-made, shallow drainage ditch occurs along the northern side of the proposed Port of Saipan fuel site.

Storm water sheet flow conditions that occur at GSN during rainfall events result in ponding in sump areas. However, the standing water percolates quickly following the cessation of runoff. The sloping perimeter areas of the airport property direct sheet flow offsite to the south, east, and west. Storm water drainage ditches and swales and small pipe culverts are used, which empty into the 20-million-gallon storm water retention basin to the north of the runway. Most storm water is directed away from the airport runway and airfield or naturally percolates into the porous limestone. However, localized flooding is reported to occur during periods of heavy rains within the developed areas, particularly around the terminal parking lot (CPA 2002).

Flood Zones. None of the proposed construction areas at GSN or the proposed Port of Saipan fuel site occur within flood zones.

Nearshore Waters. Coastal waters surrounding Saipan serve as the ultimate discharge area for all surface runoff from the island. Coastal water quality issues include eutrophication, damage to coral reefs (including sedimentation), and bacterial/viral pollution of swimming beaches. According to the CWA 305(b) reports for CNMI, coastal waters are most significantly impacted by sedimentation and nutrients (CNMI DEQ 2010aa). Sediments cause physical damage including decreased water clarity and smothering of coral and other marine resources. Nutrients (typically nitrogen for coastal environments) cause eutrophication, which results in excessive algae and weed growth, and depleted dissolved oxygen levels that support aquatic life.

GSN spans across two watersheds. The majority of GSN occurs in the Isley Watershed, which drains southwest and south into the Philippine Sea. The easternmost portion of GSN occurs within the Dandan Watershed, which drains east into the Pacific Ocean (CNMI DEQ 2010a). The Port of Saipan occurs within the West Takpochau Watershed, which drains northwest into the Philippine Sea (CNMI DEQ 2010a). The coastal waters of the Isley Watershed are impaired (Category 5) due to enterococci (bacteria) and orthophosphate (nutrient) pollution, the sources of which include a municipal point source (Agingan Point Wastewater Treatment Plant outfall), sedimentation, and other unknown sources. The Dandan Watershed does not have available water quality monitoring data of any type. The coastal waters of the West Takpochau (North) Watershed are impaired (Category 5) due to low dissolved oxygen levels, enterococci, biocriteria, and orthophosphate pollution caused by sanitary sewer overflows, urban runoff, sedimentation, landfills (the Puerto Rico Dump), and a municipal point source (Sadog Tasi Wastewater Treatment Plant outfall) (CNMI DEQ 2010a). TMDLs for these impaired waters have not yet been developed (CNMI DEQ 2010a).

Two areas of Class A waters exist on Saipan, including the coastal waters of the West Takpochau (North) watershed in the area around the commercial Port of Saipan, and the coastal waters of the Isley (West)

watershed in the area centered on the outfall for the Agingan Point Wastewater Treatment Plant. These Class A waters are downgradient of portions of the project area, including the western portion of GSN and the proposed Port of Saipan fuel site. All other marine waters downgradient of GSN are classified as Class AA waters (CNMI DEQ 2010a).

3.5.2.2 Alternative 2 – TNI

Precipitation. Tinian receives approximately 80 inches of annual rainfall with distinct wet (July through September) and dry (February through March) seasons (CNMI DEQ and GEPA 2006). On average, 58 percent of the rainfall occurs during the wet season between the months of July and November and 14 percent of the annual rainfall occurs during the dry season from January through April. The remainder is distributed in the transition months between wet and dry season (AECOS and Wil-Chee 2009). Approximately 7 percent of the annual rainfall becomes runoff, approximately 37 percent recharges the groundwater, and approximately 56 percent is evapotranspirated. Thus, most of the precipitation on Tinian either evaporates or percolates into the limestone substrata (Gingerich 2002).

Groundwater. Groundwater is the major source of water on Tinian. All fresh groundwater on Tinian originates as rainfall. Tinian is composed of permeable limestone that overlies a relatively impermeable volcanic foundation. The main source of drinking water on Tinian is the basal freshwater lens aquifer in the high-permeability limestone (Takpochao Limestone) overlying low-permeability volcanic rock (Gingerich 2002). The basal freshwater lens extends from 2 to 4 feet above mean sea level to about 80 to 160 feet below sea level at its deepest point (DON 2010c).

Surface Water. There are no perennial or intermittent streams on Tinian. The limestone plateaus of Tinian are generally far too porous to support stream or wetland development and most precipitation either evaporates or percolates into the highly permeable limestone substrata. During periods of intense rainfall, runoff approximates 6 to 12 percent of total rainfall and flows toward the low-lying coastal areas (Gingerich 2002). Surface water on Tinian is restricted to wetlands that occur on areas of impermeable clay that impound rainwater. There are several wetland areas on Tinian, the largest of which is Hagoi (36 acres) in the northern part of the island. These wetlands are entirely dependent on precipitation as a water source. In periods of drought, the water level in these wetlands drops and open water dramatically decreases. Other Tinian wetlands are smaller than Hagoi and considered ephemeral because they are not large enough to sustain during periods of low rainfall. The Sisoyan Makpo wetland once supported open water, but municipal groundwater pumping significantly altered the water levels (DON 2010a). None of the wetlands on Tinian are in close proximity to TNI. The closest wetland that is downgradient of the project area is the Makpo wetland, which is more than 1.5 miles southeast of the Site (AECOS and Wil-Chee 2009). See **Section 3.6.2.2** for more information regarding wetlands on Tinian.

A very large depression occurs between the taxiway and runway of TNI and was previously used for excavation of fill material. In addition, another large depression occurs south of the taxiway in the site of the proposed parking apron. These depressions do not permanently hold water, but likely temporarily hold water during heavy rainfall events. These depressions are designated by FEMA as Flood Zone A and are discussed in the following Flood Zones section.

A storm water retention area is in place at the west end of the TNI runway. Storm water drainage ditches and swales direct water off the runway and airfield into the storm water retention area and the large, excavated depressions in between the runway and taxiway.

Flood Zones. Since the elevation of the island is relatively uniform and there is little surface water runoff, flooding is not an important natural hazard on Tinian. FEMA has designated several isolated flood hazard areas on Tinian as Flood Zone A, which are areas with a 1 percent annual chance of

flooding. Zone A areas on Tinian are unpopulated areas and include the Hagoi wetland and portions of North Field, TNI, and the Makpo wetland (DON 2010a). According to FEMA Flood Insurance Rate Map (FIRM) Historic Community Panel Number 750001 0040 B (Effective Date May 15, 1991), three areas designated as Flood Zone A occur near the TNI runway (see **Figure 3.5-1**) (FEMA 1991). These flood zones are associated with depressions created by former excavation activities described in the previous section. One flood zone occurs within the site of the proposed parking apron. However, because these flood zones are only designated as such due to their potential to hold water during heavy rain events and because they are not associated with floodplains of surface water bodies, these flood zones would not be protected under EO 11988, *Floodplain Management*.

Nearshore Waters. As with Saipan, coastal waters surrounding Tinian serve as the ultimate discharge area for all surface runoff from the island. TNI spans across two watersheds. The western portion of TNI occurs in the Puntan Daiplolamanibot Watershed, which drains west into the Philippine Sea. The eastern portion of TNI occurs within the Masalok Watershed, which drains northeast into the Pacific Ocean (CNMI DEQ 2010a). The proposed Port of Tinian fuel site occurs within the Makpo Watershed, which drains west-southwest into the Philippine Sea (CNMI DEQ 2010a). The coastal waters of the Puntan Daiplolamanibot and Masalok watersheds are impaired (Category 5) due to orthophosphate pollution, the source of which is unknown. The coastal waters of the Makpo Watershed are impaired (Category 5) due to low dissolved oxygen levels, biocriteria, and orthophosphate pollution caused by onsite treatment systems and urban runoff (CNMI DEQ 2010a). TMDLs for these impaired waters have not yet been developed (CNMI DEQ 2010a).

All the nearshore waters surrounding Tinian are designated Class AA, except for the nearshore waters of Tinian Harbor that are designated Class A. The coastal waters of the Puntan Daiplolamanibot and Masalok watersheds are designated as Class AA marine waters. The coastal waters of the Makpo Watershed, the location of the proposed fuel site at the Port of Tinian, are designated as Class A marine waters (CNMI DEQ 2010a).

3.6 Terrestrial Biological Resources

3.6.1 Definition of Resource

Terrestrial biological resources include vegetation, wildlife, and the ecosystems in which these resources occur. Specific concerns relating to terrestrial biological resources considered in this EIS include declines in species diversity and impacts on threatened and endangered species. Most species are protected by Federal and/or Commonwealth regulations.

Migratory Bird Treaty Act. The MBTA provides the USFWS regulatory authority to protect birds that migrate. The MBTA prohibits any "take" of these species, except as permitted by the USFWS.

Endangered Species Act. The ESA requires that all Federal agencies shall seek to conserve threatened and endangered species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec. 2(c)). Wildlife Services conducts Section 7 consultations with the USFWS to ensure that "any action authorized, funded, or carried out by such an agency...is not likely to jeopardize the continued existence of any endangered or threatened species..." (Sec. 7(a)(2)).

Fish, Game, and Endangered Species Act. The Government of the CNMI has concurrent jurisdiction over all federally protected wildlife and has the authority to list non-federally protected species as endangered under P.L. #2-51, the "Fish, Game, and Endangered Species Act." The CNMI Government maintains a separate listing of locally endangered plant and animal species that is more extensive than the Federal Endangered Species list.

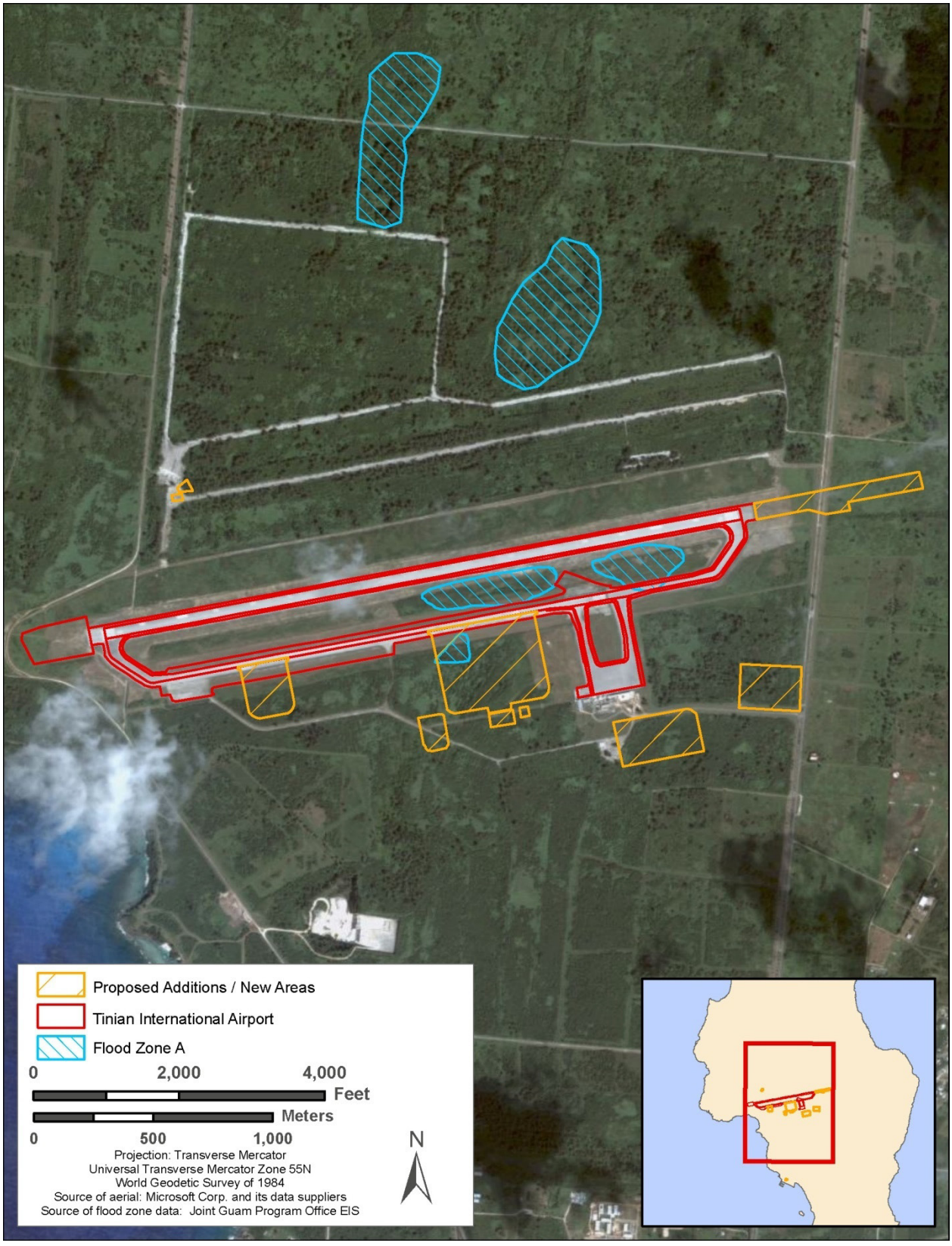


Figure 3.5-1. Areas Mapped as Flood Zone A at TNI

3.6.2 Existing Conditions

Following is a summary of the terrestrial vegetation, common wildlife species, and protected and sensitive resources for Saipan and Tinian, including GSN and TNI.

3.6.2.1 Alternative 1 – GSN (Preferred Alternative)

Terrestrial Vegetation. This section presents a characterization of flora occurring within the Project Area, including at GSN and the Port of Saipan. None of the plants found in the vegetation communities at the project site are classified as endangered, threatened, or special status by the USFWS or the CNMI Department of Lands and Natural Resources (DLNR). Vegetation community types observed at GSN at the sites of the proposed construction and improvements include mowed field, tangantangan forest, park, disturbed/unmowed, and agriculture/grazing (see **Table 3.6-1**).

Table 3.6-1. Vegetation Communities Associated with the New Areas, as Part of the Proposed Action

Proposed Additions / New Areas	Vegetation Community
Runway extension (west)	Mowed Field
Runway extension (east)	Mowed Field
Parking apron and ramp (west)	Mowed Field
Parking apron and ramp (east)	Mowed Field Tangantangan Forest
Hangar	Tangantangan Forest
Earth-covered magazine	Agriculture/Grazing
Hot cargo pad	Mowed Field Tangantangan Forest
Maintenance facility	Tangantangan Forest
BEAR site	Park
Operational fuel tanks and hydrant system	Park Tangantangan Forest Mowed Field
Bulk fuel storage	Park Tangantangan Forest
Port fuel site	Disturbed/Unmowed

The following is a description of the vegetation communities, including characteristic species, within the Project Area (see **Figure 3.6-1**).

Canopy vegetation in Tangantangan forest is characterized by a near monoculture of nonnative tangantangan (*Leucaena leucocephala*), with occasional native forest tree species: ahgao (*Premna obtusifolia*), hodda (*Ficus tinctoria*), pago (*Hibiscus tiliaceus*), sumak (*Aidia cochinchinensis),* lada *(Morinda citrifolia),* and papaya (*Carica papaya*), and nonnative trongkon-kalaskas (*Albizia lebbeck)* and

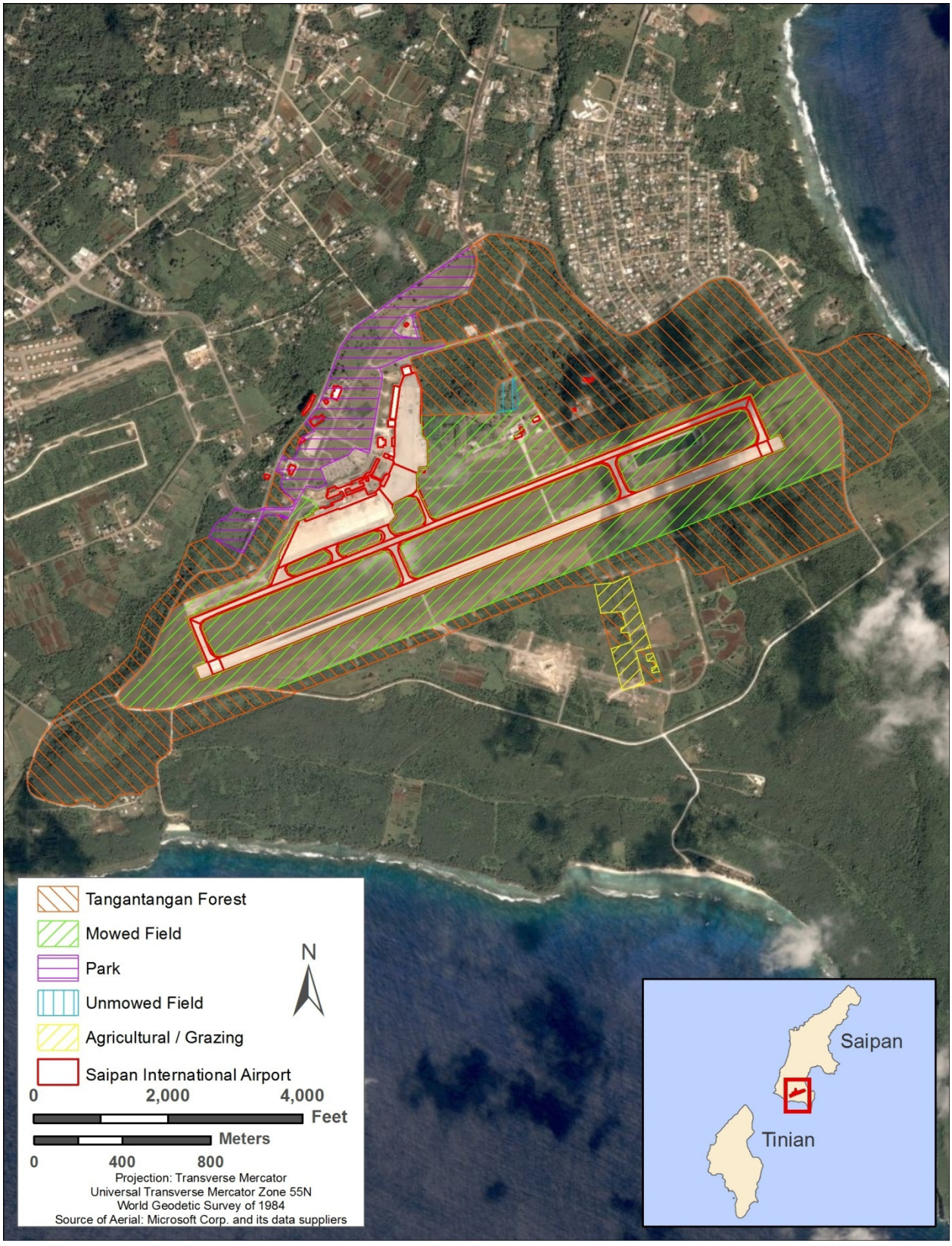


Figure 3.6-1. Vegetation Communities at GSN

atbut or flame tree (*Delonix regia*). The understory of tangantangan forest consists largely of nonnative herbaceous weeds. Common species include coral berry (*Rivina humilis*), rosary pea (*Abrus precatorius*), Chinese violet (Asystasia gangetica, and achyranthes (*Achyranthes canescens*). Gaps in the tangantangan forest and some areas of canopy are blanketed by a layer of vines. These vines include the native akankang tasi (*Canavalia rosea*); and the nonnative bittervine (*Mikania micrantha*) abubo (*Stictocardia tilifolia*), coral vine (*Antigonon leptopus*), and ivy gourd (*Coccinia grandis*). Vines present in the Project Area can also be stimulated by the opening up of the canopy after storm disturbance and can form oppressive vine mats that retard native vegetation growth or kill it outright.

Mowed field habitat consists mainly of introduced grasses and herbaceous ground cover. On the project site mowed field typically occurs between and around the airfield tarmac, runways, taxiways, and associated disturbed sites. The mowed field is characterized by grasses, including Bermuda grass (*Cynodon dactylon*), crowfoot grass (*Dactyloctenium aegyptium*), broadleaf carpetgrass (*Axonopus compressus*), golden beardgrass (*Chrysopogon aciculatus*), and (*Chloris* sp.) and herbaceous weeds including sensitive plant (*Mimosa pudica*), tropical lucerne (*Stylosanthes guianensis*), and white moneywort (*Alysicarpus vaginalis*).

Park areas associated with GSN are characterized by grasses that are mowed close to ground level with a narrow border of ornamental trees and shrubs that have been planted primarily along road edges. Grasses in the park areas are dominated by Bermuda grass (*Cynodon dactylon*) and golden beardgrass (*Chrysopogon aciculatus*). Ornamental trees that have been planted along road edges are characterized by atbut or flame tree and several species of plumeria (*Plumeria* spp.). Hodda (*Ficus tinctoria*) also occurs at several locations in the park areas. Shrub species planted along road edges are characterized by bougainvillea (*Bougainvilla* sp.) lantana (*Lantana camara*), and several species of hibiscus (*Hibiscus* spp.).

There are Agriculture/Grazing areas associated with the Multicube and Earth-Covered Magazines (Torres Lease) on the south side of GSN. The Agriculture/Grazing areas are interspersed with Tangantangan. The Agriculture/Grazing areas associated with the proposed location of the Earth-Covered Magazine to the south of GSN are characterized by scrub habitat with sparse trees. Agricultural plots in the area are characterized by planted local crops or are fallow. Grazed areas are characterized by a sparse occurrence of trees including atbut or flame tree and mango with a minor occurrence of Ahgoa. The scrub habitat is characterized by a mix of shrub and herbaceous species dominated by lantana, Jack-in-the-bush (*Chromolaena odorata*), nettleleaf velvetberry (*Stachytarpheta urticifolia*), and romerillo (*Bidens alba*). Tangantangan occurs as short saplings scattered through the scrub habitat.

The proposed location for the Fuel Tank adjacent to the Saipan Harbor is characterized by a flat disturbed area with a deteriorating asphalt surface in the northern approximately one-third of the site and by fine limestone gravel across most of the remainder of the site. Vegetation is thick and weedy around the perimeter of the site and sparse and clumpy in areas associated with the asphalt surface and limestone gravels. Several coconut palms (*Cocos nucifera*) occur around the boundaries of the site. Tangantangan is the dominant tree and sapling species occurring on the site and it also occurs around the perimeter on the site. Romerillo, Jack-in-the-bush and golden beardgrass compose the dominant herbaceous species occurring on the site.

Wildlife. Wildlife on the island consists primarily of birds and land animals including many introduced species. Characterization of fauna occurring in the Project Area at GSN and the harbor was based on incidental observation of species during the site reconnaissance surveys conducted from October 4 to 6, 2011 and the surveys conducted for nightingale reed warblers from February through March 2012 (see **Table 3.6-2**).

Table 3.6-2. Incidental Observations of Terrestrial Fauna on Saipan during the Reconnaissance Surveys, October 4 to 6, 2011 and Nightingale Reed Warbler Surveys, February through March 2012

Common name	Chamorro Name	Species Name	Occurrence
Mammals			
Norway rat	chå'ka	*Rattus norvegicus*	R
Birds			
Mariana gray swiftlet	chachaguak, yåyaguak	*Aerodramus vanikorensis bartschi*	R
Black noddy	fahang dikiki	*Anous minutus*	R
Brown noddy	fahang dankolo	*Anous stolidu*	R
Micronesian starling	sali	*Aplonis opaca*	R
Ruddy turnstone	dulili	*Arenaria interpres*	W
Golden white-eye	canario	*Cleptornis marchei*	R
Black drongo	salin taiwan	*Dicrurus macrocercus*	R
Orange cheeked waxbill	no Chamorro name found	*Estrilda melpoda*	R
White-throated ground-dove	paluman apåka', male; paluman fache', female	*Gallicolumba xanthonura*	R
Mariana common moorhen	pulattat	*Gallinula chloropus guami*	R
White tern	chunge	*Gygis alba*	R
Collared kingfisher	sihek	*Halcyon chloris*	R
Black-winged stilt	no Chamorro name found	*Himantopus himantopus*	M
Black-necked stilt	no Chamorro name found	*Himantopus mexicanus*	M
Yellow bittern	kakkak	*Ixobrychus sinensis*	R
Micronesian honeyeater	egigi	*Myzomela rubratra*	R
Whimbrel	kalalong	*Numenius phaepous*	M/W
Eurasian tree sparrow	ga'ga' pale	*Passer montanus*	R
Lesser golden plover	no Chamorro name found	*Pluvialis dominica*	M/W
Pacific golden plover	dulili	*Pluvialis fulva*	W
Mariana fruit dove	totot	*Ptilinopus roseicapilla*	R
Roufous fantail	na'abak, chichirika	*Rhipidura rufifrons saipanensis*	R
Fairy tern	no Chamorro name found	*Sterna nereis*	R
Island collared dove	paluman sinisa	*Streptopelia bitorquata bitorquata*	R
Saipan bridled white-eye	nosa'	*Zosterops conspicillatus saypani*	R

Common name	Chamorro Name	Species Name	Occurrence
Reptiles and Amphibians			
Green anole	achi'ak	*Anolis carolinensis*	R
Curious skink	achi'ak	*Carlia fusca*	R
Green tree skink	achi'ak	*Lamprolipis smaragdina*	R
Marine toad	achi'ak	*Rhinella marina*	R
Crustaceans and Mollusks			
Giant African snail	no Chamorro name found	*Achatina fulica*	R
Fiddler crab	panglao	*Uca crassipes*	R
Insects			
Lemon migrant	ababang	*Catopsilia pomona*	R
Cycad blue butterfly	ababang	*Chilades pandava*	R
Blue-banded king crow	ababang	*Euploea eunice*	R
Large grass yellow	ababang	*Eurema blanda*	R
Guardian	ababang	*Hypolimnas anomala*	R
Blue moon	ababang	*Hypolimnas bolina*	R
Common mormon	ababang	*Papilio polytes*	R
Tiny grass blue	ababang	*Zizina hylax*	R

Key: R = Year-round Resident; M = Passage migrant, generally seen in small numbers during fall and spring; W = Spends winter on the island

Mammals

The only mammal observed during the reconnaissance survey was the Norway rat (*Rattus norvegicus*).

Birds

Migratory Birds. Saipan supports a diverse variety of transient migratory shorebird species, with most species occurring in limited abundance annually. This shorebird assemblage is quite dynamic, with species diversity varying greatly every year. Shorebirds can be found anywhere on the airfield, although

most are associated with small spots of wet grass or puddles that develop following rainfall. Examples of native migratory bird species include Pacific golden plover (*Pluvialis dominica*), ruddy turnstone (*Arenaria interpres*), and whimbrel (*Numenius phaeopus*). Four nonnative species, the island collared dove (*Streptopelia bitorquata*), Eurasian tree sparrow (*Passer montanus*), black drongo (*Dicrurus macrocercus*), and orange cheeked waxbill (*Estrilda melpoda*) were frequently observed during the 2011 reconnaissance surveys. Yellow bitterns (*Ixobrychus sinensis*) were also commonly observed (see **Table 3.6-2**).

During the nightingale reed warbler surveys conducted over 10 weeks from January through March, 2012, biologists located a black noddy (*Anous minutes*) rookery at GSN (see **Figure 3.6-2**). The black noddy rookery was approximately 675 feet south of the proposed bulk fuel storage area, 640 feet south of the proposed operational fuel tanks and hydrant system, 1,115 feet northwest of the proposed maintenance



Figure 3.6-2. Photograph of a black noddy (*Anous minutes*) rookery at GSN

facility, and 1,000 feet north of the proposed west parking apron. There were in excess of 60 noddy nests located mostly in a large *Casuarina* tree with some in an adjacent flame tree. Most of the nests were active at the time of the surveys. There were also numerous white terns (*Gygas alba*) flying around the rookery. It was not determined whether the terns were also nesting in the area. Terns place their eggs in crooks on the branches, so it's difficult to determine if they are nesting from the ground. The terns were, for the most part, flying around and not perched.

In March 2005, U.S. Department of Agriculture-Wildlife Services (USDA-WS) entered into a cooperative agreement with the CPA to conduct Wildlife Hazard Assessments (WHAs) at GSN, TNI, and GRO (USDA-WS 2008a). The following sections provide details on individual bird species that were found at GSN during the WHA; accounts are ordered based generally upon relative abundance.

Pacific Golden Plover. Migrant Pacific golden plovers are the most abundant birds on the airfield between August and March. The first plovers usually arrive on Saipan in late August and are solitary, territorial adults. In September, larger flocks of juvenile plovers begin arriving on the wintering grounds. These flocks are nomadic and settle in open areas throughout Saipan, including GSN. By mid-winter, flocks of juvenile birds are generally smaller and less mobile; by early March, birds reassemble into flocks for pre-migration staging. Most plovers have left Saipan for their arctic breeding grounds by May 1, although a small number of non-breeding birds might be on the island all year; this residual population is reflected in low plover count numbers between May and July.

Ruddy Turnstone. The ruddy turnstone is the second most abundant wintering shorebird found on Saipan and the second most abundant shorebird at GSN. Turnstones use similar habitat as Pacific golden plovers and, when observed on the airfield, are usually found in mixed flocks. The single highest maximum count of turnstones on GSN property was approximately 40 birds; generally, turnstones are encountered in flocks of 10 to 15 individuals. Most birds were observed near the approach end along Taxiway Alpha and near the ponding basin, which has been filled since the WHAs were conducted. Given the number of turnstones on the airfield, it is likely that turnstone strikes have previously occurred and will in the near future.

Whimbrel. Whimbrel are large shorebirds that are common passage migrants in the Mariana Islands. A smaller number of whimbrel winter in the region, and a few non-breeding birds might spend the entire year in the islands. Whimbrel were most commonly observed at GSN between August and November, generally seen alone or in small loose flocks up to 10 birds.

Mixed Shorebirds. Saipan supports a diverse variety of transient migratory shorebird species, with most species occurring in limited abundance annually. This shorebird assemblage is quite dynamic, with species diversity varying greatly every year. Rufous-necked stint (*Calidris ruficollis*), black-bellied plover (*Pluvialis squatarola*), and black-winged stilt are found throughout the fall and winter months on Saipan, and individuals of these species can be observed in small numbers at GSN during the course of the wintering season (September–April). Several other species are regular passage migrants around the island, including wood sandpiper (*Tringa glareola*), sharp-tailed sandpiper (*Calidris ferruginea*), and Mongolian plover (*Charadrius mongolus*). These shorebirds are observed every year at GSN, generally in very low numbers (1–10 individuals) for very short times during the months of September, October, November, and December.

Egrets. Egrets, including cattle (*Bulbulcus ibis*), intermediate (*Egretta intermedia*), great (*Egretta alba*), and little egrets (*Egretta garzetta*), are seasonal migrants through the Mariana Islands. Worldwide egret populations appear to be increasing, and the annual population of migrant birds on Saipan appears to be increasing as well. Egrets generally arrive at GSN in mid-September to early October, and can be present throughout the winter months. Although a few individual birds can be observed all year, most egrets depart Saipan by April or May each year. The total number of arrivals varies annually; roughly 100 birds might winter on Saipan during a typical season. Mixed flocks, consisting of cattle, intermediate, and great egrets totaling 10 to 25 individuals regularly appear at GSN between October and December. Egrets were generally observed in the open grass on the south side of the airfield, but occurred throughout the airport operating environment. Flocks were frequently observed making flights across the runway.

White Tern. White terns are the most common breeding seabird found inland on Saipan. When inland, they are often associated with stands of ironwood (*Casuarina equisetifolia*), several of which are found adjacent to the airfield. White terns are generally observed in small groups (2–6 individuals) around the airfield, generally flying 50 to 200 feet off the ground. Terns were occasionally observed making runway crossings, usually near either end of the runway.

Island Collared Dove. The island collared dove (formerly Philippine turtle dove), native to the Philippine Islands, was introduced to the Mariana Islands, including Saipan, in the late 1700s and is now a common year-round breeding resident species. On Saipan, the doves are commonly seen in all habitats, including urban environments, throughout the island. Although island collared doves are relatively small, their flocking behavior and dense body mass present opportunities for damaging strikes. Small groups of doves were frequently observed foraging on waste grain associated with brown treesnake traps located near the terminal and adjacent areas. Loose flocks of doves numbering 50 or more were observed on the airfield, particularly near the departure end of the runway.

Eurasian Tree Sparrow. The Eurasian tree sparrow is the most abundant resident passerine found at GSN. The bird's small size and its propensity to avoid wide-open grassy habitat limit the safety risk presented by sparrows. Most sparrows at GSN are associated with shrubby vegetation along the perimeter fence of the airport and locations where grains falling from BTS traps provide a food source. The introduced sparrow is listed by the Government of Saipan as unprotected.

Native Forest Birds. A number of native forest birds have been documented in and around GSN throughout the year. Most common were Micronesian starling, collared kingfisher, and white-throated ground dove (*Gallicolumba xanthonura*). Forest birds were generally restricted to the forest habitat

outside the perimeter security fence, although ground doves were observed making runway crossings at about 100 feet AGL on several occasions.

Ducks. Ducks generally arrive in the Mariana Islands in October and depart the islands by early April. At GSN, tufted ducks (*Aythya fuligula*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), and green-winged teal (*Anas crecca*) were often observed loafing in the airfield ponding basin, which has been filled since the WHAs were conducted. A green-winged teal was observed in the storm water retention basin in the northeast section of the GSN during the nightingale reed warbler surveys conducted in February 2012.

Black and Brown Noddy. Noddies are the most common breeding seabirds in Saipan, with large colonies of black noddies distributed around the island's shorelines and smaller colonies of brown noddies found inland and on offshore islets. Noddies at GSN are essentially transiting the airspace, moving between nesting/roosting sites on land and feeding sites off shore. Noddy activity was highest at GSN during summer months.

Rock Dove. Rock doves (feral pigeons) are resident on Saipan and can occupy hangar facilities inside the airport.

Bird/Wildlife Aircraft Strike Hazard (BASH). Aircraft collisions with wildlife have the potential to cause significant structural damage to the aircraft and could result in catastrophic loss. Strikes that do not cause physical damage to aircraft often result in costs related to aircraft downtime while structural inspections are completed. Despite increased awareness of the hazards wildlife presents to aircraft, strikes occur often and occasionally have catastrophic results. Threats to human safety and the potential for damage to aircraft has prompted the FAA to require all airfields handling commercial aircraft with 30 or more passenger seats to address wildlife hazards if a real or potential wildlife problem is present (Title 14, CFR, Part 139). Detailed information regarding threats posed to aviation safety is included in **Section 3.3.2**.

The industry standard definition of a wildlife strike includes any pilot- or crew-reported collision with wildlife, or any dead or injured animal found on or within 250 feet of an active runway for which an alternate cause of death cannot be determined.

According to the FAA Wildlife Strike Database, there have been 22 reported strikes from October 2004 through December 2011 (FAA 2012c). Twelve of the 22 reported incidents occurred in 2010 and 2011. It is important to note that not all bird/aircraft strikes are reported. Southwest of the GSN airfield is a series of man-made ponds (golf course water hazards) that increase the likelihood of birds foraging at GSN, therefore, increasing the total number of birds at GSN. Given the number of movements at GSN and the density of birds using the airfield, it is likely the strike frequency is substantially greater than the documented events. None of the reported strikes resulted in damage to the aircraft. The majority of movements at GSN are air taxis that primarily service the Island of Tinian, with turboprop aircraft, larger jet aircraft, and general aviation constituting the remaining movements. Military aircraft occasionally use GSN for regular and training operations. A fairy tern was identified in one of the strikes; species identification was not reported for any other incident. Birds seen and subsequently struck involved individual birds or small flocks (two to ten individuals). Strikes occurred in various phases of the flight including take-off, climb, approach, and landing roll and in both clear and overcast/rainy weather conditions.

In November 2005, a biologist from USDA-WS conducted an initial onsite assessment of wildlife hazards at GSN. This request was precipitated by several reported bird strikes in the preceding weeks and a request by the FAA. During the duration of data collection in support of the WHA, operations staff

documented two strikes, both detected when carcasses were found on Runway 7/25. The strikes involved a Pacific golden plover and a whimbrel, both occurred during November 2005 (USDA-WS 2008a). Wildlife Services personnel determined the primary threats to aviation safety at GSN included cattle egrets, intermediate egrets, Pacific golden plovers (*Pluvialis fulva*), whimbrel (*Numensis phaeopus*), ruddy turnstones (*Arenaria interpres*), island collared doves (*Streptopelia bitorquata*), white tern (*Gygus alba*), black noddy (*Anous tenuirostris*), and brown noddy (*Anous stolidus*). Other birds present that could pose a slightly lower risk to aviation safety included feral pigeons (*Columbia livia*), yellow bitterns (*Ixobrychus sinensis*), black-winged stilts (*Himantopus himantopus*), collared kingfisher (*Halcyon chloris*), Micronesian starling (*Aplonis apoca*), and Eurasian tree sparrows (*Passer montanus*) (USDA-WS 2008a). The previous section provides details on individual wildlife species that are found at GSN.

The following are wildlife attractants located on and in the vicinity of GSN based on the WHA (USDA-WS 2008a).

- *Airfield Sheet Water.* Several areas on the airfield temporarily hold sheet water following heavy rainfall. The airfield appears to have adequate drainage across most areas, and the standing sheet water is usually an ephemeral event. Although shorebird flocks generally disperse as the water dries, large congregations can create substantial short-term safety hazards, and aggressive harassment is necessary to move birds out of these environments.
- *Storm Water Retention Basin.* A concrete storm water retention basin has recently been constructed in forested habitat in the northeast section of the GSN. The new basin replaces the storm water basin that was previously located between the runway and taxiway in the northeast section of the airfield.
- *Heavily Vegetated Infield Areas.* Current airfield mowing regimes allow substantial grass growth on many parts of the airfield, particularly on the south side of the infield, near the wind sock. As grass height increases, territorial adult Pacific golden plovers that occupy the normally short grass environment could be displaced into the nearest open space, which is often on runways or taxiways. Territorial adult plovers appear to be less likely to be struck by aircraft than juvenile birds, as they become acclimated to aircraft disturbance and do not flee as readily as juvenile birds. However, displacing territorial birds to runway and taxiway environments will likely increase their probability of being struck by aircraft. Consistent, regular mowing will create more space for plovers to occupy, and will result in fewer birds establishing territories on tarmac inside the operating environment. It is important to recognize the response egrets show to grass cutting and have active management in place to discourage their use of freshly mowed turf.
- *Flores Pond.* Flores Pond is approximately ½ mile north of GSN on private property west of Chalan Tun Herman Pan. The pond occupies about 2 acres during the height of the wet season (early autumn) and shrinks to nearly dry during the late winter and early spring months. This basin intermittently supports large numbers of ducks, shorebirds, and wading birds (egrets); it appears birds move between GSN and Flores Pond on a routine basis. Flocks of egrets often use trees surrounding this wetland for roosting. The importance of this pond for migrant and wintering birds will increase with the removal of the ponding basin on GSN.
- *Dandan Driving Range Pond.* A small wetland is adjacent to the Dandan Driving Range along Chalan Tun Herman Pan. Like Flores Pond, this wetland supports ducks, shorebirds, and wading birds, but in smaller numbers. There is likely movement between GSN and the Dandan pond, and use of the pond by migrant and wintering birds will likely increase once the GSN ponding basin is closed.

- *Black Noddy Breeding Colonies.* Two breeding colonies of black noddies (and presumably smaller numbers of brown noddies) were located to the east of the GSN operations area during the WHA; one along the south shore of Laulau Bay and another along the cliff line in Naftan. Noddies frequently travel along the airfield perimeter as they move between nesting and feeding sites. This activity was most pronounced during summer months. Transiting noddies were observed crossing Runway 07/25 several times during point counts. During the 2012 nightingale reed warbler surveys, a black noddy rookery, consisting of approximately 60 nests, was observed at GSN.
- *Adjacent Agricultural Fields.* Several farms surrounding GSN support small-scale cattle grazing; cattle egrets were occasionally observed using pasture areas for feeding and loafing.
- *Lake Susupe.* Lake Susupe is the largest permanent freshwater body on Saipan, located about 1.5 miles northwest of GSN. Although the lake is used by some waterfowl and wading birds, it is a relatively deep and open water body that provides limited habitat for most migrant and wintering species on Saipan.
- *Golf courses.* There are five golf courses on Saipan, with two courses (Laulau Bay Golf Course and Coral Ocean Point Resort) providing habitat for birds near GSN. Laulau Bay often hosts large flocks of plovers and some ducks. There is limited information available on plover movements around Saipan, but it is likely that the plover flocks that frequent Laulau Bay Golf Course also use GSN. Two lined golf course ponds are located on the Coral Ocean Point Golf Course west of the GSN. The closest and smaller of the two ponds is approximately 0.9 acres and is approximately 0.63 miles west of the end of the runway. The larger pond is approximately 2.9 acres and is approximately 1.5 miles northwest of the end of the runway.
- *Surrounding Tidal Flats and Beaches.* Reef margins and beaches surrounding GSN support small flocks of shorebirds, particularly plovers and ruddy turnstones, which might frequent the operating environment, particularly as tides change and daytime beach activities disturb birds from beaches.

Reptiles and Amphibians

Green anoles (*Anolis carolinensis*), green tree skinks (*Lamprolipis smaragdina*) and curious skinks (*Carlia fusca*) were the most common reptiles observed. Only one amphibian, the marine toad (*Rhinella marina*), was directly observed during surveys in the Project Area. [**Note:** *Rhinella* is a subgenus of the genus *Bufo*. *Rhinella marina* and *Bufo marina* are both currently used synonymously.] Focused reptile surveys were not conducted and it is likely that additional native and nonnative gecko and skink species might be present in the area. Focused surveys that include nocturnal reptile and amphibian surveys could result in additional species being identified in the Project Area.

Fish

There are no surface water features other than a concrete storm water retention basin located in the northeast section of the Project Area.

Invertebrates

Several species of butterfly were noted during surveys. Eggflies (*Hypolimnas* sp.), including blue moon and guardian, were frequently observed flying within and along the edge of Tangantangan forest. The blue-banded king crow (*Euploea eunice*), common grass blue (*Zizina hylax*), large grass yellow (*Eurema blanda*), lemon migrant (*Catopsilia pomona*), cycad blue butterfly (*Chilades pandava*), and common mormon (*Papilio polytes*) were also observed on mowed edges of the Tangantangan forest.

Threatened and Endangered Species. There are five threatened and endangered species with the potential to occur in the Saipan Project Area. They are the nightingale reed warbler (*Acrocephalus luscinia*), Mariana swiftlet (*Aerodramus bartschi*), Mariana common moorhen (*Gallinula chloropus guami*), Micronesian megapode (*Megapodius laperouse*), and the Mariana fruit bat (*Pteropus mariannus mariannus*; see **Table 3.6-3**). Due to the absence of mature forest habitat, lack of roosting or foraging trees, and distance from roosting caves, it is unlikely that the Mariana fruit bat, Mariana swiftlet, and Micronesian megapode are present in the Project Area. Additionally, there are no wetlands (moorhen habitat) at GSN; therefore, it is unlikely that moorhens are present in the Project Area. However, there are areas of standing water in the project area to which moorhens could be attracted. Based on the potential habitat for nightingale reed warblers and Mariana common moorhens in the Project Area, surveys were conducted to determine the presence of individuals over the course of 10 weeks from January through March, 2012.

Nightingale reed-warbler. The nightingale reed-warbler, known in the Chamorro language as *ga'ga'karisu* on Saipan, is approximately 7 in. (17 cm) long, and is grayish olive-brown above with a pale-yellow underside. It inhabits wetlands, thickets and the margins of forests. Tangantangan is highly utilized by the nightingale reed-warbler. On Saipan, the nightingale reed-warbler is distributed island wide, and is estimated to number 4,225 individuals (USFWS 1998b). The nightingale reed-warbler was listed as endangered on June 2, 1970 (35 FR 8491–8498).

Although breeding might occur year-round, (Mosher and Fancy 2002) identified two peak breeding seasons on Saipan for the nightingale reed warbler: January through March and July through September. Tangantangan (*Leucaena leucocephala*) are preferred nest trees, although nests were observed in *Casuarina equisetifolia, Bixia orellana*, *Brufuiera gymnorrhiza*, *Hibiscus* spp., and *Pithecellobium dulce*.

General threats to nightingale reed warblers across their range include predation by brown tree snakes, cats, rats, and monitor lizards; habitat loss associated with agricultural activities such as wetlands draining and forest burning; and habitat degradation. Development of residential and resort properties on Saipan also threatens reed warbler habitat.

Section 7 consultation has been initiated with USFWS regarding the nightingale reed warbler and will be completed prior to the issuance of the Final EIS.

Mariana common moorhen. There are no wetlands (moorhen habitat) at GSN; therefore, it is unlikely that moorhens are present in the Project Area. However, there is a constructed storm water catchment that is designed to store standing water permanently for use in emergencies in the northeast section of the GSN. In addition, there is a golf course pond associated with the Coral Ocean Point Golf Course approximately 0.6 miles southwest of the GSN. Mariana common moorhen could be attracted to standing water associated with these features. Surveys for the Mariana common moorhen were conducted between February and April 2012. Data from the nightingale reed warbler and Mariana common moorhen surveys will be provided once field survey data are analyzed.

Wetlands

Site reconnaissance was conducted between October 4 and 6, 2011, to determine the extent of jurisdictional wetlands and other waters of the United States in the project area. Determination of the extent of jurisdictional wetlands and other waters of the United States was based on the application of protocols and procedures established in the USACE *Wetlands Delineation Manual*, Technical Report Y-87-1 (USACE 1987) and the 2010 *Draft Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and Pacific Islands Region*, (2010 Regional Supplement).

Table 3.6-3. Summary of USFWS and CNMI Threatened, Endangered, and Candidate Species in the CNMI and their Potential to Occur in the Saipan Project Area

Common Name	Scientific Name	USFWS/ CNMI Status	Presence in Project Area	Comments
Little Mariana fruit bat	*Pteropus tokudae*	E	No	Likely extinct.
Mariana fruit bat	*Pteropus mariannus mariannus*	T	Unlikely	Lack of forested areas and roosting or foraging trees.
Pacific sheath-tailed bat	*Emballonura semicaudata rotensis*	C	Unlikely	Lack of nearby caves for roosting.
Nightingale reed warbler	*Acrocephalus luscinia*	E	Possible	Surveys currently being conducted.
Mariana swiftlet	*Aerodramus bartschi*	E	Unlikely	Distance from roosting caves.
Mariana crow	*Corvus kubaryi*	E	No	Not present on island.
Mariana common moorhen	*Gallinula chloropus guami*	E	Unlikely	No wetlands in action area; however, a concrete retention pond occurs in the action area. Surveys are being conducted along with the nightingale reed warbler surveys.
Guam Micronesian kingfisher	*Todiramphus cinnamominus cinnamominus*	E	No	Not present on island.
Micronesian megapode	*Megapodius laperouse*	E	Unlikely	Absence of suitable forest habitat in action area. Megapodes have not been recorded in the area.
Guam rail	*Gallirallus owstoni*	E	No	Not present on island.
Guam bridled white-eye	*Zosterops conspicallatus conspicallatus*	E	No	Extinct.
Rota white-eye	*Zosterops rotensis*	E	No	Not present on island.
Green sea turtle	*Chelonia mydas*	T	No	No nesting beaches.
Hawksbill turtle	*Eretmochelys imbricata*	E	No	Not present on island.
Micronesean gekgo	*Perochirus ateles*	E (CNMI)	Unlikely	Absence of suitable forest habitat in action area.
Nesogenes rotensis	*Nesogenes rotensis*	E	No	Not present on island.
Osmoxylon mariannense	*Osmoxylon mariannense*	E	No	Not present on island.
Serianthes nelsonii	*Serianthes nelsonii*	E	No	Not present on island.

Determination of the occurrence of jurisdictional wetlands was based on the presence or absence of hydrophytic (wetland) vegetation, hydric (wetland) soils, and wetland hydrology. The presence of all three of the criteria is necessary for an area to be designated as a jurisdictional wetland under normal conditions.

Based on the site investigations there are no jurisdictional wetlands in the project area.

3.6.2.2 Alternative 2 – TNI

Terrestrial Vegetation. This section presents a characterization of flora occurring within the Tinian Project Area. None of the plants found in the vegetation communities at the project site are classified as endangered, threatened, or special status by the USFWS or the CNMI DLNR. Vegetation community types observed at the site of the proposed additions include mowed field, semi-disturbed tangantangan forest, tangantangan/ironwood scrub, and agriculture/grazing (see **Table 3.6-4**).

Table 3.6-4. Vegetation Communities Associated with the New Areas, as Part of the Proposed Action

Proposed Additions / New Areas	Vegetation Community
Bear site	Tangantangan forest Mowed field
Bulk fuel storage	Tangantangan forest Mowed field
Hot cargo and arm/disarm pad	Mowed field Tangantangan forest
Parking apron	Tangantangan forest Mowed field
Hangar	Tangantangan forest
Maintenance facility	Tangantangan forest
Operational fuel tanks and hydrant system	Tangantangan forest
Runway extension	Mowed field Agriculture/Grazing
Temporary munitions storage area	Tangantangan/Ironwood scrub
Port fuel storage site	Mowed field

The following is a description of the vegetation communities, including characteristic species, within the Project Area (see **Figure 3.6-3**).

The primary vegetation type surrounding the runway, taxiway, apron, airport facility buildings, and vehicle parking is mowed field. This vegetation type is characterized by introduced grasses and herbs maintained by periodic mowing. Common grass species found in mowed field habitat on Tinian include Bermuda grass, and Australian beadgrass (*Dichanthium bladhii*), and common herbs include white moneywort, romerillo, sensitive plant, and tropical lucerne. In areas outside of airfield operations, mowed fields often contain landscape trees and shrubs.

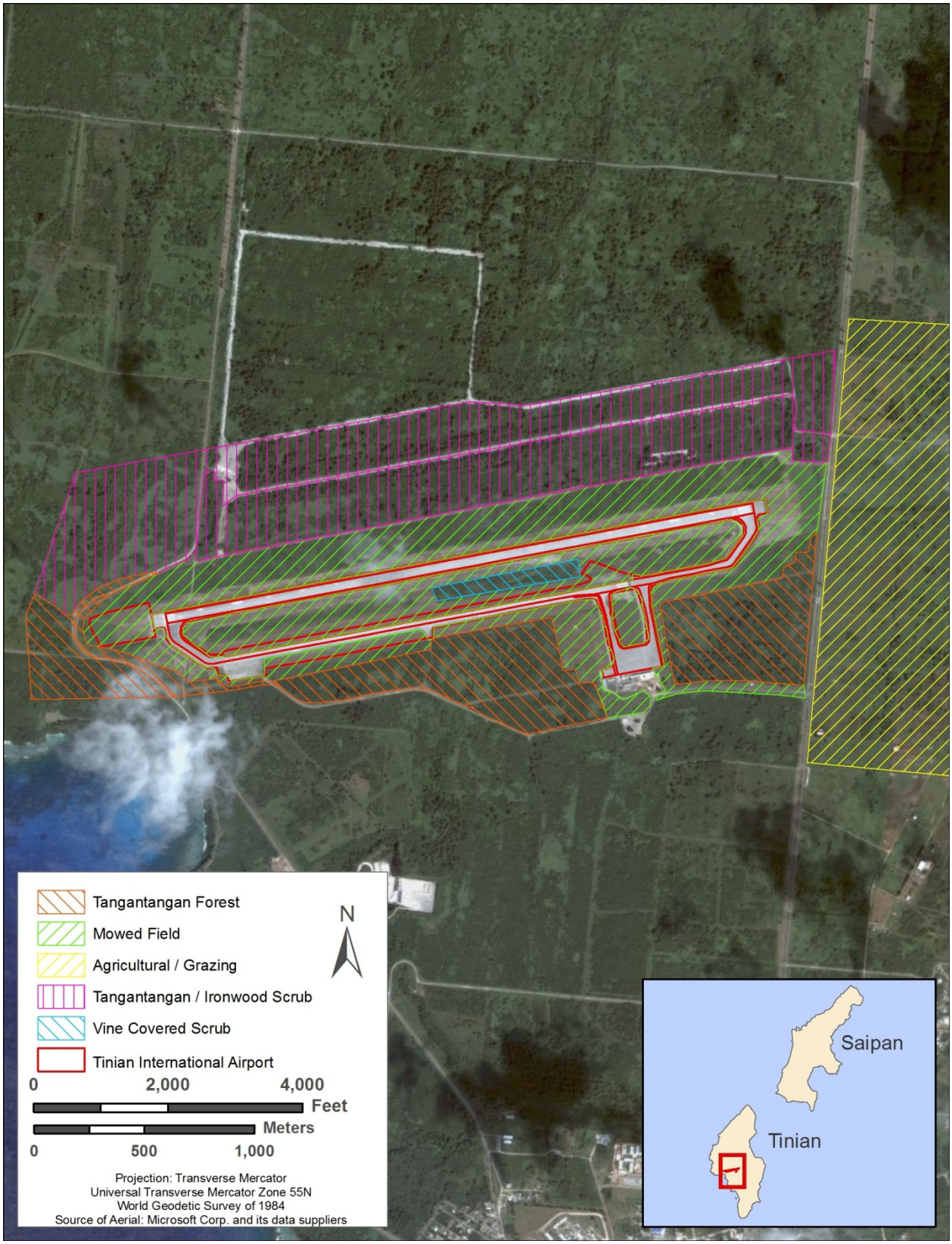


Figure 3.6-3. Vegetation Communities at TNI

There is an excavated depression between the runway and taxiway at TNI. The excavated area is characterized by a trench with steep near vertical banks that are up to 40+ feet in height. The north end has a ditch that directs runoff into the trench. Vegetation associated with upper edge and side slopes in the excavated area between the taxiway and runway is characterized by unmowed grasses intermixed with herbaceous species that are covered by a dense layer of vine species. The central area of the trench is characterized by forested habitat that is covered by dense vines. Sapling and shrub species in the unmowed areas are characterized by tangantangan in the sapling layer and lantana in the shrub layer. Grasses occurring in the unmowed areas are dominated by elephant grass (*Pennisetum purpureum*) and golden beard grass. Other herbaceous species in the area are characterized by romerillo and Jack-in-the-bush. Vines cover most of the unmowed areas. The dominant vine species in the area is Alaglag (*Operculina ventricosa*). Other common vines occurring in the area include little bell (*Ipomoea triloba*), ocean blue morning glory (*Ipomea indica*), and akangkang (*Canavalia megalantha*). Forested habitat in the central area of the trench is dominated by tangantangan, with common papaya and occasional lada. Alaglag covers most of the forested area.

Vegetation south and west of TNI consists of semi-disturbed tangantangan forest. Canopy tree species in this vegetation type consist of a near monoculture of tangantangan with ironwood (*Casuarina equisetifolia*), atbut or flame tree, kamachilie (*Pithecellobium dulce*), and papaya occasionally rising above the tangantangan. Much of the canopy in this area is covered by a variety of vine species including coral vine, ocean blue morning glory, and spotted heart (*Stictocardia tiliifolia*), creating a dimly lit understory. The understory is dominated by monarch fern (*Phymatosorus scolopendria*) in most areas. A variety of nonnative grasses were noted under thinner canopy and along tangantangan forest edges. Several native forest tree species were commonly observed under the tangantangan canopy, the most common of which were sumac (*Aidia cochinchinensis*), alom (*Melanolepis multiglandulosa*), and lada.

Vegetation north of TNI consists of semi-disturbed open canopy scrub vegetation codominated by tangantangan and ironwood and identified as tangantangan/ironwood scrub. Ironwood formed the tallest canopy component and occurs primarily around the edges of the community where the vegetation encroaches onto an old asphalt surface. Tangantangan forms a shorter open canopy around the ironwood. Native tree species, including amahadyan (*Pipturus argenteus*), ahago, lada, alom, and papaya were observed present within the community. Vines, including oceanblue morning glory, coral vine, corky stem passionflower (*Passiflora suberosa*), spottedheart, and bitterfince (*Mikania micrantha*) occur and form dense mats on the ground or over the tangantangan canopy. The understory is composed of nonnative grasses and monarch ferns as observed in tangantangan forest. In gaps or along edges where sunlight is sufficient, additional herbs were observed including romerillo, achyranthes (*Achranthes canescens*), chromolaena (*Chromolaena odorata*), lantana, light-blue snake weed (*Stachytarpheta jamaicensis*), and nettleleaf velvetberry (*S. urticifolia*)

East of TNI and Broadway is an area of fenced cattle pasture identified as Agriculture/Grazing vegetation type. This area is open with little to no canopy cover and contains scattered tree clusters. The ground cover consists of nonnative forage grasses, including (*Panicum maximum*) and Australian beadgrass, and the noxious giant sensitive plant (*Mimosa invisa*), an herb that might have been introduced as a cover crop. Scattered tree species include small Philippine acacia (*Acacia confusa*), atbut, kamachile, and tangantangan.

Wildlife. Characterization of fauna occurring in the Project Area was based on incidental observation of species during the site reconnaissance surveys conducted from October 7 to 8, 2011 (see **Table 3.6-5**). .

Mammals

No mammals were observed in the Project Area.

Table 3.6-5. Incidental Observations of Terrestrial Fauna on Tinian during the Reconnaissance Surveys, October 7 to 8, 2011

Common name	Chamorro Name	Species Name	Occurrence
Birds			
Common sand piper	dulili	*Actitis hypoleucos*	M
Brown noddy	fahang	*Anous stolidu*	R
Micronesian starling	sali	*Aplonis opaca*	R
Ruddy turnstone	dulili	*Arenaria interpres*	W
Sharp-tailed sand piper	dulili	*Calidris acuminate*	M
Black drongo	no Chamorro name found	*Dicrurus macrocercus*	R
Collared kingfisher	sihek	*Halcyon chloris*	R
Yellow bittern	kakkak	*Ixobrychus sinensis*	R
Tinian monarch	chichirikan	*Monarcha takatsukasae*	R
Micronesian honeyeater	egigi	*Myzomela rubrata saffordi*	R
Whimbrel	no Chamorro name found	*Numenius phaepous*	W
Eurasian tree sparrow	no Chamorro name found	*Passer montanus*	R
Lesser golden plover	no Chamorro name found	*Pluvialis dominica*	M/W
Pacific golden plover	dulili	*Pluvialis fulva*	W
Mariana fruit dove	tottot	*Ptilinopus roseicapilla*	R
Roufous fantail	na'abak, chichirika	*Rhipidura rufifrons saipanensis*	R
Island collared dove	paluman sinisa	*Streptopelia bitorquata bitorquata*	R
Collared kingfisher	sihek	*Todirhamphus chloris*	R
Tattler sp.	no Chamorro name found	*Tringa* sp.	M
Bridled white eye	nosa'	*Zosterops conspicillatus*	R
Saipan bridled white-eye	nosa'	*Zosterops conspicillatus saypani*	R
Reptiles and Amphibians			
Curious skink	achi'ak	*Carlia fusca*	R
Marine toad	achi'ak	*Rhinella marina*	R
Monitor lizard	iguana	*Varanus indicus*	R
Crustaceans and Mollusks			
Giant African snail		*Achatina fulica*	R
Insects			
Lemon migrant	ababang	*Catopsilia pomona*	R
Cycad blue butterfly	ababang	*Chilades pandava*	R
Large grass yellow	ababang	*Eurema blanda*	R
Guardian	ababang	*Hypolimnas anomala*	R
Blue moon	ababang	*Hypolimnas bolina*	R
Common mormon	ababang	*Papilio polytes*	R
Blue-banded king crow	ababang	*Euploea eunice*	R

Key: R = Year-round Resident; M = Passage migrant, generally seen in small numbers during fall and spring; W = Spends winter on the island

Birds

Migratory Birds. Tinian serves as an important stopover location for migratory birds, including a number of shorebirds, waterfowl, waterbirds, and seabirds. Several areas on the airfield temporarily hold sheet water following heavy rainfall, which in turn attracts flocks of shorebirds. Additionally, TNI is situated in close proximity to significant coastal environments. Shorebirds, particularly lesser golden plovers, ruddy turnstones, and whimbrels make daily movements between tidal environments and upland environments, as tides fluctuate. During periods of exceptionally high tides, many shorebirds are displaced from the coastal environment and move to inland locations, including TNI (USDA-WS 2008b). Eurasian tree sparrows and black drongos were frequently observed during the 2011 reconnaissance surveys (see **Table 3.6-5**). Native resident bird species observed includes rufous fantail and Micronesian starling.

In March 2005, USDA-WS entered into a cooperative agreement with the Commonwealth Ports Authority to conduct WHAs at the Saipan, Tinian, and Rota International Airports (USDA-WS 2008b). The following sections provide details on individual bird species that were found at TNI; accounts are ordered based generally upon relative abundance.

Pacific golden plovers and ruddy turnstones constituted more than 80 percent of the observed birds over the entire duration of the surveys. Other species detected in the counts included island collared doves, white terns, whimbrel, egrets, and Eurasian tree sparrows. Most migrant bird species (primarily shorebirds) present at TNI occur in very low abundance, and were not documented during point counts. Overall bird abundance was highest between August and April, which coincides with the movement of passage migrant species and wintering shorebird presence in the region.

Pacific Golden Plover. Migrant and wintering Pacific lesser golden plovers are the most abundant birds on the airfield between September and April and are the single greatest risk to aviation at TNI. The first plovers arrive on Tinian in late August and are usually solitary, territorial adults. In September, larger flocks of juvenile plovers begin arriving on the wintering grounds. These flocks are somewhat nomadic and settle in open areas throughout Tinian, including TNI. By mid-winter, the large flocks of juvenile birds are generally smaller and less mobile; beginning in early March, birds reassemble into flocks for pre-migration staging. Most plovers have left the Mariana Islands for their arctic breeding grounds by May 1, although a small number of non-breeding birds might be present on the island for the entire year.

Whimbrel. Whimbrels are large shorebirds that occur in loose flocks at TNI during the fall and winter months. Whimbrels were observed throughout the operations area at TNI, generally on infield turf, in flocks of up to 10 birds. A small number of non-breeding whimbrels might spend the summer months on Tinian.

Island Collared Dove. The island collared dove (formerly Philippine turtle dove), native to the Philippine Islands, was introduced to the Mariana Islands, including Tinian, in the late 1700s. On Tinian, doves are year-round residents and are commonly seen in all habitats, including urban environments, throughout the island. Doves actively forage on waste grain associated with snake traps around the airfield. Loose flocks of doves numbering 15 or more were occasionally observed on the airfield.

Egrets. Four species of white egrets were observed at TNI, with cattle egrets the most common. Yellow-billed (intermediate), great, and little egrets were also documented at TNI, generally in mixed flocks of two or more species. Egrets feed in short grass, capturing lizards and insects; mowing operations kill and injure potential egret prey items, and flocks of cattle egrets often follow mowers to exploit this food source. All egret species are seasonal migrants or wintering residents in Tinian, with a small number of nonbreeding birds spending the summer months on the island. Cattle and great egret

populations are increasing worldwide, and the annual population of migrant birds on Tinian appears to be increasing as well. Egrets generally arrive at TNI in mid-September to early October, and most egrets depart Tinian by April or May each year. Egrets were not detected during most daily point counts; however, flocks of 10 to 25 individuals regularly appear at TNI between September and December each year. Egrets were observed using a variety of locations on the airfield and often occupied infield grass just north of the terminal, adjacent to the tarmac.

White Tern. The white tern is the most common breeding seabird found inland on Tinian. When inland, they are usually associated with stands of *Casuarina equisetifolia*, including stands adjacent to the perimeter of the airport operating area. White terns are generally observed in small groups (2-6 individuals) on and around the airfield, usually flying 50 to 200 feet AGL. White terns do not spend time on the ground, but instead roost in trees adjacent to the airfield.

Ruddy Turnstone. The ruddy turnstone is the second most abundant wintering shorebird found on Tinian and the second most abundant shorebird at TNI. Turnstones use similar habitat as Pacific golden plovers and when observed on the airfield, were usually found in mixed flocks of 5 to 20 individuals. Unlike plovers, wintering turnstones are not territorial. Turnstones were observed in every month at TNI, with abundance highest between August and April. Most turnstones depart for their arctic nesting grounds by May.

Eurasian Tree Sparrow. The Eurasian tree sparrow is the most abundant resident passerine found at TNI, but was infrequently observed around movement areas. Most sparrows at TNI are associated with shrubby vegetation along the perimeter fence of the airport operating area and near the terminal. Sparrows can inadvertently receive supplemental feeding through the deposition of waste grain dropped from the approximately 50 brown tree snake traps that are found on TNI property. The introduced sparrow is listed by the Government of the CNMI as unprotected.

BASH. A query of the FAA's National Wildlife Strike Database, as of February 2012, returned a single strike record, involving unknown small birds, reported in September 1998 (FAA 2012d). The incident occurred during take-off and minor damage to the aircraft was reported. Discussions with pilots and ground crews working at TNI indicate dead birds have been previously found on the airfield, but no systematic means of identifying the species involved or recording strike events exist (USDA-WS 2008b).

In November 2005, a biologist from USDA-WS conducted an initial onsite assessment of wildlife hazards at TNI. This assessment was requested by FAA and was precipitated by several reported, but undocumented, bird strikes in the preceding weeks. Wildlife Services personnel determined the primary threats to aviation safety at TNI included cattle egrets, yellow-billed egrets, Pacific golden plovers, whimbrel, ruddy turnstones, white tern, black noddy, and brown noddy. Other birds present included feral pigeons, island collared doves, yellow bitterns, collared kingfisher, Micronesian starling, and Eurasian tree sparrows (USDA-WS 2008b). The previous section provides details on individual wildlife species that are found at TNI.

The following are wildlife attractants located on and in the vicinity of TNI based on the WHA (USDA-WS 2008b).

- *Airfield Sheet Water.* Several areas on the airfield temporarily hold sheet water following heavy rainfall, which, in turn, attracts flocks of loafing shorebirds. The airfield appears to have adequate drainage across most of the area, and the standing sheet water is usually an ephemeral event. Shorebird flocks generally disperse as the water dries, but often this dispersal is to other locations around the airport.

- *Airfield Instruments.* Airfield signage and instruments were occasionally used by egrets and doves as perch sites. Usage was not significant enough to recommend specific management activities to eliminate their use, but warrant attention when harassing birds from the airfield. A single black kite (*Milvus migrans*) observed on Tinian multiple times during the assessment occasionally perched on airfield instrumentation.

- *Tarmac.* Wintering shorebirds, particularly plovers and turnstones, spend extensive amounts of time loafing on asphalt. It is believed birds use the warming conditions of sun-exposed asphalt to increase body temperatures, which subsequently increases digestion rates while conserving their energy. The airport area provides substantial asphalt surfaces, including runways and taxiways, which brings birds into direct contact with aircraft movements.

- *Heavily Vegetated Infield Areas.* Several locations inside the airfield are heavily vegetated, particularly the infield between the runway and old runway and the hill on the northeast end of the airfield. Although most migratory shorebirds and wading birds are not attracted to heavy grass or woody vegetation, resident forest birds, including Philippine turtle-doves, might use such areas for feeding, loafing, and nesting. As vegetation growth matures, other native forest birds might begin to use the same areas.

- *Lake Hagoi.* Lake Hagoi is the largest wetland on Tinian, approximately 3 miles north of TNI. Lake Hagoi holds water all year during normal weather patterns, but can dry up during dry seasons with below normal precipitation. A variety of migratory and resident birds use Lake Hagoi, including endangered Mariana moorhens, egrets, ducks, and shorebirds. There is likely some movement of migrant species (shorebirds and egrets) between Lake Hagoi and TNI; a flock of 10 tundra swans (*Cygnus columbianus*) seen in Tinian during January 2006 spent most of their time on Lake Hagoi. This flock was observed at TNI for short durations several times over a 2 week period. Although their presence was only for 2 weeks, the massive size of these birds created a substantial hazard to aircraft.

- *Tinian Municipal Dump.* The Tinian Municipal Dump is located immediately west of TNI. Although the current waste management operations do not limit the accessibility of waste to scavenging animals, the Mariana Islands do not support flocking birds (e.g., gulls, crows, starlings) that typically occupy landfill or dump environments. Therefore, the Tinian Municipal Landfill does not appear to present any increased risk of wildlife strikes to aviation traffic using TNI.

- *Coastal and Shoreline Habitat.* As Tinian is a relatively small island, TNI is situated in close proximity to significant coastal environments. During the migratory and wintering season, shorebirds, particularly lesser golden plovers, ruddy turnstones, and whimbrels frequent the saltwater tidal regions throughout the island. Shorebirds make daily movements between tidal environments and upland environments, as tides fluctuate. During periods of exceptionally high tides, many shorebirds are displaced from the coastal environment and move to inland locations, including TNI. As tidal water recedes, many transient shorebirds move back to the tidal flats and beaches found around Tinian. This daily movement of birds is likely impacted by daily rainfall, as birds might remain on and around the airfield through low tides if adequate standing or sheet water is present.

- *Surrounding Livestock Production.* Much land surrounding TNI, particularly to the east of the airport, is used in production of livestock. Wintering flocks of cattle egrets were occasionally observed loafing, feeding, and roosting near cattle herds. It is likely these flocks moved between TNI property and the surrounding area on a daily basis.

Reptiles and Amphibians

Monitor lizards (*Varanus indicus*) and curious skinks were the most common reptiles observed. Only one amphibian, the marine toad, was directly observed during surveys in the Project Area. Focused reptile surveys were not conducted and it is likely that additional native and nonnative gecko and skink species might be present in the area. Focused surveys that include nocturnal reptile and amphibian surveys could result in additional species being identified in the Project Area.

Fish

There are no surface water features containing fish in the Project Area.

Invertebrates

Several species of butterfly were noted during surveys. Eggflies, including blue moon and guardian, were frequently observed flying within and along the edge of Tangantangan forest. The large grass yellow, lemon migrant, cycad blue butterfly and common mormon were also observed on mowed edges of the Tangantangan forest.

Threatened and Endangered Species. Federally listed threatened and endangered species on Tinian include the Mariana common moorhen, Micronesian megapode, Mariana swiftlet, Mariana fruit bat, and green sea turtle (*Chelonia mydas*) (see **Table 3.6-6**). The Mariana common moorhen is limited to the Mariana archipelago and is presently found on Guam, Saipan, Rota, and Tinian. Megapodes have been recorded in upland cliff-line forest in areas least disturbed by storms and anthropogenic forces. Not recorded on Tinian since 1976; swiftlets are considered extirpated from the island. No permanent Mariana fruit bat colony is currently known on Tinian. Although rare, sightings have been reported on the island. Hawksbill turtles are known to occur in the waters surrounding Tinian. Green sea turtles are known to nest on Tinian; there is no known nesting of hawksbill sea turtles.

The Tinian monarch (*Monarcha takatsukasae*) is an endemic land bird species that nests in limestone, secondary, and tangantangan forest habitats. It was federally delisted in 2004 (69 FR56367; USFWS 2004) and was delisted by the CNMI government in 2009. Tinian monarchs were observed in forested habitat to the north of TNI during reconnaissance surveys conducted from October 7 to 8, 2011.

The Micronesian gecko (*Perochirus scutellatus*) is listed as threatened and endangered by the CNMI government and is the only terrestrial reptile protected in the CNMI (CNMI DLNR 2000). This gecko has never been abundant on Tinian.

Wetlands. Site reconnaissance was conducted between October 7 to 8, 2011, to determine the extent of jurisdictional wetlands and other waters of the United States in the project area. Determination of the extent of jurisdictional wetlands and other waters of the United States was based on the application of protocols and procedures established in the USACE *Wetlands Delineation Manual*, Technical Report Y-87-1 (USACE 1987) and the 2010 *Draft Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and Pacific Islands Region*, (2010 Regional Supplement). Determination of the occurrence of jurisdictional wetlands was based on the presence or absence of hydrophytic (wetland) vegetation, hydric (wetland) soils, and wetland hydrology. The presence of all three of the criteria is necessary for an area to be designated as a jurisdictional wetland under normal conditions.

Based on the site investigations, there are no jurisdictional wetlands in the project area.

Table 3.6-6. Summary of USFWS and CNMI Threatened, Endangered, and Candidate Species in the CNMI and their Potential to Occur in the Tinian Project Area

Common Name	Scientific Name	USFWS Status	Presence in Project Area	Comments
Little Mariana fruit bat	*Pteropus tokudae*	E	No	Likely extinct
Mariana fruit bat	*Pteropus mariannus mariannus*	T	Unlikely	Lack of forested areas and roosting or foraging trees in action area
Pacific sheath-tailed bat	*Emballonura semicaudata rotensis*	C	Unlikely	Lack of nearby caves for roosting.
Nightingale reed warbler	*Acrocephalus luscinia*	E	No	Not present on island
Mariana swiftlet	*Aerodramus bartschi*	E	No	Presumed extirpated
Mariana crow	*Corvus kubaryi*	E	No	Not present on island
Mariana common moorhen	*Gallinula chloropus guami*	E	Unlikely	No wetlands; possible indirect effects on moorhens in surrounding wetlands
Guam Micronesian kingfisher	*Todiramphus cinnamominus cinnamominus*	E	No	Not present on island
Micronesian megapode	*Megapodius laperouse*	E	Unlikely	Absence of forest habitat in action area
Guam rail	*Gallirallus owstoni*	E	No	Not present on island
Guam bridled white-eye	*Zosterops conspicallatus conspicallatus*	E	No	Extinct
Rota white-eye	*Zosterops rotensis*	E	No	Not present on island
Green sea turtle	*Chelonia mydas*	T	Unlikely	No beaches in action area
Hawksbill turtle	*Eretmochelys imbricata*	E	No	No nesting on island
Micronesean gekgo	*Perochirus ateles*	E (CNMI)	Unlikely	Absence of suitable forest habitat in action area.
Nesogenes rotensis	*Nesogenes rotensis*	E	No	Not present on island
Osmoxylon mariannense	*Osmoxylon mariannense*	E	No	Not present on island
Serianthes nelsonii	*Serianthes nelsonii*	E	No	Not present on island

Although there are no wetlands in the Project Area, several areas on the airfield temporarily hold sheet water following heavy rainfall. The airfield appears to have adequate drainage across most of the area, and the standing sheet water is usually an ephemeral event. Lake Hagoi is the largest wetland on Tinian, located approximately 3 miles north of TNI. Lake Hagoi holds water all year during normal weather patterns, but can dry up during dry seasons with below normal precipitation.

3.7 Marine Biological Resources

3.7.1 Definition of Resource

This section describes existing environmental conditions for marine biological resources potentially affected by the proposed action alternatives described in **Section 2**. Marine biological resources include those marine species and habitats that could be affected by the construction or implementation phases of Alternatives 1 or 2. No marine biological resources would be affected by the construction phase of Alternatives 1 or 2 (see **Sections 2.3.1** and **2.3.2.1** and **Figures 2.3-1** and **2.3-11**). Marine biological resources considered include those potentially affected by take-offs and landings during unit-level training exercises (i.e., below 10,000 feet). Marine biological resources evaluated in this section include sea turtles and marine mammals. A systematic literature and data review and Internet searches were conducted to determine that these were the only species potentially affected by the proposed action.

3.7.2 Existing Conditions

Sea Turtles. All sea turtle species are listed under the ESA. National Marine Fisheries Service (NMFS) has jurisdiction over sea turtles while they are in the water and the USFWS has jurisdiction over sea turtles on land, including sea turtle eggs, nesting females, and hatchlings on the beach. Green sea turtles *(Chelonia mydas)* are the most common sea turtle in the Mariana Archipelago, although hawksbill *(Eretmochelys imbricate)*, leatherback *(Dermochelys coricea)*, and olive ridley *(Lepidochelys olivacea)*, have also been observed there (Kolinski et al. 2004). A comparison of observed turtle activities within the region suggests that the Mariana Archipelago should presently be classified as primary resident green turtle habitat with a minor green turtle nesting component (Kolinski 2001).

Marine Mammals. All marine mammals are protected under the Marine Mammal Protection Act (MMPA) as amended in 1994. In addition to the MMPA, the ESA provides protection to marine mammals that have been federally listed as endangered or threatened. Federal agency actions that reasonably have the potential to "take" a marine mammal require an incidental harassment authorization from the National Marine Fisheries Service (NMFS). Takes of marine mammals include harassment or mortality. Two levels of harassment were defined in the 1994 amendments to the MMPA: Level A and Level B. Level A harassment is defined in the MMPA as any act of pursuit, torment, or annoyance that has the potential to injure marine mammal stock in the wild. Level B has the potential to disturb marine mammal stock in the wild by disrupting behavioral patterns, including migration, breathing, nursing, breeding, feeding, or sheltering. Thirty-two marine mammal species have confirmed or possible occurrence in Mariana Archipelago (DON 2005; DON 2007; DON 2010a), 23 of which are considered to have a regular occurrence in the area (regardless of their abundance); these are all cetaceans. These include the ESA-listed blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter macrocephalus*). The ESA-listed large whale species, have a seasonal occurrence (mid-November thru mid-May) in the Mariana Archipelago, making migrations to feeding areas in higher latitudes (DON 2005, DON 2007, NMFS 2010). Since deep waters come close to shore around the Mariana Archipelago, it is possible that deepwater marine mammal species (those occurring along and seaward of the shelf break) could make their way into waters within a few kilometers of shore.

3.7.2.1 Alternative 1 – GSN (Preferred Alternative)

Sea Turtles. The resident population of green sea turtles on Saipan's nearshore environment was estimated to be 574 sea turtles in 1999 (Kolinski et al. 2001). Most are located along relatively uninhabited east coast sites with limited human access. This area has complex benthic habitat and forage

species, including 2 species of seagrass and at least 29 species of algae forage species for green turtles in other surveys around the world. Nesting activity was limited, with 15 nesting attempts and 6 nests recorded throughout the 1999 nesting season. Nests were documented at Unai Fanonchuluyan (Bird Island Beach) and Unai Halaihai (Tang Beach), both north of the GSN airfield and Unai Obyan, just south of the GSN airfield. A nesting attempt was also made at Unai Agingan (Sisters Beach), which is also just south the GSN airfield (Kolinski et al. 2001). No other sea turtle species were sighted during the 1999 survey (Kolinski et al. 2001). Sixty percent of the turtles (101 turtles) were observed along the east coast sites, which is relatively uninhabited. Eighteen percent (30 turtles) were noted along the west coast, 14 percent (23 turtles) along the north coast, and 9 percent (15 turtles) along the south coast. Immature turtles predominated along all coastlines (Kolinski et al. 2001).

Marine Mammals. During a winter (January to April) survey in 2007, humpback whales (endangered), sperm whales (endangered), pantropical spotted dolphins (*Stenella attenuata*), and unidentified small delphinids were sighted north and west of Saipan. The behavior of the humpback whales observed during the survey suggests that the waters around Saipan could an active breeding site (DON 2007, Fulling et al. 2011).

Spinner dolphins (*Stenella longirostris*) were also sighted northeast of Saipan in waters with a bottom depth of 426 meters (DON 2007). Spinner dolphins are expected to occur in shallow water (about 162 feet [49 meters] or less) resting areas throughout the middle of the day, moving into deep waters offshore during the night to feed. Preferred resting habitat is usually more sheltered from prevailing tradewinds than adjacent areas and the bottom substrate is generally dominated by large stretches of white sand bottom rather than the prevailing reef and rock bottom along most other parts of the coast (DON 2010a).

3.7.2.2 Alternative 2 – TNI

Sea Turtles. The resident population of green sea turtles in Tinian's nearshore environment was estimated to be 833 sea turtles in 1999 (Kolinski 2001). No other turtle species were observed. Seven percent (24 turtles) of the turtles were observed at northern locations, 38 percent (134 turtles) at east coast sites, 17 percent (58 turtles) along the south coast, and 38 percent (135 turtles) within west coast habitats. Sixty-nine percent (242 turtles) of the turtles were juveniles, 17 percent (61 turtles) were categorized as juvenile/adult, and 11 percent (40 turtles), appeared to be of adult size. Size determinations could not be made for eight (2 percent) of the turtles. Juveniles were dominant along all coastlines (Kolinski 2001). Nesting likely occurs on all or most of the beaches on Tinian (DON 2010a). The highest concentration of green sea turtles occurs on the beaches of Tinian Harbor, but the extent of sea turtle nesting and occurrences is mainly on the southwestern side of the island, and from Marpo Point extending toward the southern tip of the island (DON 2010a). In 2008, sea turtles were sighted within the vicinity of all the northern beaches and Tinian Harbor and adjacent waters (Minton et al. 2009).

Marine Mammals. Sperm whales (endangered) were sighted during the winter 2007 survey off Tinian within 2.7 nautical miles (NM) and 7.6 NM from shore (800–1,200 meters in bottom depth). Pantropical spotted dolphins were sighted 1.3 NM north of Tinian in waters with a bottom depth of 114 meters, during the winter 2007 survey (DON 2007; Fulling et al. 2011). In 2008, spinner dolphins, spotted dolphins, and pilot whales (*Globicephala macrorhynchus*) were observed off the coast of Tinian (Minton et al. 2009)

3.8 Cultural Resources

3.8.1 Definition of Resource

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. These include archaeological resources (prehistoric and historic), historic architectural resources, and traditional resources. Only significant cultural resources (as defined in 36 CFR 60.4) are subject to potential adverse impacts from an action. Significant archaeological and architectural resources are eligible for listing or are listed on the NRHP. Significant traditional resources are identified by Native American tribes or other groups, and might also be eligible for listing on the NRHP.

The study area for cultural resources is the area where the Proposed Action or Alternatives have the potential to affect existing or potential archaeological, historic, architectural, or traditional resources.

3.8.2 Existing Conditions

Cultural Setting. The Mariana Islands have been occupied for at least 3,500 years by prehistoric Chamorro populations and more recent settlers from Spain's colonies, the Caroline Islands, Germany, Japan, and the United States. This section presents a chronological overview of the human occupation of the Marianas and describes the archaeological traces those settlers left on the islands. The Marianas have been the subject of archaeological research since the 1920s (Thompson and Hornbostel 1932). The presence of the U.S. military brought considerable attention to Marianas archaeology in the mid 1940s (Osborne 1947, Reed 1954). Current understanding of Marianas prehistory is the outgrowth of the work of Alexander Spoehr, who surveyed Guam, Saipan, Rota, and Tinian in the mid 1950s and developed the first regional prehistoric chronology (Spoehr 1957). Knowledge of Mariana Islands archaeology increased dramatically after 1977 with the establishment of the Micronesian Survey of the Office of Historic Preservation for the U.S. Trust Territories of the Pacific Islands (Cordy 1986). Major themes in Marianas archaeology include the degree of socio-political complexity, the effects of colonizing populations on island ecology, the timing of colonization, and intensification and specialization of agricultural practices and their relationship to "social production" for status contests and power differentiation (Kirch 2002, Kirch and Ellison 1994, Rainbird 1994). A detailed cultural history of the Mariana Islands is presented in **Appendix D**.

Post-War History - The Second American Period (1944–Present). The U.S. role in the governance of Saipan, Rota, and Tinian differs from Guam due to differences in how the islands were acquired (Herald 1992, McKibben 1990). Spain ceded Guam to the United States after the end of the Spanish-American war in 1898. Guam's territorial status is managed by the U.S. Congress. Guam is one of the three unincorporated territories currently held by the United States, along with the Virgin Islands and American Samoa. In contrast, the United States was given supervisory control of the other Mariana Islands and the rest of Japan's Micronesian possessions by the United Nations under the Trust Agreement. The Trust Agreement was a bilateral contract between the United States and the U.N. Security Council that made the United States responsible for providing for the islands' political, economic, and social needs and to promote eventual adoption of self-government. The United States demanded that the United Nations designate the Trust territory a strategic area, a concession that gave the Security Council, not the General Assembly, authority over the Trust Agreement. This ensured that the United States could veto any decisions regarding the islands. Congress increased appropriations for the islands and in 1964 created a Congress of Micronesia. The Marianas chose to become a separate entity from the rest of the Micronesian islands and in 1972 began negotiating commonwealth status, in part because the proximity of the northern Marianas to Guam made them more "Americanized." The resulting formation of CNMI

was part of the United Nations mandate under which other Micronesian islands chose to separate into three political entities, the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau. Each entity negotiates its relationship with the United States separately and each has its own constitution.

3.8.2.1 Alternative 1 – GSN (Preferred Alternative)

Previous research suggests that severely disturbed prehistoric material such as ceramic, flaked stone, and ground stone artifacts are likely to exist in the study area on Saipan. However, the significant amount of historic modification to the area likely impacted pre-contact sites so that the presence of intact features, although possible, is not likely. The study area primarily contains historic artifacts and features associated with the construction of Japanese Aslito Field beginning in 1934 and the U.S. expansion of the facility during World War II (at which time it was renamed Isley Field). Artifacts dating to this period include bottle dumps, military supplies and equipment, refuse piles, and other durable metal objects. Features associated with this period, such as concrete foundations and buildings, are also present.

The project area for Alternative 1 was surveyed in 1980 in preparation for nominating Isley Field to the NRHP (Denfeld and Russell 1984). This survey defined 29 sites that encompass 29 intact structures, an Okinawan farm house foundation, two runways, hundreds of hardstands and foundations from the U.S. period, concrete and asphalt roads, and many other features and artifacts within the airport perimeter fence as it stood in 1980. These sites are listed in **Table 3.8-1** and shown on **Figure 3.8-1**. Some of the historic structures associated with the sites recorded by Denfeld and Russell (1984) are still visible on recent aerial imagery and are presumably intact (see **Figure 3.8-1**). The report further suggested that additional features and associated artifacts not specifically mentioned in the report are also likely to be present.

The field was nominated to the NRHP as a historic district on September 16, 1980, and was included in the NRHP on June 26, 1981, as the "Isley Field Historic District" (National Register Information System [NRIS] No.: 81000667). As nominated, the district is defined by the "perimeter road," probably Flame Tree Road (on the north, west, and east) and Naftan Road (along the south), that encircles GSN and encompasses 1,189 acres. The condition of the historic fabric contained within the district is listed as deteriorated and altered by the modern airport. The following 27 buildings and structures are mentioned in the nomination as contributing to the NRHP eligibility of the property:

- Operations Center. This building was built and used by the Japanese and later used for similar purposes by the U.S. 73rd Bombardment Wing. At the time of the nomination the structure had been refitted for use by the Marianas Visitors Bureau, now known as the Marianas Visitors Authority, and was called out as a "...fine example of adaptive reuse."
- Four gas drum storage bunkers.
- Power plant.
- A building to house an electric generator.
- Semi-subterranean bomb storage facility. This structure was called out in the nomination as being particularly unique, representing "...the only remaining example of this type of building in Micronesia, and the structure is in excellent condition."
- Defensive gun emplacement atop the bomb storage facility.
- Semi-subterranean fuel storage facility.
- Three associated fuel tanks.

Table 3.8-1. Features and Structures Recorded At Isley Field.

Feature or Structure Number	Description
SP-H-1	Japanese Barracks Complex
SP-H-2	Japanese Military Hospital
SP-H-3	Japanese Engineers Barracks
SP-H-4	Japanese Barracks Complex
SP-H-5	Japanese Staff Quarters
SP-H-6	Japanese Pyrotechnics Bldg.
SP-H-7	Japanese Garage
SP-H-8	Japanese Sentry Post
SP-H-9	Japanese Road
SP-H-10	Japanese Dispensary
SP-H-11	Japanese Administration Building
SP-H-12	Japanese Power Plant
SP-H-13	Japanese Oxygen Generating Building
SP-H-14	Japanese Repair and Maintenance Area #1
SP-H-15	Japanese Repair and Maintenance Area #2
SP-H-16	Japanese Semi Underground Bomb Storage
SP-H-17	Japanese Airplane Hangers
SP-H-18	Japanese Air Operations Building
SP-H-19	Japanese Gasoline Storage Bunkers
SP-H-20	Japanese Power Plant Building
SP-H-21	Japanese Unidentified Structure
SP-H-22	Japanese Water Supply Facility
SP-H-23	Japanese Gasoline Bunker
SP-H-24	Japanese Radio Station
SP-H-25	Okinawan Housing Area
SP-H-26	Japanese Service Apron
SP-H-27	U.S. North Service Apron
SP-H-28	U.S. Maintenance and Repair Complex
SP-H-29	U.S. B-29 Hardstands

Source: Denfeld and Russell (1984))

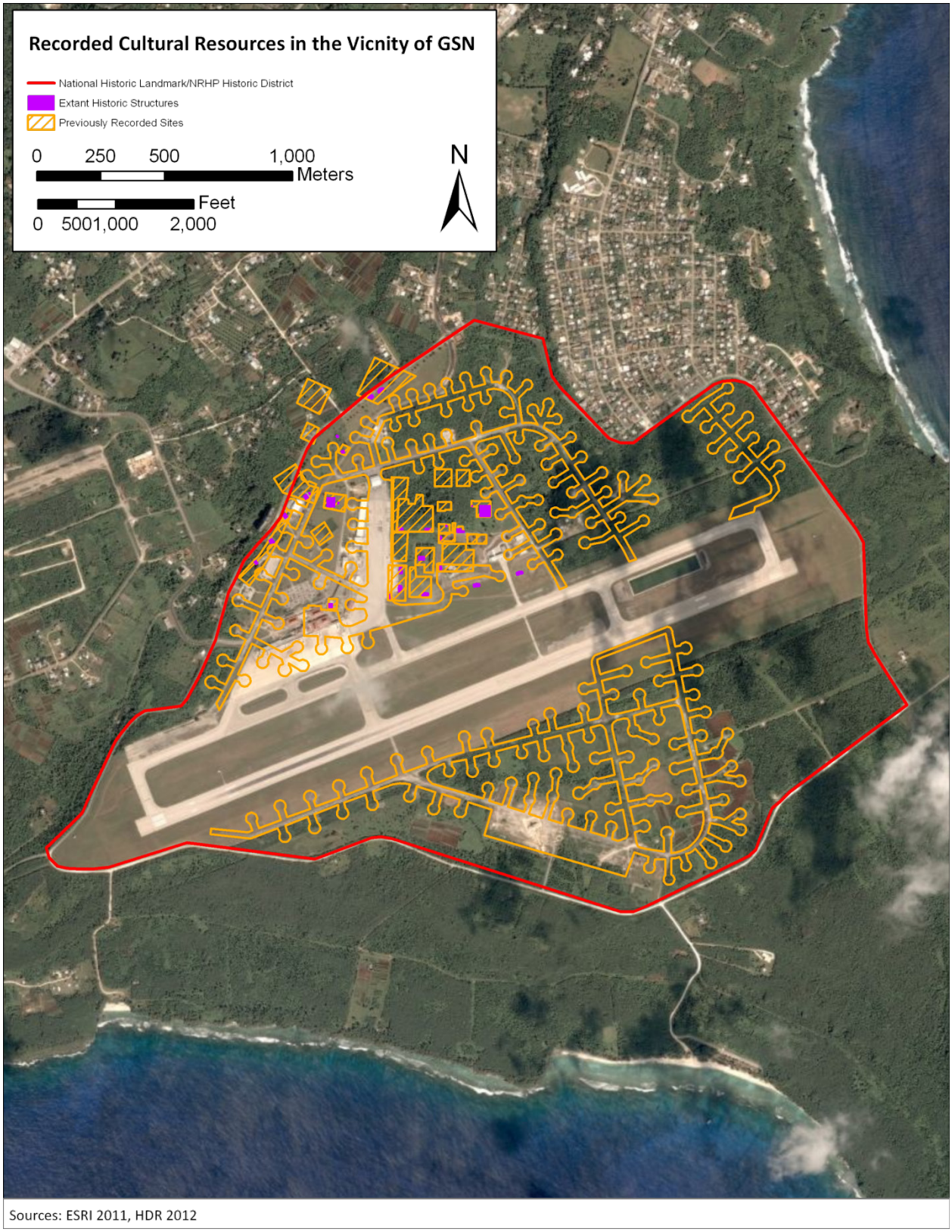


Figure 3.8-1. Cultural Resources at GSN

- Pump house.
- Torpedo regulating shop.
- Cold storage building.
- Eleven air raid shelters.

The nomination also briefly mentions the two runways as well as "...hundreds of hardstands and foundations from the U.S. period." The Historic Properties Database lists 27 contributing buildings (those listed above), 2 contributing structures (probably the runways), and no non-contributing elements, but no other details are offered.

Isley Field was later included in a National Historic Landmark recommendation for three of Saipan's World War II-era sites. The separate World War II-related properties were listed as Saipan Landing Beaches, Aslito/Isley Field, and Marpi Point National Landmark on February 4, 1985 (National Historic Landmark System [NHLS] No.: 85001789). In the landmark nomination, Isley Field's size is listed as 1,453 acres, whereas the district nomination is for 1,189 acres. No reason for the expansion is given. All of the features noted in the district nomination are recommended for inclusion in the Aslito/Isley Field portion of the landmark designation including the following:

- The sites of the two B-29 runways, taxiways, and hardstands.
- The 73rd Bombardment Wing's administrative area, listed as the Operations Center in the district nomination.
- All concrete structures associated with Aslito Field. This would presumably include all of the structures listed on the district nomination (above) and any previously undocumented Japanese structures within the district boundary.

3.8.2.2 Alternative 2 – TNI

The project area has been partially surveyed for archaeological sites and historic structures, first by Alexander Spoehr in the 1950s (Spoehr 1957). Several surveys have been conducted since, although the project area has not been subject to a comprehensive pedestrian survey. Instead, surveys have been of specific small areas or have employed only aerial photographs to identify archaeological site boundaries and historic structures (Welch and Tuggle 1998), which are shown in **Figure 3.8-2**. Despite massive disturbance to the project area by the Japanese construction of the first Gurguan Airfield in 1944, by the U.S. Naval bombardment of the island prior to the July 1944 assault of the island by U.S. forces, the subsequent expansion of the airfield by 1945 to accommodate B-29 bombers, and the more recent modification of the airport to handle modern commercial aviation, the project area is known to contain historic and prehistoric cultural materials (Dixon et al. 2011, Welch and Tuggle 1998)

Spoehr (1957) identified two prehistoric archaeological sites in the Gurguan Point area. The first, which he called Leprosarium I, was in the area farmed by patients of the leprosarium that was founded in 1948. The site consisted of a 5-acre (20,000-square-meter) area containing a dense surface concentration of prehistoric sherds, the remains of an eight-shaft latte house and scattered latte shaft and capstone fragments, and a low but well-defined mound. The second site, Leprosarium II, was found north of Leprosarium I. The site consisted of a 250-square-yard (200-square-meter) surface sherd scatter and one eight-shaft latte house. Spoehr's maps are not precise, but it is possible that these two sites have since been recorded as site Z-594, a prehistoric site that was recommended as eligible for listing on the NRHP (Welch and Tuggle 1998), suggesting that other prehistoric sites exist in the area.

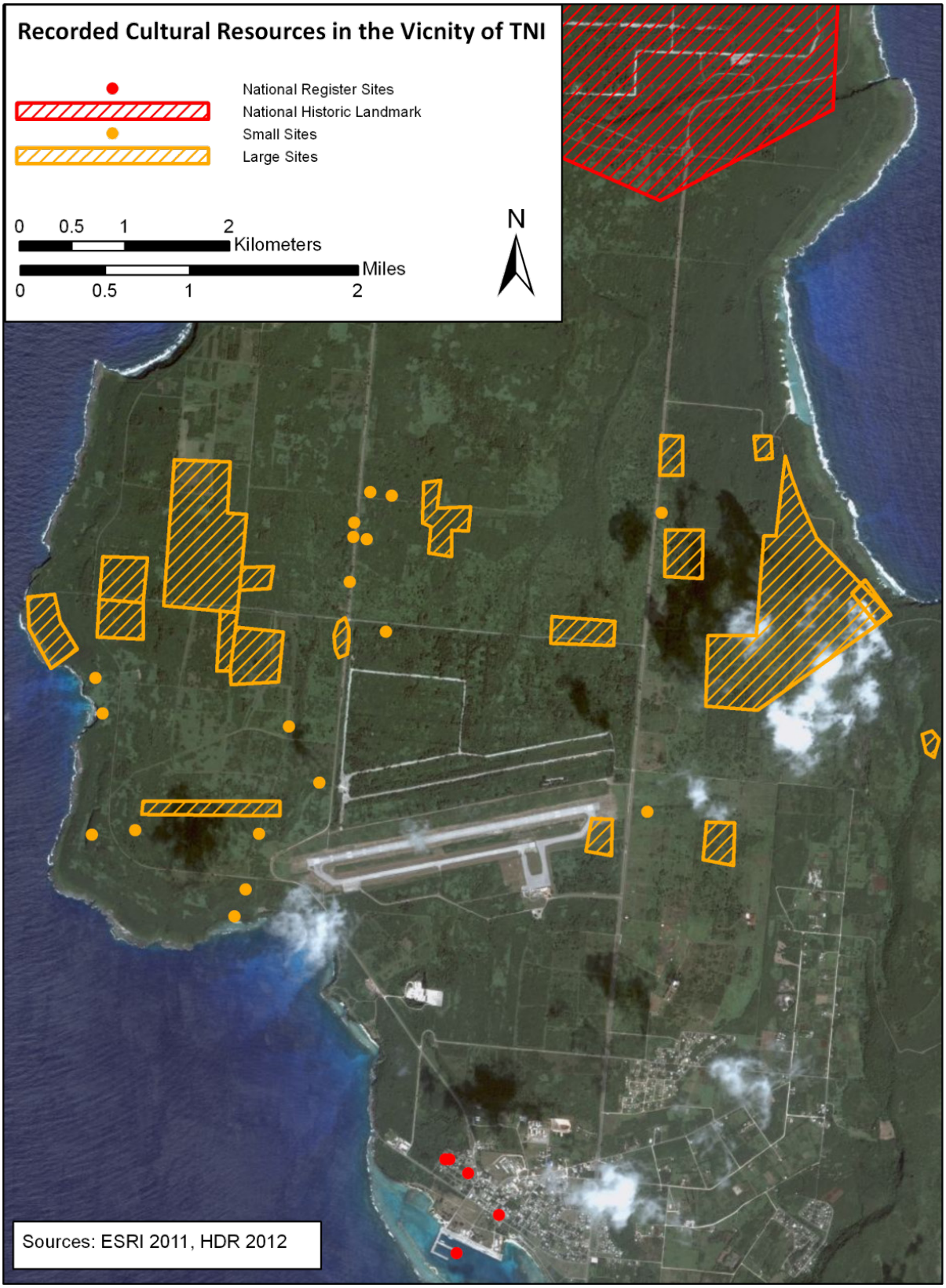


Figure 3.8-2. Cultural Resources at TNI

Tinian was all but deserted between 1695 and 1926, when the island was leased by the Japanese government to Nanyo Kohatsu Kabushiki Kaisha (NKK) for sugarcane production. NKK built a Japanese-style town at the then-abandoned site of San Jose. Despite massive U.S. Naval bombardment of the town, four buildings from this period still stand and have been listed on the NRHP: an NKK administration building, ice storage building, a laboratory, and a building known only as the "Japanese structure" that might have been a small store. These four NRHP-listed properties are outside of the study area, as shown in **Figure 3.8-2**.

NKK's sugarcane production also involved the construction of 49 miles of narrow-gauge railroad lines to link sugarcane fields with mills. The NRHP nomination form for North Field includes a map showing the Gurguan Point airfield crossing one of these narrow-gauge rail lines. The study area is therefore likely to contain traces of this railroad. Three pre-World War II Japanese civilian sites have been recorded north of the airport (sites Z-566, Z568, and Z569) (Welch and Tuggle 1998). All three sites were recommended as eligible for listing to the NRHP.

The APE is immediately east of the identified boundaries of the Japanese-era Gurguan Airfield, built in 1944 (Site TN-589) (Welch and Tuggle, 1998). The site has been recommended as eligible for listing on the NRHP (Welch and Tuggle, 1998). The site's boundaries were identified purely from aerial photos (Welch and Tuggle, 1998), and it is, therefore, highly likely that the site extends into the APE and that the Proposed Action would have major direct, adverse effects on this historic resource. Comprehensive survey is also likely to identify additional Japanese World War II-era historic resources in the project area.

The project area also preserves the remains of the U.S. expansion of the Gurguan Airfield into the much larger West Field between 1944 and 1945 to support B-29 bombers in the Twentieth Air Force XXI Bomber Command 58th Bombardment Wing and their missions to the Japanese home islands, helping to end World War II. Although they are partially covered by vegetation, several building slabs, B-29 hardstands, and taxiways are clearly visible on modern aerial photographs and not all World War II-era features have been replaced by modern airport construction. West Field has been recorded as a historic archaeological site (TN-030) and has been recommended as eligible for listing on the NRHP (see Welch and Tuggle 1998). Note that the boundary of site TN-030 has not been defined and, therefore, does not appear on the map of archaeological resources in the project area (see **Figure 3.8.2**). The modern airport also encompasses the U.S. Naval Air Base HQ at the southeast corner of the modern airstrips (SiteTN-048) (Welch and Tuggle 1998); the site has been recommended as eligible to the NRHP. Two sites associated with U.S. World War II-era anti-aircraft artillery units (site Z-611, HQ LAA 18th AAA; and site Z-613, D Battery, 18th AAA) (Welch and Tuggle 1998) have also been recommended as eligible for listing on the NRHP.

3.9 Recreation

3.9.1 Definition of Resource

The term "recreation" refers to both natural and human-made lands designated by planning entities to offer visitors and residents diverse opportunities to enjoy leisure activities. Recreational resources are places or amenities set aside as parklands, beaches, trails, recreational fields, sport or recreational venues, open spaces, open waters, and aesthetically pleasing landscapes along with a variety of other uses. Federal, commonwealth, and local jurisdictions typically have designated land areas with defined boundaries for recreation. Other less-structured activities (e.g., fishing) are performed in broad, less-defined locales. A recreational setting might consist of natural or human-made landscapes and can vary in size from a roadside monument to a designated sport area to a wilderness area. For the purpose of

this analysis, recreational activities include any type of outdoor activity in which area residents, visitors, or tourists could participate and pertain to the physical geography of the islands.

3.9.2 Existing Conditions

3.9.2.1 Alternative 1 – GSN (Preferred Alternative)

Saipan is approximately 115 miles northeast of Guam and 3 miles north of Tinian. Saipan contains a lagoon/barrier reef system along its western coastline and fringing reefs scattered throughout its eastern coastline. Approximately 40 percent of the population lives along Saipan's coasts and has direct access to marine-related recreational activities. Tourists frequent the larger hotels in Garapan and Susupe. Notable recreational resources include trails, historic and cultural attractions, beaches and parks, scenic points, dive spots, and recreational fishing (see **Figure 3.9-1**).

Trails. The Saipan Beach Pathway is a "boonie stomping" (hiking through "boonies" or large areas of undeveloped jungle and beaches) trail that traverses approximately 3 miles along Saipan's western coast. The trail connects to Kilili Beach Park and has various historic attractions along its path. A pathway from Micro Beach, which is approximately 1 mile southwest of the Port of Saipan, goes through American Memorial Park, where a variety of World War II bunkers and memorials are found (MVA 2012).

Historic and Cultural Attractions. As described in detail in **Section 3.8**, GSN airport is wholly contained within the Isley Field Historic District and National Historic Landmark. Because of its modern status as a functioning international airport, most of the historic structures and sites that make up the district are not directly accessible to the public; however, three exceptions exist. Six extant Japanese concrete air raid bunkers are visible from the runway at GSN. While few visitors can approach the bunkers directly, the visual reminder of Saipan's critical role in the Pacific theater during World War II provided by the bunkers is an important experience for visitors to the island. The CNMI Historic Preservation Office (HPO) on Saipan has cited the visual impact of these bunkers as one of the main motivations for their continued preservation. Two additional bunkers, regularly visited by the public, are outside of the airport boundaries along the edge of a current soccer field that would be used for the BEAR-kit site for Alternative 1. A number of Japanese-era buildings just outside of airport boundaries, including an excellent example of a pre-World War II Okanawan farmhouse, and concrete hardstands that served as parking apron for U.S. B-29s during World War II, are included in a small walking tour area with paths and interpretive signage. This interpretive park is popular with school children on field trips and tourists to the island.

Beaches and Parks. Saipan has approximately 50 miles of coastline and there are approximately 29 public beach/shoreline access sites on the island. Public access to the shoreline has a high demand throughout the CNMI. Saipan residents use beaches for a variety of activities including swimming, picnicking, snorkeling/diving access, surfing, playing sports, and for relaxing. Kilili Beach is used as an occasional canoe boat racing site. Laolao Bay and Obyan Beach, on the eastern and southern portions of the island, respectively, are consistently inundated with snorkelers and scuba divers (NOAA 2011). The Beach of Managaha, on Saipan Lagoon, is a widely used snorkel and dive spot, but is also used for viewing wildlife and historical artifacts. Agingan Beach, along Saipan's southern coast, has one of the island's most diverse archaeological areas and can be accessed through the Coral Ocean Point Golf Course. Micro Beach is often used as a staging point for watersports (e.g., windsurfing, parasailing, jet-skiing) (MVA 2012).

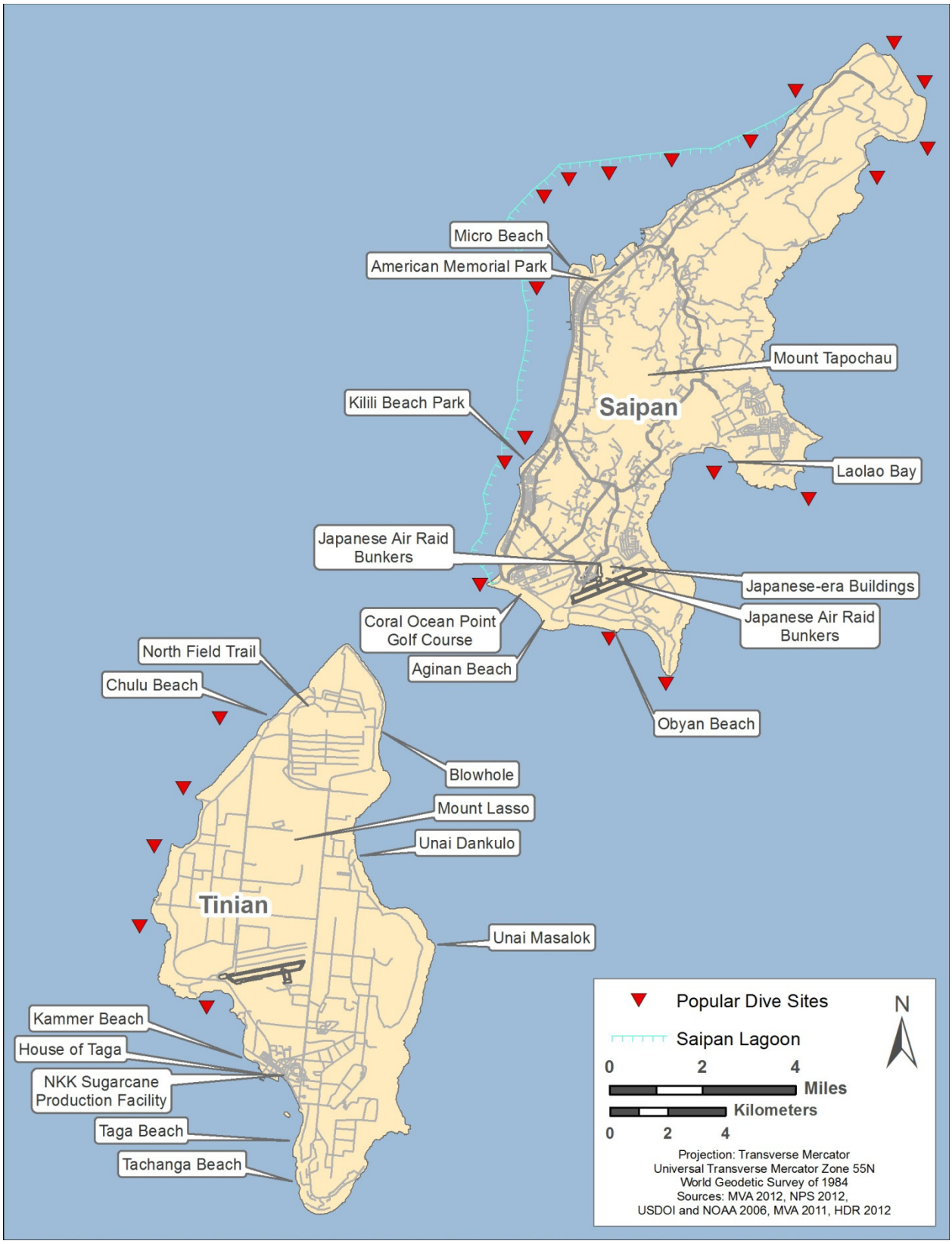


Figure 3.9-1. Popular recreational resources on Tinian and Saipan

American Memorial Park is the only national park on Saipan. The 133-acre park contains beaches, sports fields, picnic sites, boat marinas, playgrounds, walkways, and a 30-acre wetland and mangrove forest. Kilili Beach Park, in Susupe along Beach Road, received a National Park Service (NPS) Land and Water Conservation Fund grant in 2004 to develop an access road and paved parking, and to replace picnic shelters, park walkways, and various visitor facilities. Watersports are popular in both parks (NPS 2012).

Scenic Points. The majority of the scenic points on Saipan are in the northeastern portion of the island. Suicide Cliff and Banzai Cliff are common tourist hot spots. Mount Tapochau, at the center of the island, has a panoramic view of the entire island and is frequented by tourists and other sightseers (USAF 1987).

Dive Spots. The CNMI consistently attracts scuba divers due to warm water and prolific coral reefs, which maintain an incredible amount of diversity. Saipan has more than 18 different dive sites scattered around the island (DON 2010a). Saipan Lagoon, Laolao Bay, and Obyan Beach are among the most popular (USDOI and NOAA 2006).

Recreational Fishing. Recreational fishing is prominent throughout CNMI, and is generally conducted in small fishing fleets. Trips are typically made during the daytime within an approximate 26 NM radius of Saipan (DON 2010a). Launching points for Saipan's annual fishing tournament are the Smiling Cove Marina and the Garapan Fishing Base Complex, both on the western side of the island approximately 1 mile southwest of the Port of Saipan (MVA 2011). Saipan Lagoon is considered to be heavily harvested by recreational fishermen. Coral reefs are not thought to be harvested by recreational fishermen; however, poaching by foreign boats is suspected (DON 2010a).

3.9.2.2 Alternative 2 – TNI

Tinian is approximately 100 miles northeast of Guam and 3 miles south of Saipan. Approximately 26 of the 39 square miles Tinian covers are leased to the DOD (DON 2010b). The predominant community and tourism activities are on the southwestern portion of the island, associated with San Jose Village. Tinian is known for its precipitous cliffs, though a few coves and beaches are found throughout the island. Several small and narrow fringing reefs and a small barrier reef are found near Tinian Harbor on the western side of the island. Recreational resources include trails, historic and cultural attractions, beaches and parks, scenic points, and dive spots throughout the island (see **Figure 3.9-1**).

Trails. The most notable recreational trail feature on Tinian is the Ushi Field-North Field Trail. The trail, traversing the northern portion of the island, identifies 14 points of interest from World War II. Before the U.S. took control of the island, the Japanese had constructed an airfield on northern Tinian (Ushi Field). Afterwards, the Seabees and the Marines constructed six airstrips during the war, four on northern Tinian (dubbed North Field) and two on central Tinian (dubbed West Field), to support B-29 bombers. Each strip on North Field had an alphabetical designation. The northernmost strip, Able, was the launching point for the Enola Gay and Bockscarto drop the atomic bombs on Hiroshima and Nagasaki, Japan on August 6 and 9, 1945, respectively (DON 2010b). The smaller runway at West Field is now TNI. World War II Japanese fortification features, including a bunker, naval battery, command post, and the Bomb Assembly Building, can also be found along the trail.

Historic and Cultural Attractions. There are several publicly enjoyed historic properties on Tinian. The House of Taga, north of the seaport, is the remains of prehistoric latte stone pillars that were originally 15 feet (4.6 meters) high, making them the tallest latte stones in the Mariana Islands. Four NRHP-listed properties from the Japanese-era NKK sugarcane production facility, including an NKK administration building, ice storage building, laboratory, and a building known only as the "Japanese structure" that might have been a small store, are found in San Jose. Structures at North Field, including Japanese-era buildings, B-29 hardstands, and the loading point for the atomic bombs that were eventually dropped on

Hiroshima and Nagasaki to end World War II, are also popular with tourists. Historic and cultural sites at TNI, discussed in **Section 3.8**, are not accessible to the public and, therefore, are not considered historical attractions.

Beaches and Parks. Unai Dankulo, along Tinian's east coast, is the island's largest beach. A continuous reef crest runs along the entire beach. At least 10 beaches are found along Unai Dankulo over a distance of 4,900 feet (1.5 km). Other notable beaches include Chulu Beach, on the northwestern shore, and Unai Masalok, which is composed of three beaches over a distance of 1,600 feet (0.5 km), on the eastern shore. Kammer Beach is found to the east of the Port of Tinian, south of San Jose Village (DON 2010b).

Tinian has approximately 34 miles of coastline, and there are 12 public beach/shoreline access sites on the island (NOAA 2011). Of note, Taga Beach, along the southern end of Tinian, has picnic facilities, parking, and a place to rent scooters. Tachogna Beach, adjacent to Taga Beach, offers activities including snorkeling, scuba diving, jet skiing, and a variety of other marine activities. Unai Dankulo is a favored spot for shore-based spear fishing (MVA 2012). Although there are no national parks on Tinian, six local parks can be found throughout the island (NOAA 2011).

Scenic Points. Mount Lasso Lookout and Tinian Blowhole, on the southern and eastern sides of North Field, respectively, are frequently visited lookout points (DON 2010a).

Dive spots. Tinian has numerous World War II dive sites, predominantly on the northwestern side of the island (DON 2010a).

3.10 Land Use

3.10.1 Definition of Resource

Land Use. The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. In appropriate cases, the location and extent of a proposed action is evaluated for its potential effects on a project site and adjacent existing land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

Coastal Zone and Submerged Lands. The CZMA was promulgated in 1972 as a means to "…preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zones for this and succeeding generations [through] the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and aesthetic values, as well as the needs for compatible economic development…" (16 U.S.C. §§ 1451–1466). The CZMA is administered through local programs designed in cooperation with the Federal government.

Federal consistency requirements of the CZMA require that Federal activities comply to the greatest extent possible with the enforceable policies of applicable local coastal zone management programs. Non-Federal activities must comply fully with local management programs if they require a Federal

permit or license, or if they receive Federal funding (15 CFR Part 930). Land and submerged lands under Federal jurisdiction are excluded from the territorial coastal zone. According to the CZMA, Federal activities that affect any land or submerged land use or natural resource of a territory's coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforcement policies of the federally approved territorial Coastal Zone Management Program.

Region of Influence. The region of influence for land use is the land and submerged lands of Tinian and Saipan in the CNMI. For Saipan, the land use analysis focuses on GSN and the Port of Saipan. For Tinian, the analysis focuses on TNI and the Port of Tinian.

3.10.2 Existing Conditions

The CNMI (including Saipan and Tinian) are located to the east of the Philippine Sea. Saipan has an area of approximately 46.5 square miles; Tinian has an area of approximately 39.5 square miles.

CNMI Land Use and Ownership. The Northern Mariana Islands became self-governing as a Commonwealth to the United States in 1976 under the terms of the "Covenant to Establish the Commonwealth of the Northern Mariana Islands with the United States of America" (hereinafter referred to as the Covenant). Land ownership within the CNMI is subject to the stipulations of Article XI and XII of the CNMI Constitution (CNMI 2012) which states that "lands can be privately owned in the CNMI, but only by persons of Northern Mariana descent." Public lands, which are managed by the CNMI Department of Public Lands (DPL), make up the majority of lands found within Saipan and Tinian.

Public lands are subcategorized as Grant of Public Domain Lands, Designated Public Lands, Leased Lands, Undesignated Public Lands, or Covenant Leased Lands. Grant of Public Domain Lands have been transferred to and are managed by another public agency in the CNMI. Designated Public Lands are actively managed for a particular use, such as a forest or a park. Leased Lands are leased to non-government agencies and require government approval. If the area is greater than 12.4 acres the lease must be approved by the CNMI legislature; if the lease is for an area of less than 12.4 acres it must be approved by the CNMI DPL. Public lands without a specified use are undeveloped and are classified as Undesignated Public Lands (DON 2010b).

Covenant Leased Lands have been leased to the military for training purposes under Article VIII of the Covenant, which states that approximately 17,799 acres on Tinian and 177 acres on Saipan would "be made available to the U.S. by lease to enable it to carry out its defense responsibilities." The lease for these lands was issued on January 6, 1983, for an initial term of 50 years with an option to renew for an additional 50-year term upon expiration. A separate *Technical Agreement Regarding Use of Land to be Leased by the United States in the Northern Mariana Islands* (hereinafter referred to as the Technical Agreement) was simultaneously executed with the Covenant that provided for the leaseback of property and joint use arrangements for San Jose Harbor and West Field on Tinian and the Port of Saipan and other property on Saipan (DON 2010b).

CNMI Coastal Zone and Submerged Lands. Submerged lands refer to coastal waters extending from the CNMI coastline into the ocean for 3 NM) which is the limit of state, commonwealth, or territorial jurisdiction. Article XI of the CNMI Constitution states that "the submerged lands off the coast of the commonwealth are public lands belonging collectively to the people of the Commonwealth who are of Northern Marianas descent." However, in *CNMI v. U.S.* (399 F.3d 1057, 9th Cir. 2005), it was affirmed that the "U.S. possesses paramount rights in and powers over the waters extending seaward of the ordinary water mark on the Commonwealth coast and the lands, minerals, and other things of value underlying the waters…"

The CZMA is administered in CNMI by the Coastal Resources Management Office. The coastal zone includes all non-Federal lands on the island, offshore islands, and non-Federal submerged lands, within 3 NM of the coast. The Coastal Resources Management Office has identified Areas of Particular Concern (APC), which are geographically delineated areas with special management requirements. Before work beings on any project to be located wholly or partially within an APC, a valid coastal permit is required. This is not applicable to Federal-lease lands or federally owned submerged lands. Currently, there are five APCs in CNMI (CNMI CRMO 2012):

- *Shoreline* – The area between the mean high water mark and 150 feet inland.
- *Lagoon and Reef* – The area extending seaward from the mean high water mark to the outer slope of the reef.
- *Wetlands and Mangrove* – Those areas which are permanently or periodically covered with water and where species or mangrove vegetation can be found.
- *Port and Industrial* – Those land and water areas surrounding the commercial ports of Saipan, Tinian, and Rota.
- *Coastal Hazards* – Those areas identified as a coastal flood hazard zones in the FEMA FIRMs.

3.10.2.1 Alternative 1 – GSN (Preferred Alternative)

Land Use and Ownership. Saipan is the most heavily populated island in the CNMI. Land ownership on Saipan is primarily public. A breakdown of land ownership percentages is not currently available. Land use on the Island of Saipan is regulated by the Saipan Zoning Law of 2008 (CNMI Zoning Board 2008), which stipulates that no development shall commence on Saipan without a zoning permit. The primary land use on Saipan is designated as Rural, with much of the interior of the island consisting of lightly or undeveloped areas. Several large areas along the coast of the islands have been designated as Tourist Resort. Additionally, much of the northern part of the island has been designated as Public Resources. The rest of the island has been designated as a mixture of Industrial, Village Commercial, Village Residential, Mixed Commercial, and Agriculture (CNMI Zoning Board 2012).

The U.S. DOD does not have any active training areas on Saipan; however, the Technical Agreement allows for leaseback at the Port of Saipan to be used for uses compatible with DOD use. The Technical Agreement also allowed the leaseback of the remaining leased property on Saipan for use as a memorial park to honor those who died in the World War II Mariana Islands campaign. The remaining portion of the lease area at the Port of Saipan is used as a U.S. Army Reserve Center.

Saipan International Airport. GSN is situated on approximately 700 acres in the southern portion of the Island of Saipan (see **Figure 2.3-1**). It is owned and operated by the CPA under the Commonwealth Ports Authority Act (P.L. 2-48), which was enacted in October 1981. The airport is designated as an Industrial land use according to the CNMI Zoning Board. The land use surrounding the airport primarily consists of agricultural, recreation, and conservation. The 2002 Saipan International Airport Master Plan outlines the development strategy for the airport as it prepares for increases in passenger use (CPA 2002).

Port of Saipan. The Port of Saipan is situated on west coast of Saipan (see **Figure 2.3-7**). It contains 2,600 linear feet of berthing space and a 22-acre container yard. It is owned and operated by the CPA under the jurisdiction of the Commonwealth Ports Authority Act of 1981. The Port is designated as industrial according to the CNMI Zoning Board. The land surrounding the harbor is a mixture of undesignated public lands and mixed commercial (CPA 2012a).

Coastal Zone and Submerged Lands. The coastal zone includes all non-Federal lands on the island, offshore islands, and non-Federal submerged lands within 3 NM of the shoreline.

3.10.2.2 Alternative 2 – TNI

Land Use and Ownership. Private lands account for approximately 2,422 acres (10 percent) and public lands account for approximately 22,729 acres (90 percent) of the lands on Tinian. **Table 3.10-1** presents the breakdown of land ownership on Tinian.

Table 3.10-1. Tinian Land Ownership

Owner	Sub-classification	Acres
Private Lands	Private	2,422
Public	Grant of Public Domain	1,569
	Designated/In Use	662
	Leased	1,638
	Covenant Leased	15,469
	Undesignated/Not in Use	3,388
Total		**25,151**

Source: DON 2010b

The DOD currently leases 16,100 acres, known as the MLA, in the northern portion of Tinian (NPS 2001). In 1983, the Navy signed a lease for the MLA for a period of 50 years with a renewal option for an additional 50 years. The MLA encompasses approximately the northern two-thirds of Tinian land area, and is divided into two sections. The northern portion is the EMUA and the southern portion is the LBA. The EMUA is used for periodic military training exercises, and is open to the public for recreational purposes when not being used for military training. The roads that connect the EMUA with the Tinian Seaport and TNI are also used by the Navy during training exercises. The LBA is a joint-use area where both military and non-military activities can occur. The LBA has been leased back to the CNMI for uses determined by the Navy to be compatible with long-term DOD needs, primarily grazing and agriculture. Under the leaseback agreement, the LBA can be used for DOD training activities that would not be detrimental to ongoing CNMI economic and agricultural activities (NPS 2001).

The EMUA covers approximately the northern third of Tinian and contains approximately 7,574 acres of land. The area is used for ground element exercises, including Military Operations in Urban Terrain- (MOUT) type exercises, command and control, logistics, bivouac, vehicle land navigation, convoy training, and other field activities (DON 2010b). The LBA consists of approximately 7,779 acres located in the middle third of the island where the U.S. Government has agreed to lease land back to the CNMI government. In consultation with the U.S. Government, the CNMI government issues permits for LBA lands to Tinian residents for grazing and agricultural uses. Within the LBA, there are 35 lessees with 48 parcels totaling approximately 2,552 acres of grazing and agricultural land (DON 2010b).

Land Use on Tinian is overseen by the CNMI DPL. The primary land use is agriculture, with other primary land uses including Tourism, Natural Resource Extraction/Alteration, Natural Resource Conservation/Preservation, Urban/Buildup, and Undeveloped (DON 2010b).

Tinian International Airport. TNI is owned and operated by the CPA under the Commonwealth Ports Authority Act. The airport is situated on approximately 1,400 acres of land (see **Figure 2.3-11**). The

airport is designated as urban/buildup and the area surrounding the airport is designated primarily as Agricultural or Undeveloped/Site in a Natural State by the CNMI DPL (DON 2010b).

Port of Tinian. The Port of Tinian is situated on the southwest coast of Tinian (see **Figure 2.3-16**). It contains three piers, a small boat ramp, and a bulk fuel plant. It is owned and operated by the CPA under the jurisdiction of the Commonwealth Ports Authority Act (CPA 2012b). The port is designated as Urban/Buildup and the area surrounding the port is designated as a mixture of Private Land, Agricultural, and Undeveloped/Site in a Natural State by the CNMI DPL (DON 2010b).

Coastal Zone and Submerged Lands. The coastal zone includes all non-Federal lands on the island, offshore islands, and non-Federal submerged lands within 3 NM of the shoreline. The Coastal Resources Management Office has identified three APCs for Tinian: Shoreline, Wetlands, and Port and Industrial. The shoreline APC encompasses the entire island from the mean high water mark to 150 feet inland. The Wetlands APC consists of two areas: one in the north-central part of the island within the EMUA and a second on the southeast portion of the island. The Port and Industrial APC consists of Tinian Harbor in San Jose (DON 2010b).

3.11 Transportation

3.11.1 Definition of Resource

This section describes the existing roadway facilities that serve the islands of Saipan and Tinian. The CNMI Comprehensive Highway Master Plan was used to identify the existing conditions of the roadway network potentially impacted by the proposed action. The roadways discussed in the following sections are located in proximity to the proposed fuel truck routes and personnel transport routes as a result of the proposed action. Roadway condition and capacity are included in the descriptions where available.

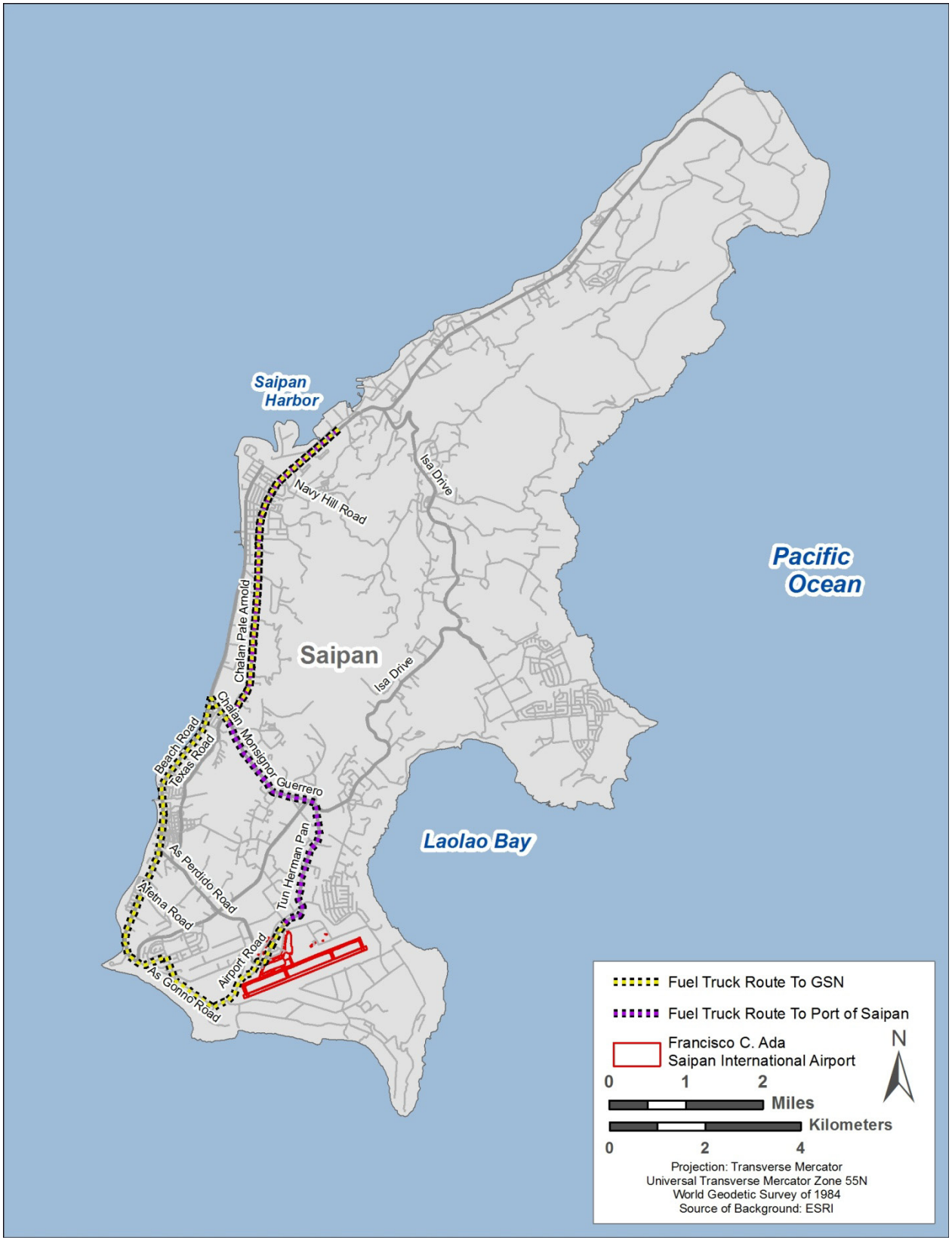
3.11.2 Existing Conditions

3.11.2.1 Alternative 1 – GSN (Preferred Alternative)

Saipan has the largest roadway network in the Mariana Islands with approximately 80 miles of roads on the Territorial Highway System (CNMI Department of Public Works [DPW]). A majority of Saipan roadways were paved during and shortly after World War II under U.S. Navy Administration auspices. Some of the roadway facilities have been widened or repaved since originally constructed (USDOI-OIA 1999).

Several major traffic generators are located in the vicinity of the proposed action including several schools and the Commonwealth Health Center. Key roadways identified on Saipan are shown in **Figure 3.11-1** and described in **Table 3.11-1**. Primary aspects of the existing conditions include traffic volume, level of service (LOS) and pavement condition. LOS is a term used to describe the traffic operations of a roadway. LOS is described using letter designations A through F, with A representing excellent traffic operations with little to no delay and F representing failing traffic operations with extensive delay. Most roadways in the vicinity of the proposed action operate at an acceptable LOS (LOS D or better) with the exception of Beach Road. Beach Road north of As Perdido Road operates at LOS E or F (CNMI DPW 2009).

Pavement conditions on Saipan tend to be poor as a result of drainage issues and the use of coral and acidic-based pavement materials. Chalan Pale Arnold was repaved and Chalan Monsignor Guerrero was widened to four lanes in the past 15 years (since the previous highway master plan was completed) (CNMI DPW 2009).



Source: HDR 2012

Figure 3.11-1. Existing Roadway Network – Saipan

Table 3.11-1. Year 2008 Existing Conditions: Key Saipan Roadways

Roadway	Cross-Section	Average Daily Traffic (ADT) Volume	Level of Service
Chalan Pale Arnold	4-Lane Undivided	23,180–31,350	C–D
Chalan Monsignor Guerrero	4-Lane Undivided	22,330–29,040	C
Beach Road	4-Lane Undivided/ 2-Lane Undivided south of Afetna Rd	20,860–39,890 12,690	D–F D
Airport Road	2-Lane Undivided	6,950	C
Tun Herman Pan	2-Lane Undivided	5,280	B
Isa Drive	2-Lane Undivided	7,530	D

Source: CNMI DPW 2009

The CNMI Comprehensive Highway Master Plan identified three signalized intersections in the vicinity of the proposed action as key intersections of concern, as shown in **Table 3.11-2**. All of these intersections currently operate at LOS D or better.

Table 3.11-2. Year 2008 Existing Conditions: Key Saipan Intersections

Intersection	Level of Service
Beach Road/Chalan Monsignor Guerrero	C
Chalan Pale Arnold/Navy Hill Road	D
Chalan Pale Arnold/Chalan Monsignor Guerrero	B

Source: CNMI DPW 2009

In addition to existing conditions, the CNMI Comprehensive Highway Master Plan includes projected average daily traffic (ADT) volumes and associated future traffic operations (assuming no improvements). **Table 3.11-3** shows the future conditions of key roadways on Saipan. Based on the predicted future LOS, the Comprehensive Highway Master Plan also provides improvement recommendations for several roadways.

Table 3.11-3. Year 2022 Future Conditions: Key Saipan Roadways

Roadway	ADT Volume	Level of Service	Master Plan Proposed Improvements
Chalan Pale Arnold	35,610–40,130	E–F	Intersection Improvements to 3 Intersections
Chalan Monsignor Guerrero	28,580–37,170	C–E	Intersection Improvements to 3 Intersections
Beach Road	26,700–51,060 16,240	E–F F	Install Two-Way Left-Turn Lane Intersection Improvements to 3 Intersections
Airport Road	8,900	D	No Improvements
Tun Herman Pan	9,680	C	Intersection Improvements at Flame Tree Drive Upgrade and Improve
Isa Drive	9,640	E	No Improvements

Source: CNMI DPW 2009

The three signalized intersections that were analyzed for existing conditions were also analyzed under future conditions in the CNMI Comprehensive Highway Master Plan. These intersections and corresponding levels of service are shown in **Table 3.11-4**. Chalan Pale Arnold/Navy Hill Road would fail under future conditions; however it would operate at LOS D if the improvements recommended in the CNMI Comprehensive Highway Master Plan are constructed. The other two intersections would operate with adequate capacity in the future.

Table 3.11-4. Year 2022 Future Conditions: Key Saipan Intersections

Intersection	Level of Service	Master Plan Proposed Improvements
Beach Road/Chalan Monsignor Guerrero	D	Signal Phase Modifications
Chalan Pale Arnold/Navy Hill Road	F	Signal Phase Modifications Northbound Right-Turn Lane Eastbound Dual Left-Turn Lanes Westbound Dual Left-Turn Lanes
Chalan Pale Arnold/Chalan Monsignor Guerrero	C	Signal Phase Modifications Realign Texas Road to Create 4th Leg Free Westbound Right-Turn Movement

Source: CNMI DPW 2009

3.11.2.2 Alternative 2 – TNI

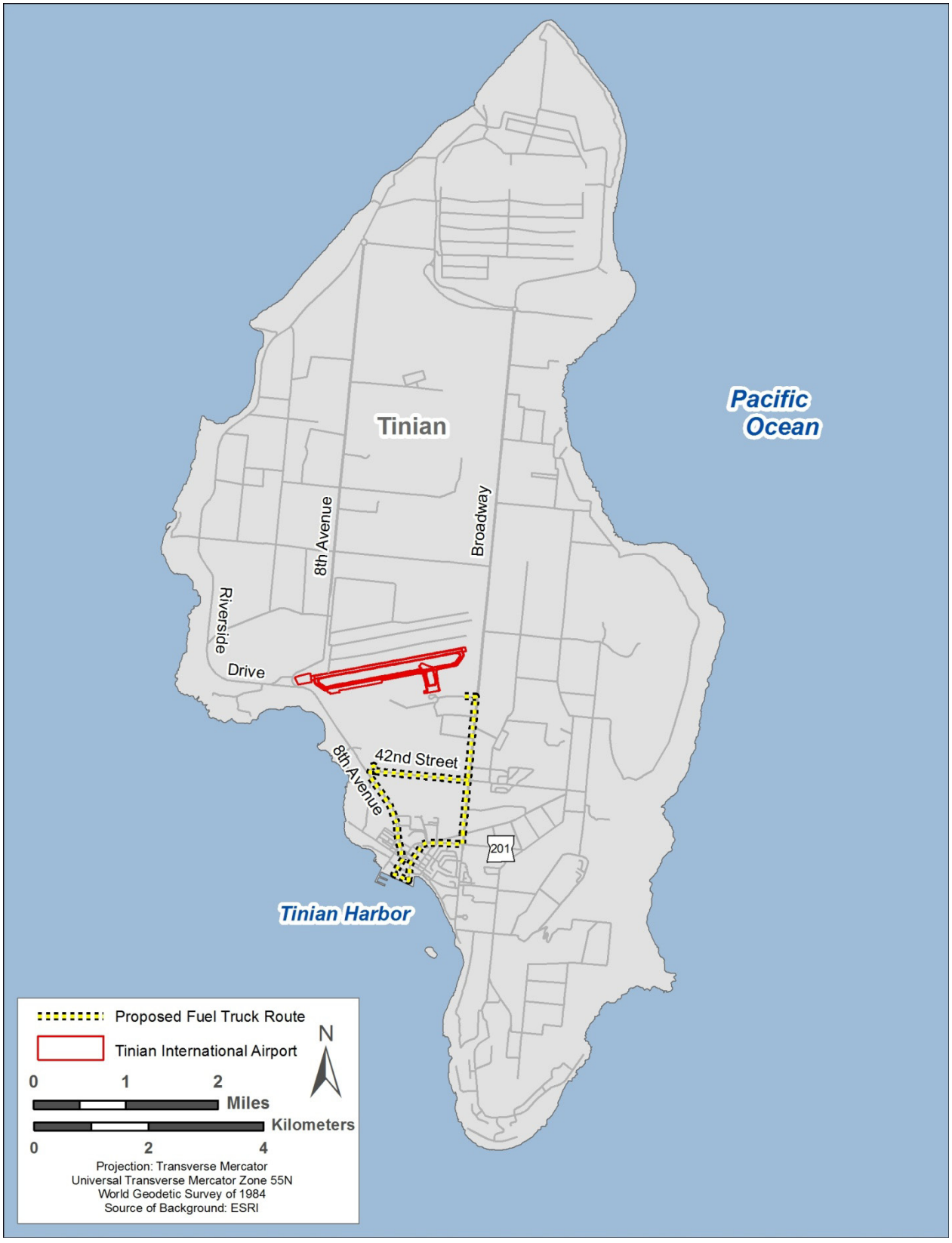
Tinian's roadway system consists of approximately 60 miles of two-lane undivided roadways on the Territorial Highway System (CNMI DPW undated). As with Saipan, a majority of Tinian roadways were paved during and shortly after World War II under U.S. Navy Administration (USDOI-OIA 1999). One major traffic generator located in the vicinity of the proposed action is the Tinian Health Centre. Key roadways identified on Tinian are described in **Table 3.11-5** and shown in **Figure 3.11-2**. **Table 3.11-5** includes ADT volumes and LOS. All of the roadways currently operate at LOS A. No intersections on Tinian were identified and analyzed in the CNMI Comprehensive Highway Master Plan. Similar to Saipan, the pavement conditions tend to be poor as a result of drainage issues and the use of coral and acidic-base pavement materials (CNMI DPW 2009).

Table 3.11-5. Year 2008 Existing Conditions: Key Tinian Roadways

Roadway	ADT Volume	Level of Service
Broadway Road	390–1,470	A
42nd Street	150	A
8th Avenue	180–300	A
Route 201	2,240	A

Source: CNMI DPW 2009

In addition to existing conditions, the CNMI Comprehensive Highway Master Plan includes projected ADT volumes and associated future traffic operations (assuming no improvements). **Table 3.11-6** shows the future conditions of key roadways on Tinian. Based on the predicted future LOS, the CNMI Comprehensive Highway Master Plan also provides improvement recommendations for several roadways; however no improvements were identified for the key roadways in the table below.



Source: HDR 2012

Figure 3.11-2. Existing Roadway Network – Tinian

Table 3.11-6. Year 2022 Future Conditions: Key Tinian Roadways

Roadway	ADT Volume	Level of Service
Broadway Road	500–1,880	A
42nd Street	190	A
8th Avenue	230–380	A
Route 201	2,870	A

Source: CNMI DPW 2009

3.12 Hazardous Materials and Wastes

3.12.1 Definition of Resource

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act (TSCA) Title 15 U.S.C. Chapter 53. USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR Part 763 with additional regulation concerning emissions (40 CFR Part 61). Whether from lead abatement or other activities, depending on the quantity or concentration, the disposal of the LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

AFPD 32-70, *Environmental Quality*, and the AFI 32-7000 series incorporate the requirements of all Federal regulations, and other AFIs and DOD Directives for the management of hazardous materials and hazardous wastes.

Evaluation of hazardous materials and wastes focuses on underground storage tanks (USTs); aboveground storage tanks (ASTs); and the storage, transport, handling, and use of pesticides, herbicides, fuels, solvents, oils, lubricants, ACMs, PCBs, and LBP. Evaluation might also extend to the generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project

site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of a release of hazardous materials or wastes, the extent of contamination varies based on the contaminant and the type of soil, topography, and water resources.

3.12.2 Existing Conditions

3.12.2.1 Alternative 1 – GSN (Preferred Alternative)

Hazardous Materials and Hazardous Wastes. As a full-service commercial and private airport, GSN uses, handles, and stores hazardous materials for day-to-day operations. Common hazardous materials at GSN include pesticides and herbicides (discussed separately in the *Pesticides* subsection), industrial and household cleaning products, hydraulic fluids, paints, solvents, and other hazardous materials. Hazardous materials are stored and managed by GSN personnel in accordance with applicable Federal and CNMI regulations.

GSN is a registered RCRA Small Quantity Generator (SQG) of hazardous wastes (USEPA Identification Number: TTR000128868). To qualify as an RCRA SQG, a facility must meet one of the following criteria: (1) generate between 100 kilograms (kg) and 1,000 kg of hazardous waste during any calendar month and accumulate less than 6,000 kg of hazardous waste at any time, or (2) generate no more than 100 kg of hazardous waste during any calendar month and accumulate no more than 1,000 kg of hazardous waste at any time. The hazardous wastes generated by GSN include universal wastes such as used batteries and fluorescent lamps, ignitable hazardous wastes, reactive hazardous wastes, cadmium, chromium, lead, mercury, endrin, methoxychlor, benzene, carbon tetrachloride, 1,2-dichloroethane, trichloroethylene, and vinyl chloride (EDR 2011b). These wastes are managed for safe handling and fire prevention under 40 CFR Part 264 and CNMI regulations. The CNMI DEQ Toxic Waste Management branch regulates the management of hazardous waste activities in the CNMI.

No hazardous materials or hazardous wastes are known to be stored within the Alternative 1 proposed areas.

Petroleum Products. Saipan is supplied with petroleum products that include jet fuel, gasoline, diesel, oils and lubricants, and other miscellaneous petroleum products. As discussed in **Section 3.13.2.1**, liquid fuel is delivered to the island in bulk quantities and stored in ASTs at the seaport on Saipan for dispensing throughout the island. The seaport on Saipan has two jet fuel and nine diesel and gasoline fuel ASTs (AFCEE/PACAF 2010). Petroleum products on Saipan are stored and managed in accordance with applicable Federal and CNMI regulations.

The most prominent petroleum product used at GSN is jet fuel, which is used to fuel aircraft. Jet fuel originates from Singapore and arrives on ocean-going tankers. The tankers berth at the seaport on Saipan, and jet fuel is transferred from the tankers to ASTs at the seaport through a 10-inch dedicated pipeline. Tankers make fuel deliveries approximately once per month and deliver a maximum of 10,000 bbls (420,000 gallons) of jet fuel per trip. The seaport has two jet fuel ASTs, each with 15,000 bbls (630,000 gallons) of capacity. Head-space requirements on the ASTs limit the maximum jet fuel storage capacity at the seaport to 24,000 bbls (1,008,000 gallons). Both ASTs are considered to be in good condition, and there is no record of any releases (AFCEE/PACAF 2010).

Jet fuel is transported from the seaport to GSN by two Mobil-operated bridger trucks. The bridger trucks are capable of transporting 9,000 and 10,000 gallons of jet fuel per trip, respectively, and can transport a maximum of 190,000 gallons per day assuming 24-hour operations (AFCEE/PACAF 2010). The distance

between the seaport and GSN is approximately 8 miles, and the route uses paved roadways through residential, industrial, and undeveloped portions of the island.

After arriving at GSN, the jet fuel is transferred from the bridger trucks into two 1,100-bbl (46,200-gallon) ASTs and one 2,800-bbl AST (117,600-gallon) at the Mobil-owned bulk fuel area to the north of GSN. An in-ground hydrant system dispenses the jet fuel from the ASTs to 13 hydrant outlets on the aircraft parking apron via a 10-inch pipeline. The hydrant system is capable of dispensing at a rate of 1,200 gallons per minute. The condition of the hydrant system is deteriorated as the pipeline between the ASTs and the hydrant outlets no longer has cathodic protection and there is no plan to restore this service (AFCEE/PACAF 2010). One release of jet fuel from the hydrant system was reported in 2001 and is further discussed in the *Existing Contamination Areas* subsection. GSN does not have any trucks capable of refueling or defueling aircraft (AFCEE/PACAF 2010).

While jet fuel is the most prominent petroleum product used at GSN, other petroleum products are used at GSN for aircraft maintenance and day-to-day operations. Oils and lubricants are used for aircraft and airport facility maintenance. Diesel and gasoline fuel are used for ground vehicles, such as trucks, cargo loaders, and push tractors. GSN maintains a 4,000-gallon AST, with compartments for gasoline and diesel, adjacent to the Continental cargo building. No underground pipelines are associated with this AST and no releases have been reported (Kretzers 2009).

All ASTs and USTs in the CNMI are managed by the CNMI DEQ, and the CNMI DEQ requires owners of ASTs and USTs to obtain a Permit to Install and Permit to Operate for each AST and UST. The CNMI DEQ published the latest AST regulations for the CNMI in the Commonwealth Register, Volume 27, Number 04, May 18, 2005, at pages 24139 through and including 24165: *Commonwealth of Northern Mariana Islands Aboveground Storage Tank Regulations* (CNMI DEQ 2005). The latest UST regulations for the CNMI are published in Northern Mariana Islands Administrative Code *Title 65: Division of Environmental Quality, Chapter 65-100 Underground Storage Tank Regulations* (CNMI DEQ 2004b).

Existing Contamination Areas. There are no known areas of environmental contamination at the Alternative 1 proposed areas. However, a review of historical aerial photographs indicates that World War II-era structures formerly were located throughout much of the area to be disturbed at GSN. The area at and surrounding GSN was used during World War II by both Japanese and American forces as a military airfield where aircraft servicing occurred. The World War II-era predates modern environmental regulations; therefore, there is the potential for improper onsite disposal of hazardous materials, hazardous wastes, and petroleum products during the former airfield operations. All of the Alternative 1 areas at GSN have the potential to have been impacted by former airfield operations.

Due to the history of Saipan during the Pacific Theater of World War II, there is the potential for unexploded ordnance (UXO) to be present at the Alternative 1 areas. UXO is most likely to be discovered in heavily vegetated areas that have not been developed since World War II. While the presence of UXO has not been confirmed and is unlikely, the possibility for its discovery at the Alternative 1 areas remains.

Several areas of known contamination have been identified in the vicinity of the Alternative 1 areas. A summary of these sites is included as follows:

- In June 2000, approximately 26 55-gallon drums were discovered during land clearing on a CPA-owned parcel just south of Continental Drive. The parcel is legally known as Lot 028 K 11 Parcel "B." Subsequent investigations of the discovered drums determined that all but one of these drums was filled with soil, partially buried, and rusting. The remaining drum was one-third full of waste oil. One drum was labeled "U.S. Army" suggesting that it dates from World War II.

A preliminary site inspection indicated the presence of contaminants in the soil at levels greater than USEPA reporting limits. The parcel currently is listed as a Brownfields property and is considered an area for uncontrolled dumping of municipal wastes, tires, construction debris, bottles, and cars. World War II-era UXO contamination is a possibility due to the suspected age of some materials deposited on the property (CNMI DEQ 2010b, CNMI DEQ undated). There is no record of remedial action being conducted at the property. The proposed Alternative 1 bulk fuel storage area is approximately 200 feet to the north of this property.

- On 1 January 2001, a pipe flange within a surge suppression vault on an underground jet fuel line between the main and commuter terminals failed, resulting in a release of 7,418 gallons of jet fuel. Of this quantity, 5,873 gallons were not recovered and impacted soil. A soil vapor extraction system was installed to remediate subsurface soil contamination, and groundwater sampling has been occurring on a periodic basis to ensure that contaminants have not impacted groundwater. Remedial action for this release remains ongoing (MOMAR 2001 and CNMI DEQ 2010b). The proposed western aircraft parking apron and ramp is the nearest component of Alternative 1 to this release site at a distance of approximately 300 feet.

- An inspection of GSN property during 2005 identified seven Areas of Concern (AOCs) with the potential for environmental contamination. These AOCs included the CPA Incinerator Area, CPA Operational Maintenance Facility, Freedom Air Maintenance Facility, Pacific Island Aviation Maintenance Facility, Continental Airlines Maintenance Facility, Continental Cargo Facility, and the Former Fuel Storage and Dispensing Facility. A total of 50 surface and subsurface soil samples were taken from these AOCs and analyzed for petroleum hydrocarbons and heavy metals. All seven AOCs were found with some form of soil contamination greater than CMNI DEQ Clean-up Goals. No areas of soil contamination were found below 48 inches of ground surface, and while groundwater sampling was not conducted, impacts on groundwater were determined unlikely. Excavation of contaminated soil and bioremediation was recommended for each of the seven AOCs; however, there is no record of these actions ever taking place (CPA 2006).

- The "Isley Field Commonwealth Utilities Corporation Power Plant #3" property was used formerly as an electrical power generation facility, but after operations ceased, the property was used for the storage of waste oils and discarded electrical transformers, some containing PCBs. A December 2010 Site Investigation of the property identified several hundred 55-gallon drums, some containing waste oils, as being on the property. The Site Investigation recommended the removal and proper disposal of these materials, which equated to approximately 2,500 gallons of oily wastewater, 950 gallons of total petroleum hydrocarbons (TPH) sludge, 8 yds^3 of TPH contaminated soil in 55-gallon drums, and less than 4 cubic feet (ft^3) each of paint chips, oil pads, and oily metallic debris on the property. No groundwater contamination was identified, but the Site Investigation recommended the excavation of several areas of contaminated soil. It is not known if these remedial actions have been completed (Kretzers 2009). The proposed Alternative 1 bulk fuel storage area is approximately 50 feet to the east of Power Plant #3.

- The Puerto Rico Dump is an approximately 20-acre, unlined, inactive landfill adjacent to Tanapag Harbor and immediately to the south of the seaport on Saipan. The landfill received military, industrial, and domestic solid wastes between the World War II-era and 2003. The dump became inactive in 2003 after a new sanitary landfill opened; however, the dump has not yet received official closure. Groundwater and soil contamination have been identified at the Puerto Rico Dump and some contamination has entered the marine environment of Tanapag Harbor (NOAA 2007). The proposed Alternative 1 seaport bulk fuel storage area is approximately 200 feet east of the Puerto Rico Dump.

Asbestos-Containing Material. Asbestos is regulated by the USEPA under the CAA; TSCA; and CERCLA. The USEPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM.

There are no known ACMs at the Alternative 1 proposed areas. These areas do not contain structures; therefore, ACMs in standing buildings would not be present. However, the potential exists for ACMs in the soils of the Alternative 1 areas at GSN. As noted in the *Existing Contamination Areas* subsection, review of historical aerial photographs indicates that World War II-era structures formerly were located throughout much of the Alternative 1 areas at GSN. As such, there is the potential for asbestos to be present in abandoned utility lines and demolition debris buried in surface or near-surface soil. There is no record of soil investigations to determine the presence of buried ACMs at GSN being conducted.

Lead-Based Paint. Federal agencies are required to comply with applicable Federal, CNMI, and local laws relating to LBP activities and hazards.

There is no known LBP at the Alternative 1 project areas. These areas do not contain structures; therefore, LBP in standing buildings would not be present. However, because of the former presence of World War II-era structures at the Alternative 1 areas at GSN, the potential exists for finding buried debris containing LBP and lead-contaminated soils. There is no record of soil investigations to determine the presence of buried debris containing LBP or lead-contaminated soils at GSN being conducted.

Polychlorinated Biphenyls. PCBs are a group of chemical mixtures used as insulators in electrical equipment. Chemicals classified as PCBs were widely manufactured and used in the United States throughout the 1950s and 1960s. PCBs can be present in products and materials produced before the 1979 ban. Common products that might contain PCBs include electrical equipment (e.g., transformers and capacitors), hydraulic systems, and fluorescent light ballasts.

Some electrical equipment (e.g., electrical transformers) at the Alternative 1 areas might contain PCBs. However, because the Alternative 1 areas do not contain buildings, the number of equipment possibly containing PCBs is limited. There is no known PCB contamination at GSN or the seaport.

Pesticides. Pesticides in CNMI are managed under *Title 65: Division of Environmental Quality, Chapter 65-70: Pesticide Regulations* of the Northern Mariana Islands Administrative Code. The CNMI DEQ issues permits for the application of pesticides and controls the importation of pesticides to the island (CNMI DEQ 2004c). Pesticides are assumed to be applied at GSN and the seaport on a regular basis to control noxious weeds and other nuisance species. It is assumed that all pesticide applications are conducted in accordance with manufacturer specifications and CNMI regulations. There are no areas of known pesticide contamination at GSN or the seaport.

Radon. Radon is a naturally occurring radioactive gas found in soils and rocks. It comes from the natural breakdown or decay of uranium. Radon has a tendency to accumulate in enclosed spaces that are usually below ground and poorly ventilated (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. In general, the risk of lung cancer increases as the level of radon and length of exposure increase.

The USEPA has established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences; however, standards have not been established for commercial structures. Radon gas accumulation greater than 4 pCi/L is considered to represent a health risk to occupants. The USEPA has not established formal radon designations on Saipan. There are no records of radon testing being conducted at the existing buildings at GSN or the seaport.

3.12.2.2 Alternative 2 – TNI

Hazardous Materials and Hazardous Wastes. Much like GSN, TNI uses, handles, and stores hazardous materials for day-to-day airport operations; however, due to the limited aircraft maintenance and repair capabilities available to TNI, the amounts of these hazardous materials are limited. Common hazardous materials at TNI include pesticides and herbicides (discussed separately in the *Pesticides* subsection), industrial and household cleaning products, hydraulic fluids, paints, solvents, and other hazardous materials. Hazardous materials are stored and managed by TNI personnel in accordance with applicable Federal and CNMI regulations.

The use of hazardous materials generates various quantities of hazardous wastes. TNI is not identified as a RCRA hazardous waste generator or handler implying that the quantities of hazardous wastes generated are minimal and less than reporting requirements (EDR 2011a). Hazardous wastes generated at TNI are managed for safe handling and fire prevention under 40 CFR Part 264 and CNMI regulations. The CNMI DEQ Toxic Waste Management branch regulates the management of hazardous waste activities in the CNMI.

No hazardous materials or hazardous wastes are known to be stored within the Alternative 2 areas.

Petroleum Products. Tinian is supplied with petroleum products that include gasoline and diesel fuel, oils and lubricants, and other miscellaneous petroleum products. Diesel and gasoline are delivered to Tinian monthly on shallow-draft barges that originate from Guam. Liquid fuels are offloaded via one 4-inch pipeline into two ASTs at the seaport at Tinian. One of these ASTs is dedicated to diesel and has capacity for 12,000 bbl (500,000 gallons); the other AST is dedicated to gasoline and has capacity for 1,500 bbl (63,000 gallons). Diesel and gasoline fuel are used at TNI for ground vehicles, such as trucks, cargo loaders, and push tractors; however, diesel and gasoline are not delivered or stored at TNI. The nearest commercial source of diesel or gasoline to TNI is approximately 3 miles distance on Broadway Street (PACAF undated a).

Jet fuel is not available on Tinian. The only aviation fuel available to TNI is 100 Low Lead Aviation Gasoline, which is for piston-engine aircraft. The 100 Low Lead Aviation Gasoline is delivered from Saipan via Isotanks. TNI exchanges one empty Isotank at the seaport when a full tank arrives (AFCEE/PACAF 2010).

TNI also uses oils and lubricants for aircraft maintenance and day-to-day operations. However, because the airport has limited aircraft maintenance and repair capabilities, the amount of these products are limited.

Existing Contamination Areas. There are no known areas of environmental contamination at the Alternative 2 areas. However, much of the area at and surrounding TNI was used during World War II by both Japanese and American forces as a military airfield where aircraft servicing occurred. The World War II-era predates modern environmental regulations; therefore, there is the potential for improper onsite disposal of hazardous materials, hazardous wastes, and petroleum products during the former airfield operations. The Alternative 2 areas at TNI have the potential to have been impacted by former airfield operations.

Due to the history of Tinian during the Pacific Theater of World War II, there is the potential for UXO to be present at the Alternative 2 areas. UXO is most likely to be discovered in heavily vegetated areas that have not been developed since World War II. While the presence of UXO has not been confirmed and is unlikely, the possibility exists for its discovery at the Alternative 2 areas.

A Defense Environmental Restoration Program for Formerly Used Defense Sites site, known as the "Tinian Asphalt Drum Dump Site" at Puntan Diaplo, has been identified at the western end of Tinian's runway. Few details regarding the extent of possible contamination at this dumpsite are available; however, this site is believed to have resulted from military activities during the World War II-era. The proposed Hot Cargo and Arm/Disarm Pad is the nearest component of Alternative 2 to the site at more than 2,000 feet distance (U.S Army Engineer 1994).

Asbestos-Containing Materials. There are no known ACMs at the Alternative 2 areas. These areas presently do not contain structures; therefore, ACMs in standing buildings would not be present. However, the potential exists for ACMs in the soils of the Alternative 2 areas at TNI due to former development and use of TNI during the World War II-era. There is the potential for asbestos to be present in abandoned utility lines and demolition debris buried in surface or near-surface soil. There is no record of soil investigations to determine the presence of buried ACMs at TNI being conducted.

Lead-Based Paint. There is no known LBP at the Alternative 2 areas. These areas do not contain structures; therefore, LBP in standing buildings would not be present. However, because of the former development and use of TNI during the World War II-era, the potential exists for finding buried debris containing LBP and lead-contaminated soils. There is no record of soil investigations to determine the presence of buried debris containing LBP or lead-contaminated soils at TNI being conducted.

Polychlorinated Biphenyls. Some electrical equipment (e.g., electrical transformers) at the Alternative 2 areas might contain PCBs. However, because the Alternative 2 areas do not contain buildings, the number of equipment possibly containing PCBs is limited. There is no known PCB contamination at TNI or the seaport.

Pesticides. Pesticides are assumed to be applied at TNI and the seaport on a regular basis to control noxious weeds and other nuisance species. It is assumed that all pesticide applications are conducted in accordance with manufacturer specifications and CNMI regulations. There are no areas of known pesticide contamination at TNI or the seaport.

Radon. The USEPA has not established formal radon designations on Tinian. There are no records of radon testing being conducted at the existing buildings at TNI or the seaport.

3.13 Infrastructure and Utilities

3.13.1 Definition of Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity for expansion are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include airfield, port, utilities, and solid waste management.

The airfield includes all pavements, runways, taxiways, overruns, aprons, hazardous cargo pads, arm/disarm pads, navigational aids, hangars, and facilities and equipment that are associated with aircraft maintenance and aircraft operations. Utilities include electrical supply, central heating and cooling, liquid fuel supply, natural gas supply, water supply, sanitary sewer and wastewater systems, storm water drainage, and communications systems. Solid waste management primarily relates to the availability of systems and landfills to support a population's residential, commercial, and industrial needs. The

infrastructure information contained in this section provides a brief overview of each infrastructure component and comments on its existing general condition.

3.13.2 Existing Conditions

3.13.2.1 Alternative 1 – GSN (Preferred Alternative)

Airfield. GSN has two FAA-compliant runways, Runway 07/25, which is 8,700 feet long, 150 feet wide and has 25-foot shoulders; and Runway 06/24 which is only 100 feet wide, is controlled via NOTAM and is restricted to aircraft B-737 and below. Runway 07/25 has paved blast pads and 1,000-foot nonpaved overruns at each end of the runway, but does not have an arm/disarm pad or hazardous cargo pad. The runway is designed to accommodate aircraft up the size and dimensions of a 747. The lighting along the runway consists of a medium intensity approach lighting system with runway alignment indicator lights, distance remaining markers, runway end identifier lights, 12 precision approach path indicator systems, a middle marker, a non-directional beacon, a glidescope, a localizer, and edge lights (AFCEE/PACAF 2010).

GSN has eight taxiways located at various locations throughout the airfield. The taxiways are 70 feet wide with 35-foot wide shoulders. The 34.4-acre parking apron has a commercial hydrant fueling system and parking capacity for six 747 aircraft. The concrete portion of the parking apron is adjacent to the main terminal building. The asphalt portion of the parking apron is adjacent to the cargo handling area and does not have adequate width for most large frame aircraft. There is no maintenance facility or aircraft hangar available to support PACAF divert landings, joint military exercises, and humanitarian assistance and disaster relief efforts. Current conditions cannot support the flight line operations of 12 KC-135s (AFCEE/PACAF 2010).

Aircraft operations at GSN between March 2010 and March 2011 consisted of 32,442 air taxi flights, 4,942 air carrier flights, 7,799 international flights, 208 local flights, and 555 military operations. There are about 126 airport operations every day, only about 1.2 percent of which are military-related (FAA 2012b).

Port. The Port of Saipan features 2,600 linear feet of berthing space, a 22-acre container yard, and an underground fuel line protected by concrete. The channel, turning basin, and berthing area have all been expanded to 40 feet deep in order to receive deep draft vessels. The tanker schedule is currently on an approximate 1-month schedule but out-of-cycle deliveries can be requested as needed. The typical Jet A1 resupply load is between 378,000 and 420,000 gallons (AFCEE/PACAF 2010). The seaport has two loading racks; one is dedicated to loading ground product and the other is dedicated to loading Jet A1 fuel to transfer trucks. The storage tanks at the seaport are addressed in the *Liquid Fuel Supply* subsection.

The location of the proposed seaport bulk fuel site is currently a vacant lot with a few shipping containers on federally leased land adjacent to the existing fuel storage area.

Electrical Supply. Saipan has a maximum electrical power capacity of 57 megawatts (MW), a peak load of 45 MW, and a base load of 39 MW (CNMI undated). For the past several years, Saipan's annual electrical power production has remained below 300,000 Megawatt Hours (MWh). The majority of this production was for general residential and light commercial consumption. The daily load is generally consistent throughout the year with approximate lows of 30 MW and highs of 45 MW. The GSN uses about 1 MW of electricity per day (CNMI 2011).

Saipan is powered by diesel generators from three power plants near the central port of Tanapag. One of the plants is operated under a power purchase agreement with the private company Pacific Marine

Industrial Corporation (PMIC). The other two are operated by the Commonwealth Utilities Corporation (CUC). The two power plants operated by the CUC are in the same location and together make up the central power plant. The central power plant generators are in poor condition with two of them decommissioned and several others were undergoing rehabilitation and overhauls as of July 2011 (CNMI 2011).

Most commercial power on the island is provided via a 13.8-kVA multiple feeder distribution system with a single 34.5-kVA transmission link between the central power plant and the Kiya Substation. Some commercial sites use onsite generation instead of purchasing power. The electrical distribution system is underutilized and the Kiya Substation has an electrical capacity more than double its current load of approximately 16 MW. However, a more expansive high-voltage transmission backbone would be needed to tap into this potential for certain locations of the island. A considerable amount of energy is required to pump and treat potable water, and to collect, pump, and treat wastewater on Saipan (CNMI 2011).

GSN's electricity is supplied by the Kiya Substation, which has ample capacity but limited feeder distribution (CNMI 2011). The Port of Saipan has sufficient electrical capacity for the few operations that occur there.

Central Cooling and Heating. The GSN has its own separate cooling system. There are no central cooling or heating systems at the Alternative 1 areas (CNMI undated).

Natural Gas Supply. There is currently no natural gas infrastructure on the island (CNMI undated).

Liquid Fuel Supply. Currently, GSN has limited capacity for the receipt, storage, and distribution of aviation fuel. The existing Mobil A1 fuel storage capacity of the airport includes two 94,000-gallon fixed roof ASTs and one 117,600-gallon fixed roof AST. Until all the ASTs have been inspected, upgraded, and repaired, as necessary, one AST will be out of service at a time. No timeline has been provided for when all ASTs will be simultaneously in operation. All aviation fuel is issued using a hydrant system, but currently there is no capability for defueling an aircraft. The hydrant system consists of two 600-gpm pumps that issue fuel to 13 hydrants via a 10-inch pipeline. The aviation fuel is issued via three commercial HSVs (AFCEE/PACAF 2010).

At the Port of Saipan, fuel tankers offload A1 jet fuel via an aboveground 10-inch dedicated pipeline. The Jet A1 fuel storage capacity consists of two 630,000-gallon Mobil-owned ASTs with fixed roofs. However, each AST has a "safe fill" level of 504,000 gallons limiting the actual combined storage capacity to 1,008,000 gallons. The ASTs are in good condition and have recently passed API 653 inspection. Both ASTs can be in use simultaneously during high-consumption periods. Jet A1 fuel is delivered to the airport via two locally owned, Mobil-operated, Bridger trucks (one 9,000 gallons and one 10,000 gallons). It has been estimated that the maximum transfer rate between the Port of Saipan and GSN is 190,000 gallons every 20 hours (AFCEE/PACAF 2010).

There is potential to improve the infrastructure at the Port of Saipan. Joint Logistics over the Shore (JLOTS) operations and training currently take place at unimproved ports around the world, including the Port of Saipan (CNMI 2009).

Current vulnerabilities and inadequacies of the existing Mobil fueling system at the airport and seaport include the following (AFCEE/PACAF 2010):

- Inadequate aviation fuel supply and storage capability on Saipan
- Aviation fuel hydrant pumping rate at GSN is insufficient for high-volume tanker requirements

- The cathodic system has been disabled for years and as a result, the condition of the hydrant system at GSN remains unknown
- No fuel trucks are capable of refueling or defueling aircraft at GSN
- If both seaport Jet A1 fuel storage tanks were subjected to Quality Control hold for aviation fuel testing, re-supply to airport operational storage tanks would cease.

Water Supply. Potable water on Saipan is from groundwater sources (wells), with the exception of one small catchment system near GSN (CNMI 2011). Groundwater is pumped and distributed by the CUC (USGS 2003). There are about 140 groundwater wells on Saipan, which produce approximately 90 percent of the island's water supply (USGS 2003). The groundwater pumps typically operate at maximum capacity 24 hours per day; however, many parts of the water supply system lack 24-hour supply and residents do not have a continuous potable water supply (USGS 2003, CNMI Department of Commerce 2009, DON 2010a). The existing water supply system on Saipan produces approximately 10 million gallons per day; however, the CUC estimates that approximately 50 percent of the potable water supply in the CNMI is lost due to leaks in the piping system (CNMI 2011). Additionally, due to high chloride concentrations, only about 1.5 million gallons per day meet USEPA drinking standards (CNMI Department of Commerce 2009).

Another factor contributing to water insecurity on Saipan is that all fresh groundwater originates as rain and the island has a distinct wet and dry season (USGS 2003). Water supply issues are intensified during the dry season and periods of drought (DON 2010a). Saipan gets approximately 80 inches of rainfall per year and 30 percent of precipitation is estimated to recharge the groundwater (USGS 2003).

The airport area has a combination of artesian wells and a catchment system that contribute to approximately 10 percent of the island's total water supply (AFCEE/PACAF 2010). The catchment system consists of three springs and one rainwater collector (DON 2010a). The proposed BEAR kit area is about 2,000 feet from the nearest existing water supply at the intersection of Flame Tree Road and Airport Access Road.

It is assumed that both capacity and quality of water at GSN are sufficient to support personnel under both the construction phase and the implementation phase of the Proposed Action.

Sanitary Sewer and Wastewater Treatment. The only provider of wastewater treatment on Saipan is the CUC. Wastewater treatment occurs at the Marpi Solid Waste Facility (MSWF), which also includes solid waste management and storm water control systems, and Sadog Tasi Wastewater Treatment Plant (CNMI 2011, CEEC 2006). The wastewater treatment system is highly deficient and the resulting leaks and runoff contribute to the degradation on Saipan's marine ecosystems, which is a major concern of the island's residents (CEEC 2006).

The 2009 Comprehensive Economic Development Strategic Plan for the U.S. Commonwealth of the Northern Mariana Islands highlighted that the existing wastewater and sewer systems need major rehabilitation and upgrades in order be USEPA compliant and achieve sufficiency (CNMI Department of Commerce 2009).

GSN is connected to the sewer main line at the intersection of Flam Tree Road and Airport Access Road; therefore, the Alternative 1 areas at the airport are close to existing wastewater lines.

Storm Water. Water pollution and coral reef degradation caused by storm water runoff and sewage operations is by far the most important environmental threat perceived by the residents of Saipan (CEEC 2006). A large lagoon (locally referred to as "Saipan Lagoon") that parallels virtually the entire

western coastline serves as a natural sink for mobilized pollutants during storm events. Saipan Lagoon actually consists of three smaller lagoons (i.e., Tanapag Lagoon, Garapan Lagoon, and Chalan Kanoa Lagoon). It receives storm water from numerous storm drains along its entire length and receives sewer outfall from the Sadog Tasi Wastewater Treatment Plant (CEEC 2006, USGS 2009a).

A study by Winzler and Kelly discussed the storm water drainage issues on Saipan. The study highlighted the negative influence of paved and developed areas on drainage discharges and the sensitive benthic environment. It also identified infiltration issues and mobilized pollutants over paved areas as major issues contributing to the complex storm water and degradation threats. Impervious surfaces and deforestation diminishes infiltration, evapotranspiration, and groundwater recharge, and increases runoff, which is generally discharged to the ocean and degrades the coral reefs. In addition, the limited available land due to development limits options for best management practices (BMPs). In order to properly address the existing drainage issues and resulting degradation threat, Saipan needs to implement a range of BMPs and low-impact development such as permeable and porous pavements to reduce storm water runoff (Allen and Kaspari undated).

The 2007 *CNMI DEQ's Round Table with Developers* discussed the deficiencies of the storm water management system. For example, many areas do not have adequate drainage systems (e.g., Mt. Carmel Church). In addition, many projects are not constructed according to the plans approved by the government agencies. An example of this includes improperly sloped parking lots that discharge runoff offsite instead of into an onsite drainage system approved by DEQ. The DEQ published a two-volume design manual with additional regulations in 2007 (CNMI DEQ 2007). New regulations included the following:

- A menu of BMPs instead of only ponding basins
- Location-specific storm water quality and quantity requirements
- 70% impervious cover limits for developments greater than 1 acre except for "infill" projects, which are project locations surrounded by existing development.

GSN is about 1,300 feet from the eastern coastline and 3,000 feet from the western coastline. It is relatively flat; however, storm water sheet flows to the south, west, and east. Localized flooding occurs in the developed portions of the airport, such as the terminal area, during heavy rainfalls (CPA 2002).

Storm water at the seaport area sheet flows to the coastline, except for the areas around the ASTs, which have secondary containment systems.

Because the Alternative 1 areas are undeveloped, they do not have any storm water management infrastructure; therefore, storm water in these areas follows the natural topography.

Communications. GSN's transmitters and receivers are sufficient for providing very high frequency and ultra high frequency capabilities to communicate between the control tower, radar control, and aircrafts. Saipan's air traffic control has one radio to support backup radio capabilities. GSN does not have an Air Traffic Control and Landing System (ATCALS). However, they do get ATCALS support from Guam (AFCEE/PACAF 2010).

Solid Waste. Solid waste processing on Saipan includes the MSWF, the Refuse Transfer Station, and eight recycling centers. Saipan uses private waste collectors for all waste collection (i.e., residential, commercial, and industrial). After the waste is collected, it is taken to either the Refuse Transfer Station or the landfill at the MSWF. As much of the waste as possible is recycled. At the Refuse Transfer Station there is an area for sorting, grinding, and storing green waste (i.e., vegetation). The transfer

facility is an 8,000-square-foot building with all utilities (i.e., water, sewer, power, and communications) where civilian and commercial vehicles can drop off solid waste. If recycled materials cannot be re-used, they can often be used for energy or liquid fuels production (CNMI 2011).

The MSWF was constructed in 2003 at the north end of the island in the Marpi depression after the Puerto Rico Dump was closed due to environmental concerns. The MSWF uses state-of-the-art waste reduction and diversion technologies and implements recycling programs, a new solid waste transfer station and materials recovery facility, and a new municipal solid waste landfill. In addition to non-recyclable materials, the landfill receives waste from the sewage treatment plant and the hospital (CNMI 2011).

Logistical information for the MSWF is sparse. In 2009, the input into the landfill was about 100 tons per day. The facility was expected to receive a total of 43,000 tons of materials (10,449 tons of which was expected to be diverted) in 2010 (CNMI 2011). **Table 3.13-1** shows the actual inventory of the materials diverted from the landfill in 2010.

Table 3.13-1. Diverted Materials in 2010

Item	Tons/Year
Backfill	7,600
Green Waste	1,671
Sewage Sludge	480
Cardboard	445
Tires	158
Paper	109
Metals	83
Mixed Recyclables	61
Total	**10,607**

Source: CNMI 2011

3.13.2.2 Alternative 2 – TNI

Airfield. The TNI airfield is currently designed to accommodate aircraft up to the size and dimensions of a 747. The existing runway (08/26) is 8,600 feet long, 150 feet wide, and has two 25-foot paved shoulders. It is grooved for flight safety and drainage purposes. Runway 08/26 has paved blast pads and a 1,000-foot nonpaved overrun at each end of the runway, but does not have an arm/disarm pad or hazardous cargo pad. The lighting along the runway consists of runway end identifier lights, a precision approach path indicator, medium-intensity runway edge lights, an instrument landing system, a rotating beacon, and distance remaining markers (AFCEE/PACAF 2010).

Taxiway A runs parallel to the runway and its centerline is 750 from the centerline of the runway. The taxiway is 70 feet wide and has a 30-foot shoulder. The parking apron is approximately 6 acres, has little capability to park large frame aircraft, and has no fuel hydrant system infrastructure (AFCEE/PACAF 2010).

TNI does not have a maintenance facility or aircraft hangar available to support PACAF divert landings, joint military exercises, and humanitarian assistance and disaster relief efforts. TNI is not as built up as GSN; therefore, it has a higher capability for infrastructure expansion.

Between January and February 2011, the average daily operational count at TNI was 74 (FAA 2011).

Port. The main wharf at the Tinian seaport is 2,200 feet long with depths between 25 and 29 feet. There are two piers (Pier 1 and Pier 2) on the southwest of the main wharf, both of which are in a state of disrepair. The main wharf is used to moor commercial barges operating between Tinian and Saipan and for hydrofoil ferry service for visitors from Saipan. No tugboats operate in Tinian Harbor.

The existing breakwater at the Port of Tinian is in very poor condition. As a result, the harbor is not properly protected from large swells and storm damage to dock facilities. The infrastructure is in such bad condition that a large storm could destroy the existing seawall and the harbor would have to be dredged repeatedly. Maintaining long-term and safe use of the harbor is dependent on repairing the seawall (CNMI Department of Commerce 2009).

The Tinian seaport receives, stores, and issues diesel and unleaded gasoline, but has no aviation fuel capacity. The seaport's storage tanks are discussed in the *Liquid Fuel Supply* subsection. The Golden Micronesian fuel barge offloads fuel products to the seaport via a 4-inch pipeline once a month. The seaport has one fuel truck loading rack for diesel and unleaded gasoline.

The location of the proposed seaport bulk fuel site is currently a vacant lot adjacent to the existing fuel storage area at the seaport.

Electrical Supply. The energy infrastructure at Tinian is capable of satisfying considerably more demand than the current base and peak loads with a maximum electrical capacity of around 20 MW. This is because the plant was built during a time of high resort development interest. The energy infrastructure is also in good condition and well-maintained. The power plant consists of five 4-MW Wartsilla diesel generators located just outside San Jose. Telesource owns and operates the power system on the island under a power purchase agreement contract (CNMI 2011). Tinian has a peak load of 5.2 MW and a base load of 4.7 MW. The current load is almost consistently between 4 and 5 MW year round (CNMI 2011, CNMI undated). The distribution is through four 13.4-kV feeders, one of which is dedicated solely to the U.S. Government International Broadcasting Bureau (IBB) (CNMI 2011). A more expansive electrical grid would be needed to tap into this potential for certain locations of the island (CNMI 2011).

The population of Tinian is only approximately 4,000 people and about 50 percent of its power consumption is from two customers: Tinian Dynasty Hotel & Casino and the IBB. The airport is a much smaller, yet still considerable consumer of power (CNMI 2011). A significant amount of energy is required to pump and treat potable water, and to collect, pump, and treat wastewater on Tinian (CNMI 2011).

The Joint Region Marianas Energy Conservation Instruction has set a goal to reduce energy consumption by 3 percent every year for a cumulative reduction of 30 percent by 2015. It also aims to increase renewable energy use and sustainable design in all new construction and major renovations (DON 2010a).

TNI is connected to the existing power system; however, it has a highly limited feeder distribution network (CNMI 2011). An electrical line runs on the east end of the airport property but does not extend to many of the Alternative 2 areas (AFCEE/PACAF 2010).

Central Heating and Cooling. TNI has its own separate cooling system. There are no central cooling or heating systems on the Alternative 2 areas.

Natural Gas Supply. There is no natural gas infrastructure on Tinian.

Liquid Fuel Supply. Currently, TNI has limited capacity for the receipt, storage, and distribution of aviation fuel. The airfield has no A1 jet fuel infrastructure. Current aviation fuel inadequacies of Tinian include (AFCEE/PACAF 2010):

- No capability for Jet A1 fuel supply or storage on Tinian
- No fuel hydrant system on the airfield
- No fuel trucks capable of servicing aircraft on Tinian
- No deepwater port capable of offloading ship to shore.

The Port of Tinian is currently in disrepair and has a limited capability to accept fuel shipments at the port. It can support limited cargo ships requiring less than 20 feet draft and the main wharf can support up to 4,500 tons of cargo per day (AFCEE/PACAF 2010, DON 2010a). Fuel storage at the seaport includes a 12,000-bbl (500,000-gallon) diesel AST and a 1,500-bbl (63,000-gallon) unleaded gasoline AST. The Mobil seaport has no aviation fuel storage capability (AFCEE/PACAF 2010).

Water Supply. Potable water on Tinian is primarily withdrawn from groundwater wells; however, some households use catchment basins (CNMI 2011, AFCEE/PACAF 2010). Most of the agricultural and domestic water supply originates in the Makpo wetland area and is collected in storage tanks at Makpo Heights and Carolinas Heights (DON 2010a).

Data on water supply, withdrawals, and consumption on Tinian is sparse. From 1945 to 1999 all municipal water was supplied by the Municipal Well (a 300-foot long horizontal trench). In 1999, two vertical wells (i.e., TH04 and TH06) were added to the system. By 2001, a new 400-foot long infiltration gallery replaced the Municipal Well in a nearby location. Pumps are generally operated 24 hours a day, except during maintenance and low demand in the rainy season. Withdrawals have fluctuated less than 10 percent throughout the years. The new infiltration gallery can supply about 875 gpm. Well TH06 produces approximately 60 gpm and well TH04 is capable of producing 50 gpm; however, they are generally only used to maintain pressure in the distribution system used during peak demand hours (Gingerich 2002). Based on the available withdrawal data, Tinian is capable of producing approximately 1,260,000 gallons of water per day. Due to the lack of considerable amounts of heavy water usage activities on Tinian, such as irrigation, ranching, aquaculture, and mining, it is assumed that the per capita usage of water is similar to the U.S. domestic water usage rate, which is 98 gallons per day per person (USGS 2009b). Based on the Tinian population of 3,136 people, the island is estimated to use approximately 307,328 gallons per day. The CUC estimates that approximately 50 percent of CNMI's potable water supply is lost as a result of leaks in the piping system (CNMI 2011). Given these assumptions, Tinian has a water supply surplus of approximately 322,672 gallons per day.

Sanitary Sewer and Wastewater Treatment. There is no wastewater processing facilities on Tinian (CNMI Department of Commerce 2009). Residents and businesses on Tinian, including TNI, use septic systems for wastewater treatment (CNMI 2011).

Storm Water. There is limited information on the storm water infrastructure on Tinian and at TNI. Most of the precipitation on Tinian either evaporates or percolates into the limestone substrata. During periods of intense rainfall, approximately 6 to12 percent of total rainfall becomes runoff that flows toward the low-lying coastal areas (Gingerich 2002). TNI is surrounded by pervious soil with vegetation. Most of the Alternative 2 areas, except a portion of the proposed runway extension, are currently vegetated.

Storm water at TNI handled by open drainage ditches and sheet flow overland to lower elevations. TNI is about 1,600 feet from the eastern coastline.

Storm water at the seaport area sheet flows to the coastline, except for the areas around the ASTs, which have secondary containment systems.

Because the Alternative 2 areas are primarily undeveloped, they do not have any storm water management infrastructure.

Communications. TNI has no ATCALS, instrument landing system, or air traffic control tower. TNI receives ATCALS support from the Guam tower and use their voice communications equipment for both air-to-ground and in- and outbound activities. TNI has one radio to support backup radio capabilities (AFCEE/PACAF 2010)

Solid Waste. The CNMI uses private waste collectors for all waste collection (i.e., residential, commercial, and industrial). There is only one recycling center on Tinian (CNMI 2011). Currently, all solid waste is collected and transported off the Island of Tinian using commercial solid waste haulers and commercial barges or ships.

On November 2006, the Mayor of Tinian declared a "state of disaster emergency" due to the failure to close Tinian's unsafe dumpsite (i.e., Tinian landfill). The municipality of Tinian has been warned by Commonwealth and Federal officials of the dangerous aboveground and belowground fires at Tinian landfill. These fires resulted in the accumulation of CO in the surrounding areas and the pollution of the popular Barcinas Bay destination. The landfill is located adjacent to the TNI runway and has hampered aircraft landings due to fires. The FAA has requested that the landfill be relocated away from the airport (CNMI House of Representatives 2007).

On 20 January 2010, the DEQ issued an administrative order to the CNMI DPW and the Mayor's Offices of Tinian for failure to comply with landfill operating requirements at the municipal dump. The DEQ stated that the office's "non-compliance posed a threat to human health and the environment." The municipal dump received violations for air quality regulations for the open burning of solid wastes. They also failed to cover the solid waste at the end of each operating day, control disease carriers, implement a waste exclusion plan to prevent receiving hazardous wastes and PCB wastes, have trained operators in the two dumps, and have control of public access to prevent unauthorized disposal within and outside the dump (Saipan Tribune 2010).

3.14 Socioeconomics and Environmental Justice

3.14.1 Definition of Resource

Socioeconomics. Socioeconomics is defined as the basic attributes and resources associated with the human environment. Two fundamental socioeconomic indicators, population and economic activity, are the primary focus of this analysis.

Population size and demographics identify the population levels and changes to population levels of a region. Demographics data might also identify a region's characteristics in terms of race, ethnicity, poverty status, and other broad indicators. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Data on employment might identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the "before" and "after" effects of any jobs created or lost as a result of a project. Data on industrial or commercial growth or growth in other sectors provide baseline

and trendline information about the economic health of a region. Changes in demographic and economic conditions are typically accompanied by changes in other community components, such as housing availability and the provision of public services, which are also discussed in this section. Sociocultural issues, such as land ownership, quality of life, and cultural identity, are also important indicators of the socioeconomic condition of a region.

The geographic area in which a majority of the socioeconomic effects of a proposed action and alternatives would occur is defined as the socioeconomic area of impact. The area of impact is considered a primary effect area because it receives direct and indirect economic benefits from a proposed action due to residency distribution of employees, commuting distances and times, and the location of businesses providing goods and services during construction and operation of the action, and their dependents. Other components include regional economic activity, population, housing, and public services.

Due to the small size of the CNMI, most anticipated socioeconomic impacts under the Proposed Action would likely affect CNMI as a whole. However, socioeconomic data are presented in this section at the island or municipality level (i.e., Saipan and Tinian) and, when available, for geographic subsets such as election districts and villages that are in the project area. Tourism is highlighted in this document as the industry most likely to be affected by the Proposed Action. Data have been collected from previously published documents issued by Federal, CNMI, and local agencies.

Environmental Justice. On February 11, 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued. EO 12898 also requires each Federal agency to identify and address whether their proposed action results in disproportionately high and adverse environmental and health impacts on low-income or minority populations. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. This EO also requires that each Federal agency conduct its programs, policies, and activities that substantially affect human health and the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participating in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

A Presidential memorandum accompanying EO 12898 states that existing Federal statutes should be used to evaluate environmental justice concerns. One of the referenced statutes is NEPA, and the memorandum highlights the importance of NEPA in addressing environmental hazards in minority and low-income communities. The memorandum states, "Each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321 et seq."

Consideration of environmental justice concerns includes the race, ethnicity, and poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the populations targeted for protection. In addition, the USAF has issued guidance (*Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process [EIAP]*) on environmental justice analysis in determining the environmental effect on populations in the vicinity of a proposed action (USAF 1997).

The environmental justice area of impact is the area within which potential impacts from a proposed action could occur. As defined by the CEQ, the environmental justice area of impact is considered to have disproportionately high percentage of minority or low-income residents if the percentage of persons characterized as being a minority or low-income within the area of impact is either greater than 50 percent, or is disproportionately higher than the community of comparison. CEQ also states, "A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds (CEQ 1997)." The community of comparison is the smallest jurisdiction for which U.S. Census data is collected that encompasses the footprint of impacts for all resource areas.

For purposes of this EIS, minority and low-income populations are defined as follows:

1. Minority Population: The CEQ defines minority populations as members of the following population groups: Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and multi-race that includes one of the aforementioned races; and Hispanic or Latino (CEQ 1997). The U.S. Census Bureau considers race and Hispanic or Latino origin (ethnicity) as two separate concepts and these data are recorded separately. However, the *Report on the 2005 CNMI Household, Income, and Expenditures Survey (HIES)* refers to ethnicity, not race, when characterizing CNMI populations (CNMI Department of Commerce, Central Statistics Division 2008). This report uses racial and ethnic categories to identify ethnicity of the CNMI population. Some of the single and combined ethnic categories identified are Chamorro, Carolinian, Pacific Islanders, Chinese, Filipino, Asian, Caucasians, and multiple ethnicities. There is no definition of minority populations that is specific to the CNMI. Therefore, for the purposes of the environmental justice analysis, the total minority population will include racial and ethnic minority populations as defined by and collected during the 2000 U.S. Census, the latest available. However, data from the *2005 CNMI HIES* will also be presented in this section to provide baseline conditions and supplement the 2000 U.S. Census data. 2010 U.S. Census data did not include demographic profile data for CNMI and only population counts were available. CNMI demographic profile data are anticipated in 2012 and will be incorporated into the EIS as they become available.
2. Low-income Population: Populations whose income is below the Federal poverty threshold according to 1999 income data collected in the 2000 U.S. Census. For the 2000 U.S. Census, the Federal poverty threshold for a family of four with two related children was $16,895 (U.S. Census Bureau 2010a). 2010 U.S. Census data did not include demographic profile data for CNMI and only population counts were available. CNMI demographic profile data are anticipated in 2012 and will be incorporated into the EIS as they become available.

For purposes of this analysis, the environmental justice areas of impact are the (pre-2007) election districts that encompass the Proposed Action activities at GSN, TNI, Saipan and Tinian Seaports, and the proposed fuel truck routes (Saipan Districts 10 and 11 and Tinian District 2), and the communities of comparison are the islands of Saipan and Tinian.

3.14.2 Existing Conditions

Alternative 1 – GSN (Preferred Alternative) and Alternative 2 – TNI

Overview. Following World War II, the Mariana Islands were administered by the United States as part of the United Nations Trust Territory of the Pacific. In the 1970s, the Mariana Islands decided to form closer ties with the United States. A Covenant Agreement to establish a CNMI in political union with the United States was approved in 1975 and took effect in 1976. In 1978, the CNMI became self-governing

when its first elected governor took office; however, the United States was responsible for CNMI's foreign affairs and defense. The Covenant Agreement was fully implemented in 1986 at which time legally qualified CNMI residents attained U.S. citizenship.

Terms of the Covenant Agreement allowed the CNMI to set its own immigration, labor, and wage laws, which played an important role in the CNMI's socioeconomic development and racial/ethnic composition. The CNMI took advantage of this economic autonomy and experienced a large increase in the private sector between 1980 and 2004 (McPhee & Associates and Conway 2009). Garment manufacturing and tourism emerged as leading industries in the CNMI economy due to its relationship with the United States, its proximity to cheap labor from Asian nations, its appeal as a tourist destination, and foreign investment from Asian countries (McPhee & Associates and Conway 2009). The success of these industries relied on favorable economic conditions created under the terms of the Covenant Agreement, which allowed for the hiring of foreign workers at low wages.

Foreign workers, primarily from China and the Philippines, were hired for difficult-to-fill positions in the garment manufacturing industry on Saipan and the tourism sector because there were an insufficient number of local workers to populate the workforce and support the growing economy (U.S. GAO 2000). These workers were exempt from U.S. visa and immigration regulations, and were paid less than the U.S. minimum wage. Therefore, manufacturers, particularly those in the garment industry, were able to sell "American-made" products duty-free and quota-free to the U.S. market using cheap foreign labor.

The importance of the garment manufacturing and tourism industries to the CNMI economy and the reliance of these industries on foreign workers were evident in economic and workforce statistics. In 1995, the garment manufacturing and tourism industries directly supported more than 50 percent of CNMI employment, and foreign workers made up more than 90 percent of the garment manufacturing industry and more than 70 percent of the tourism industry (McPhee & Associates and Conway 2009). According to *An Economic Study of the Commonwealth of the Northern Marianas Islands* prepared by the Northern Marianas College in 1999, these two industries produced approximately 96 percent of the CNMI's exports and generated 85 percent of the CNMI's total economic activity (U.S. GAO 2000).

While the large influx of foreign workers was needed to support the economy, it also changed the demographics of the CNMI. Between 1990 to 2000 during the peak years of the garment manufacturing and tourism industries, the annual population growth rate of the CNMI was among the highest in the world. The population growth rate slowed during the early 2000s, but still remained high (U.S. Census Bureau International Programs 2012). In 2003, the CNMI was the only Pacific island entity where foreign-born residents outnumbered indigenous residents by a ratio of nearly 2 to 1 (Bank of Hawaii and East-West Center 2003). As of January 2010, it was reported that there were 20,859 aliens (i.e., non-U.S. citizens) in the CNMI of which 99 percent were legally in the CNMI, and 16,304 were alien workers. More than 18,500 of these aliens had been in the CNMI more than 5 years (Secretary of the Interior 2010).

During the 2000s, several factors affected the CNMI economy contributing to the collapse of the garment manufacturing industry and to the decline of the tourism industry, which in turn affected the demographics. Following are some of the factors affecting the socioeconomic characteristics of the CNMI.

- *World Trade Organization (WTO) Agreement on Textiles and Clothing (ATC).* In 2005, as part of the WTO ATC, the United States lifted quotas for textile and apparel imports from other countries to conform to the General Agreement on Tariffs and Trade. The effect of this action exposed CNMI garment manufacturers to greater competition from previously restricted countries such as China and Vietnam that had lower labor costs. Without their quota free economic

advantage, garment manufacturers in the CNMI were unable to compete in the global marketplace and began shutting down. All garment manufacturers had closed by early 2009. The closure of the garment factories also affected the tourism industry because there was a large reduction in revenue for the CNMI government, which was previously spent on critical services, infrastructure, destination enhancement, and overseas tourist marketing (CNMI Department of Commerce 2009).

- *Federalization of the minimum wage.* The Fair Minimum Wage Act of 2007 (Title VIII of P.L. 110-28) as amended by P.L. 111-117 and P.L. 111-244 applied Federal minimum wage rates to the CNMI. According to the legislation, the CNMI minimum wage will increase $0.50 per hour each year on September 30 (except 2011, when no increase occurred) until it reaches the minimum wage generally applicable in the U.S ($7.25 as of February 2012). The first increase occurred in May 2007 when the CNMI minimum wage increased from $3.05 per hour to $3.55 per hour. As of February 2012, the minimum wage in the CNMI is $5.05 per hour and is scheduled to increase to $5.55 per hour on September 30, 2012. Based on responses to surveys conducted by the Government Accountability Office, minimum wage increases instituted through 2015 would affect more than 80 percent of workers at private sector employers that responded to the survey (U.S. GAO 2010), and increases through 2016 would affect 95 percent of tourism workers employed by questionnaire respondents (U.S. GAO 2011a). Direct effects from the minimum wage increases are difficult to determine due to the existence of other variables affecting the economy.

- *Federalization of immigration.* The Consolidated Natural Resources Act of 2008 (Title VII of P.L. 110-29) applied Federal immigration law to the CNMI in November 2009 with provisions affecting foreign visitors, temporary alien workers, and business investors. AOCs due to implementation of the Federal immigration law include the availability of foreign workers, status of existing foreign workers, and ease of entry for Chinese and Russian visitors and businesspeople that have to be paroled into the CNMI on a case-by-case basis (U.S. GAO 2011b). The latter is important because tourists and investors from China and Russia are important to the CNMI economy. Given the importance of foreign citizens to the CNMI labor market, tourism industry, and as investors, the long-term impact of the federalization of immigration on the CNMI economy is uncertain (U.S. GAO 2008).

- *Factors affecting tourism.* Tourism in the CNMI peaked in the mid-1990s and has been declining since that time. The decline began with the Asian financial crisis in the late 1990s, which abruptly decreased tourist arrivals (Bank of Hawaii and East-West Center 2003). Several other unexpected events, including the severe acute respiratory syndrome (SARS) epidemic; 9/11 terrorist attacks; war in Iraq; decisions by Korean Air Lines and Japan Air Lines to suspend flights to the CNMI; and the 2011 Japanese earthquake, tsunami, and ongoing nuclear disaster contributed to decreased visitor arrivals. Total visitor arrivals to the CNMI dropped from a peak of 726,690 in 1997 to 368,186 in 2010 (U.S. GAO 2011a).

In recent years the CNMI has been working to develop new industries and encourage foreign development. This has been difficult due to the instability of transportation, high cost of utilities, and the uncertainty of labor supply availability (CNMI Department of Commerce 2009). In January 2008, the CNMI Comprehensive Economic Development Strategic (CEDS) Planning Commission, a public-private organization, was appointed by the CNMI governor to improve the quality of life of CNMI residents through the growth and development of the economy and the promotion of investment in the CNMI. Within the resulting 2009 CEDS Plan, the CEDS Commission identified and prioritized approximately $500 million of projects to address infrastructure upgrades needed to improve quality of life and the economy, and to encourage the U.S. military's use of Tinian for training (CNMI Department of Commerce 2009). As of 2011, approximately 40 percent of the projects and needs listed in the 2009

CEDS Plan have been completed, funded, or were under construction. These projects include upgrades to water and wastewater systems, public school facilities, and CNMI broadband infrastructure; energy efficiency and renewable energy projects; and expansion of the CNMI road system.

As a supplement to the CEDS Plan, the CNMI conducted two Economic Restoration Summits (ERSs) in 2009 and 2011. The goal of the 2009 ERS was to solicit public input to identify several industries for development. Four industries (agriculture, aquaculture, educational tourism/eco-tourism, and call/data centers) were identified during the 2009 ERS (CNMI Department of Commerce 2011). While the 2009 ERS resulted in economic development recommendations, it failed to consider the fiscal constraints on the CNMI, and to provide examples of implementation measures used under economic conditions similar to the CNMI. A 2011 ERS was conducted to solicit feedback from experts in the targeted industries to assess the CNMI's opportunities and challenges associated with introducing and developing each industry. The 2011 ERS resulted in a general set of "next steps" required to introduce, grow, and make the targeted industries sustainable (CNMI Department of Commerce 2011).

The CNMI has also recognized the potential benefits to the CNMI economy and community from the military buildup in the region. The Military Integration Management Committee was established to guide the planning and policymaking for all activities related to the expansion of military training activities in the CNMI. The CNMI has identified the following three areas where it can provide goods and services to facilitate the military buildup:

- *Operational support:* Alternate aerial and surface port capabilities to support training and operations, maintenance infrastructure and services, and staging of prepositioned equipment and supply stocks).
- *Maintenance and supply support:* Logistics support including management, handling, and distribution of necessary supplies and services; subsistence items such as food and potable water; and human capital and other technical expertise.
- *Quality of life services:* Rest and relaxation infrastructure and services such Armed Forces Recreation Center and other Morale, Welfare, and Recreation activities; and use of the CNMI's natural resources such as weather, beaches, pristine scenes, recreational activities, and historic sites (CNMI 2009).

3.14.2.1 Socioeconomics

Population Characteristics. From 1973 through 2000, the population of the CNMI more than tripled from 14,333 to 69,221 people (see **Table 3.14-1**). The most drastic growth occurred from 1980 to 1990 when the population more than doubled and experienced an annual growth rate of 9.5 percent (CNMI Department of Commerce 2002). The primary reason for dramatic growth has been attributed to the in-migration of foreign nationals, primarily to Saipan, for employment and business opportunities (CNMI Department of Commerce, Central Statistics Division 2000). From 2000 to 2010, the CNMI population trend reversed and the populations of CNMI, Saipan, and Tinian decreased. The populations of CNMI and Saipan decreased approximately 22 percent, while the population of Tinian decreased 11 percent since 2000. In 2010, more than 95 percent of CNMI's population resided in Saipan and Tinian (89.5 percent in Saipan and 5.8 percent in Tinian) (U.S. Census Bureau 2010b). Population projections provided by the Secretariat of the Pacific Community show the CNMI population increasing through 2015 and 2020 (SPC-SDP 2011).

Table 3.14-1. Actual and Projected Population, 1973–2020

Geographic Area	1973	1980	1990	2000	2010	2015	2020
CNMI	14,333	16,780	43,345	69,221	53,883	66,591	70,276
Saipan	12,382	14,549	38,896	62,392	48,220	N/A	N/A
Tinian	714	866	2,118	3,540	3,136	N/A	N/A

Sources: CNMI Department of Commerce 2002, U.S. Census Bureau 2010b, SPC-SDP 2011
Note: N/A = Not applicable. Projected population data are not available for Saipan and Tinian.

Saipan is divided into 77 villages. GSN is within the village of I Fadang and the Saipan Seaport is within the village of Puerto Rico. In 2010, I Fadang and Puerto Rico had no residents (see **Table 3.14-2**). Tinian is divided into 8 villages; TNI is in the village of Western Tinian and the Tinian Seaport is in the village of San Jose. Western Tinian did not have any residents in 2010; however, San Jose has 1,939 residents, which is 61.8 percent of the Tinian population. **Table 3.14-2** presents the population of villages in the proposed project areas (i.e., proposed airports, seaports, and fuel truck routes). The proposed fuel truck route on Saipan traverses or is adjacent to 30 villages, which account for 71.1 percent of the island's population. The proposed fuel truck route on Tinian traverses or is adjacent to 4 villages within which 88.4 percent of Tinian's population resides (U.S. Census Bureau 2010c).

In 2005, the population of the CNMI was relatively young; the median age was 29.4 years old. The median age of the population of Saipan (29.2 years old) was similar to that of CNMI as whole, while Tinian's population was slightly older (median age 32.2 years old). It was estimated that persons under 18 years old accounted for approximately one-third of the populations of the CNMI, Saipan, and Tinian (37.4 percent, 37.4 percent, and 32.7 percent, respectively), while the populations over 65 years old was small accounting for 2.2 percent of the populations of the CNMI and Saipan and 3.0 percent of the Tinian population. Approximately 48 percent of the populations of the CNMI and Saipan, and 53 percent of the population of Tinian were estimated to be between 20 to 44 years old. This is primarily due to the large number of foreign workers in the CNMI (CNMI Department of Commerce, Central Statistics Division 2008).

Females outnumbered males in the CNMI and Saipan representing 53 percent and 54 percent, respectively, of the populations. However, female population on Tinian was estimated to be lower than the male population (47 percent female and 53 percent male) (CNMI Department of Commerce, Central Statistics Division 2008).

Table 3.14-3 shows the birthplace of residents of the CNMI, Saipan, and Tinian in 2005. More than half of the residents of the CNMI and Saipan were foreign born, while slightly less than half of Tinian residents were born outside the CNMI or the United States. Of foreign born residents, those born in the Philippines and China make up the largest percentages of the populations of the CNMI, Saipan, and Tinian (CNMI Department of Commerce, Central Statistics Division 2008).

Asians made up more than half of the populations of the CNMI (53 percent) and Saipan (54 percent), and slightly less than half of the population of Tinian (49 percent) of Tinian. Filipinos were the largest single ethnic group in the CNMI and Saipan at 30 percent and 31 percent of the populations, respectively. Chamorro was the largest single ethnic group on Tinian representing 44 percent of the population. Chamorro made up 23 percent of the CNMI population and 20 percent of Saipan population. Approximately 6 percent of the population of Saipan was Carolinians; there were no Carolinians on Tinian in 2005. Caucasians made up less than 2 percent of the populations of the CNMI, Saipan, and Tinian (CNMI Department of Commerce, Central Statistics Division 2008).

Table 3.14-2. Population Data for Villages in the Proposed Project Areas, 2010

Geographic Area	2010 Population	Percent of Population
Saipan	**48,220**	**100**
Airport and Seaport		
I Fadang	0	0.0
Puerto Rico	0	0.0
Along Fuel Truck Route		
Afetnas	1486	3.1
Agingan	308	0.6
American Memorial Park	0	0.0
As Gonna	157	0.3
As Lito	920	1.9
As Palacios	718	1.5
As Terlaje	282	0.6
Chalan Kanoa II	921	1.9
Chalan Kanoa IV	631	1.3
Chalan Kiya	1,062	2.2
Chalan Laulau	1,096	2.3
Chalan Piao	1,282	2.7
Chalan Rueda	257	0.5
China Town	1,274	2.6
Dagu	780	1.6
Dandan	3,280	6.8
Fananganan	1,201	2.5
Finasisu	2,451	5.1
Garapan	3,983	8.3
Gualo Rai	1,660	3.4
I Liyang	917	1.9
Kannat Tabla	874	1.8
Koblerville	2,493	5.2
Opyan	20	0.0 *
San Antonio	1,149	2.4
San Jose (Oleai)	954	2.0
San Vincente	2,091	4.3
Susupe	2,078	4.3
Tinian	**3,136**	**100**
Airport and Seaport		
San Jose	1,939	61.8
Western Tinian	0	0.0
Along Fuel Truck Route		
Eastern Tinian (Marpo Valley)	155	4.9
Marpo Heights	679	21.7

Source: U.S. Census Bureau 2010c

Note: * Due to rounding, percentages below 0.1 percent are shown as 0.0 percent.

Table 3.14-3. Residents by Birthplace, 2005

Total Population	Saipan	Tinian	CNMI
	60,608	**2,829**	**65,927**
Percent U.S. Born	***45.7%***	***54.2%***	***47.2%***
CNMI	42.0%	46.2%	43.1%
Elsewhere in the United States	3.8%	8.1%	4.2%
Percent Foreign Born	***54.3%***	***45.8%***	***52.8%***
Philippines	24.7%	27.0%	24.6%
China	16.0%	8.8%	15.1%
Korea	2.2%	1.4%	2.1%
Japan	1.6%	1.1%	1.6%
Other foreign	9.8%	7.5%	9.4%

Source: CNMI Department of Commerce, Central Statistics Division 2008

Housing. Approximately 80 percent of Saipan's 15,527 housing units were occupied in 2000, while 75 percent of Tinian's 1,055 housing units were occupied (see **Table 3.14-4**). Of the occupied housing units on Saipan and Tinian, most were occupied by renters (69.0 percent on Saipan and 64.7 percent on Tinian) (SPC-SDP 2011). By 2005, the number of occupied housing units on Saipan had increased by approximately 18 percent, but had decreased by 17 percent on Tinian (CNMI Department of Commerce, Central Statistics Division 2008). The percent of housing units occupied by renters in Saipan and Tinian remained generally unchanged from 2000 to 2005. However the median house value on Saipan and Tinian decreased more than 35 percent from 2000 to 2005, and the median rent on Saipan decreased 11 percent. Median rent on Tinian increased approximately 4 percent from 2000 to 2005. Renters on Saipan and Tinian paid approximately 19 percent and 16 percent, respectively, of their household income toward rent in 2000.

Economic Characteristics. Economic activity in the CNMI declined sharply in 2009 as real gross domestic product decreased 19.8 percent reflecting decreases in exports (by 40 percent) and in real consumer spending (by 12.8 percent) (Hamano 2011). Decreased exports are primarily attributed to the collapse of the garment manufacturing industry in 2009 and the decline in tourism. Tourism services were the CNMI's only significant export in 2009. From 2008 to 2009, the number of employed people decreased approximately 13 percent based on CNMI government tax data (U.S. GAO 2011a).

The most recent comprehensive economic data for the CNMI is from the *2005 CNMI HIES*. The labor forces in Saipan and Tinian were approximately 35,500 people and 1,960 people, respectively. The current unemployment rate in the CNMI has not been determined; however, in 2005, 8 percent of Saipan's labor force and 17 percent of Tinian's labor force was unemployed (CNMI Department of Commerce, Central Statistics Division 2008). Due to the economic downturn since 2005, it is likely that the current unemployment rates are higher.

Private sector workers represented approximately 86 percent of the labor force in Saipan and 74 percent in Tinian; a majority of the remaining workers were in the public sector working for some form of government (CNMI Department of Commerce, Central Statistics Division 2008).

Table 3.14-4. Housing Characteristics, 2000 and 2005

Housing Characteristic	Saipan		Tinian	
	2000	2005	2000	2005
Total Housing Units	15,527	N/A	1,055	N/A
Occupied Units	12,507	14,807	790	656
Vacant Units	3,020	N/A	265	N/A
Owner Occupied	3,878	4,309	279	216
Renter Occupied	8,629	10,498	511	440
Median Value of Owner Occupied Units	$161,200	$105,706	$162,200	$100,000
Median Contract Rent [a]	$310	$276	$288	$299
Median Gross Rent [b]	$372	N/A	$386	N/A
Median Gross Rent as Percentage of Household Income	18.9%	N/A	15.8%	N/A
Total Median Household Income	$22,555	N/A	$23,542	N/A
Owner Occupied	$37,056	N/A	$45,208	N/A
Renter Occupied	$18,399	N/A	$15,491	N/A

Source: SPC-SDP 2011, CNMI Department of Commerce, Central Statistics Division 2008

Notes:

a. Contract rent is the monthly cash rent agreed to, regardless of any furnishings, utilities, fees, meals, or services that might be included.

b. Gross rent is the amount of contract rent plus the estimated average monthly cost of utilities and fuels if these are paid for by the renter.

In 2005, the largest industry in Saipan and CNMI was manufacturing, which accounted for more than 30 percent of employment (see **Table 3.14-5**). Of the approximately 11,000 workers in the manufacturing industry, 93 percent worked for apparel manufacturers and all of these workers were on Saipan. The accommodation, food and drinking services industry (i.e., tourism) was the largest employer on Tinian employing 42.3 percent of workers, and the second largest employer on Saipan accounting for approximately 13 percent of workers. Public administration was the second largest employer on Tinian and the third largest employer on Saipan. The construction industry accounted for approximately 5 percent of the workforces of the CNMI, Saipan, and Tinian. Of the approximately 1,650 construction workers in the CNMI, 93 percent were not U.S. citizens (CNMI Department of Commerce, Central Statistics Division 2008).

According to the U.S. Census Bureau's 2009 County Business Patterns, Saipan businesses accounted for approximately 90 percent of paid employees and annual payroll in the CNMI (see **Table 3.14-6**). As of March 2009, the accommodation and food services and retail trade industries had the first and second highest number of paid employees and highest annual payroll in CNMI and Saipan. These two industries accounted for approximately 44 percent of paid employees in Saipan, and more than $52 million in annual payroll. Specific data regarding the number of paid employees and annual payroll by industry was not provided for Tinian (U.S. Census Bureau 2011).

Table 3.14-5. Overview of Employment by Industry, 2005

Employment Characteristics	Saipan	Tinian	CNMI
Persons 16 Years Old and Over	44,743	2,197	48,669
Persons 16 Years Old and Over in the Labor Force*	35,491	1,958	38,533
Employed Persons 16 Years Old and Over	31,109	1,602	33,622
Percent Employed Persons 16 years old and over (by industry)			
Agriculture, forestry, fishing, hunting, mining	1.3	0.9	1.3
Construction	4.8	4.8	4.9
Manufacturing	35.2	1.9	32.7
Wholesale trade	1.0	0.5	0.9
Retail trade	7.7	1.4	7.2
Transportation, communication, public utilities	2.8	1.4	2.7
Information	1.2	0.0	1.1
Finance, insurance, real estate, and rentals	2.4	3.9	2.4
Professional, scientific, management, administrative, and waste management	5.6	2.9	5.4
Educational, health, and social services	5.8	8.2	6.2
Arts, entertainment, and recreation	4.0	4.3	4.3
Accommodation, food and drinking services	13.1	42.3	14.5
Other services (except public administration)	7.1	10.6	7.2
Public administration	8.2	16.9	9.4

Sources: CNMI Department of Commerce, Central Statistics Division 2008

Note: * Labor force includes persons 16 years old and over that are defined as employed or unemployed civilians.

Table 3.14-6. Payroll Employment, 2009

	Saipan	Tinian	CNMI
Number of establishments	1,160	36	1,232
Number of paid employees *	9,205	735	10,188
Annual payroll	$119,469,000	$10,458,000	$131,407,000

Sources: U.S. Census Bureau 2011

Note: * During week of March 2009.

The CPA manages GSN, TNI, and the Saipan and Tinian seaports. In FY 2009, CPA employed 140 employees on Saipan and 28 employees on Tinian. CPA reported that in FY 2009, 418,296 people enplaned and 425,982 people deplaned in Saipan, while 24,220 people enplaned in Tinian and 21,226 people deplaned (CPA 2010). GSN also handles cargo and airmail; in 1999, approximately 42,800,000 pounds of cargo was enplaned and deplaned and 635,000 pounds of mail was enplaned

(CPA 2002). In FY 2009, the Saipan Seaport imported 316,883 revenue tons (RT)[2] and exported 21,997 RT, while the Tinian Seaport imported 7,566 RT and exported 2,291 RT (CPA 2010).

Tourism. After the closure of the last garment manufacturer in early 2009, tourism became the only major industry supporting the CNMI (CNMI Department of Commerce 2009).

Several airlines provide service to the CNMI through GSN. International flights are provided by Asiana Airlines, Delta Air Lines, and Fly Micronesia/Fly Guam from cities in Japan, Korea, Hong Kong, China, and Guam (CPA 2005). Domestic inter-island flights are provided by Cape Air (doing business as United Express), Freedom Air, and Star Marianas Air. Charter flights are provided by China Southern, Air China, Sichuan Airlines, and Shanghai Airlines (Rabago 2011, CPA 2005). There were 126 average aircraft operations per day at GSN for the 12-month period ending March 2011. Commercial flights represented 11 percent of these operations, while air taxi was 71 percent (AirNav.com 2012b).

Passenger traffic originating from or terminating at TNI consists of inter-island travel from Saipan, Rota, and Guam. Freedom Air is the only airline currently operating regularly scheduled flights to/from TNI; however, Star Marianas Air provides charter flights to/from TNI and GSN (CPA 2005). There was an average of 82 aircraft operations per day at TNI for the 12-month period ending March 2011. Ninety-five percent of these operations were air taxi (AirNav.com 2012a).

Visitor arrivals to the CNMI have been decreasing since their peak in the mid-1990s; visitor arrivals in the CNMI through the third quarter of 2010 were approximately 295,000 (see **Table 3.14-7**). Japanese tourists represent the largest segment of the tourist population, although the number of Japanese tourists has been decreasing in recent years. Visitors from Korea and China also make up a significant portion of arrivals to the CNMI accounting for approximately 40 percent of tourists (CNMI Department of Commerce 2010).

Table 3.14-7. CNMI Visitor Arrivals by Market, 2006–2010

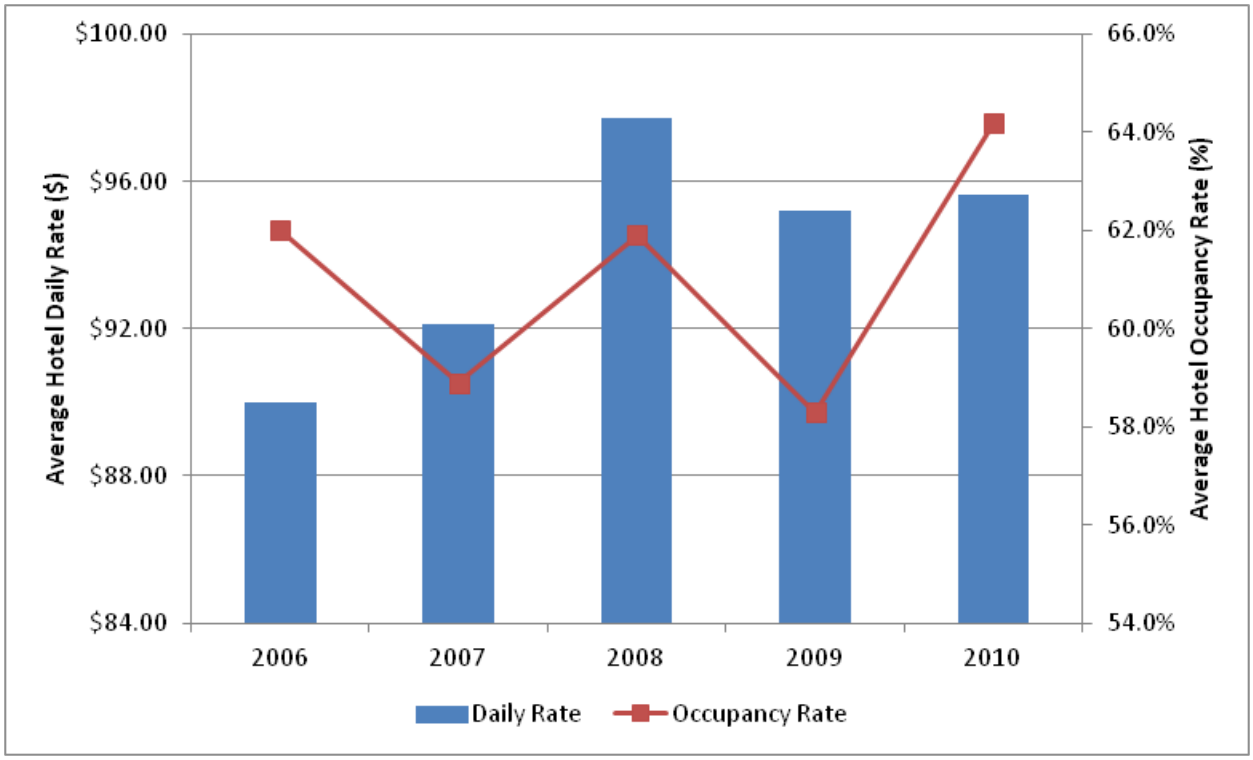
Geographic Area	2006	2007	2008	2009	2010 *
Total Visitors	435,494	389,261	397,271	353,956	294,556
Percent of Total Visitors by Market					
Japan	61.9%	51.4%	53.7%	54.0%	50.3%
Korea	19.0%	27.8%	28.0%	25.2%	29.3%
U.S. and Guam	7.4%	7.2%	7.8%	8.3%	6.9%
China/Hong Kong	8.8%	10.4%	6.8%	8.4%	11.1%
Philippines	1.0%	1.3%	0.4%	0.4%	0.2%
Russia	0.4%	0.9%	1.7%	1.8%	1.1%
Taiwan	0.1%	0.1%	0.1%	0.1%	0.1%
All other areas	1.4%	0.9%	1.5%	1.8%	1.1%

Source: CNMI Department of Commerce 2010, CNMI Department of Commerce 2006

Note: * Only includes visitor arrivals through 3rd quarter 2010 (January–September 2010).

[2] A revenue ton is a measurement on which shipments are freighted. If cargo is rated as weight or measure, whichever produces the higher revenue will be considered the revenue ton. Weights are based on metric tons and measures are based on cubic meters. Therefore 1 revenue ton = 1 metric tonne or 1 cubic meter.

The average CNMI hotel occupancy rate and hotel daily rate have varied over the past several years (see **Figure 3.14-1**). In 2010, CNMI hotels had an average occupancy rate of 64.2 percent and the average daily hotel rate was $95.65 (CNMI Department of Commerce 2010).



Source: CNMI Department of Commerce 2010

Figure 3.14-1. CNMI Average Hotel Daily Rate and Occupancy Rates, 2006–2010

Saipan is the capital, principal island, and major commercial center of the CNMI and, therefore, has more tourist opportunities than other islands in the CNMI. Tourist-related activities include outdoor/nature activities (hiking, golfing, and adventure tours), water sports (fishing, parasailing, snorkeling, and scuba diving) and touring cultural and historic sites. The Hotel Association of the Northern Mariana Islands (HANMI) represents 13 hotels on Saipan that have more than 2,500 guest rooms, although there are several other hotels and lodging options on Saipan (HANMI 2012). In 2002, Saipan had 3,692 hotel rooms (Bank of Hawaii and East-West Center 2003). Because GSN is the only airport in the CNMI that can accommodate international flights, it is accounts for most visitor arrivals to the CMNI. In 2001, 480,303 visitors entered Saipan, which accounted for 96.5 percent of all entries to the CNMI (CNMI Department of Commerce 2002).

The focus of tourism on Tinian has been the development of the gaming industry. Five casino licenses were approved for Tinian; however only one licensed full-scale casino is operating (Tinian Dynasty Hotel and Casino) (CNMI Department of Commerce 2011). In 2002, Tinian had 452 total hotel rooms and 440 of these rooms were at the Tinian Dynasty Hotel and Casino (Bank of Hawaii and East-West Center 2003). Other tourism-related activities include cultural and historic sites, and marine activities such as snorkeling, scuba diving, fishing, and beach going. In order to promote tourism, the runway at TNI was expanded to allow for direct flights from China; however, TNI does not currently have international flights (Shin 2007). In 2000, visitors conducted 60,045 day tours and 93,679 overnight stays on Tinian arriving by air (21,069 visitors) and ferry (123,145 visitors) (Tinian Department of Commerce, Statistics Section 2001).

While tourism is the major industry on Saipan and Tinian, other smaller industries exist. Saipan supports small-scale agriculture, an aquaculture operation, one small call center, and many retail businesses (CNMI Department of Commerce 2011). Other industries on Tinian include commercial agriculture consisting of small-scale vegetable and fruit cultivation that is marketed locally and shipped to Saipan, a few family-owned ranches, and retail establishments in the village of San Jose (NPS 2001).

Public Services. This section addresses health and human services and public safety as these are two public services most likely to be affected by the Proposed Action.

Health and Human Services. Health and medical services on Saipan are primarily provided by the Commonwealth Health Center (CHC), a 74-bed hospital that began operations in 1986. CHC can accommodate inpatient and outpatient medical/surgical services; emergency care; public health, mental health, and dental services; hemodialysis; other ancillary and diagnostic services; electrocardiography; ultrasound; and radiology and has a clinical laboratory (CDA undated). As of January 2012, CHC employed 27 physicians and 4 physicians' assistants (Deposa 2012). In 2011, the CHC experienced a shortage of nurses, and was placed under a state of emergency due to a severe cash shortage that threatened the disruption of the delivery of healthcare services (Deposa 2011a, Deposa 2011b). There are also several private health, dental, and optical clinics on Saipan.

Tinian Health Center, built in 1987, is the island's primary health care facility. The health center provides emergency services, treatment, two holding beds, delivery, laboratory, X-ray, pharmacy, dental, and public health services (USDOI-OIA 2008). In December 2011, Tinian Health Center, which accommodates approximately 50 patients per day, had no permanent doctor and was staffed by two rotating physicians and 15 nurses (Deposa 2011c).

Public Safety. The CNMI Department of Public Safety (DPS) consists of the Police, Fire, and Corrections Divisions; Bureau of Motor Vehicles; Office of Special Services; Criminal Investigation Bureau; Internal Affairs; Fiscal Affairs and Human Resources; and the General Support Bureau. The DPS Fire Division has five stations on Saipan.

The GSN ARFF department, which is managed by the CPA, has approximately 35 personnel and 9 firefighting vehicles and equipment. It runs two 24-hour shifts with 15 personnel assigned to each shift and an average of 8 personnel on duty per shift each day. A Fire Captain is in charge of each shift. Administration of the GSN ARFF department includes the Fire Chief, Assistant Fire Chief, Secretary, Training Officer, Training Coordinator, Fire Inspector/Logistics, ARFF Chief Mechanic, and ARFF Mechanic (CPA 2005). In addition, the Pacific Region ARFF Training Center is operated from GSN.

DPS has a 24-hour operations center and police, fire, traffic, criminal investigation, and motor vehicle sections on Tinian. The DPS facilities are in the village of San Jose and, as of late 2008, were staffed by 20 police officers, 12 firefighters, and 6 administrative support personnel (DON 2010b).

The TNI ARFF department has 2 firefighting vehicles and a staff of 10 personnel who have dual roles as ARFF personnel and Ports police officer. TNI ARFF operates on three 8-hour shifts with an average of two to three personnel on duty per shift each day. A Fire/Police Captain runs the daily operation for both law enforcement and ARFF protection (CPA 2005). TNI's firefighting capability can be made available to DPS in the event of a major emergency (DON 2010b).

The CNMI has correctional facilities on Saipan and Tinian. These facilities consist of a detention facility, jail, a women's unit, and a work release unit in Saipan and a police lockup in Tinian. These facilities are inadequate and are overcrowded (USDOI-OIA 2008).

Sociocultural Issues. A 45-day Public Scoping Period occurred from September 27 through November 10, 2011, and several public scoping meetings were conducted in the CNMI in October 2011 to present preliminary information on the Proposed Action and to identify potential issues of concern. Some concerns that were identified related to the socioeconomic impact of the Proposed Action beyond areas discussed in the above sections. This section describes some of these other issues such as land ownership, quality of life, and cultural identity.

The U.S. citizen population of the CNMI is primarily of Chamorro cultural descent, although Carolinians (e.g., Chuukese, Kosraeans, Pohnpeians, and Yapese) and immigrants from East Asia and Micronesia have also settled in the Mariana Islands. English is the official language of the CNMI, but Chamorro and Carolinian are the spoken native tongues. Spanish culture, which influenced the Chamorro culture for approximately 400 years, is still present today. Japanese is also spoken in some areas of the CNMI and is a reflection of the importance of Japanese to the tourism industry. Filipino and Chinese make up a large portion of the non-U.S. citizen population with some representation from other Asian countries (SPC-SDP 2011).

Chamorro life revolves around family and clans. Family loyalty is seen as important in both politics and business in the CNMI. One of the most distinctive aspects of family life in the CNMI is the fiesta, which is held for events such as births, baptisms, religious holidays, and weddings (Shin 2007).

Quality of life is a person's overall well-being. It is a difficult concept to measure, but standard indicators of quality of life include not only wealth and employment (i.e., standard of living), but also available infrastructure, environmental quality, personal safety/security, health, education, recreation and leisure opportunities, and social belonging. Quality of life includes many of the resource areas discussed in this EIS. Generally, it relates to the ability of Saipan and Tinian to adequately support the Proposed Action, including how the island's general tranquility, family and community relations, cultural identity, infrastructure, social services, and standards of living could be affected.

3.14.2.2 Environmental Justice

Table 3.14-8 presents race, ethnicity, and poverty status characteristics collected in the 2000 U.S. Census, the latest for which information is available, for Saipan, Tinian, Saipan Districts 10 and 11, Tinian District 2, and the CNMI. Native Hawaiian and Other Pacific Islanders made up 34.8 percent of Saipan's population and 41.7 percent of Tinian's population. Within Saipan District 10 and Tinian District 2, Native Hawaiian and Other Pacific Islanders made up slightly more than half of the population (50.6 percent and 52.0 percent, respectively). Native Hawaiian and Other Pacific Islanders made up 24.0 percent of the population of Saipan District 11. Among people reporting to be Native Hawaiian and Other Pacific Islander alone and identifying one specific ethnic group, more than 50 percent identified themselves as Chamorro. Those reporting to be Asian made up more than 50 percent of the populations of Saipan, Saipan District 11, and the CNMI. Filipinos and Chinese were the largest ethnic groups within the Asian population (U.S. Census Bureau 2000b).

As described in **Section 3.14.2.1**, the CNMI has a complex and dynamic ethnic history due to the influences of many cultures throughout its past history and the in-migration of many foreign workers in recent history. Based on the Federal definition of a minority, most of the CNMI population would be considered a minority. There is no regional or CNMI-specific definition of a minority; therefore the Federal definition is used in this analysis.

Table 3.14-8. Race, Ethnicity, and Poverty Status Characteristics, 2000

Demographic	Saipan	Saipan District 10	Saipan District 11	Tinian	Tinian District 2	CNMI
Total Population	62,392	15,845	14,999	3,540	1,063	69,221
Native Hawaiian and Other Pacific Islander	21,697	8,015	3,598	1,477	553	25,127
Carolinian	12.2%	8.3%	14.1%	0.2%	0.0%	10.6%
Chamorro	53.7%	60.1%	53.9%	89.4%	89.0%	58.7%
Chuukese	6.4%	5.4%	7.3%	0.3%	0.2%	5.5%
Kosraean	0.2%	0.4%	0.1%	0.0%	0.0%	0.2%
Marshallese	0.5%	0.3%	0.5%	0.0%	0.0%	0.4%
Palauan	7.6%	6.7%	7.9%	0.4%	0.9%	6.7%
Pohnpeian	2.8%	3.5%	1.5%	0.3%	0.4%	2.5%
Yapese	0.9%	0.8%	0.2%	0.8%	0.9%	0.8%
Other Pacific Islander	2.3%	2.0%	1.3%	0.3%	0.9%	2.0%
None or Two Native Hawaiian and Other Pacific Islander Groups Selected	13.4%	12.4%	13.2%	8.3%	7.8%	12.4%
Asian	36,309	6,308	10,324	1,593	390	38,953
Bangladeshi	1.9%	1.0%	2.1%	5.6%	4.6%	2.2%
Chinese	41.4%	25.6%	42.9%	16.0%	6.9%	39.3%
Filipino	44.8%	62.2%	43.0%	60.8%	78.2%	46.6%
Japanese	2.5%	1.9%	4.3%	1.1%	2.6%	2.4%
Korean	5.4%	6.9%	4.7%	4.4%	6.7%	5.2%
Nepalese	0.5%	0.4%	0.8%	8.1%	0.0%	0.8%
Other Asian	2.7%	1.1%	1.4%	2.9%	0.5%	2.6%
None or Two Asian Groups Selected	0.9%	1.0%	0.8%	1.1%	0.5%	0.9%
White	1,150	328	374	73	16	1,274
Black or African American	35	12	4	4	1	43
Other Ethnic Origin or Race	450	103	149	33	1	491
Two Ethnic Origins or Races	2,751	1,079	550	360	102	3,333
Families Below Poverty Level	31.2%	30.5%	25.6%	28.0%	22.2%	30.6%

Source: U.S. Census Bureau 2000b

Data from the Commonwealth of the Northern Mariana Islands Summary File collected during the 2000 U.S. Census and from the *2005 CNMI HIES* was used to identify minority and low-income populations within the Proposed Action areas of impact, which are the (pre-2007) election districts that encompass the Proposed Action (i.e., GSN, TNI, Saipan and Tinian Seaports, and fuel truck routes) in Saipan (Districts 10 and 11) and Tinian (District 2). Election district data for Tinian are not presented in the *2005 CNMI HIES*; therefore, only 2000 U.S. Census data are used to determine if the minority and low-income populations of District 2 are disproportionately higher than that of Tinian.

In order to determine whether each election district contains a disproportionately high percentage of minority or low-income residents, these districts are compared to the islands of Saipan and Tinian, which are the communities of comparison, using the methodology described in **Section 3.14.1**.

Based on 2000 U.S. Census data, Saipan Districts 10 and 11 had lower percentages of minorities than Saipan. Data from the *2005 CNMI HIES* indicate that District 10 had a higher minority percentage than Saipan and District 11 had a lower minority percentage. All differences (higher or lower) between the districts' minority percentages and those of Saipan were less than 1 percent. However, regardless whether data from the 2000 U.S. Census or the *2005 CNMI HIES* were used, Saipan Districts 10 and 11 both had minority percentages higher than 50 percent. The low-income population of District 10 was lower than that of Saipan when using 2000 U.S. Census and *2005 CNMI HIES* data. District 11 had a higher percentage of low-income residents when compared to Saipan when using *2005 CNMI HIES* data, but not when using 2000 U.S. Census data. Tinian District 2 had a higher percentage of minorities than Tinian, but a lower percentage of low-income residents. **Table 3.14-9** presents the data used in determining if minority and low-income populations within the Proposed Action areas of impact (Saipan Districts 10 and 11, and Tinian District 2) were higher than that of the areas of comparison (Saipan and Tinian).

Table 3.14-9. Determination of Disproportionate Minority and Low-Income Populations, 2000 and 2005

Demographic	2000			2005			Disproportionate Minority Population	Disproportionate Low-Income Population
	Total Population	Percent Minority [a]	Percent Low-Income [b]	Total Population	Percent Minority [a]	Percent Low-Income [c]		
CNMI	69,221	98.2	30.6	65,927	98.3	47.3	--	--
Saipan	62,392	98.2	31.2	60,608	98.3	48.4	--	--
Tinian	3,540	97.9	28.0	2,829	99.1	35.0	--	--
Pre-2007 Election Districts in Proposed Project Area								
Election District 10 (Saipan)	15,845	97.9	30.5	18,662	98.9	46.2	Yes	No
Election District 11 (Saipan)	14,999	97.5	25.6	13,646	97.7	54.6	Yes	Yes
Election District 2 (Tinian)	1,063	98.5	22.2	N/A	N/A	N/A	Yes	No

Sources: CNMI Department of Commerce, Central Statistics Division 2008, U.S. Census Bureau 2000c

Notes:

N/A= Not applicable

a. Within **Table 3.14-9**, the definition of "minority" is Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and multi-race that includes one of the aforementioned races; and Hispanic or Latino as defined by the CEQ (CEQ 1997).

b. Percent low-income for 2000 is defined as families below the 1999 poverty.

c. Percent low-income for 2005 is defined as families below the 2004 poverty.

3.15 Human Health and Safety

3.15.1 Definition of Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses workers' and the public's health and safety during facility demolition and construction activities and subsequent operation of the newly constructed facilities.

The Occupational Safety and Health Administration (OSHA) developed standards to promote a safe working environment. These standards establish general environmental controls, including personal protective equipment (PPE), wherever necessary because of hazards, processes, or the environment. Exposure limits for noise, ionizing and nonionizing radiation, and toxic and hazardous substances have been established; and requirements for handling and storing compressed gases and flammable liquids.

Contractor safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and USAF regulations designed to comply with standards issued by the OSHA and the USEPA. These standards specify the amount and type of training required for industrial workers, the use of PPE and clothing, engineering controls, and maximum exposure limits for workplace stressors.

Safety and accident hazards can often be identified, and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the location of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of extremely noisy environments. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns. Refer to **Sections 3.1** and **4.1** for information regarding noise.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFPD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

UFC 3-260-01, *Airfield and Heliport Planning and Design*, provides standardized airfield, heliport, and airspace criteria for the layout, design, and construction of runways, helipads, taxiways, aprons, and related permanent facilities. It details dimensional and geometric layout criteria for safety standards for airfields, landing zones, heliports and helipads, related permanent facilities, and the navigational airspace surrounding such facilities. USAF installations on a municipal airport or FAA-controlled airfields must apply FAA criteria to facilities such as runways and taxiways that are jointly used by civilian and military aircraft. However, facilities that are for military use only need only comply with USAF/DOD criteria.

An RSA is a defined surface surrounding a runway that enhances the safety of and reduces the risk of damage to airplanes in the event of an undershoot (i.e., aircraft landing short of the runway), an overshoot (i.e., aircraft landing on the runway but not able to stop on the runway), or an excursion from the runway (i.e., aircraft moving off the runway to the right or left). RSAs also provide accessibility for firefighting

and rescue equipment responding to such incidents. The requirement to ensure that all certificated airports have RSAs compliant with 14 CFR 139 was brought about by aircraft accidents that resulted in passenger and crew fatalities or injuries and property damage.

Threat to human safety and the potential for damage to aircraft prompted the FAA to require all airfields handling commercial aircraft with 30 or more passenger seats to address wildlife hazards if a real or potential wildlife problem is present. The FAA is responsible for setting and enforcing Federal Aviation Regulations (FARs) and policies to ensure commercial aviation safety. FAR Part 139.337 requires certificated airports to conduct a WHA to identify and quantify wildlife hazards to aviation safety.

Explosive safety clearance zones must be established around facilities used for the storage, handling, or maintenance of munitions. AFMAN 91-201, which implements AFPD 91-2 and DOD Manual 6055.9-M, establishes the size of the clearance zone based upon QD criteria or the category and weight of the explosives contained within the facility. Areas that require QD safety zones include munitions facilities, firing ranges, and FAA restricted areas.

3.15.2 Existing Conditions

3.15.2.1 Alternative 1 – GSN (Preferred Alternative)

Contractor Health and Safety. All contractors performing activities are responsible for following ground safety regulations and workers compensation programs and are required to conduct those activities in a manner that does not pose an undue risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of PPE, and availability of Material Safety Data Sheets (MSDSs). Industrial hygiene is the responsibility of the contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemicals (e.g., asbestos, lead, hazardous materials), physical hazards (e.g., noise propagation, falls), and biological agents (e.g., infectious waste, wildlife, poisonous plants); to recommend and evaluate controls (e.g., prevention, administrative, engineering) to ensure personnel are property protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures.

Military Health and Safety. Military personnel do not currently operate at GSN, except for occasional emergency divert landings.

Public Health and Safety. GSN has a 24-hour Aircraft Rescue and Fire Fighting unit. It includes approximately 35 personnel and 9 pieces of firefighting apparatus (CPA 2012c).

Airfield Safety. The RSA for the runway at GSN is an area 500 feet wide centered on the runway centerline and extending 1,000 feet beyond each runway end (CPA 2002). Refer to **Section 3.3** for information on aircraft operations at GSN.

The WHA prepared in August 2008 recommended that GSN develop and implement a Wildlife Hazard Management Plan (WHMP) to reduce aviation safety hazards (CPA 2008). The WHMP for GSN outlines applicable wildlife control measures. Refer to **Section 3.6** for additional information regarding the WHA and BASH statistics at GSN.

Explosive Safety. Currently, there are no munitions facilities, firing ranges, or FAA restricted areas at GSN or the seaport.

3.15.2.2 Alternative 2 – TNI

Contractor Health and Safety. The existing conditions for contractors at Tinian are identical to that at Saipan.

Military Health and Safety. Military personnel do not currently operate at TNI.

Public Health and Safety. TNI has an Aircraft Rescue and Fire Fighting unit that includes approximately 10 personnel working three 8-hour shifts. The unit has two pieces of firefighting apparatus (CPA 2012c).

Airfield Safety. The RSA for the runway at TNI is an area 500 feet wide centered on the runway centerline and extending 1,000 feet beyond each runway end (CPA 2012d). Refer to **Section 3.3** for information on aircraft operations at TNI.

The WHA prepared for TNI recommended the development and implementation of a WHMP to reduce aviation safety hazards (CPA undated). The WHMP for TNI outlines applicable wildlife control measures. Refer to **Section 3.6** for additional information regarding the WHA and BASH statistics at TNI.

Explosive Safety. Currently, there are no munitions facilities, firing ranges, or FAA restricted areas at TNI or the seaport.

4. Environmental Consequences

4.1 Noise

The noise analysis contained in the EIS is based upon readily available background information and data that were current at the time of the analysis. Refinement of the noise analysis is an ongoing process and will be finalized based on comments and further analysis. Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to high noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors exposed to high noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to high noise levels or ultimately increase the ambient sound level).

Noise annoyance is defined by USEPA as any negative subjective reaction to noise by an individual or group. DNL is an accepted metric for quantifying community annoyance to general environment noise, including aircraft noise. **Table 4.1-1** presents the percentages of people that would be projected to be "highly annoyed" when exposed to various levels of noise measured in DNL. This table presents the results of more than a dozen studies of the relationship between noise and annoyance levels. This relationship was suggested in 1977 by the National Academy of Sciences and was recently reevaluated for use in describing people's reaction to semicontinuous (transportation) noise (Finegold et al. 1994). The data shown provide a perspective on the level of annoyance that might be anticipated.

Table 4.1-1. Percentage of Population Highly Annoyed by Noise Zones

DNL Noise Contours	Percentage of Persons Highly Annoyed	
	Low	High
65–69 dBA	12	22
70–74 dBA	22	36
75–79 dBA	36	54
80+ dBA	> 54	

Source: Finegold et al. 1994

4.1.1 Alternative 1 – GSN

4.1.1.1 Construction Phase

Short-term, direct, minor, adverse impacts on the noise environment would be expected from construction activities associated with Alternative 1. Impacts associated with construction noise under Alternative 1 would result from the projects identified in **Table-2.3-1** and would be constructed at different times and locations over 24 to 36 months. Individual equipment used for construction activities would be expected to result in noise levels comparable to those shown in **Table 3.1-3**. New temporary sources of noise would be imposed by construction activities at the specific selected construction sites and the vehicle traffic on public roads associated with the mobilization/demobilization of construction equipment, delivery of construction materials, and the daily transport of construction workers to and from the construction sites.

Noise from construction activities varies depending on the type of equipment being used, the area that the action would occur in, and the distance from the noise source. Individual equipment used for construction activities would be expected to result in noise levels comparable to those shown in **Table 3.1-3.** To predict how these activities would impact adjacent populations or other nearby sensitive noise receptors, noise levels from the probable equipment was estimated. For example, as shown in **Table 3.1-3**, construction usually involves several pieces of equipment (e.g., bulldozers and trucks) that can be used simultaneously. Under Alternative 1, the cumulative noise from the equipment during the busiest day was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected cumulative construction noise during daytime hours at specified distances are shown in **Table 4.1-2**. These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source of the noise.

Table 4.1-2. Estimated Noise Levels from Construction Activities

Distance from Noise Source	Estimated Noise Level
50 feet	90–94 dBA
100 feet	84–88 dBA
150 feet	81–85 dBA
200 feet	78–82 dBA
400 feet	72–76 dBA
800 feet	66–70 dBA
1,200 feet	< 64 dBA

Source: HDR

The majority of the projects under Alternative 1 would occur on or adjacent to GSN property. The closest residences to the construction sites are approximately 150 feet north of the proposed BEAR kit site. As shown in **Table 4.1-2**, at this distance, noise levels from construction equipment would be approximately 81 to 85 dBA. The Bulk Fuel Storage site is approximately 700 feet from these same residences; they would experience noise levels of about 67 to 71 dBA at this distance under Alternative 1. In addition to the projects at GSN, two fuel tanks would be constructed at the Port of Saipan. Most of the property around this site consists of industrial land use. The closest noise-sensitive receptors are residences, approximately 300 feet away. At this distance, noise levels from construction equipment would be approximately 75 to 79 dBA.

Given the extent of the projects associated with the Proposed Action and the proximity to residents, short-term, direct, minor, adverse impacts from construction noise under Alternative 1 would be expected. Noise generation would last only for the duration of construction activities and could be minimized through measures such as the restriction of these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), and the use of equipment exhaust mufflers. It is not anticipated that the short-term increase in noise levels resulting from construction activities associated with Alternative 1 would cause significant adverse impacts on the surrounding populations.

Construction-related traffic that would add to existing traffic noise levels is calculated and shown in **Section 4.11.1.1** to be 840 additional trips per day. As a rule of thumb, doubling the noise source, in this case the number of vehicles, would result in a 3 dBA increase in the existing noise level. This increase over the ADT volume shown in **Table 3.11-1** in **Section 3.11.2.1** for any of the roadways anticipated to be primarily used represents only a fractional increase in terms of noise generation. There are numerous

noise-sensitive receptors adjacent to the roadways that construction traffic would travel on including schools (such as the Northern Marianas College), recreational facilities (such as the Saipan Country Club), and residences. Noise levels from construction trucks generally range between 83 to 94 dBA, 50 feet from the source. However, these levels would be temporary, occurring several times a day during work hours. Therefore, the impacts from construction traffic are not anticipated to be significant.

4.1.1.2 Implementation Phase

Aircraft operations under Alternative 1 were analyzed with three noise-level scenarios: low, medium, and high. The analysis for Alternative 1 (Low, Medium, and High Scenarios) is based on Runway Option A. Under this option, military aircraft would use the proposed runway extension when departing. The current runway is 8,700 feet long; under Alternative 1 it would be extended to 10,075 feet. Military aircraft would use the proposed runway extension when departing. Since the aircraft that currently use GSN do not require the additional runway length to depart, they would likely depart from the existing runway end.

Under the Proposed Action, joint U.S. and foreign military cargo, tanker, and other multi-engine aircraft could use the improved facilities and infrastructure. Since the type of aircraft and the mix of aircraft are not likely to be the same during every exercise, several scenarios were analyzed to determine different levels of impacts. Several aircraft were chosen to model the noise analysis. The KC-135 aircraft was chosen because it is the design aircraft for the Proposed Action and 2 types of fighter aircraft were chosen because they dominate the noise environment. The Low Scenario was modeled with 12 KC-135 aircraft; the Medium Scenario with 6 KC-135, 8 F-16, and 4 F-22 aircraft; and the High Scenario was modeled with 12 F-16 and 12 F-22 aircraft. The following sections describe the results under each scenario.

Aircraft Operations

Alternative 1–Low Scenario. Periodic, direct, minor, adverse impacts on the noise environment would be expected from the Alternative 1–Low Scenario. Impacts would be periodic and short-term because they would only occur during planned joint military exercises or other unit-level exercises for a maximum of 8 weeks per year. To model the Alternative 1–Low Scenario, the current aircraft operations under the Baseline Scenario were increased by 15 percent, as shown on **Table 4.1-3**. This reflects the expected increase in aircraft operations from the airfield improvements under the Proposed Action. The percent of operations between 10 p.m. and 7 a.m. and the flight tracks did not change as compared to baseline conditions. In addition to the aircraft that were modeled under the Baseline Scenario, the Low Scenario includes operations with the KC-135 aircraft. As discussed in **Section 2.3.1**, under Alternative 1, GSN would be able to accommodate up to 12 KC-135 aircraft. To model an average busy day, it was estimated that each KC-135 aircraft would complete 4 operations per day, 2 arrivals and 2 departures, during military exercises. Since there would be 12 KC-135s, and each aircraft would complete 4 operations per day, the number of KC-135 daily operations was modeled at 48. It was assumed that 70 percent of the KC-135 operations would occur during the day (7 a.m. to 10 p.m.) and 30 percent at night (10 p.m. to 7 a.m.). KC-135 flight tracks were modeled heading to the airspace areas where they would train, which is to the north and south.

Table 4.1-4 shows the acreage within the noise contours under the Alternative 1–Low Scenario. Under the Low Scenario, the total number of acres within the 65 to 80+ dBA DNL noise contours is 1,654 which is an increase of 820 acres as compared to the Baseline Scenario. This is the result of the increase in aircraft operations (by approximately 69) and the addition of the KC-135 operations. Of the total amount of acres, approximately 1,215 acres include off-airport property.

Table 4.1-3. Alternative 1–Low Scenario Aircraft Operations at GSN

Aircraft	Daily Operations
747-200	7.35
767-300	7.35
Piper Cherokee	130.23
Cessna 441	15.32
C-130	0.66
F-16	0.32
KC-135	48.00
Total	**209.23**

Source: HDR

Table 4.1-4. Alternative 1–Low Scenario Noise Contour Acreage at GSN

Noise Contours	Alternative 1–Low Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	1,008	103	1,111
70–74 dBA DNL	198	140	338
75–79 dBA DNL	9	168	177
80+ dBA DNL	0	28	28
Total	**1,215**	**439**	**1,654**

Source: HDR

Figure 4.1-1 shows the Alternative 1–Low Scenario and the Baseline Scenario noise contours at GSN. Under the Low Scenario, the noise contours extend farther out from the runway ends as compared to the Baseline Scenario. The 65 and 70 dBA DNL noise contours extend off airport property over the Pacific Ocean. To the southwest, portions of the Coral Ocean Point Golf Course are within the 65 and 70 dBA DNL contours. The 75 to 80 dBA DNL contours remain on airport property or encompasses vacant land.

Noise levels were calculated for noise-sensitive locations around GSN. Most of the population around the airport is north of GSN. As shown in **Table 4.1-5**, there are numerous noise-sensitive land uses around GSN including residences, schools, and recreation areas. Portions of the Coral Ocean Point Golf Course that are under 65 dBA DNL in the Baseline Scenario increase to 69 dBA DNL under the Alternative 1–Low Scenario. According to the USAF, the FAA, and the HUD criteria, noise-sensitive land uses or above the 65 dBA DNL contour are considered to be within areas of high noise exposure. The rest of the noise-sensitive receptors remain below 65 dBA DNL.

The increase in acreage under the Alternative 1–Low Scenario, as compared to the Baseline Scenario, would result in a temporary increase in noise levels around GSN. Populations using the Coral Ocean Point Golf Course would be periodically exposed to higher noise levels (69 dBA DNL) as compared to the Baseline Scenario (63 dBA DNL). However, the DNL values under the Low Scenario were estimated for an average busy day during the military exercises, which could occur for a total of 8 weeks per year, and have been used to calculate how the noise contours would change during that limited period.

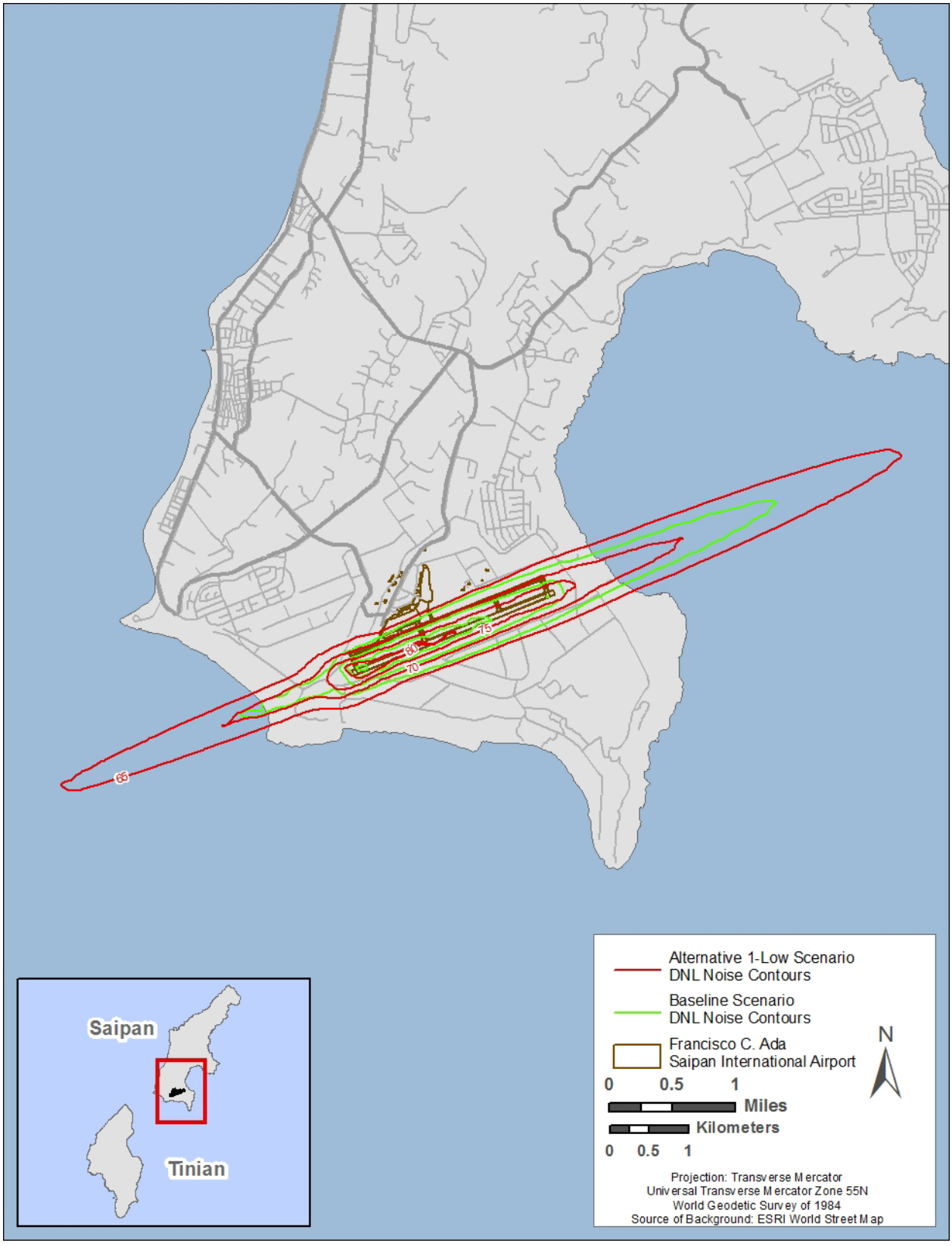


Figure 4.1-1. Alternative 1–Low Scenario Noise Contours at GSN

Table 4.1-5. Alternative 1–Low Scenario Noise Levels at Noise Sensitive Locations around GSN

Land Use	DNL Noise Level
Coral Ocean Point Golf Course	69 dBA
Residential, Dandan	52 dBA
Dandan Elementary School	48 dBA
Residential, Koblerville	49 dBA
Koblerville Elementary School	54 dBA
Saipan Southern High School	53 dBA
Saipan International School	44 dBA
Lao Lao Bay Golf Course	46 dBA
Ladder Beach	60 dBA
Babui Beach on Tinian	56 dBA
Unai Chulu Beach on Tinian	56 dBA

Source: HDR

Alternative 1–Medium Scenario. Periodic, direct, moderate, adverse impacts on the noise environment would be expected from the Alternative 1–Medium Scenario. This represents a significant impact on noise-sensitive receptors. Impacts would be periodic and short-term because they would only occur during planned joint military exercises or other unit level exercises for a maximum of 8 weeks per year. To model the Alternative 1–Medium Scenario, the aircraft operations under the Baseline Scenario were increased by 15 percent to reflect the expected increase in aircraft operations from the airfield improvements under the Proposed Action, similar to the Alternative 1–Low Scenario. The time of operations and flight tracks did not change as compared to baseline conditions. In addition to the aircraft that were modeled under the Baseline Scenario, the Medium Scenario included operations with the KC-135 and F-22 aircraft, and more operations with the F-16 (see **Table 4.1-6**). During military exercises, it was estimated that each of these aircraft would complete 4 operations per day, 2 arrivals and 2 departures. Under the Medium Scenario, there would be 6 KC-135, 8 F-16, and 4 F-22 aircraft operating from GSN. Since each aircraft would complete 4 operations per day, the number of KC-135 daily operations was modeled at 24, the F-22 at 16, and the F-16 at 32 (plus 0.32 operations from other transient F-16 aircraft). Similar to the Low Scenario, it was assumed that 70 percent of the military aircraft operations would occur during the day (7 a.m. to 10 p.m.) and 30 percent at night (10 p.m. to 7 a.m.).

Like the Low Scenario, half of the KC-135 flight tracks were modeled heading to the north and half to the south. For the fighter aircraft (which include the F-16 and F-22), 75 percent of the flight tracks were modeled to the north and 25 percent were modeled to the south. It was estimated that 10 percent of the fighter aircraft would use afterburner when departing. Upon arrival it was estimated that 95 percent of the fighter aircraft would complete an overhead (an elliptical pattern) before landing. Therefore, 5 percent of fighter aircraft would arrive using a straight-in approach.

Table 4.1-7 shows the acreage within the noise contours under the Alternative 1–Medium Scenario. Under the Medium Scenario, the total number of acres within the 65 to 85+ dBA DNL noise contours is 19,884, which is an increase of 19,050 acres as compared to Baseline Scenario. This is the result of the overall increase in aircraft operations (by approximately 93) and the addition of fighter aircraft, which produce louder noise levels than other aircraft. Under the Medium Scenario, the majority of noise contours encompasses non-airport property.

Table 4.1-6. Alternative 1–Medium Scenario Aircraft Operations at GSN

Aircraft	Daily Operations
747-200	7.35
767-300	7.35
Piper Cherokee	130.23
Cessna 441	15.32
C-130	0.66
F-16	32.32
KC-135	24.00
F-22	16.00
Total	**233.23**

Source: HDR

Table 4.1-7. Alternative 1–Medium Scenario Noise Contour Acreage at GSN

Noise Contours	Alternative 1–Medium Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	12,275	0	12,275
70–74 dBA DNL	4,912	3	4,915
75–79 dBA DNL	1,515	15	1,530
80–84 dBA DNL	519	76	595
85+ dBA DNL	163	406	569
Total	**19,384**	**500**	**19,884**

Source: HDR

Figure 4.1-2 shows the Alternative 1–Medium Scenario noise contours at GSN. The noise contours extend farther out from the runway ends as compared to the Baseline Scenario, particularly to the northeast. All of the contours extend off airport property over the Pacific Ocean, except the 85 dBA DNL. To the northeast, the 65 dBA DNL contour encompasses land south of Lao Lao Bay Golf Course and land zoned for public uses. To the southwest, military land on the northeast of Tinian is within the 65 dBA DNL contour. In addition, residences north of the airport and the majority of the Coral Ocean Point Golf Course on Saipan are within noise contours above 65 dBA DNL.

Noise levels were calculated for noise-sensitive locations around GSN. As shown in **Table 4.1-8**, noise levels at the Dandan Elementary School and residences in Koblerville would increase to 66 dBA DNL. Noise levels at the Village of Dandan, Koblerville Elementary School, and Saipan Southern High School would increase to 70 dBA DNL. The noise levels at Coral Ocean Point Golf Course and Ladder Beach would increase to 78 and 77 dBA DNL, respectively. According to the USAF, the FAA, and the HUD criteria, noise-sensitive land uses within or above the 65 dBA DNL contour are considered to be within areas of high noise exposure.

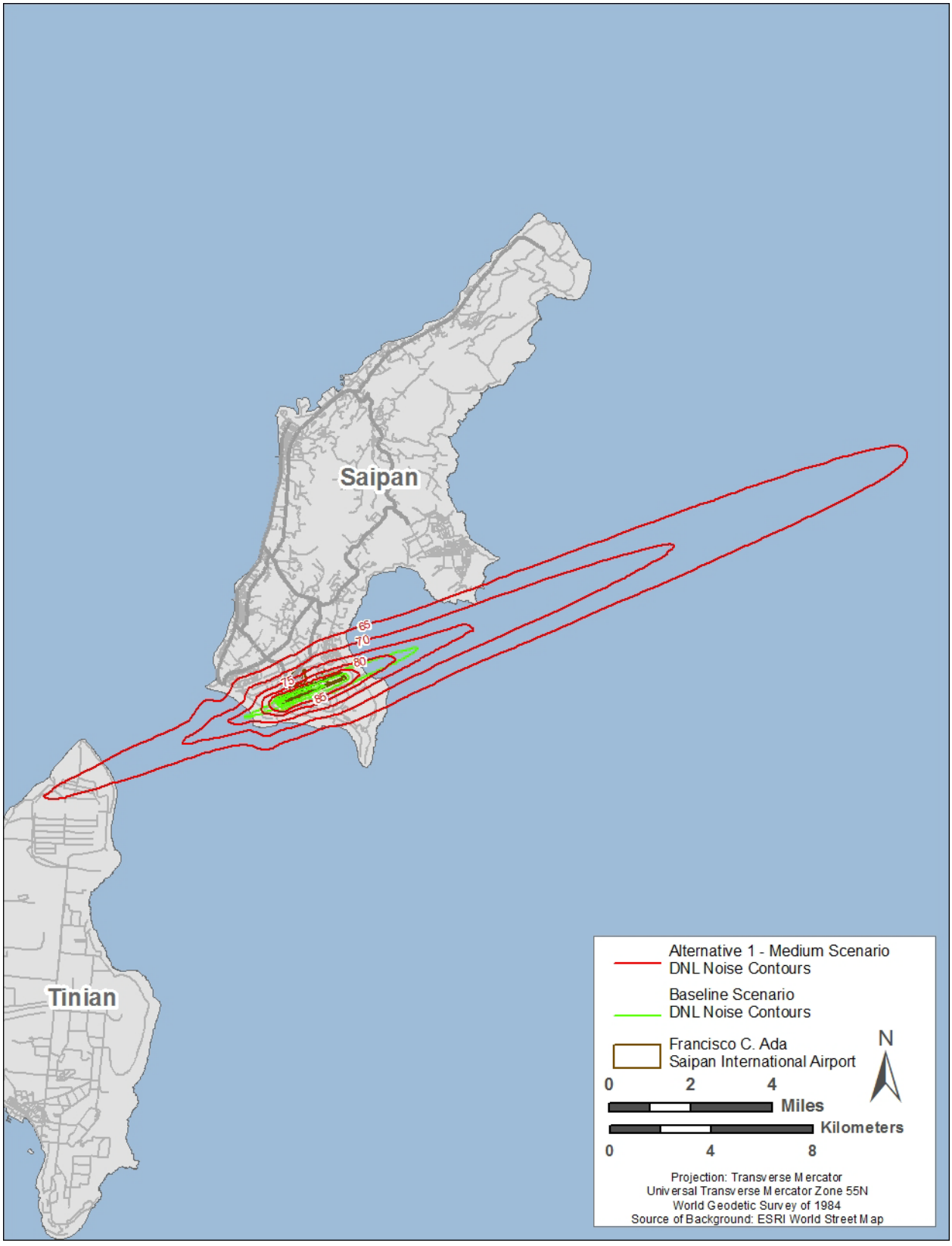


Figure 4.1-2. Alternative 1–Medium Scenario Noise Contours at GSN

Table 4.1-8. Alternative 1–Medium Scenario Noise Levels at Noise-Sensitive Locations around GSN

Land Use	DNL Noise Level
Coral Ocean Point Golf Course	78 dBA
Residential, Dandan	70 dBA
Dandan Elementary School	66 dBA
Residential, Koblerville	66 dBA
Koblerville Elementary School	70 dBA
Saipan Southern High School	70 dBA
Saipan International School	61 dBA
Lao Lao Bay Golf Course	60 dBA
Ladder Beach	77 dBA
Babui Beach on Tinian	64 dBA
Unai Chulu Beach on Tinian	64 dBA

Source: HDR

The increase in acreage under the Alternative 1–Medium Scenario, as compared to the Baseline Scenario, would result in a temporary increase in populations exposed to aircraft noise levels and consequently, additional people who would likely be periodically annoyed by these levels. However, the DNL values under the Medium Scenario were estimated for an average busy day during the military exercises, which could occur for a total of 8 weeks per year, and have been used to calculate how the noise contours would change during that limited period.

Alternative 1–High Scenario. Periodic, direct, moderate to major, adverse impacts on the noise environment would be expected from the Alternative 1–High Scenario. This represents a significant impact on noise sensitive receptors. Impacts would be periodic and short-term because they would only occur during planned joint military exercises or other unit level exercises for a maximum of 8 weeks per year. To model the Alternative 1–High Scenario, the aircraft operations under the Baseline Scenario were increased by 15 percent, similar to the Low and Medium Scenarios. The time of operations and flight tracks did not change as compared to baseline conditions. In addition to the aircraft that were modeled under the Baseline Scenario, the High Scenario included operations from the F-16 and F-22 aircraft (see **Table 4.1-9**). To model an average busy day, it was estimated that each of these aircraft would complete 4 operations per day, 2 arrivals and 2 departures during military exercises. Under the High Scenario, there would be 12 F-16 and 12 F-22 aircraft operating from GSN. Since each aircraft would complete 4 operations per day, the number of F-16 daily operations was modeled at 48 (plus 0.32 operations from other transient F-16 aircraft), and the F-22 at 48 operations. Similar to the Low and Medium Scenarios, it was assumed that 70 percent of the military aircraft operations would occur during the day (7 a.m. to 10 p.m.) and 30 percent at night (10 p.m. to 7 a.m.).

The assumptions that were used under the Medium Scenario for fighter aircraft were also used under the High Scenario (i.e., flight tracks, afterburner, and overhead assumptions).

Table 4.1-9. Alternative 1–High Scenario Aircraft Operations at GSN

Aircraft	Daily Operations
747-200	7.35
767-300	7.35
Piper Cherokee	130.23
Cessna 441	15.32
C-130	0.66
F-16	48.32
F-22	48.00
Total	**257.23**

Source: HDR

Table 4.1-10 shows the acreage within the noise contours under the High Scenario. Under the High Scenario, the total number of acres within the 65 to 85+ dBA DNL noise contours is 37,615, which is an increase of 36,781 acres as compared to Baseline Scenario. This is the result of the overall increase in aircraft operations (by approximately 117) and the increase in the number of fighter aircraft, which produce louder noise levels than other aircraft. Under the Medium Scenario, approximately 37,115 acres consists of non-airport property.

Table 4.1-10. Alternative 1–High Scenario Noise Contour Acreage at GSN

Noise Contours	Alternative 1–High Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	19,003	0	19,003
70–74 dBA DNL	11,660	0	11,660
75–79 dBA DNL	4,490	5	4,495
80–84 dBA DNL	1,367	18	1,385
85+ dBA DNL	595	477	1,072
Total	**37,115**	**500**	**37,615**

Source: HDR

Figure 4.1-3 shows the Alternative 1–High Scenario noise contours at GSN. All of the noise contours extend off airport property over the Pacific Ocean, including the 85 dBA DNL. To the northeast, the 65 dBA DNL contour encompasses portions of the Lao Lao Bay Golf Course and residential land south of the Kagman Schools. The 70 dBA DNL contour encompasses land south of Lao Lao Bay Golf Course and within land zoned for public uses. North of GSN, the 70 to 75 dBA DNL contours encompasses numerous residences and schools. Within the 65 to 80 dBA DNL contours land is zoned for uses that can be noise-sensitive including residential, commercial, and public resources. To the southwest, land on the northern tip of Tinian is within the 65 and 70 dBA DNL contours. Land within the 70 dBA DNL contour includes military property. There are several beaches on the northwestern part of Tinian within the 65 dBA DNL contour including the Unai Chulu Beach and Babui Beach.

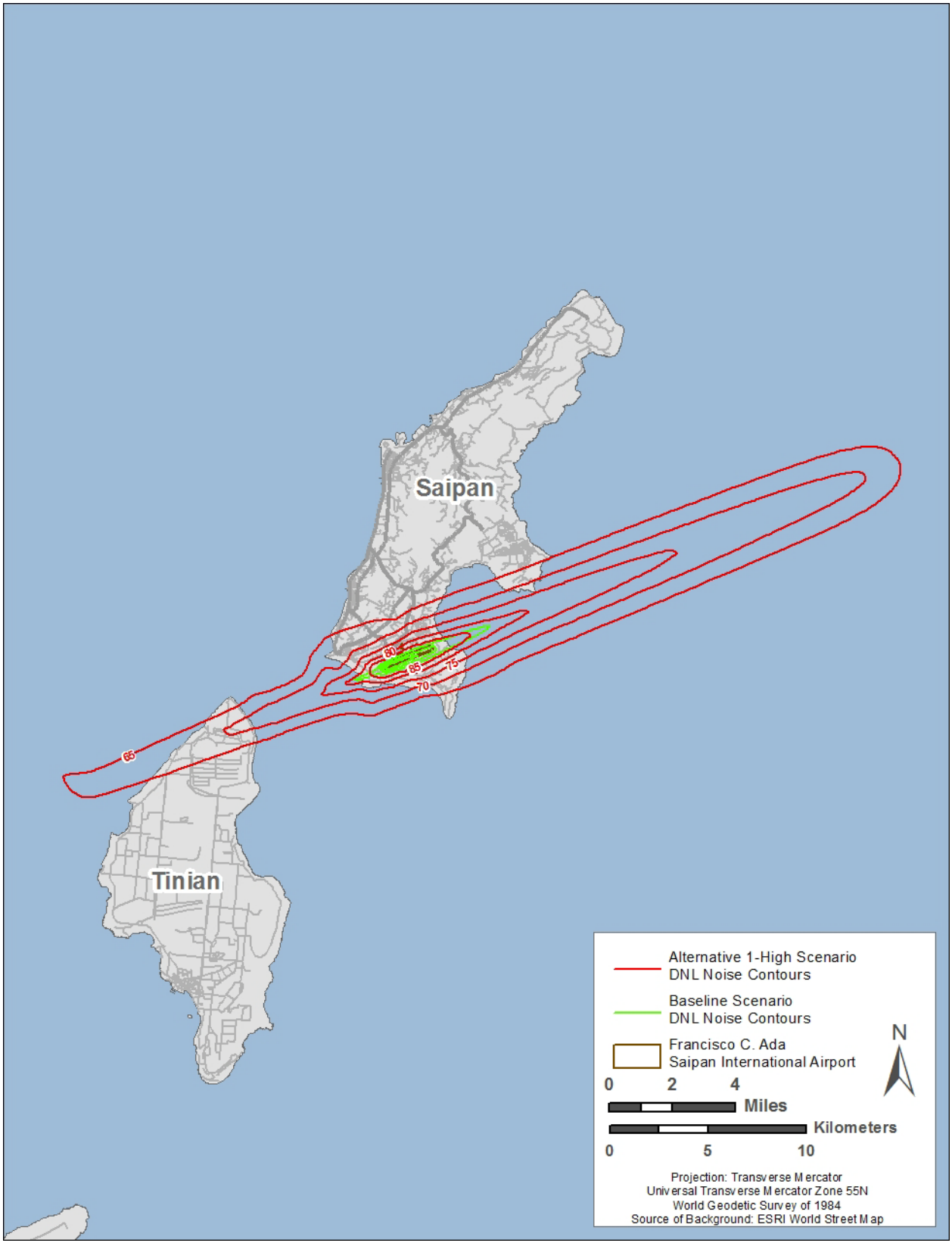


Figure 4.1-3. Alternative 1–High Scenario Noise Contours at GSN

Noise levels were calculated for noise-sensitive locations around GSN and are shown in **Table 4.1-11** and **Figures 4.1-4** through **4.1-6**. All of the noise-sensitive locations in the table would be above 65 dBA DNL under the Alternative 1–High Scenario. This includes residences in 2 towns, 4 schools, 2 golf courses, and 3 beaches. In addition, Obyan Beach, which is south of Ladder Beach, would have noise levels of 69 dBA DNL. Noise levels at the Dandan Elementary School and residences in Koblerville would increase to 70 dBA DNL. Noise levels at the Village of Dandan, Koblerville Elementary School, and Saipan Southern High School would increase to 74 dBA DNL. The noise levels at Coral Ocean Point Golf Course and Ladder Beach would increase to 83 and 81 dBA DNL, respectively. According to the USAF, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses within or above the 65 dBA DNL contour are considered to be within areas of high noise exposure.

Table 4.1-11. Alternative 1–High Scenario Noise Levels at Noise-Sensitive Locations around GSN

Land Use	DNL Noise Level
Coral Ocean Point Golf Course	83 dBA
Residential, Dandan	74 dBA
Dandan Elementary School	70 dBA
Residential, Koblerville	70 dBA
Koblerville Elementary School	74 dBA
Saipan Southern High School	74 dBA
Saipan International School	66 dBA
Lao Lao Bay Golf Course	65 dBA
Ladder Beach	81 dBA
Babui Beach on Tinian	69 dBA
Unai Chulu Beach on Tinian	68 dBA

Source: HDR

The increase in acreage under the Alternative 1–High Scenario, as compared to the Baseline Scenario, would result in a temporary increase in populations exposed to aircraft noise levels and, consequently, additional people who would likely be periodically annoyed by these levels. The number of people within the noise contours was estimated from 2010 U.S. Census population data for the villages on Saipan. There are no villages on Tinian within the noise contours. Villages with the largest number of people encompassed by the noise contours have been estimated and include Dandan (2,967 people), Koblerville (2,493 people), and Afetnas (1,430 people). There is a total of approximately 11,052 people within the High Scenario noise contours that reside on Saipan. See **Table 4.1-12** for estimated population numbers within the High Scenario noise contours on Saipan.

Land uses including recreation, education, and residential that are not exposed to noise levels under the Baseline Scenario would periodically be within the 65 to 80 dBA DNL contours under the High Scenario. However, the DNL values under the High Scenario were estimated for an average busy day during the military exercises, which could occur for a total of 8 weeks per year, and have been used to calculate how the noise contours would change during that limited period.

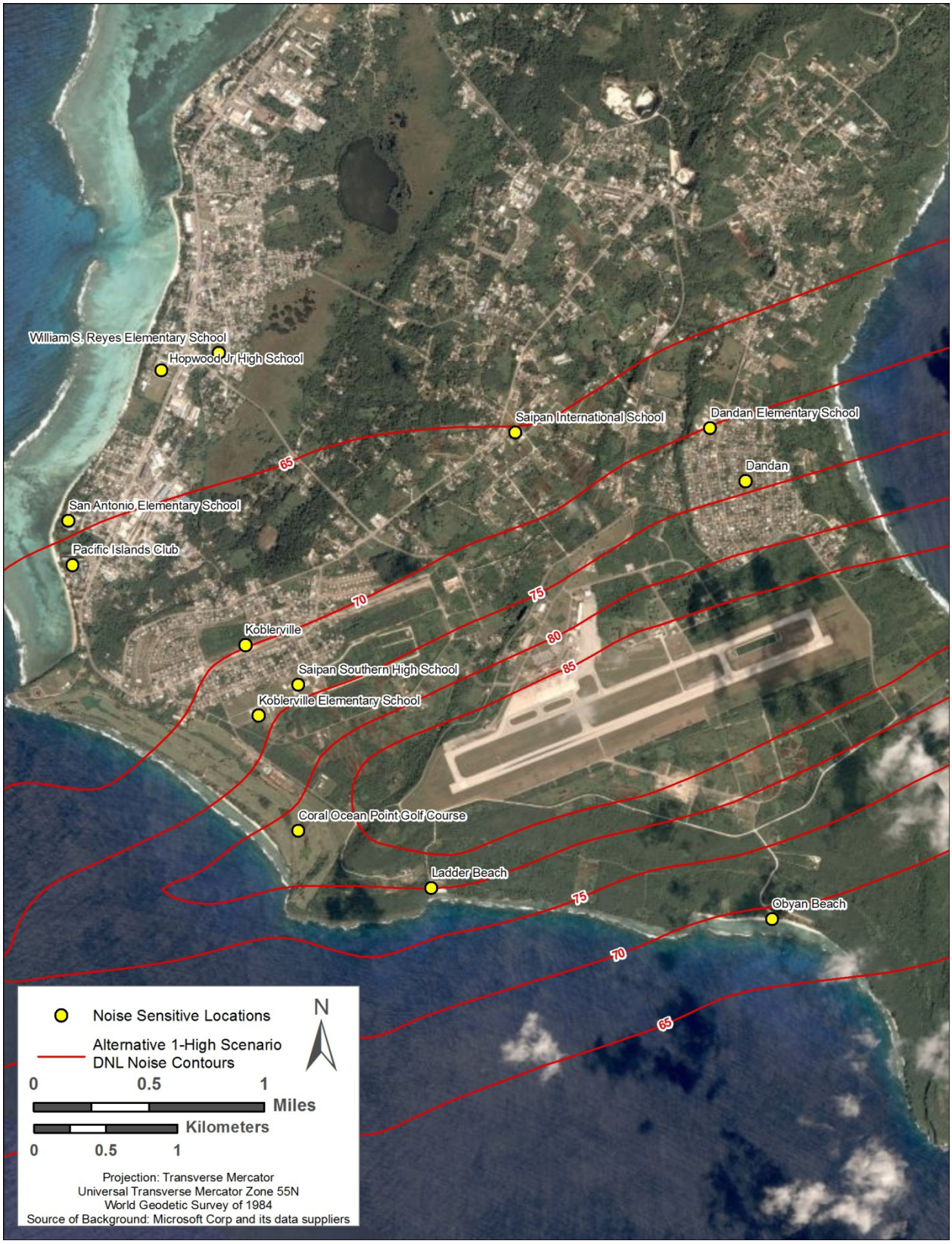


Figure 4.1-4. Noise-Sensitive Locations at GSN–West

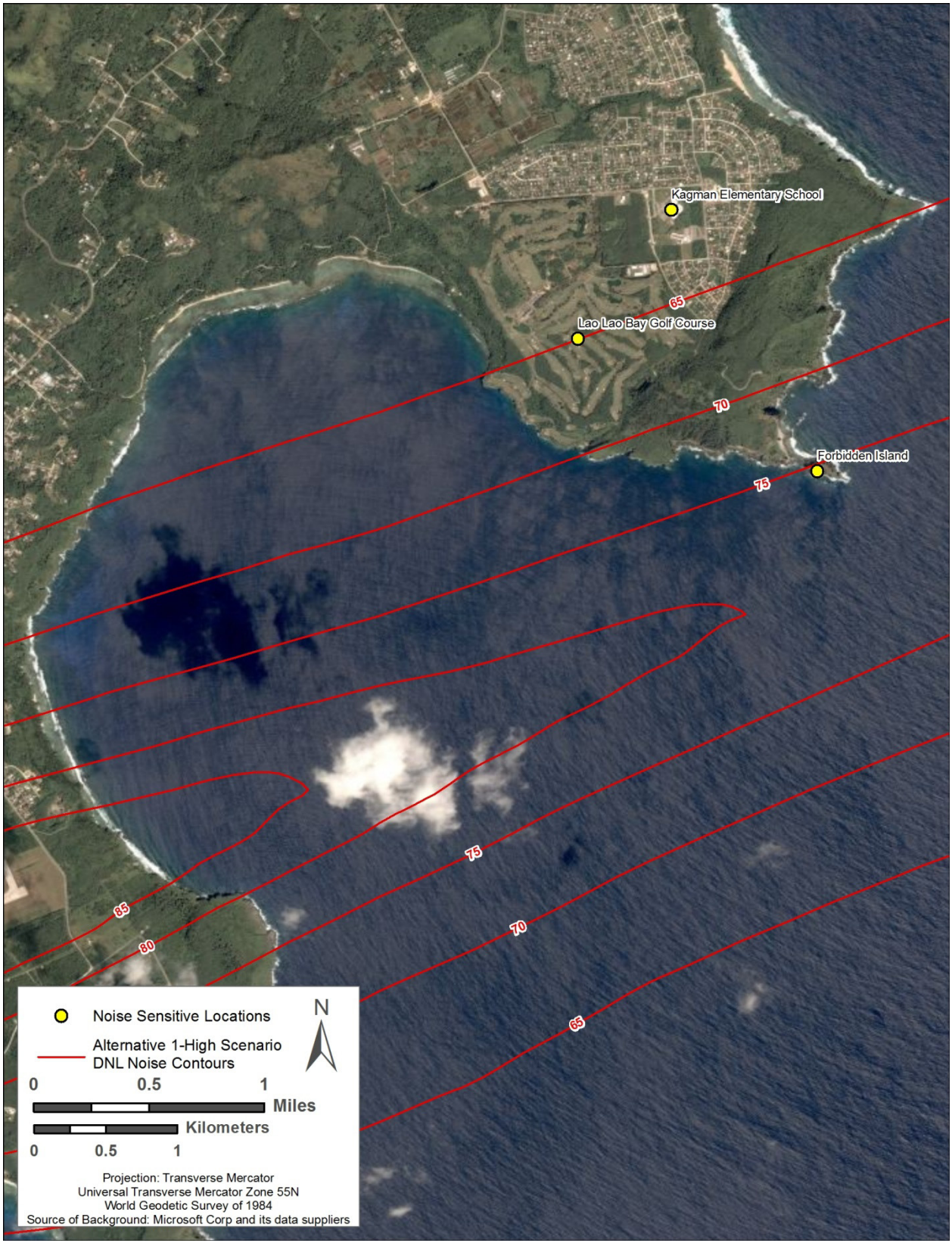


Figure 4.1-5. Noise-Sensitive Locations at GSN–East

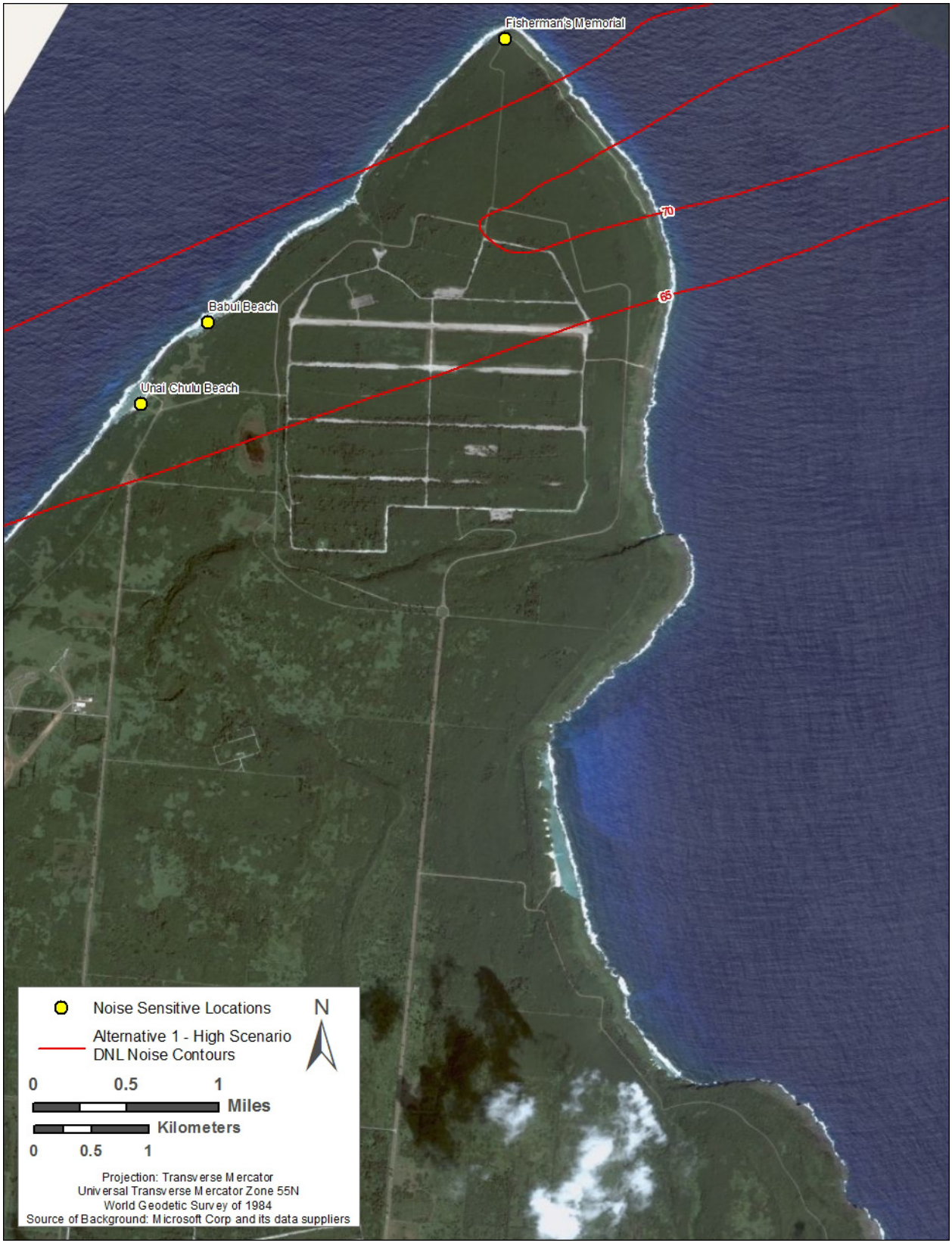


Figure 4.1-6. Noise-Sensitive Locations from GSN Contours on Tinian

Table 4.1-12. Alternative 1–Estimated Population within High Scenario Noise Contours

Village on Saipan	Estimated Population
Kagman III	915
I Naftan	30
Tottoville	258
Agingan	308
Koblerville	2,493
Afetnas	1,430
As Perdido	238
San Antonio	417
Chalan Piao	250
Dandan	2,967
Dagu	176
San Vicente	91
Opyan	20
As Gonna	157
Finasisu	386
As Lito	916
Total	**11,052**

Source: HDR and U.S. Census Bureau 2010c

A summary of the noise contour acreage at GSN under the Baseline Scenario and the Low, Medium, and High Scenarios is shown in **Table 4.1-13**. The number of acres increases considerably when operations from the fighter aircraft are added, as shown under the Medium and High Scenarios. To compare, the number of F-16 and F-22 operations totals 96.32 under the High Scenario, 48.32 under the Medium Scenario, and 0.32 under the Low Scenario.

Table 4.1-13. Summary of GSN Noise Contour Acreage for the Baseline Scenario and Low, Medium, and High Scenarios

DNL Noise Contours	Baseline Scenario (in acres)	Alternative 1– Low Scenario (in acres)	Alternative 1– Medium Scenario (in acres)	Alternative 1– High Scenario (in acres)
65–69 dBA	569	1,111	12,275	19,003
70–74 dBA	188	338	4,915	11,660
75–79 dBA	75	177	1,530	4,495
80–84 dBA	2	28	595	1,385
85+ dBA	0	0	569	1,072
Total	**834**	**1,654**	**19,884**	**37,615**

Source: HDR

Vehicle Use and Billeting

Under Alternative 1, vehicle traffic would increase due to fuel truck delivery from the fuel storage at the port to the proposed airfield fuel storage facility. These short-term impacts would be realized during a 14-day period to initially fill the 100,000-bbl bulk storage tank at the airport and throughout the 8 weeks of anticipated operations each year to replace the daily projected use of 300,000 gallons for aircraft operations. The short-term periodic increase in fuel truck deliveries would use existing roadways commonly used by similar delivery trucks on each island. For initial fuel supply to fill the proposed new bulk storage facility at the airport, it is anticipated that 84 daily one-way trips of the fuel truck would be required over the 14-day period. During each day of the 8 weeks of annual operations, 60 one-way trips by the fuel trucks would be required. The increase of roadway vehicles as compared to existing average daily traffic now experienced on these roadways would not present a significant increase in current noise levels.

Other potential vehicle use increases would be associated with bus transportation of support personnel on Saipan from the hotel to the airfield on a daily basis during the 8-week training operations. This short-term increase would be realized in 60 additional one-way bus trips from commercial lodging to the airport and return. Buses would use existing roadways on Saipan and the level of increased traffic as compared to existing average daily traffic levels shown in **Section 3.11** would not impose a significant increase in current noise levels associated with traffic.

If the USAF chooses to use the BEAR kit option for billeting under Alternative 1, power would be provided by generators and there would be a short-term increase in noise levels to the immediate area. The BEAR kit location under Alternative 1 is neither within the immediate vicinity of the airport nor adjacent to an existing population and there would be no impacts realized by the public from this source.

4.1.2 Alternative 2 – TNI

4.1.2.1 Construction Phase

Impacts associated with construction noise under Alternative 2 would result from the projects identified in **Table 2.3-2** and would be constructed at different times and locations over 24 to 36 months. New temporary sources of noise would be imposed by construction activities at the specific selected construction sites and the vehicle traffic on public roads associated with the mobilization/demobilization of construction equipment, delivery of construction materials, and the daily transport of construction workers to and from the construction sites.

Noise from construction activities varies depending on the type of equipment being used, the area that the action would occur in, and the distance from the noise source. Individual equipment used for construction activities would be expected to result in noise levels comparable to those shown in **Table 3.1-3**. To predict how these activities would impact adjacent populations or other nearby sensitive noise receptors, noise levels from the probable equipment was estimated. For example, as shown in **Table 3.1-3**, construction usually involves several pieces of equipment (e.g., bulldozers and trucks) that can be used simultaneously. Under Alternative 2, the cumulative noise from the equipment, during the busiest day, was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected cumulative construction noise during daytime hours at specified distances are shown in **Table 4.1-14**. These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source of the noise.

Table 4.1-14. Estimated Noise Levels from Construction Activities

Distance from Noise Source	Estimated Noise Level
50 feet	90–94 dBA
100 feet	84–88 dBA
150 feet	81–85 dBA
200 feet	78–82 dBA
400 feet	72–76 dBA
800 feet	66–70 dBA
1,200 feet	< 64 dBA

Source: HDR

The majority of the projects under Alternative 2 would occur on TNI property. The closest noise-sensitive receptors to the airport are residences, approximately 5,200 feet away. At this distance, noise levels from construction equipment would be below 55 dBA, which are typically the levels heard in suburban residential areas (see **Table 3.1-2**). In addition to the projects at TNI, a fuel tank would be constructed at the Port of Tinian. The closest noise-sensitive receptors to this site are residences, approximately 700 feet away. At this distance, noise levels from construction equipment would be approximately 67 to 71 dBA.

Given the extent of the projects associated with the Proposed Action and the proximity to residences, short-term, direct, minor, adverse impacts from construction noise under Alternative 2 would be expected. However, noise generation would last only for the duration of construction activities and could be minimized through measures such as the restriction of these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), and the use of equipment exhaust mufflers. It is not anticipated that the short-term increase in noise levels resulting from construction under Alternative 2 would cause significant adverse impacts on the surrounding populations.

Construction-related traffic that would add to existing traffic noise levels is calculated and shown in **Section 4.11.2.1** to be 380 additional trips per day. As a rule of thumb, doubling the noise source, in this case the number of vehicles, would result in a 3 dBA increase in the existing noise level. This increase over the ADT volume shown in **Table 3.11-5** in **Section 3.11.2.2** for any of the roadways anticipated to be primarily used represents only a fractional increase in terms of noise generation. Roadways that would likely receive the majority of the construction traffic include 8th Avenue and Broadway. Noise-sensitive receptors adjacent to these roadways include Kramer Beach and residences. Noise levels from construction trucks generally range between 83 to 94 dBA, 50 feet from the source. However, these levels would be temporary, occurring several times a day during work hours. Therefore, the impacts from construction traffic are not anticipated to be significant.

4.1.2.2 Implementation Phase

Aircraft Operations

Aircraft operations under Alternative 2 were analyzed with three noise-level scenarios: low, medium, and high. The analysis for Alternative 2 (Low, Medium, and High Scenarios) is based on Runway Option A. Under this option, military aircraft would use the proposed runway extension when departing. The current runway is 8,600 feet long; under Alternative 2 it would be extended to 10,000 feet. Military aircraft would use the proposed runway extension when departing. Since the aircraft that currently use

TNI do not require the additional runway length to depart, they would likely depart from the existing runway end.

Under the Proposed Action, joint U.S. and foreign military cargo, tanker, and other multi-engine aircraft could use the improved facilities and infrastructure. Since the type of aircraft and the mix of aircraft are not likely to be the same during every exercise, several scenarios were analyzed to determine different levels of impacts. Several aircraft were chosen to model the noise analysis. The KC-135 aircraft was chosen because it is the design aircraft for the Proposed Action and 2 types of fighter aircraft were chosen because they dominate the noise environment. The Low Scenario was modeled with 12 KC-135 aircraft; the Medium Scenario with 6 KC-135, 8 F-16, and 4 F-22 aircraft; and the High Scenario was modeled with 12 F-16 and 12 F-22 aircraft. The following sections describe the results under each scenario.

Alternative 2–Low Scenario. Periodic, direct, minor, adverse impacts on the noise environment would be expected from the Alternative 2–Low Scenario. Impacts would be periodic and short-term because they would only occur during planned joint military exercises or other unit level exercises for a maximum of 8 weeks per year. To model the Alternative 2–Low Scenario, the aircraft operations under the Baseline Scenario were increased by 15 percent, as shown on **Table 4.1-15**. This reflects the expected increase in aircraft operations from the airfield improvements under the Proposed Action. In addition, charter flights that are scheduled to begin flying locally and between China and Tinian were included under Alternative 2 at TNI (Star Marianas Air 2012). This includes the Cessna 441 and the 737-500 aircraft. The number of Piper Cherokee operations that occur between the hours of 10 p.m. and 7 a.m. was not expected to change from the Baseline Scenario. It was assumed that the Cessna 441 and the 737-500 would fly during daytime hours (7 a.m. to 10 p.m.).

Table 4.1-15. Alternative 2–Low Scenario Aircraft Operations at TNI

Aircraft	Daily Operations
Piper Cherokee	130.22
Cessna 441	0.07
737-500	0.13
KC-135	48.00
Total	**178.42**

Source: HDR

The Low Scenario also includes operations with the KC-135 aircraft. As discussed in **Section 2.3.2**, under Alternative 2, TNI would be able to accommodate 12 KC-135 aircraft. To model an average busy day, it was estimated that each KC-135 aircraft would complete 4 operations per day, 2 arrivals and 2 departures, during military exercises. Since there would be 12 KC-135s, and each aircraft would complete 4 operations per day, the number of KC-135 daily operations was modeled at 48. It was assumed that 70 percent of the KC-135 operations would occur during the day (7 a.m. to 10 p.m.) and 30 percent at night (10 p.m. to 7 a.m.). KC-135 flight tracks were modeled heading to the airspace areas where they would train, which is to the north and south. The analysis for Alternative 2 (Low, Medium, and High Scenarios) is based on Runway Option A. Under this option, military aircraft would use the proposed runway extension when departing.

Table 4.1-16 shows the acreage within the noise contours under the Alternative 2–Low Scenario. Under the Low Scenario, the total number of acres within the 65 to 80+ dBA DNL noise contours is 731. Under the Baseline Scenario, the total number of acres within the 65 to 80+ dBA DNL is 0. This is the result of the increase in aircraft operations (by approximately 90) and the addition of the Cessna 441, 737-500, and the KC-135 aircraft operations.

Table 4.1-16. Alternative 2–Low Scenario Noise Contour Acreage at TNI

Noise Contours	Alternative 1–Low Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	324	109	433
70–74 dBA DNL	73	136	209
75–79 dBA DNL	3	68	71
80+ dBA DNL	0	18	18
Total	**400**	**331**	**731**

Source: HDR

Figure 4.1-7 shows the Alternative 2–Low Scenario noise contours at TNI, which extend out from the runway ends. The 65, 70, and 75 dBA DNL contours extend off airport property over vacant land. The 80 dBA DNL noise contour remains on airport property.

Noise levels were calculated for noise-sensitive locations around TNI. Since the land north of the airport is leased for military use, the areas on Tinian that are sensitive to noise are south of TNI. As shown in **Table 4.1-17**, the residential area, Marpo Heights, and the Old San Jose Bell Tower would be exposed to very low noise levels from aircraft operations under Alternative 2–Low Scenario. As discussed in **Section 3.1.1**, noise levels in the mid-30 dBA DNL range are well below the typical ambient levels in a quiet suburban area.

Table 4.1-17. Alternative 2–Low Scenario Noise Levels at Noise-Sensitive Locations around TNI

Land Use	DNL Noise Level
Marpo Heights–Residential	37 dBA
Old San Jose Bell Tower	34 dBA

Source: HDR

The increase in acreage under the Alternative 2–Low Scenario, as compared to the Baseline Scenario, would result in a temporary increase in noise levels around TNI. However, the land use within the noise contours is rural. In addition, the DNL values under the Low Scenario were estimated for an average busy day during the military exercises, which could occur for a total of 8 weeks per year, and have been used to calculate how the noise contours would change during that limited period.

Alternative 2–Medium Scenario. Periodic, direct, moderate, adverse impacts on the noise environment would be expected from the Alternative 2–Medium Scenario. Impacts would be periodic and short-term because they would only occur during planned joint military exercises or other unit-level exercises for a maximum of 8 weeks per year. To model the Alternative 2–Medium Scenario, the aircraft operations under the Baseline Scenario were increased by 15 percent, and the charter flights discussed for the Low Scenario were added. The time of operations and flight tracks did not change as compared to Low Scenario. In addition, the Medium Scenario included operations with the KC-135, F-16, and F-22 aircraft (see **Table 4.1-18**). During military exercises, it was estimated that each of these aircraft would complete 4 operations per day, 2 arrivals and 2 departures. Under the Medium Scenario, there would be 6 KC-135, 8 F-16, and 4 F-22 aircraft operating from TNI. Since each aircraft would complete 4 operations per day, the number of KC-135 daily operations was modeled at 24, the F-16 at 32, and the F-22 at 16 operations.

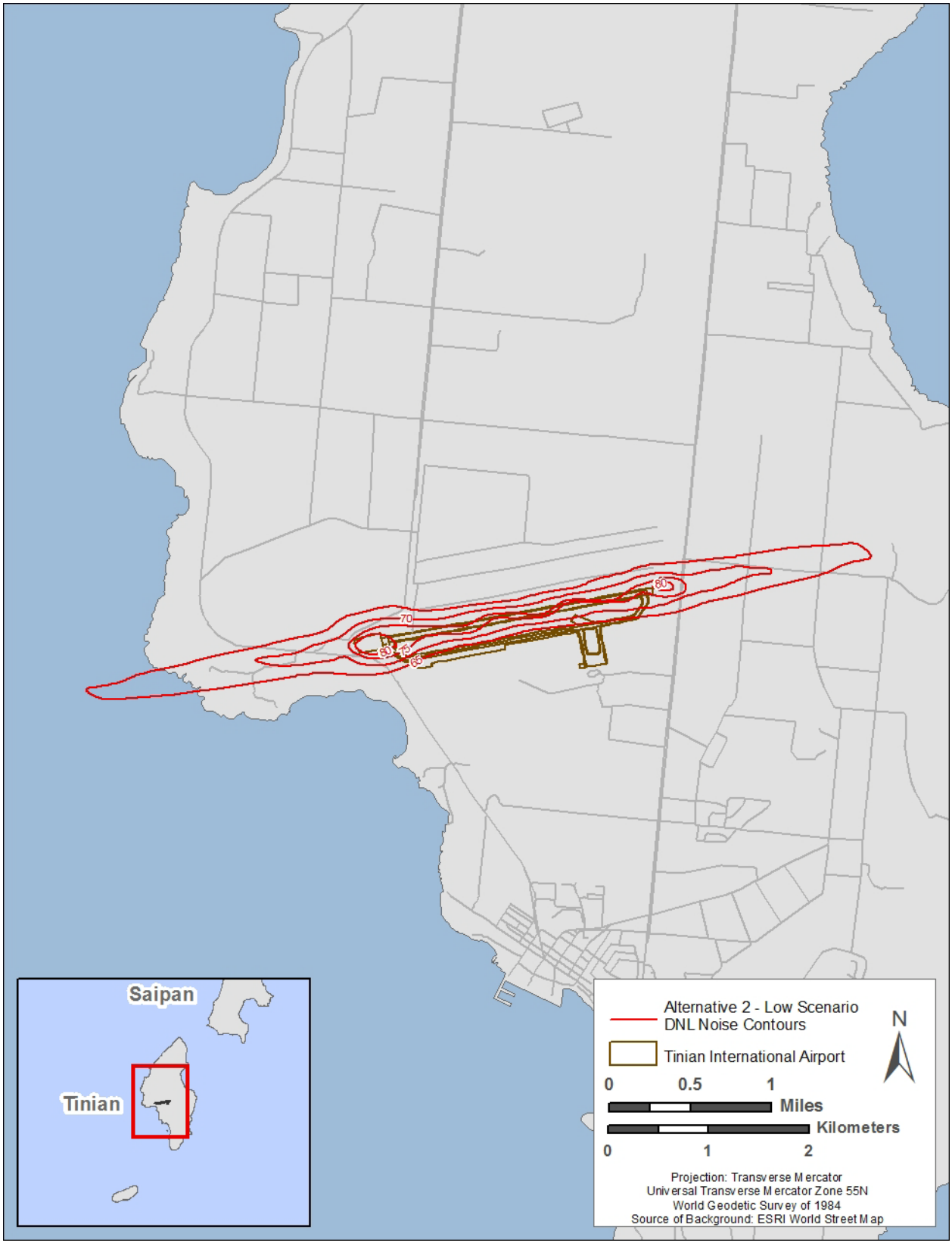


Figure 4.1-7. Alternative 2–Low Scenario Noise Contours at TNI

Table 4.1-18. Alternative 2–Medium Scenario Aircraft Operations at TNI

Aircraft	Daily Operations
Piper Cherokee	130.22
Cessna 441	0.07
737-500	0.13
F-16	32.00
KC-135	24.00
F-22	16.00
Total	**202.42**

Source: HDR

Similar to the Low Scenario, it was assumed that 70 percent of the military aircraft operations would occur during the day (7 a.m. to 10 p.m.) and 30 percent at night (10 p.m. to 7 a.m.).

As under the Low Scenario, half of the KC-135 flight tracks were modeled heading to the north and half to the south. For the fighter aircraft (which include the F-16 and F-22), 75 percent of the flight tracks were modeled to the north and 25 percent to the south. It was estimated that 10 percent of the fighter aircraft would use afterburner when departing. Upon arrival it was estimated that 95 percent of the fighter aircraft would complete an overhead (an elliptical pattern) before landing. Therefore, 5 percent of fighter aircraft would arrive using a straight-in approach.

Table 4.1-19 shows the acreage within the noise contours under the Medium Scenario. The total number of acres within the 65 to 80+ dBA DNL noise contours under the Medium Scenario is 19,975; under the Baseline Scenario there are no acres. This is the result of the overall increase in aircraft operations (by approximately 89) and the addition of fighter aircraft, which produce louder noise levels than other aircraft. Most of the acreage under the Medium Scenario, approximately 19,253 acres, encompasses non-airport property.

Table 4.1-19. Alternative 2–Medium Scenario Noise Contour Acreage at TNI

Noise Contours	Alternative 1–Medium Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	12,186	0	12,186
70–74 dBA DNL	4,915	0	4,915
75–79 dBA DNL	1,481	24	1,505
80–84 dBA DNL	556	84	640
85+ dBA DNL	115	435	550
Total	**19,253**	**543**	**19,796**

Source: HDR

Figure 4.1-8 shows the Alternative 2–Medium Scenario noise contours at TNI. The 65, 70, and 75 dBA DNL contours extend off airport property and over the Pacific Ocean. Although most of the land is vacant, the 65 dBA DNL contour extends to the south and encompasses an area with scattered residences.

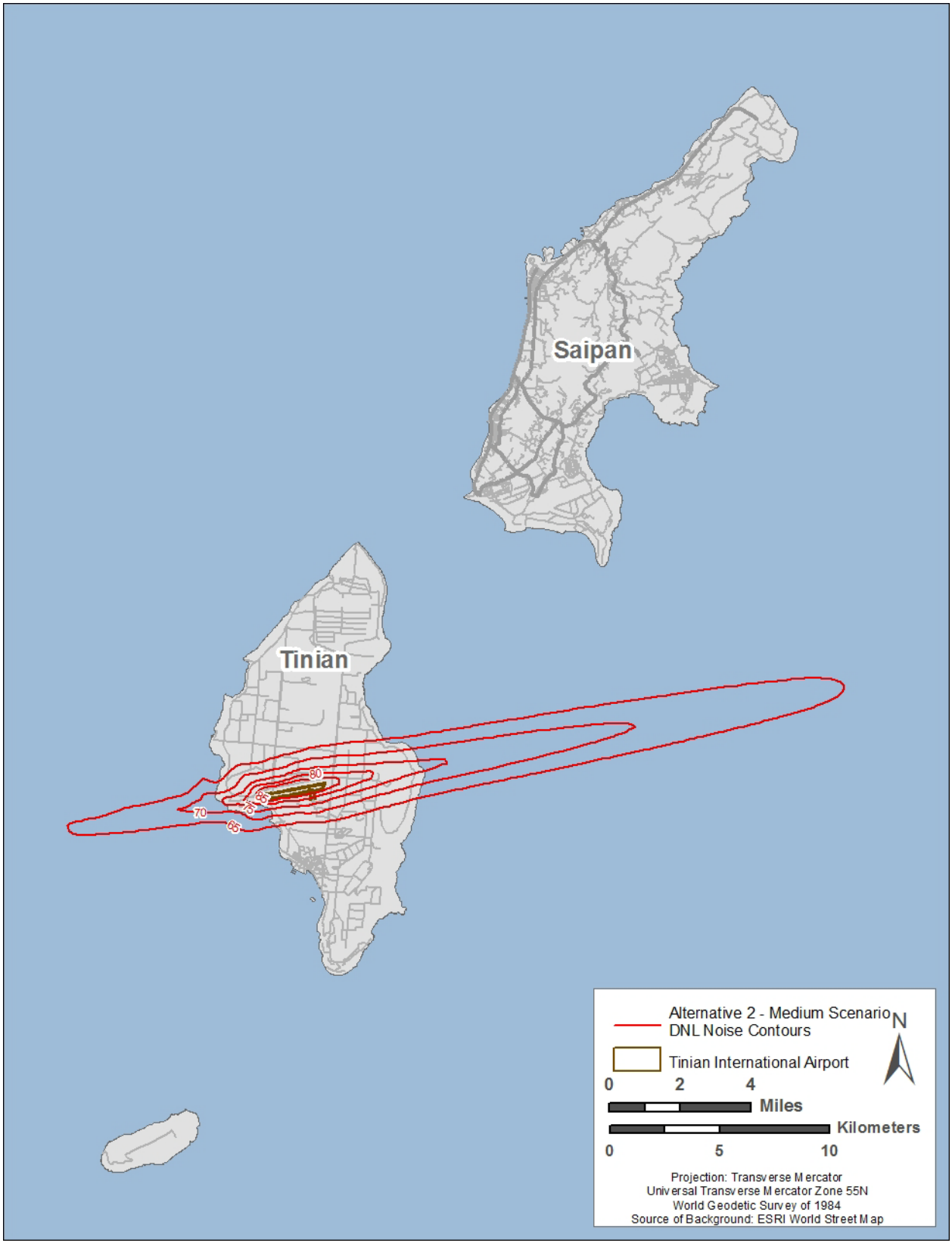


Figure 4.1-8. Alternative 2–Medium Scenario Noise Contours at TNI

Noise levels were calculated for noise-sensitive locations around TNI. As shown in **Table 4.1-20**, the residential area, Marpo Heights, would be temporarily exposed to 61 dBA DNL, which is equivalent to the levels in an urban residential area. Single-event noise levels are estimated to reach 95 dBA SEL during the military exercises, which would be similar to hearing a heavy truck on an adjacent roadway. The DNL level at the Old San Jose Bell Tower would be 9 dBA lower than those levels heard in Marpo Heights.

Table 4.1-20. Alternative 2–Medium Scenario Noise Levels at Noise-Sensitive Locations around TNI

Land Use	DNL Noise Level
Marpo Heights–Residential	61 dBA
Old San Jose Bell Tower	52 dBA

Source: HDR

The increase in acreage under the Alternative 2–Medium Scenario, as compared to the Baseline Scenario, would result in a slight increase in populations temporarily exposed to aircraft noise levels and, consequently, additional people who would likely periodically be annoyed by these levels. However, the DNL values under the Medium Scenario were estimated for an average busy day during the military exercises, which could occur for a total of 8 weeks per year, and have been used to calculate how the noise contours would change during that limited period.

Alternative 2–High Scenario. Periodic, direct, moderate to major, adverse impacts on the noise environment would be expected from Alternative 2–High Scenario. This represents a significant impact on a portion of Marpo Heights, the primarily affected noise-sensitive receptor under this scenario. Impacts would be periodic and short-term because they would only occur during planned joint military exercises or other unit-level exercises for a maximum of 8 weeks per year. To model the Alternative 2–High Scenario, the aircraft operations under the Baseline Scenario were increased by 15 percent, and the charter flights discussed for the Low and Medium Scenarios were added. The time of operations and flight tracks did not change as compared to baseline conditions. In addition, the High Scenario included operations from the F-16 and F-22 aircraft (see **Table 4.1-21**). To model an average busy day, it was estimated that each of these aircraft would complete 4 operations per day, 2 arrivals and 2 departures, during military exercises. Under the High Scenario, there would be 12 F-16 and 12 F-22 aircraft operating from TNI. Since each aircraft would complete 4 operations per day, the number of F-16 daily operations was modeled at 48 and the F-22 at 48 daily operations. Similar to the Low and Medium Scenarios, it was assumed that 70 percent of the military aircraft operations would occur during the day (7 a.m. to 10 p.m.) and 30 percent at night (10 p.m. to 7 a.m.).

The assumptions that were used under the Medium Scenario for fighter aircraft were also used under the High Scenario (i.e., flight tracks, afterburner, and overhead assumptions).

Table 4.1-22 shows the acreage within the noise contours under the High Scenario. The total number of acres within the 65 to 80+ dBA DNL noise contours under the High Scenario is 36,774; under the Baseline Scenario there are no acres. This is the result of the overall increase in aircraft operations (by approximately 113) and the increase in the number of fighter aircraft, which produce louder noise levels than other aircraft. Almost all of the acreage, approximately 36,231 acres, encompasses non-airport property.

Table 4.1-21. Alternative 2–High Scenario Aircraft Operations at TNI

Aircraft	Daily Operations
Piper Cherokee	130.22
Cessna 441	0.07
737-500	0.13
F-16	48.00
F-22	48.00
Total	**226.42**

Source: HDR

Table 4.1-22. Alternative 2–High Scenario Noise Contour Acreage at TNI

Noise Contours	Alternative 1–High Scenario (in acres)		
	Off-Airport Property	Airport Property	Total Acres
65–69 dBA DNL	17,958	0	17,958
70–74 dBA DNL	11,725	0	11,725
75–79 dBA DNL	4,594	0	4,594
80–84 dBA DNL	1,367	35	1,402
85+ dBA DNL	587	508	1,095
Total	36,231	543	36,774

Source: HDR

Figure 4.1-9 shows the Alternative 2–High Scenario noise contours at TNI. All of the noise contours extend off airport property and over the Pacific Ocean. Although most of the land is vacant, the 65 and 70 dBA DNL contours extend to the south and encompass scattered residences and the 65 dBA DNL contour encompasses a residential development, Marpo Heights.

Noise levels were calculated for noise-sensitive locations around TNI. As shown in **Figure 4.1-10** and **Table 4.1-23**, Marpo Heights would be exposed to 65 dBA DNL under Alternative 2–High Scenario. According to the USAF, the FAA, and the HUD criteria, residential units within or above the 65 dBA DNL contour are considered to be within areas of high noise exposure. The noise level at the Old San Jose Bell Tower is estimated to be 57 dBA DNL.

Table 4.1-23. Alternative 2–High Scenario Noise Levels at Noise-Sensitive Locations around TNI

Land Use	DNL Noise Level
Marpo Heights–Residential	65 dBA
Old San Jose Bell Tower	57 dBA

Source: HDR

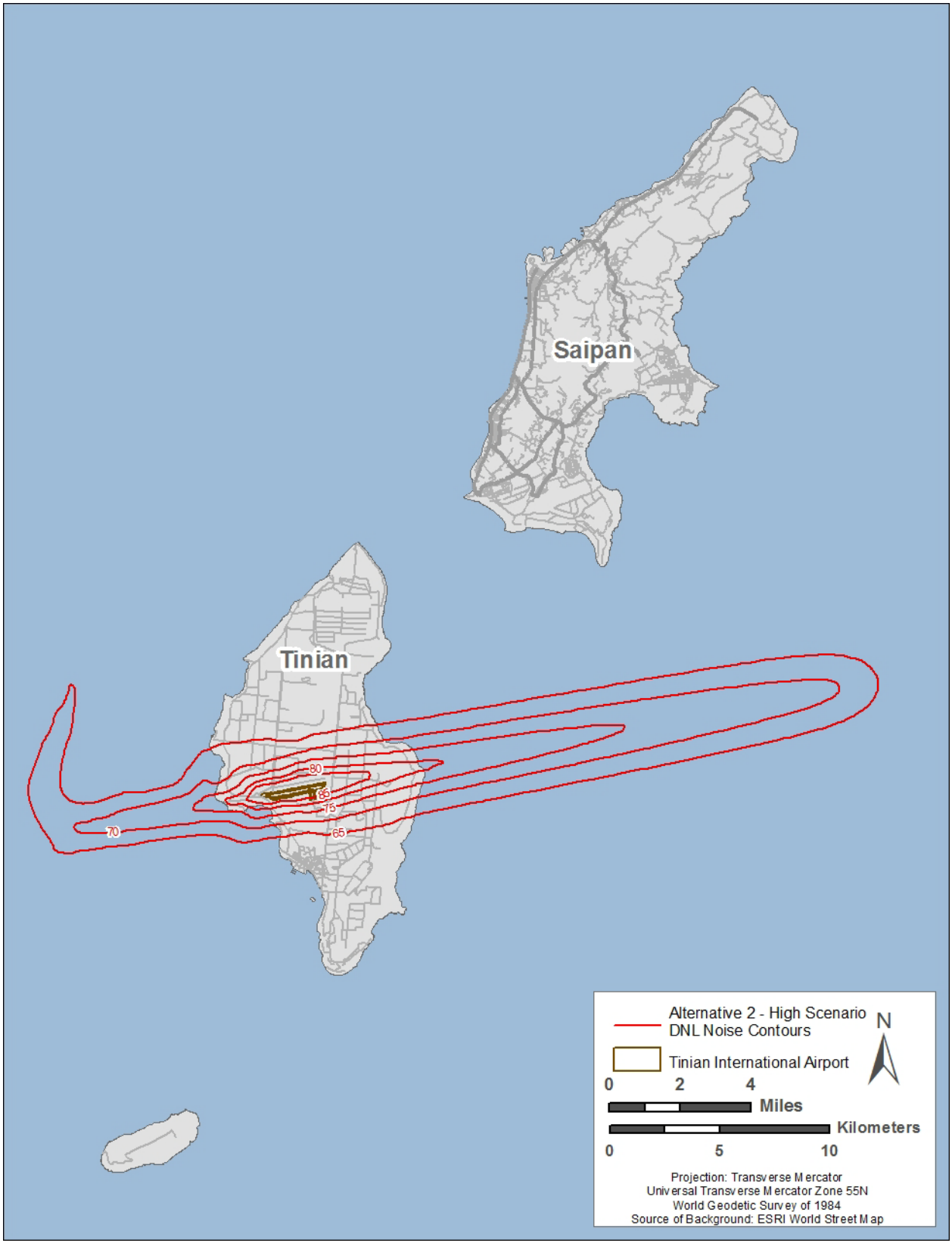


Figure 4.1-9. Alternative 2–High Scenario Noise Contours at TNI

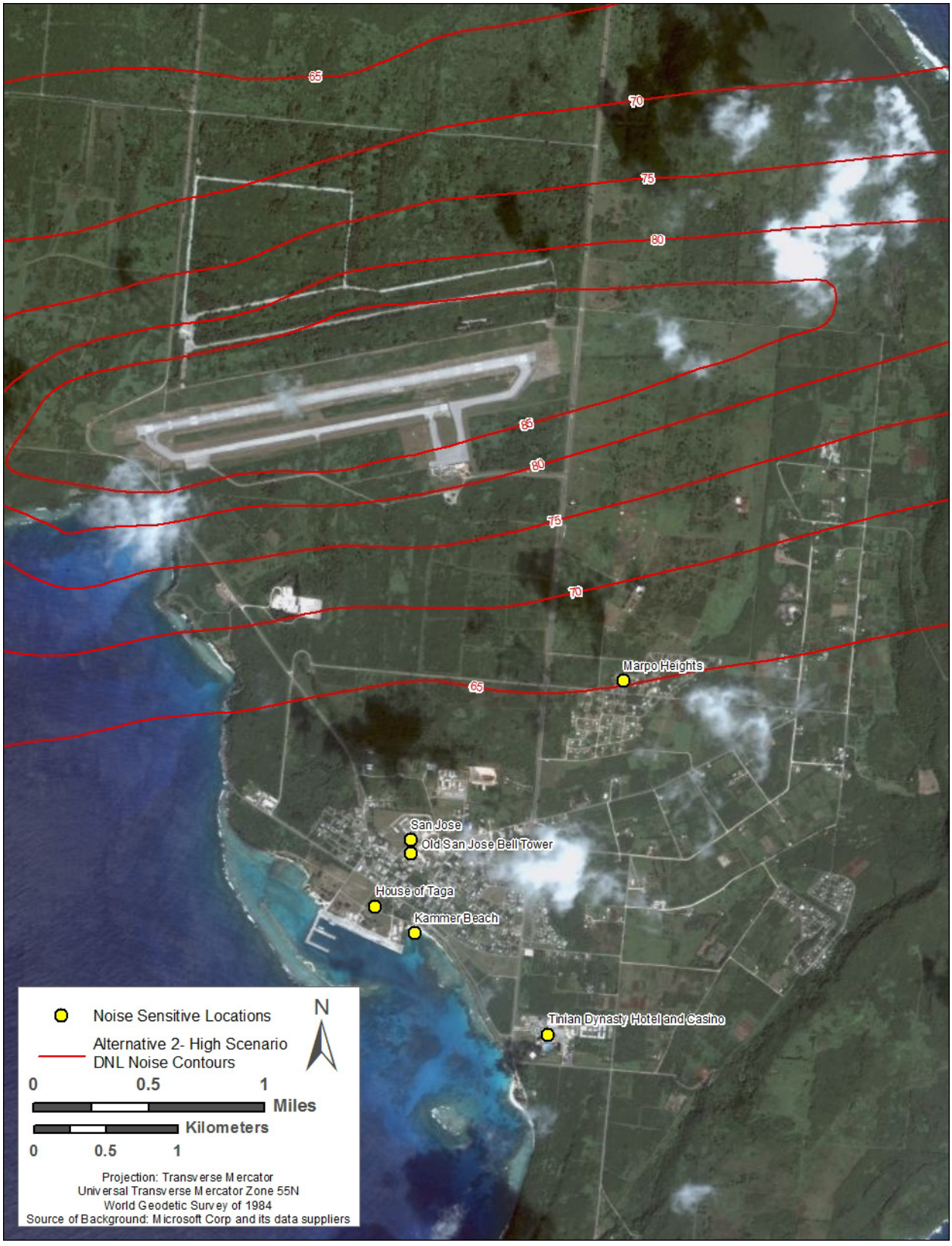


Figure 4.1-10. Noise-Sensitive Locations at TNI

The increase in acreage under the Alternative 2–High Scenario, as compared to the Baseline Scenario, would result in a temporary increase in populations exposed to aircraft noise levels and, consequently, additional people who would likely be periodically annoyed by these levels. The number of people within the noise contours was estimated from 2010 U.S. Census population data for the villages on Tinian. Populations encompassed by the High Scenario noise contours were estimated and include 309 people in Marpo Heights, 124 people in Eastern Tinian, and 90 people in San Jose for a total of approximately 523 people that reside on Tinian. Under the Baseline Scenario, there are no people within the noise contours. See **Table 4.1-24** for the estimated population within High Scenario noise contours on Tinian.

Table 4.1-24. Alternative 2–Estimated Population within High Scenario Noise Contours

Village on Tinian	Estimated Population
San Jose	90
Marpo Heights	309
Eastern Tinian	124
Total	**523**

Source: HDR, U.S. Census Bureau 2010c, and

The DNL values under the High Scenario were estimated for an average busy day during the military exercises, which would occur for a total of 8 weeks per year, and have been used to calculate how the noise contours would change during that limited period. Given the increase in population and residential land use within the noise contours, long-term, direct, moderate to major, adverse impacts on the noise environment would be expected.

A summary of the noise contour acreage at TNI under the Baseline Scenario and the Low, Medium, and High Scenarios is shown in **Table 4.1-25**. The number of acres increases considerably when operations from the fighter aircraft are added, as shown under the Medium and High Scenarios. To compare, the number of F-16 and F-22 operations totals 96 under the High Scenario, 48 under the Medium Scenario, and 0 under the Low Scenario.

Table 4.1-25. Summary of TNI Noise Contour Acreage for the Baseline Scenario and Low, Medium, and High Scenarios

DNL Noise Contours	Baseline Scenario (in acres)	Alternative 2–Low Scenario (in acres)	Alternative 2–Medium Scenario (in acres)	Alternative 2–High Scenario (in acres)
65–69 dBA	0	433	12,186	17,958
70–74 dBA	0	209	4,915	11,725
75–79 dBA	0	71	1,505	4,594
80–84 dBA	0	18	640	1,402
85+ dBA	0	0	550	1,095
Total	**0**	**731**	**19,796**	**36,774**

Source: HDR

Vehicle Use and Billeting

Under Alternative 2, minor increases in vehicle traffic are anticipated due to fuel truck delivery from the port to the proposed airfield fuel storage facility during the 8 weeks of anticipated operations each year. However, the short-term periodic increase in noise levels from fuel truck deliveries would not be significant because they would not exceed noise levels expected under average traffic conditions. Therefore, periodic, direct, minor, adverse impacts on noise from truck traffic would be expected.

Under Alternative 2, vehicle traffic would increase due to fuel truck delivery from the fuel storage at the port to the proposed airfield fuel storage facility. These short-term impacts would be realized during a 14-day period to initially fill the 100,000-bbl bulk storage tank at the airport and throughout the 8 weeks of anticipated operations each year to replace the daily projected use of 300,000 gallons for aircraft operations. The short-term periodic increase in fuel truck deliveries would use existing roadways commonly used by similar delivery trucks on Tinian. For initial fuel supply to fill the proposed new bulk storage facility at the airport, it is anticipated that 84 daily one-way trips of the fuel truck would be required over the 14-day period. During each day of the 8 weeks of annual operations, 60 one-way trips by the fuel trucks would be required. The increase of roadway vehicles as compared to existing average daily traffic now experienced on these roadways would not present a significant increase in current noise levels.

Under Alternative 2, the USAF would use the BEAR kit for billeting and power would be provided by generators, resulting in a short-term increase in noise levels to the immediate area. The BEAR kit location under Alternative 2 is neither within the immediate vicinity of the airport nor adjacent to an existing population and there would be no impacts realized by the public from this source.

4.1.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.1.2.1** and **3.1.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on the ambient noise environment would be expected as a result of the No Action Alternative. Ambient noise levels on Saipan and Tinian would not increase due to construction traffic, planned military exercises, and support personnel traffic. The No Action Alternative would result in a continuation of existing conditions.

4.2 Air Quality

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS attainment areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Exceed any Evaluation Criteria established by a SIP or permit limitations/requirements
- Emissions representing an increase of 100 tpy for any attainment criteria pollutant or their precursors (O_3 [NO_x and VOCs], CO, PM_{10}, $PM_{2.5}$, and SO_2), unless the proposed activity qualifies for an exemption under the Federal General Conformity Rule.

Although the 100 tpy threshold is not a regulatory driven threshold, it is being applied as a conservative measure of significance in attainment areas. The rationale for this conservative threshold is that it is consistent with the highest General Conformity *de minimis* levels for nonattainment areas and maintenance areas. In addition, it is consistent with Federal stationary major source thresholds for Title V permitting which formed the basis for the nonattainment *de minimis* levels.

The two Alternatives are located in attainment areas for all criteria pollutants; therefore, the General Conformity rule does not apply to either Alternative or General Conformity and is not further discussed.

Each Alternative discussion is divided into a Construction Phase and Implementation Phase. Implementation Phases would occur after the Construction Phases so their associated emissions do not overlap and are not additive.

4.2.1 Alternative 1 – GSN (Preferred Alternative)

4.2.1.1 Construction Phase

Short-term, direct, minor, adverse impacts would be expected from construction emissions and land disturbance. Alternative 1 would result in minor impacts on regional air quality during construction activities primarily from site-disturbing activities; operation of construction equipment; evaporative emissions from architectural coatings; transport of concrete materials from the port to the commercial concrete supply company; transport of concrete from the commercial concrete supply company to the project site; and concrete and asphalt paving operations. Fugitive dust emissions were not calculated for the activities conducted at the commercial concrete supply company because it is assumed that the commercial concrete supply company operates under an approved air permit issued by the CNMI DEQ. Appropriate fugitive dust-control measures would be employed during construction activities to suppress emissions. All emissions associated with construction operations would be temporary in nature. The construction phase of Alternative 1 would occur over a 2- to 3-year time period; therefore, construction emissions were equally divided over a 3-year time period. It is not expected that emissions from construction of the projects associated with Alternative 1 would contribute to or affect local or regional attainment status or violate any NAAQS standards. Emissions from the construction activities associated with Alternative 1 are summarized in **Table 4.2-1**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E.**

The construction projects associated with the Alternative 1 would generate air pollutant emissions as a result of grading, filling, compacting, trenching, and construction operations, but these emissions would be temporary and would not be expected to generate any offsite impacts.

Construction, demolition, and infrastructure projects would generate particulate matter emissions as fugitive dust from ground-disturbing activities. Fugitive dust emissions would be greatest during initial site-preparation activities and would vary from day to day depending on the construction phase, level of

Table 4.2-1. Estimated Emissions Resulting from Alternative 1 Construction Activities

Construction Emissions by Calendar Year	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2 (metric tonnes)
Year 1	14.88	7.97	46.42	0.90	43.55	5.38	5,697.38
Year 2	14.88	7.97	46.42	0.90	43.55	5.38	5,697.38
Year 3	14.88	7.97	46.42	0.90	43.55	5.38	5,697.38
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	Not Applicable

Source: **Appendix E**
Key: tpy = tons per year

activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Appropriate fugitive dust-control measures would be employed during construction and demolition activities to suppress emissions.

Emissions from Alternative 1 Construction Phase are below the conservative air quality significance criteria threshold of 100 tons per year (tpy) as shown in **Table 4.2-1.** No significant impacts on local and regional air quality are anticipated from implementation of construction activities associated with Alternative 1. In addition, the Title V permit criteria do not apply to the Construction Phase as all sources are mobile sources which are not regulated under the Title V permit program.

4.2.1.2 Implementation Phase

Aircraft Operations

Periodic, direct, minor, adverse impacts on local and regional air quality would be expected from aircraft operations due to the implementation of Alternative 1. Under Alternative 1, military exercises as described under Alternative 1 would occur at GSN. It is assumed that no more than two annual joint military exercises lasting 2 weeks per exercise (a total of 4 weeks of exercises) would occur at GSN with other periodic unit-level training, to include divert and humanitarian airlift staging training (an additional 4 weeks of exercises) occurring throughout the year as analyzed in the MIRC EIS; and exercises would not exceed 8 weeks per year (DON 2010).

For planning purposes, air emissions from aircraft operations were developed using the following assumptions and methodologies:

- Each aircraft would take off and land twice each day during exercises and individual units would periodically land and take off to become familiar with the airfield while in the AOR.
- A mix of fighter, tactical and large logistics aircraft, could be diverted to or exercised from GSN simultaneously for any element of Alternative 1 as long as the mix does not exceed airfield design capabilities of 12 large logistics aircraft (KC-135). For every large logistics aircraft, two fighters can take its place to a maximum of 24 fighters (F-22) and zero large logistics aircraft.
- The USEPA has established formal procedures for calculating exhaust emissions associated with aircraft operations based on a landing and takeoff (LTO) cycle (USEPA 1992). Under these procedures, an emissions inventory for aircraft operations focuses on the emissions in the vertical

column of air where pollutant chemical reactions occur. This portion of the atmosphere, which begins at the Earth's surface and can range from several hundred to several thousand feet in altitude, is commonly referred to as the "mixing zone" or "inversion layer." Exhaust emissions occurring within this area are calculated for one complete LTO cycle for each aircraft type by applying aircraft engine-specific emissions factors derived from fuel flow rates; the period of time (or time-in-mode, TIM) that each engine operates at a particular power setting during an LTO; and activity-based operational data such as the number of aircraft, the number of engines per aircraft, and the annual number of sorties or LTOs. Emissions occurring above the mixing zone are typically not considered during the emissions inventory process (AFCEE 2009a).

- An aircraft sortie is defined as at least one LTO cycle, and might also include related training and readiness activities such as touch and go (TGO), low flyby (LFB) and low flight pattern (LFP) operations. Regardless of fuel type, emissions of concern from aircraft operations include the pollutants NO_x, VOCs, CO, PM_{10} and $PM_{2.5}$, and SO_2 (AFCEE 2009a).
- Each LTO cycle is composed of five operating modes: approach, taxi/idle in, taxi/idle out, take off, and climb out. The TIM for each mode is measured as discussed below:
    - *Approach* – The period of time from the moment the aircraft enters the mixing zone until the aircraft lands.
    - *Taxi/Idle In* – The period of time spent after landing until the aircraft is parked and the engines are turned off.
    - *Taxi/Idle Out* – The period of time from engine startup to takeoff.
    - *Takeoff* – Characterized by full engine thrust, the period of time it takes the aircraft to reach between 500 and 1,000 feet AGL. This transition height is fairly standard and does not vary much from location to location or among aircraft categories.
    - *Climb Out* – The period of time following takeoff that concludes when an aircraft exits the mixing zone and continues on to cruise altitude.
- Military aircraft engines are exempt from the Federal aircraft engine NO_x emissions standards in 40 CFR 87. Further, military aircraft engines are not subject to permitting requirements or to any other Federal stationary or mobile source emissions standards or regulations.
- Changes in the aircraft mission at GSN must be evaluated to confirm that associated emissions changes conform to the regional Clean Air Plan component of the SIP, in accordance with the General Conformity Rule in 40 CFR Parts 51 and 93.

The exact types and numbers of aircraft proposed to operate in the AOR are not known at this time. Therefore, air quality emissions were developed using two worst-case scenarios, which would generate the largest emissions. All other types and number scenarios would be assumed to generate smaller emissions than those analyzed in this EIS. The following scenarios were used to analyze emissions from aircraft operations for Alternative 1:

- Scenario 1: 12 KC-135 aircraft
- Scenario 2: 24 F-22-s aircraft.

Criteria emissions from Airfield Operations associated with the Alternative 1 are summarized in **Table 4.2-2**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-2. Estimated Aircraft Operations Emissions

Aircraft	LTOs	Total Fuel (gal)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO (tons)	NO_x (tons)	SO_x (tons)	VOC (tons)
KC-135	48	105,839.0	0.11	0.10	1.66	0.02	0.07	0.22
F-22	24	137,723.5	0.42	0.42	1.27	0.01	0.10	0.04
Worst-Case Scenario (tons)*			**0.42**	**0.42**	**1.66**	**0.02**	**0.10**	**0.22**

Source: **Appendix E**

Note: *Highest emissions value from either proposed aircraft mix extreme

GHG emissions from aircraft under Alternative 1 at GSN are presented in **Table 4.2-3**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**. Divert operations under this EIS are assumed to require approximately 300,000 gallons per day for 60 days.

Table 4.2-3. Estimated Aircraft Operations Greenhouse Gas Emissions

Fuel Use (gal)	Fuel	CO_2 (metric tonnes)
18,000,000	JP-8	176,400

Source: **Appendix E**

Emissions from Alternative 1 Aircraft Operations are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-2**. No significant impacts on local and regional air quality are anticipated from aircraft operations associated with Alternative 1. In addition, the Title V permit criteria do not apply to the Construction Phase as all sources are mobile sources which are not regulated under the Title V permit program.

Fuel Truck and Commuter Vehicle Emissions

Periodic, minor, direct, adverse impacts on local and regional air quality would be expected from the fuel truck and commuter vehicle operations due to the implementation of Alternative 1. Under Alternative 1, two activities would require commuter emissions. These activities include jet fuel receiving, storage, and distribution; and billeting (commercial lodging option). Under Alternative 1, jet fuel receiving, storage, and distribution fuel standard fuel transfer trucks would include transfer fuel to the 100,000-bbl bulk storage tank at the airport. It is assumed six 10,000-gallon fuel tank trucks, operating 10 hours per day, would take approximately 14 days to fill the bulk storage tank at the airport initially. During scheduled joint military exercises, bulk jet fuel at the airport bulk tank would be transferred to one of two operating tanks adjacent to the parking apron. The fuel would then be transferred to fuel tankers or other aircraft taking part in the exercises. In order to maintain the airport tank fuel supply for operations exceeding 14 days, fuel trucks would need to transport fuel over surface roads. It is assumed that up to six trucks operating 10 hours per day for the duration of the operation would be required.

Under Alternative 1, billeting (commercial lodging option) would require commercial buses to transport a maximum of 700 personnel to and from commercial lodging and the airfield. It is assumed all buses would transport approximately 50 personnel per busload, or approximately 56 trips per day. For emissions analysis, it is assumed 14 buses would be used to transport personnel, requiring 4 trips each to and from the airfield each operation day. Under Alternative 1, BEAR kit option, lodging would be

installed close to the existing taxiway and ramp; therefore no commuting emissions would be required to accommodate lodging under this option.

Because the exact types and mixes of commuter vehicles is not known at this time, this EIS uses the following vehicle class types to analyze potential emissions related to Alternative 1:

- HDDV8A (Bus) - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 pounds gross vehicle weight [GVW])
- HDDV8B (Fueler) - Class 8b Heavy-Duty Diesel Vehicles (> 60,000 pounds GVW).

Emissions from the operation of on-road vehicles can be classified as exhaust, evaporative, or fugitive in nature. Exhaust emissions result from the combustion (sometimes incomplete) of the motor fuel, typically while evaporative emissions result from the volatilization of the fuel at engine components during the different stages of a vehicle's operating cycle. In addition to exhaust and evaporative emissions, a small amount of fugitive particulate emissions (in the form of road dust, brake wear dust, and tire wear dust) can be attributed to the operation of on-road vehicles. The emissions of concern from the operation of on-road vehicles include NO_x VOCs, CO, SO_2, $PM_{2.5}$ and PM_{10}. Some of these direct pollutant emissions also participate in atmospheric reactions that contribute to the formation of ground-level ozone and fine particulate matter pollution.

Emissions from fuel truck and commuter vehicles were calculated using USEPA MOBILE 6 (MOVES) vehicle categories, applicable source classification codes (SCCs) and emissions factors provided in AFCEE's Air Emissions Factor Guide to Air Force Mobile Sources dated December 2009.

Criteria emissions from fuel transfer trucks and commuter vehicles associated with the Alternative 1 are summarized in **Table 4.2-4**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-4. Estimated Commuter Emissions

Vehicle Class	Model Year	Annual Miles	Emissions (tpy)					
			PM_{10} (tons)	$PM_{2.5}$ (tons)	CO (tons)	NO_x (tons)	SO_x (tons)	VOC (tons)
HDDV8A (Bus) - Class 8a Heavy-Duty Diesel Vehicles (33,001–60,000 pounds GVW)*	2000	125,440	0.035	0.028	0.397	1.684	0.001	0.091
HDDV8B (Fueler) - Class 8b Heavy-Duty Diesel Vehicles (> 60,000 pounds GVW)	2000	30,800	0.008	0.007	0.117	0.470	0.001	0.026
Total Emissions* (tpy)			**0.043**	**0.034**	**0.514**	**2.154**	**0.002**	**0.118**

Source: **Appendix E**

Note: *HDDV8A (Bus) emissions will only be generated under the Commercial Lodging Option.

GHG emissions from commuting under Alternative 1 at GSN are presented in **Table 4.2-5**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-5. Estimated Commuter Greenhouse Gas Emissions

Vehicle Class	Annual Miles	Annual Gallons Consumed	GHG Pollutant Emissions (metric tonnes/year)
			CO_2
HDDV8A(Bus) - Class 8a Heavy-Duty Diesel Vehicles (33,001–60,000 pounds GVW)	125,440	17,422	176.84
HDDV8B (Fueler) - Class 8b Heavy-Duty Diesel Vehicles (> 60,000 pounds GVW)	30,800	4,278	43.42
Total (metric tonnes/year)			**220.26**

Source: **Appendix E**

Note: *HDDV8A (Bus) emissions will only be generated under the Commercial Lodging Option.

Emissions from Alternative 1 fuel truck and commuter vehicles are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-4.** No significant impacts on local and regional air quality are anticipated from fuel truck and commuter vehicle operations associated with Alternative 1. In addition, the Title V permit criteria do not apply to the Construction Phase as all sources are mobile sources which are not regulated under the Title V permit program.

Fuel Transfer Emissions

Periodic, minor, direct, adverse impacts on local and regional air quality would be expected from fuel transfer operations due to the implementation of Alternative 1. Two types of fuel operations would be required under Alternative 1, which include loading fuel onto aircraft from nearby hydrants and loading fuel onto refueler trucks at the seaport.

The emissions of concern from fuel transfer operations are VOCs. As liquid fuel is loaded into a source (e.g., into a tanker truck cargo tank, an aircraft tank, a vehicle/equipment tank, or a bowser), vapors are displaced and emitted into the atmosphere. The amount of emissions released is dependent on several factors, such as the type of fuel being transferred, temperature, and the loading method. The amount of emissions caused during fuel transfer is also influenced by the recent history of the tank/bowser being loaded. If the tank/bowser has just been cleaned and vented, it will contain vapor-free air. However, if the tank truck has just carried fuel and has not been vented, it will contain vapors which are expelled during the loading operation along with newly generated vapors (AFCEE 2009b).

Emissions from fuel transfer operations were calculated using AP 42 **Section 5.2**, Transportation and Marketing of Petroleum Liquids (USEPA 2008).

VOC emissions from fuel transfer associated with Alternative 1 are summarized in **Table 4.2-6**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Emissions from Alternative 1 fuel transfer operations are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-6**. No significant impacts on local and regional air quality are anticipated from fuel transfer operations associated with Alternative 1.

Table 4.2-6. Estimated Fuel Loading Emissions

Location	Description	Fuel Type	Fuel Transferred	Displaced Vapor (Total VOC)
			(gal)	(tons)
Flightline	Loading Aircraft from Hydrants	JP-8	16,800,000	0.169
Seaport, Loading Racks (50,000 bbl tank 1)	Loading Refueler Trucks	JP-8	8,400,000	0.085
Seaport, Loading Racks (50,000 bbl tank 2)	Loading Refueler Trucks	JP-8	8,400,000	0.085
Total			**33,600,000**	**0.339**

Source: **Appendix E**

Internal Combustion Engines Emissions

Periodic, minor, direct, adverse impacts on local and regional air quality would be expected from the operation of internal combustion engines due to the implementation of Alternative 1. Under Alternative 1 only one ICE was identified. The ICE identified is a 920-kW generator set, which will support billeting (BEAR kit Option). It is assumed this generator would be used 24 hours a day for 8 weeks and will use JP-8 fuel.

Emissions from the operation of ICE can be classified as exhaust, evaporative, or fugitive in nature. Exhaust emissions result from the combustion (sometimes incomplete) of the motor fuel, typically while evaporative emissions result from the volatilization of the fuel at engine components during the different stages of a vehicle's operating cycle. In addition to exhaust and evaporative emissions, a small amount of fugitive particulate emissions can be attributed to the operation of ICE. The emissions of concern from the operation of ICE include NO_x, CO, SO_2, $PM_{2.5}$ PM_{10}, and VOC (AFCEE 2009b).

Emissions from ICE were calculated using equations provided in the AFCEE Stationary Source Air Emissions Inventory Guidance, Dec 2009, Equation 32-4 (AFCEE 2009b).

Emissions from ICE operation associated with Alternative 1 are summarized in **Table 4.2-7**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-7. Estimated ICE Emissions

Description	Emissions (tons/year)					
	CO (tons)	NO_x (tons)	PM (tons)	PM_{10} (tons)	SO_x (tons)	VOC (tons)
920-kW Generator Set	5.54	25.70	1.82	1.82	1.70	2.07

Source: **Appendix E**

GHG emissions from ICE under Alternative 1 at GSN are presented in **Table 4.2-8**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-8. Estimated ICE Greenhouse Gas Emissions

Description	CO_2 (metric tonnes)
920-kW Generator Set	864.94

Source: **Appendix E**

Emissions from Alternative 1 ICE operations are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-7**. No significant impacts on local and regional air quality are anticipated from ICE operations associated with Alternative 1.

All new diesel-powered engines must meet the recent emission limits established by the USEPA, called the New Source Performance Standards (NSPS) Title 40, CFR, Part 60, Subpart IIII, (40 CFR 60).

The CNMI DEQ requires all stationary sources to submit an air quality construction permit prior to their construction activities commencing. Construction permits in the CNMI require air dispersion modeling; however, less rigorous screening modeling might be adequate. The CNMI DEQ and associated regulations should be consulted to confirm such permit requirements. PACAF will coordinate with CNMI DEQ to obtain the necessary stationary source permits prior to conducting ICE operations.

Fuel Storage Tank Emissions

Periodic, minor, direct, adverse impacts on local and regional air quality would be expected from Fuel Storage Tanks due to the implementation of Alternative 1. Under Alternative 1, all fuel storage tanks are assumed to be fixed roof, aboveground storage tanks with no pressure/vacuum vents installed. All fuel storage tanks are assumed to contain JP-8 fuel.

Emissions from fixed roof tanks are caused by changes in temperature, pressure, and liquid level. The amount of emissions varies as a function of vessel capacity, vapor pressure of the stored liquid, utilization rate of the tank, and atmospheric conditions at the tank location. In general, there are two types of emissions from fixed roof tanks, "storage losses" and "working losses." Storage loss from a fixed roof tank is in the form of "breathing loss," which is the expulsion of vapor from a tank as a result of vapor expansion and contraction caused by changes in temperature and barometric pressure. This occurs without any liquid level change in the tank. Working loss is the combined loss from filling and emptying the tank. Evaporation during filling operations is a result of an increase in the liquid level in the tank. As the liquid level increases, the pressure inside the tank exceeds the relief pressure and vapors are expelled from the tank. Evaporative loss occurs as the fuel is emptied when air drawn into the tank during liquid removal becomes saturated with organic vapor and expands; therefore, exceeding the capacity of the vapor space (AFCEE 2009b).

Emissions from fuel storage tanks were calculated using USEPA's TANKS Emissions Estimation Software, Version 4.09.

Emissions from Fuel Storage Tanks associated with the Alternative 1 are summarized in **Table 4.2-9**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Emissions from Alternative 1 Fuel Storage Tanks are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-7.** No significant impacts on local and regional air quality are anticipated from tank fuel storage associated with Alternative 1.

Table 4.2-9. Estimated Fuel Storage Tank Emissions

Tank Type	Total VOC*(tons)
Tank 1 (Seaport)- 50,000 bbl, cut and cover or AST	0.33
Tank 2 (Seaport)- 50,000 bbl, cut and cover or AST	0.33
Tank 3 (Airport) - 100,000 bbl, cut and cover or AST	0.72
Total	**1.38**

Source: **Appendix E**

Note: Total VOCs calculated using TANKS (TANKS 4.0.9d 2012a and 2012b).

The CNMI DEQ requires all stationary sources to submit an air quality construction permit prior to their construction activities commencing. Construction permits in the CNMI require air dispersion modeling; however, less rigorous screening modeling might be adequate. The CNMI DEQ and associated regulations should be consulted to confirm such permit requirements. PACAF will coordinate with CNMI DEQ to obtain the necessary stationary source permits prior to constructing the bulk fuel storage area.

Summary of Alternative 1 Implementation Phase Emissions

Periodic, minor, adverse impacts would be expected from all activities associated with the implementation phase of Alternative 1. A summary of emissions from the Implementation Phase associated with Alternative 1 are summarized in **Table 4.2-10**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-10. Estimated Annual Emissions Resulting from Alternative 1's Implementation Phase

Source Category	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2 (metric tonnes)
Airfield Operations	0.024	0.218	1.661	0.096	0.423	0.419	176,400
Fuel Truck and Commuter Vehicle Emissions	2.15436	0.11774	0.51397	0.00206	0.04306	0.03444	220
Fuel Transfer Emissions	N/A	0.339	N/A	N/A	N/A	N/A	0
ICE	25.701	2.073	5.538	1.700	1.824	1.824	865
Fuel Storage Tank Emissions	N/A	1.383	N/A	N/A	N/A	N/A	0
Total Pollutant Emissions	27.88	4.13	7.71	1.80	2.29	2.28	177,485
Significance Criteria (tpy)	100	100	100	100	100	100	N/A

Source: **Appendix E**

Emissions from all activities associated with the implementation phase of Alternative 1 are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-10.** No significant impacts on local and regional air quality are anticipated from the implementation phase associated with Alternative 1.

The CNMI DEQ requires all stationary sources to submit an air quality construction permit prior to their construction activities commencing. Construction permits in the CNMI require air dispersion modeling; however, less rigorous screening modeling might be adequate. The CNMI DEQ and associated regulations should be consulted to confirm such permit requirements. PACAF will coordinate with CNMI DEQ to obtain the necessary stationary source permits prior to commencing construction activities.

4.2.2 Alternative 2 – TNI

4.2.2.1 Construction Phase

Short-term, minor, direct, adverse impacts would be expected from construction emissions and land disturbance. Alternative 2 would result in minor impacts on regional air quality during construction activities primarily from site-disturbing activities; operation of construction equipment; evaporative emissions from architectural coatings; transport of concrete materials to from the port to the commercial concrete supply company; transport of concrete from the commercial concrete supply company to the project site; and concrete and asphalt paving operations. Fugitive dust emissions were not calculated for the activities conducted at the commercial concrete supply company because it is assumed that the commercial concrete supply company operates under an approved air permit issued by the CNMI DEQ. Appropriate fugitive dust-control measures would be employed during construction activities to suppress emissions. All emissions associated with construction operations would be temporary in nature. The construction phase of Alternative 2 would occur over a 2- to 3-year time period; therefore, construction emissions were equally divided over a 3-year time period. It is not expected that emissions from construction of the projects associated with Alternative 2 would contribute to or affect local or regional attainment status or violate any NAAQS standards. Emissions from the construction activities associated with Alternative 2 are summarized in **Table 4.2-11**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-11. Estimated Emissions Resulting from Alternative 2 Construction Activities

Construction Emissions by Calendar Year	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2 (metric tonnes)
Year 1	19.07	9.39	52.32	1.18	69.25	8.22	6,410.95
Year 2	19.07	9.39	52.32	1.18	69.25	8.22	6,410.95
Year 3	19.07	9.39	52.32	1.18	69.25	8.22	6,410.95
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	Not Applicable

Sources: **Appendix E**

The construction projects associated with Alternative 2 would generate air pollutant emissions as a result of grading, filling, compacting, trenching, and construction operations, but these emissions would be temporary and would not be expected to generate any offsite impacts.

Construction, demolition, and infrastructure projects would generate particulate matter emissions as fugitive dust from ground-disturbing activities. Fugitive dust emissions would be greatest during initial site-preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Appropriate fugitive dust-control measures would be employed during construction and demolition activities to suppress emissions.

Emissions from Alternative 2 Construction Phase are below the conservative air quality significance criteria of 100 tpy as shown in **Table 4.2-11.** No significant impacts on local and regional air quality are anticipated from implementation of construction activities associated with Alternative 1. In addition, the Title V permit criteria do not apply to the Construction Phase as all sources are mobile sources which are not regulated under the Title V permit program.

4.2.2.2 Implementation Phase

The Implementation Phase emissions calculations for TNI are identical to GSN except for the following:

- Internal Combustion Engines
- Tanks.

Therefore, only these two types of emissions sources are discussed in detail as follows.

Internal Combustion Engines

Periodic, minor, direct, adverse impacts on local and regional air quality would be expected from the operation of ICEs due to the implementation of Alternative 2. Under Alternative 2 three ICEs were identified. The three ICEs are a 920-kW generator set which will support the Billeting (BEAR kit Option), and two generators (assume 550-kW) to support the operating tanks and the bulk fuel tank at the airport. It is assumed the BEAR KIT generator will be used 24 hours a day for 8 weeks and the two emergency generators will run 41.6 hours per month for 8 weeks and all will use JP-8 fuel. The ICE equipment produces pollutants and the emissions factors for JP-8 fuel are similar to diesel emissions factors (AFCEE 2009b).

Emissions from the operation of ICEs can be classified as exhaust, evaporative, or fugitive in nature. Exhaust emissions result from the combustion (sometimes incomplete) of the motor fuel, typically while evaporative emissions result from the volatilization of the fuel at engine components during the different stages of a vehicle's operating cycle. In addition to exhaust and evaporative emissions, a small amount of fugitive particulate emissions can be attributed to the operation of ICEs. The emissions of concern from the operation of ICEs include NO_x, VOCs, CO, SO_2, and $PM_{2.5}$ and PM_{10} (AFCEE 2009b).

Emissions from ICEs were calculated using equations provided in the AFCEE Stationary Source Air Emissions Inventory Guidance, December 2009, Equation 32-4 (AFCEE 2009b).

Emissions from ICE operation associated with Alternative 2 are summarized in **Table 4.2-12**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

GHG emissions from ICEs under Alternative 2 at GSN are presented in **Table 4.2-13**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Emissions from Alternative 1 ICE operations are below the conservative air quality significance criteria threshold of 100 tpy as shown in **Table 4.2-12**. No significant impacts on local and regional air quality are anticipated from ICE operations associated with Alternative 1.

All new diesel-powered engines must meet the recent emission limits established by the USEPA, called the NSPS Title 40, CFR, Part 60, Subpart IIII, (40 CFR 60).

Table 4.2-12. Estimated ICE Emissions

Description	Emissions (tpy)					
	CO (tons)	NO_x (tons)	PM (tons)	PM_{10} (tons)	SO_x (tons)	VOC (tons)
920-kW Generator Set	5.54	25.70	1.82	1.82	1.70	2.07
550-kW Generator	0.21	0.95	0.07	0.07	0.06	0.08
550-kW Generator	0.21	0.95	0.07	0.07	0.06	0.08
Total	**5.95**	**27.61**	**1.96**	**1.96**	**1.83**	**2.23**

Source: **Appendix E**

Table 4.2-13. Estimated ICE Greenhouse Gas Emissions

Description	CO_2 (metric tonnes)
920-kW Generator Set	865
550-kW Generator	32
550-kW Generator	32
Total	**929**

Source: **Appendix E**

The CNMI DEQ requires internal combustion engines to submit an air quality construction permit prior to their construction activities commencing. Construction permits in the CNMI require air dispersion modeling; however, less rigorous screening modeling might be adequate. The CNMI DEQ and associated regulations should be consulted to confirm such permit requirements. PACAF will coordinate with CNMI DEQ to obtain the necessary stationary source permits prior to obtaining ICEs.

Fuel Storage Tank Emissions

Periodic, minor, direct, adverse impacts on local and regional air quality would be expected from fuel tanks due to the implementation of Alternative 2. Under Alternative 2, all fuel storage tanks are assumed to be fixed-roof aboveground storage tanks with no pressure/vacuum vents installed. All fuel storage tanks are assumed to contain JP-8 fuel.

Emissions from fixed-roof tanks are caused by changes in temperature, pressure, and liquid level. The amount of emissions varies as a function of vessel capacity, vapor pressure of the stored liquid, utilization rate of the tank, and atmospheric conditions at the tank location. In general, there are two types of emissions from fixed roof tanks, "storage losses" and "working losses." Storage loss from a fixed-roof tank is in the form of "breathing loss," which is the expulsion of vapor from a tank as a result of vapor expansion and contraction caused by changes in temperature and barometric pressure. This occurs without any liquid level change in the tank. Working loss is the combined loss from filling and emptying the tank. Evaporation during filling operations is a result of an increase in the liquid level in the tank. As the liquid level increases, the pressure inside the tank exceeds the relief pressure and vapors are expelled from the tank. Evaporative loss occurs as the fuel is emptied when air drawn into the tank during liquid removal becomes saturated with organic vapor and expands; therefore, exceeding the capacity of the vapor space (AFCEE 2009b).

Emissions from fuel storage tanks were calculated using USEPA's TANKS Emissions Estimation Software, Version 4.09.

Emissions from Fuel Storage Tanks associated with the Alternative 2 are summarized in **Table 4.2-14**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-14. Estimated Fuel Storage Tank Emissions

Tank Type	Total VOC (tons)*
Tank 1 (Seaport)- 100,000 bbl, cut and cover or AST	0.72
Tank 2 (Airport)-10,000 bbl, cut and cover or AST	0.27
Tank 3 (Airport) - 10,000 bbl, cut and cover or AST	0.27
Tank 4 (Airport) - 100,000 bbl, cut and cover or AST	0.72
Total (tons)	**1.97**

Source: **Appendix E**

Note: Total VOCs calculated using TANKS (TANKS 4.0.9d 2012b and TANKS 4.0.9d 2012c).

Emissions from Alternative 2 Fuel Storage Tanks are below the conservative air quality significance criteria of 100 tpy as shown in **Table 4.2-14.** No significant impacts on local and regional air quality are anticipated from tank fuel storage associated with Alternative 2.

Summary of Alternative 2 Implementation Phase Emissions

Periodic, minor, adverse impacts would be expected from all activities associated with the implementation phase of Alternative 2. Emissions from the Implementation Phase associated with Alternative 2 are summarized in **Table 4.2-15**. Emissions estimation spreadsheets and a summary of the methodology used are included in **Appendix E**.

Table 4.2-15. Estimated Annual Emissions Resulting from the Alternative 2's Implementation Phase

Source Category	NO_x (tons)	VOC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	CO_2 (metric tonnes)
Airfield Operations	0.45	0.22	1.66	0.10	0.42	0.42	176,400
Fuel Truck and Commuter Vehicle Emissions	2.15	0.12	0.51	0.00	0.04	0.03	220
Fuel Transfer Emissions	N/A	0.34	N/A	N/A	N/A	N/A	0
ICE	27.61	2.23	5.95	1.83	1.96	1.96	865
Fuel Storage Tank Emissions	N/A	1.97	N/A	N/A	N/A	N/A	0
Total Pollutant Emissions	30.21	4.87	8.12	1.92	2.43	2.41	177,485
Significance Criteria Threshold (tpy)	100	100	100	100	100	100	N/A

Source: **Appendix E**

Emissions from all activities associated with the implementation phase of Alternative 2 are below the conservative air quality significance criteria of 100 tpy as shown in **Table 4.2-15.** No significant impacts on local and regional air quality are anticipated from the implementation phase associated with Alternative 2.

The CNMI DEQ requires all stationary sources to submit an air quality construction permit prior to commencement of their construction activities. Construction permits in the CNMI require air dispersion modeling; however, less rigorous screening modeling might be adequate. The CNMI DEQ and associated regulations should be consulted to confirm such permit requirements.

4.2.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.2.2.1** and **3.2.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises

would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on air quality would be expected as a result of the No Action Alternative. Emissions levels on Saipan and Tinian would not increase due to construction, planned military exercises, fuel storage, and support personnel traffic. The No Action Alternative would result in a continuation of existing conditions.

4.3 Airspace Management and Airport Operations

This section reviews the impacts of proposed construction and implementation to the airfield and surrounding airspace at the GSN, Saipan; and TNI, Tinian, airports. Airspace/airfield impacts were assessed based on the following criteria:

- Disruption of airfield operations
- Disruption of the existing flow of commercial air traffic to or from the selected airport
- Obstructions which would be considered hazardous to air traffic.

If the analysis shows that these conditions might occur, then the impacts were further evaluated in terms of duration (short- or long-term) and intensity (minor, moderate, or major).

4.3.1 Alternative 1 – GSN (Preferred Alternative)

4.3.1.1 Construction Phase

USAF operational and safety requirements drive the need for the Proposed Action and construction at GSN under Alternative 1. The following paragraphs relate specific construction elements that are required, and provide a summary of potential impacts on airspace and airfield operations. Potential

impacts due to construction activities are anticipated in the form of airspace and airfield management and operations constraints, with possible associated socioeconomic and safety concerns. Assumptions have been made for the purpose of analysis at this stage. They will either be confirmed or re-analysis will occur in the Final EIS based on the results of the Aeronautical Study.

Runway. Construction activities under Alternative 1 at GSN would result in short-term, direct, moderate, adverse impacts on airfield operations when extending the runway length under Option A. Requirements to support takeoff and landing requirements for KC-135 aircraft indicate that the operational runway should optimally be 10,500 feet long, and at least 150 feet wide with 25-foot-wide paved shoulders. Impacts from construction of runway Option B would be similar to those described for Runway Option A. No impacts from construction are anticipated from Runway Option C; although, this option could limit the load capability for KC-135 aircraft.

While RWY 07/25 qualifies as a Class B runway, the length of the runway is only 8,700 feet. Construction would be required to provide an additional 350 feet of runway under Option A. Short-term, direct, moderate, adverse impacts on aircraft operations would be expected during construction because large aircraft would not have the ability to depart or land with men and equipment operating at the end of the runway. Coordination with CPA and commercial aviation could minimize these impacts and construction timing could be adjusted to accommodate the majority of civil and commercial traffic. Intermittent delays would likely result from unanticipated construction issues and time-sensitive construction operations. Additionally, FAA Form 7460-1 must be submitted prior to any construction within 10,000 feet of an active runway.

GSN is the preferred divert location for commercial aviation in the region. GSN's availability as a divert location for civil and commercial aircraft would be limited during active construction activities. An alternative civil and commercial divert location would be need to be identified for these possibilities. Potential divert locations for the construction phase include TNI and Andersen AFB, Guam. Though the probability of a commercial airliner needing a divert location is extremely low, short-term, indirect, moderate, adverse impacts would be expected on commercial aviation, from any military emergency divert landings, or the construction of divert facilities at GSN. For example, an emergency military landing at GSN in February 2012 resulted in the grounding of all air traffic headed to Guam from Japan until a suitable alternative divert location could be found. Aircraft fuel limitations and distances to other suitable divert locations are problematic for commercial carriers headed to Guam from the west and the east. Modification to approach procedures and relocation of the localizer would be required.

Parking Apron. Construction of the parking apron on the north side of the runway under Alternative 1 at GSN would lead to minor, short-term, direct, adverse impacts on airfield operations. Impacts on airfield operations would occur from additional congestion on the existing parking apron, the possible generation of foreign object debris (FOD), and construction vehicles transitioning on the taxiways. Ballfield-type lighting is proposed on the apron boundary to provide adequate security and lights for night operations. The proposed parking apron would conform to UFC 3-260-1 criteria. Procedures could be implemented during construction to accommodate aircraft taxiing to and from the runway.

Temporary Munitions Storage Area. Minor, short-term, direct, adverse impacts on airfield operations would be expected during development of the munitions storage area. Periodic scheduling of the movement of construction equipment could be required to avoid interfering with commercial and civil aircraft takeoff and landing operations. Construction of the munitions storage area at the proposed location, 1,750 feet south of the centerline of the runway and approximately 1,160 feet east of the ARTA, would not present the potential for impacts related to munitions storage to airfield operations. Confirmation of possible impacts will be based on the results of the Safety Management System Plan.

Hazardous Cargo Pad/Arm-disarm Pad. Construction of the hazardous cargo pad/arm-disarm pad under Alternative 1 at GSN would result in minor, short-term, adverse, direct impacts on airfield operations. UFC 3-260-1 prohibits hazardous cargo pads being sited in a way that will allow penetration of the approach/departure clearance surface areas. Additionally, USAF arm/disarm pads should be located adjacent to runway thresholds and sited such that armed aircraft are oriented in the direction of least populated areas or towards revetments. The proposed pad is outside approach/departure clearance surface areas, but would likely cause minor, adverse impacts on airfield operations due to construction equipment or vehicles transitioning to and from the proposed site. Procedures could be implemented to avoid the area during construction to accommodate aircraft taxiing to and from the runway. Confirmation of possible impacts will be based on the results of the Safety Management System Plan.

Aircraft Hangar. Construction of the aircraft hangar under Alternative 1 at GSN could result in moderate, long-term, direct, adverse impacts on airspace operations as a possible obstruction to air navigation. Construction at the proposed location should not present impacts on airfield "ground" operations, but airfield "air" operations could be affected. FAR Part 77 establishes the requirements to provide notice to the FAA of certain proposed construction or the alterations of existing structures and determination of obstructions impact to air navigation. Data required to complete the obstruction analysis has not been developed but will be included in the aeronautical study. Potential impacts include changes to instrument approach procedures, aeronautical charts, and potential permanent notices to airmen (NOTAMs) informing aircrews of the possible navigation obstruction.

Maintenance Facility. Construction of the maintenance facility under Alternative 1 at GSN could result in moderate, long-term, direct impacts on airspace operations as a possible obstruction to air navigation. Construction at the proposed location should not present impacts on airfield "ground" operations; however, the airfield "air" operations could be affected. FAR Part 77 establishes the requirements to provide notice to the FAA of certain proposed construction or the alteration of existing structures and determination of obstructions impact on air navigation. Data required to complete the analysis has not been developed but will be included in the aeronautical study. Potential impacts include changes to instrument approach procedures, aeronautical charts, and potential permanent NOTAMs informing aircrews of the possible navigation obstruction.

Jet Fuel Receiving, Storage, and Distribution. Short-term, minor, direct, adverse impacts would be expected on airfield operations from the construction of fuel receiving, storage and distribution systems. Construction of DOD-designed 2,400 gpm Type III Hydrant Refueling System would cause minimum disruption to airfield ground operations because of FOD and vehicles transitioning on the taxiway during installation of the underground fuel system. Procedures could be implemented to avoid the area during construction to accommodate aircraft taxiing to and from the runway.

Additionally, construction of the proposed bulk fuel tank and hydrant system could create an obstruction to air navigation. However, FAR Part 77 establishes the requirements to provide notice to the FAA of certain proposed construction, or the alteration of existing structures and determination of obstruction impacts on air navigation. Data required to complete the analysis have not been developed but will be included in the aeronautical study. Potential impacts include changes to instrument approach procedures, aeronautical charts, and potential permanent NOTAMs informing aircrews of the possible navigation obstruction.

Billeting. No impacts on airfield or airspace operations would be expected from the proposed BEAR kit location or height of the proposed structures within the BEAR kit.

To help ensure that construction can be completed in a safe manner, and recognizing the operational needs of other airport users, the USAF could prepare an airport construction safety plan in accordance

with Advisory Circular 150/5370-2F. This safety plan would then be subjected to a Safety Management System (SMS) evaluation.

4.3.1.2 Implementation Phase

Analyses of the implementation stage on airspace and airport operations have been based on assumptions. Results of this analysis will either be confirmed or re-analysis will occur based on the results of the Aeronautical Study and Safety Management System Plan.

Military Exercises. Short-term, periodic, moderate, direct, adverse impacts would be expected on the immediate airspace and airfield operations due to implementation of joint military exercises under Alternative 1. Air operations of the proposed joint military exercises under Alternative 1 at GSN have previously been analyzed in the MIRC EIS (DON 2010 a). Military exercises would have moderate, direct, adverse, short-term, periodic impacts on airspace and airfield operations as indicated in the MIRC EIS. It is assumed that two annual exercises lasting 2 weeks per exercise (a total of 4 weeks of exercises) would occur at GSN, in addition to no more than 4 weeks of other periodic unit-level exercises per year, not to exceed a total of 8 weeks of exercises per year (DON 2010 a). These military exercises are well within levels of training previously analyzed in MIRC EIS. DOD, local stakeholders, and Federal regulators collect and review military training data annually to implement required adaptive management techniques and adaptive mitigation techniques if required. In addition to this annual review, military training in the MIRC ROD is also reviewed on a 5-year cycle. This adaptive management approach ensures that any increase or changes in quality or quantity of exercises is fully analyzed on a continuing basis. In addition to the exercise requirements, individual units would periodically land and take-off to become familiar with the airfield while in the AOR. This type of training is also included within the analysis contained in the MIRC EIS.

Jet Fuel Receiving, Storage, and Distribution. Implementation of the jet fuel receiving, storage and distributing system would have long-term, direct, moderate, beneficial, impacts on the airspace and airfield because the fueling system would provide a more efficient fueling operation at the airfield. Currently aircrafts are fueled via refueling vehicles which is labor-intensive and creates additional airfield vehicular traffic. The refueling system provides increased operation efficiency by allowing commercial and DOD aircraft the capability to re-fuel rapidly.

Billeting. Use of commercial lodging or the BEAR Kit for billeting would result in no impacts on the airspace and airfield.

4.3.2 Alternative 2 – TNI

4.3.2.1 Construction Phase

Runway. Short-term, minor, direct, adverse impacts on airfield operations would be expected from construction of the runway extension under Option A of Alternative 2 at TNI. Displacement of agricultural outleases in the area would be required; however terms of the lease back provide for termination of the agricultural leases by DLNR and Public lands upon notification of the need for the property by DOD. Additionally, FAA Form 7460-1 must be submitted prior to any construction within 10,000 feet of an active runway. Optimum capability to support takeoff and landing for KC-135 aircraft include an operational runway that is 10,500 feet long, and at least 150 feet wide with 25-foot-wide paved shoulders. While the TNI RWY 08/26 qualifies as a Class B runway, it is only 8,600 feet long. Construction would be required to provide an additional 1,400 feet of runway. A summary of commercial aircraft usage at TNI is presented in **Section 3.3.2.2**.

The combination of air carrier, air taxi, and general aviation operations compose the majority of air traffic using TNI. Modification to approach procedures would be required to minimize impacts during construction. Since most of the aircraft landing and taking off at TNI require only a very short runway, a temporary displaced threshold and appropriate runway markings could limit the overall 8,600-foot runway for use during construction. This is consistent with the CPA's proposed development of a "hot taxi way" near the center of the existing runway. By development and use of the hot taxiway, appropriate segregation between runway construction and operations can be accomplished. Though limiting the ability of TNI to develop commercial charter flights from Chinese locations in the short term, the runway limitations would permit continued use of the airport under existing conditions including the existing charter and air taxi services while addressing the potential adverse impacts of construction. Since the runway extension is proposed only on the east end of the runway and a majority of approaching flights land west to east, a redesignated east threshold could provide the buffer needed between construction and operations. Extending the runway east could be accomplished with minimum disruption to existing airport operations. Intermittent delays could result from unanticipated construction issues and time-sensitive construction operations.

Parking Apron. Short-term, minor, direct, adverse impacts on airfield operations would be expected due to construction of the parking apron under Alternative 2. The proposed parking apron would be approximately 291,820 ft^2 and located south of the runway. Avoidance of an abandoned quarry/borrow pit west of the existing TNI parking area and appropriate fill and compaction would be required to create the parking apron just west of the exiting ramp. Quarrying of fill would be required for this action which would contribute to additional congestion at the site. Abandoned quarries on Tinian could provide sufficient material for this purpose. Ball field-type lighting is proposed on the apron boundary to provide adequate security and lights for night operations. Procedures could be implemented to avoid the area during construction to accommodate aircraft taxiing to and from the runway.

Temporary Munitions Storage Area. No impacts on airfield operations would be expected due to construction of the temporary munitions storage area under Alternative 2. Periodic scheduling of the movement of construction equipment could be required to avoid interfering with commercial and civil aircraft takeoff and landing operations. Construction of the munitions storage area at the proposed location, 1,550 feet south of the centerline of the runway and approximately 1,600 feet east of the ARTA, would not present the potential for impacts related to munitions storage to airfield operations. Confirmation of possible impacts will be based on the results of the Safety Management System Plan.

Hazardous Cargo Pad. No impacts on airspace or airfield operations would be expected due to construction of the hazardous cargo pad under Alternative 2, provided segregation between usable runway and the construction area can be maintained. UFC 3-260-1 prohibits siting hazardous cargo pads in a way that would allow penetration of the approach/departure clearance surface areas. The proposed pad is outside approach/departure clearance surface areas. Confirmation of impact will be based on the results of the Safety Management System Plan.

Arm/Disarm Pad. No impacts on airspace or airfield operations would be expected due to construction of the hazardous cargo pad under Alternative 2, provided segregation between usable runway and the construction area can be maintained. UFC 3-260-1 prohibits siting arm/disarm pads in a way that would allow penetration of the approach/departure clearance surface areas. Also, USAF arm/disarm pads should be located adjacent to runway thresholds on either CPA or military leased property adjacent to CPA property, and would be sited such that armed aircraft are oriented in the direction of military leased area, which is the least populated area. Revetments would not be necessary because of the location of the pad adjacent to or on leased military property. The area would be outside the approach/departure clearance surface areas. Procedures could be implemented to avoid the area during construction to accommodate

aircraft taxiing to and from the runway. Confirmation of impacts will be based on the results of the Safety Management System Plan.

Aircraft Hangar. Although no impacts would be expected on airfield ground operations, construction of the aircraft hangar under Alternative 2 would lead to the relocation of the TNI fire and rescue fire station. FAR Part 77 establishes the requirements to provide notice to the FAA of certain proposed construction, or the alterations of existing structures and determination of obstruction impact on air navigation. Data required to complete the analysis has not been fully developed but will be included as part of the Aeronautical study and the Safety Management System plans.

Maintenance Facility. Long-term, minor, direct, adverse impacts on airspace could be expected as a result of the new maintenance facility potentially creating a new obstruction to air navigation. Construction at the proposed location should not present impacts on airfield "ground" operations however the airfield "air" operations could be affected. In addition, construction at the proposed location would not present impacts on airfield "ground" operations, but relocation of the fire station would be required as a condition precedent to the construction of this facility. Data required to complete the analysis has not been developed but will be included in the aeronautical study.

Jet Fuel Receiving, Storage, and Distribution. Short-term, minor, direct, impacts on airfield operations would be expected due to construction of the proposed jet fuel receiving, storage, and distribution system under Alternative 2. Construction of the proposed cut and cover storage fuel tanks would be constructed near the entrance to CPA property near Broadway. Construction of fuel storage tanks at TNI would be consistent with the intent of the DOD and CNMI in the reservation of leasehold rights to develop POL capabilities within the CPA areas in exchange for the release of the military leasehold, dated 1999. The fuel storage facility could be developed with limited disruption of CPA activities. The development of a DOD-designed 2,400 gpm Type III Hydrant Refueling System could cause minor disruption to airfield "ground" operations because of need to develop POL lines and hydrants in the proposed parking areas. Trenching of CPA property and possible FOD and vehicles transitioning on taxiway and existing parking areas during installation of the underground fuel system could be problematic. Confirmation of impacts will be based on the results of the Safety Management System Plan. Procedures would be implemented to avoid operational areas to the extent practicable during construction to accommodate aircraft taxiing to and from the runway.

The aboveground tanks would be analyzed in accordance with FAR PART 77 to determine any minor, long-term impacts on airspace operations due to the potential for creating a new airspace obstruction. Construction at the proposed bulk fuel tank and hydrant system location should not present impacts on airfield "ground" operations; however, the airfield "air" operations could be affected because of minimal obstruction to air navigation, depending on their height. FAR Part 77 establishes the requirements to provide notice to the FAA of certain proposed construction, or the alteration of existing structures and determines obstruction impacts on air navigation. Data required to complete the analysis have not been fully developed but will be included as part of the Aeronautical Study and the Safety Management System plans.

Billeting. No impacts on airspace or airfield operations would be expected from construction of the proposed BEAR kit under Alternative 2. Due to the proposed location and low height of proposed structures, there is no potential for airspace obstruction and airfield operations would not be hindered. The proposed BEAR kit area is located on CPA property and there are no known agricultural leases in the area. Access to the site is also along existing CPA access roads.

To help ensure that construction can be completed in a safe manner, and recognizing the operational needs of other airport users, the USAF could prepare an airport construction safety plan in accordance with Advisory Circular 150/5370-2F. This safety plan would then be subjected to an SMS evaluation.

4.3.2.2 Implementation Phase

Assumptions have been made for the purpose of analysis at this stage. They will either be confirmed or re-analysis will occur based on the results of the Aeronautical Study or Safety Management System Plan.

Military Exercises. Short-term, periodic, moderate, direct, adverse impacts on airspace and airfield operations would be expected due to implementation of joint military exercises under Alternative 2. It is assumed that no more than two annual exercises lasting 2 weeks per exercise (a total of 4 weeks of exercises) would occur at TNI, with 4 additional weeks of periodic unit-level training exercises for a total of 8 weeks of exercises per year (DON 2010). This level of military training is well within levels of training previously analyzed in the MIRC Final EIS (DON 2010a). DOD, local stakeholders, and Federal regulators collect military training data annually. Yearly DOD and stakeholders review that data to implement required adaptive management techniques and adaptive mitigation techniques if required. In addition to this annual review, military training in the MIRC is reviewed on a 5-year cycle. This adaptive management approach ensures that any increase of types or changes in quality or quantity of training is fully analyzed on a continuing basis. In addition to the exercise requirements, individual units would periodically land and take off to become familiar with the airfield while in the AOR. This type of training is also included within the analysis contained in the MIRC ROD. Implementation of military exercises could lead to moderate short-term, periodic impacts on the airspace. Implementation of the proposed joint military exercises and other periodic unit-level exercises at TNI could lead to periodic moderate, short-term, direct, adverse impacts on the immediate approach and departure airspace as there is no ATC tower to provide positive control instructions to aircraft and vehicles operating on the airfield. There is no surveillance (radar) service available below 3,500 feet above MSL. Therefore, FAA radar separation standards would increase, causing delays in the non-radar environment during joint military exercises. In addition, there are no NAVAIDS located on airfield. Because there are only non-precision instrument approach procedures to the airfield, capability would be further limited during poor weather conditions.

Jet Fuel Receiving, Storage, and Distribution. No adverse impacts on airspace or airfield operations would be expected due to operation of the jet fuel receiving, storage, and distribution system under Alternative 2. Moderate, indirect, beneficial impacts on the airfield operations could be expected due to the diversification of fuel supply at TNI. As with any similar system, implementation of jet fuel distributing system could result in incidental spills of fuel on CPA property, but implementing appropriate spill containment and management plans would alleviate any adverse impacts. Jet fuel availability at TNI would provide beneficial impacts on airfield operations. Currently there is no jet refueling capability on the airfield. The refueling system provides the airfield the capability to help stimulate more air carriers to use the airfield. It would provide DOD the capability to refuel their aircraft rapidly.

Billeting. No adverse impacts on airspace or airfield operations would be expected due to implementation of the BEAR kit under Alternative 2. Implementation of the Bear Kit could provide minor, indirect, beneficial impacts on airfield operations through improvements on airport-related services for tourists including refreshments and other concessions. The proximity of the BEAR kit to available commercial air passenger terminal amenities could improve the small business component of this portion of CPA operations.

4.3.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.3.2.1** and **3.3.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative could provide detriment to the existing conditions currently experienced on Saipan and Tinian.

The No Action Alternative would have short-term, direct, moderate, adverse, impacts on airspace and airport operations. Under the No Action Alternative, divert landings would continue to occur at GSN on an emergency basis; and the runway and airport would not be improved to accommodate the landing of larger aircraft. An emergency divert landing could interrupt and impact commercial operations and cause damage airport infrastructure.

4.4 Geological Resources and Soils

Protection of unique geological features, minimization of soil/sediment erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Generally, adverse impacts can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

Impacts on geological resources were assessed by evaluating the following:

- Potential to destroy unique geological features
- Potential for soil erosion
- Proximity to or impact on geologic hazards (such as locating a proposed action in a seismic zone)
- Potential to affect soil or geological structures that control groundwater quality or groundwater availability
- Alteration of soil structure or function.

4.4.1 Alternative 1 – GSN (Preferred Alternative)

4.4.1.1 Construction Phase

Short- and long-term, direct and indirect, minor to moderate, adverse impacts on soils would be expected as a result of Runway Options A and B. Minor impacts on geology and topography would also be expected as a result of Runway Options A and B. Currently, the areas to the northeast and southwest of the runway slopes steeply to the ocean. Extending the runway and associated clear zones (CZs) would require rock to be quarried to build up the land to the correct grade so that the airstrip is relatively flat. This would result in short- and long-term moderate impacts on geological resources and soil through the removal and relocation of rock and the compaction of soil underlying the newly extended airstrip. Option

C would have the least impact on geology and topography because soils and geography would not be disturbed by runway construction.

Some removal of rock might be necessary to provide level areas for construction activities. A minimal amount of grading would be required due to the gently undulating nature of the ground surface associated with billeting using the BEAR kit. Ground-penetrating radar or other subsurface geologic studies could be conducted prior to initiating construction activities to determine if there is the presence of sinkholes, caves, or other karst features beneath the surface of the site of the Proposed Action or to determine if other engineering limitations exist.

Construction activities associated with the Proposed Action would be expected to result in short-term, direct, minor to moderate, adverse impacts as soils would be disturbed, vegetation would be cleared, and grading would occur. All soils have been previously disturbed. Clearing of vegetation would increase erosion rates and sedimentation potential into nearby water bodies. If the commercial lodging option is chosen over the BEAR kit option, the disturbance to soil would be reduced. ESCPs could be developed and implemented both during and following site development to contain soil and runoff on site, and reduce potential for adverse impacts associated with erosion and sedimentation and transport of sediments in runoff (see **Section 3.5** for a discussion on water resources). Site-specific soil surveys could be conducted in areas requiring excavation of soil to determine the depth of soils and if any engineering limitations exist.

Short-term, direct, minor, adverse impacts would be expected from excavation activities associated with placement of utilities (i.e., the waterline and sewer line) and fuel piping. Excavation would involve removal of vegetation and disturbance of soil structure. Removal of vegetation would temporarily increase erosion and sedimentation potential until disturbed soil has been stabilized and vegetation regrowth has occurred. Once vegetation has been reestablished, impacts from trenching activities associated with erosion and sedimentation would be reduced to negligible.

Soil disturbance at GSN has the potential to result in excessive erosion as soils on the site of the Proposed Action could be highly erosive. Less soil disturbance, potential erosion, and sedimentation would occur if a shorter runway expansion, or no expansion, was adopted. BMPs would be implemented and an ESCP established so that no impacts from erosion and sedimentation would occur. The ESCP would describe the measures implemented to prevent loss of soil during construction by storm water runoff or wind erosion and to prevent sedimentation of storm sewer or receiving water bodies. Construction BMPs would be implemented to minimize soil erosion; therefore, no major, adverse impacts on the soils would be anticipated.

Long-term, indirect, moderate impacts would be expected from compaction of soils under the weight of vehicles and other construction equipment, buildings, and other structures. Compaction of soils would result in disturbance and modification of soil structure. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and be eliminated in those areas within the footprint of roadways or structures. Loss of soil structure due to compaction from foot and vehicle traffic could result in changes in drainage patterns.

Because development would occur in Seismic Zone 3, building and other structures should be constructed consistent with building code requirements in the Uniform Building Code for development in Seismic Zone 3. This would minimize potential for adverse impacts on human life associated with earthquakes and development in the area. In addition, structures must be able to withstand maximum winds of at least 155 miles per hour and withstand the minimum horizontal and uplift pressures set forth in the regulations adopted by the Building Safety Official in accordance with the Building Safety Code (CNMI 1988). Landslides would not be anticipated to affect the Proposed Action as no steep slopes and unconsolidated

materials exist within the various sites; however, if runway extension Options A or B are selected, fill material would need to be compacted as much as possible to support the runway and decrease the potential for landslides to occur.

Although BMPs would be implemented to minimize soil erosion and sedimentation during construction activities, due to the additional 2,392,200 ft^2 of new impervious surfaces that would be introduced to the area, moderate impacts on geology and soil would be anticipated. BMPs could include installing silt fencing and sediment traps, applying water to disturbed soil, and revegetating disturbed areas as soon as possible after the disturbance, as appropriate. All construction BMPs would follow the guidelines provided in Federal and CNMI permitting processes and regulations; a USEPA Construction General Permit and a CNMI DEQ Noncommercial Earthmoving permit might need to be submitted prior to the start of any construction activities under Alternative 1. In the event of a spill, a Spill Prevention, Control, and Countermeasures (SPCC) Plan would be followed to quickly contain and clean up a spill (see **Section 3.12**, hazardous materials and wastes, and **Section 3.5**, water resources). There remains the possibility that a spill or leak could occur, but implementation of BMPs identified in the SPCC plan would minimize the potential for and extent of associated contamination. An SPCC plan would be followed to quickly contain any leaks or spills generated from construction vehicles, the fuel hydrant system, or any other operational spills.

4.4.1.2 Implementation Phase

Impacts on geology and topography would be long-term, direct, minor to moderate, and adverse from the potential removal of surface rock and alteration in topography from grading activities. Once construction activities have ceased, impacts could occur from the compaction of soil, degradation in soil productivity, alteration of storm water drainage and the percolation of rainwater, and the increased rates of soil erosion and sedimentation of nearby water bodies, including lagoons and the Philippine Sea. Introduction of increased sedimentation into waters surrounding the island could adversely impact water quality and habitat. See **Sections 3.5, 3.6,** and **3.7** for discussions on water resources and biological resources, respectively.

4.4.2 Alternative 2 – TNI

4.4.2.1 Construction Phase

Impacts on soils from implementing Alternative 2 would be anticipated to be similar to, but greater than, those described for Alternative 1 as 4,090,800 ft^2 of new impervious surface would be required. Therefore, short- and long-term, direct, moderate impacts would be anticipated. The Proposed Action at TNI would require an additional 1,698,600 ft^2 of impervious surface when compared to the Proposed Action at GSN. This increase is due to the additional square footage required for the maximum runway extension, parking apron, and Hazardous Cargo Pad and Arm/Disarm Pad (see **Tables 2.3-1** and **2.3-2**). If Option A is selected, Broadway Avenue would need to be rerouted to accommodate the longer runway, which would require additional disturbance of soil. Runway Options B and C would have fewer impacts than those of Option A due to less impervious surface area and disturbance of soil.

The inoperable borrow pit within the parking area would need a substantial amount of fill to bring the quarry up to the same grade as the airstrip. In addition, a small limestone hill with shallow to rock conditions is adjacent to the parking area. The hardness of the limestone could present construction limitations as previous construction work has resulted in equipment breaking down. Therefore, the fill would likely need to be added until it was level with the hill, and then the fill would need to be compacted.

Site-specific soil and geotechnical surveys should be conducted during design development and prior to the initiation of construction activities to ascertain if any engineering limitations exist. An ESCP would be developed and BMPs would be implemented to minimize any impacts on geology and soils. All construction BMPs would follow the guidelines provided in Federal and CNMI permitting processes and regulations; a USEPA Construction General Permit and a CNMI DEQ Noncommercial Earthmoving permit might need to be submitted prior to the start of any construction activities under Alternative 2.

4.4.2.2 Implementation Phase

Implementation of Alternative 2 would result in impacts similar to those described for GSN. Long-term, direct, minor to moderate, adverse impacts on geology and soil would be anticipated under the implementation phase for Alternative 2.

4.4.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.4.2.1** and **3.4.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on geological resources and soils would be expected as a result of the No Action Alternative. Geological resources on Saipan and Tinian would not be disturbed as a result of construction or implementation. The No Action Alternative would result in a continuation of existing conditions.

4.5 Water Resources

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would have significant impacts on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Create or contribute to overdraft of groundwater basins
- Exceed safe annual yield of water supply sources
- Cause a violation of water quality standards or increase the magnitude or frequency of an existing water quality violation
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

4.5.1 Alternative 1 – GSN (Preferred Alternative)

4.5.1.1 Construction Phase

Construction activities such as clearing, grading, trenching, and excavating displace soils and sediment. If not managed properly, disturbed soils and sediments could be washed into nearby surface water bodies or nearshore waters during storm events and reduce water quality. Under Alternative 1, the construction contractors would obtain all necessary construction permits and comply with the requirements and guidelines set forth in those permits to minimize potential for these adverse impacts. All construction BMPs would follow DOD policy for implementing guidelines provided in Federal and CNMI permitting processes and regulations (e.g., USEPA Construction General Permit, CNMI DEQ Earthmoving and Erosion Control Regulations and permit), EISA Section 438, the CNMI DEQ/GEPA Stormwater Management Manual, and the site-specific SWPPP and ESCP (see **Section 3.5.1**), as applicable. With proper sediment and erosion controls and storm water management BMPs in place, it is assumed that storm water runoff during construction activities would result in short-term, indirect, minor, adverse impacts on water quality in downgradient surface water bodies and nearshore waters.

Without proper site design and BMPs, land development under Alternative 1 would have long-term, moderate to major, adverse impacts on water resources by altering the local hydrologic cycle in the project area. Initial land clearing would remove vegetation that evapotranspirates a large proportion of rainfall that falls in the project area. Grading activities would remove natural depressions that might serve to temporarily pond storm water and naturally infiltrate precipitation into the groundwater. Removal of vegetation and the soil's humus layer would further decrease storm water interception and increase runoff and soil erosion in the area.

Under Alternative 1, the maximum increase in impervious surfaces, including the maximum runway extension of 1,375 feet to 10,075 feet, is estimated to be 2,392,200 ft^2 (54.9 acres). Impervious surfaces preclude the natural infiltration of rainwater, thereby reducing the groundwater recharge rate. Consequently, most rainfall is directly converted into storm water runoff. The volume of storm water runoff increases sharply with impervious cover. For example, a one-acre parking lot can produce 16 times more storm water runoff than a one-acre grassland each year (Schueler 1994). Furthermore, a reduction in groundwater recharge could result in a lowering of the water table and a reduction of the thickness of the groundwater lens. Ultimately, without proper site design, the implementation of Alternative 1 could lead to a depletion of groundwater resources and increased salt water intrusion to drinking water wells. Runway extension options B and C would have similar, but slightly less, impacts on water resources due to the reduced amount of impervious surfaces when compared to runway extension A.

However, as required by Section 438 of the EISA, predevelopment site hydrology at GSN and at the proposed Port of Saipan fuel tank site must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Therefore, the vast majority (more than 90 percent) of precipitation occurring within the project areas would be required to remain on site (i.e., not be allowed to flow off GSN or the proposed Port of Saipan fuel tank site) and be allowed to infiltrate into the ground or be made available to vegetation for evapotranspiration. In order to maintain predevelopment site hydrology, designs could incorporate structural storm water management methods, such as storm water retention ponds, shallow infiltration basins, and infiltration trenches, to collect storm water from the new impervious surfaces and allow runoff to infiltrate back into the ground to help restore or enhance natural (i.e., predevelopment) recharge rates. Some storm water management efforts are

already used on GSN and at the Port of Saipan; however, due to the proposed large increase in impervious surfaces, these storm water management features could be re-sized or supplemented in order to accommodate the increase in storm water runoff from the improved areas. Storm water management and infiltration features should be designed in accordance with the CNMI DEQ/GEPA Stormwater Management Manual (CNMI DEQ and GEPA 2006).

Because the storm water from the proposed runway improvements could be degraded with a broad range of pollutants, and due to the high permeability of the limestone on Saipan, the Mariana Limestone Aquifer could be very susceptible to contamination. Therefore, storm water directed from the runway, taxiway, parking areas, and refueling areas could require substantial pre-treatment and filtering prior to infiltration to protect the quality of groundwater resources. Storm water management and infiltration features should not be located in close proximity to the wellhead protection area at GSN (Isley Field) in order to ensure protection of a safe drinking water supply.

In the event of a spill or leak of fuel or other construction-related products, there could be short- and long-term, minor to moderate adverse impacts on groundwater quality. All construction equipment would be maintained according to the manufacturer's specifications and all fuels and other potentially hazardous materials would be contained and stored appropriately. In the event of a spill, procedures outlined in the SPCC Plan would be followed to quickly contain and clean up the spill. Therefore, adverse impacts on groundwater quality as a result of accidental spills of petroleum or other contaminants during construction activities are anticipated to be negligible to minor.

No flood zones occur within the proposed GSN or Port of Saipan fuel site project sites; therefore, no impacts on flood zones would be expected under Alternative 1.

4.5.1.2 Implementation Phase

Fuel storage and aircraft-refueling activities associated with the Proposed Action could result in long-term, indirect, minor to major, adverse impacts on groundwater quality as a result of sheet runoff or petroleum spills at GSN and the proposed fuel tank site at the Port of Saipan. However, these impacts could be avoided or minimized through proper secondary containment and maintenance of fuel storage and delivery equipment; through implementation of the SPCC plan; and through planned implementation of the various applicable Federal and CNMI storm water management, pre-treatment, and filtering requirements, so that petroleum and other contaminants are prevented from reaching the underlying aquifer. Therefore, adverse impacts on groundwater quality as a result of accidental spills of petroleum or other contaminants during fuel storage or aircraft-refueling activities are anticipated to be negligible to minor.

4.5.2 Alternative 2 – TNI

4.5.2.1 Construction Phase

As with Alternative 1, the construction contractors would obtain all necessary construction permits and comply with the requirements and guidelines set forth in those permits to minimize potential for these adverse impacts on downgradient surface water bodies and nearshore waters from the increase in soil erosion and sedimentation. All construction BMPs would follow the guidelines provided in Federal and CNMI permitting processes and regulations (e.g., USEPA Construction General Permit, CNMI DEQ Earthmoving and Erosion Control Regulations and permit), EISA Section 438, the CNMI DEQ/GEPA Stormwater Management Manual, and the site-specific SWPPP and ESCP (see **Section 3.5.1**).

Under Alternative 2, the maximum increase in impervious surfaces is estimated to be 4,090,800 ft^2 (93.9 acres), including runway Option A (extension 1,400 feet to 10,000 feet). Runway Option B, which includes no extension of the runway, would have impacts similar to, but less than, those discussed for runway Option A due to the smaller amount of impervious surfaces. Long-term, adverse impacts on local hydrologic conditions from the increases in impervious surfaces under Alternative 2 would be similar to, but greater than, Alternative 1. As required by Section 438 of the EISA, predevelopment site hydrology at TNI and at the proposed fuel tank site at the Port of Tinian must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Therefore, the vast majority (more than 90 percent) of precipitation occurring within the project areas would be required to remain on site (i.e., not be allowed to flow off TNI or the proposed Port of Tinian fuel tank site) and be allowed to infiltrate into the ground or be made available to vegetation for evapotranspiration. In order to maintain predevelopment site hydrology, designs would need to incorporate structural storm water management methods, such as storm water retention ponds, shallow infiltration basins, and infiltration trenches, to collect storm water from the impervious surfaces and allow runoff to infiltrate back into the ground to help restore or enhance natural (i.e., predevelopment) recharge rates. Due to the proposed large increase in impervious surfaces under Alternative 2, the existing storm water management features at TNI would likely need to be resized or supplemented in order to accommodate the increase in storm water runoff from the improved areas. Storm water management and infiltration features should be designed in accordance with the CNMI DEQ/GEPA Stormwater Management Manual (CNMI DEQ and GEPA 2006).

Because the storm water from the proposed runway improvements could be degraded with a broad range of pollutants, and due to the high permeability of the limestone on Tinian, the underlying aquifer could be very susceptible to contamination. Therefore, storm water directed from the runway, taxiway, parking areas, and refueling area could require substantial pre-treatment and filtering prior to infiltration to protect the quality of groundwater resources.

In the event of a spill or leak of fuel or other construction-related products, there could be adverse impacts on groundwater quality. All construction equipment would be maintained according to the manufacturer's specifications and all fuels and other potentially hazardous materials would be contained and stored appropriately. In the event of a spill, procedures outlined in the SPCC Plan would be followed to quickly contain and clean up the spill. Therefore, impacts on groundwater quality as a result of accidental spills of petroleum or other contaminants during construction activities are anticipated to be negligible to minor.

Although an area designated as Flood Zone A within the proposed parking apron site at TNI would need to be filled, no impacts on flood hazard would be expected under Alternative 2. Because this flood zone area is only designated as such due to its potential to hold water during heavy rain events and because it is not associated with floodplains of surface water bodies, this area would not be protected under EO 11988, *Floodplain Management*. The proposed runway improvements would be properly graded and managed to direct storm water away from the runway and prevent ponding of water in these areas.

4.5.2.2 Implementation Phase

Fuel storage and aircraft-refueling activities associated with the Proposed Action could result in long-term, minor to major, adverse impacts on groundwater quality as a result of sheet runoff or petroleum spills at TNI and the proposed Port of Tinian fuel tank site. However, these impacts could be avoided or minimized through proper secondary containment and maintenance of fuel storage and delivery equipment; through implementation of the SPCC plan; and through planned implementation of the various applicable Federal and CNMI storm water management, pre-treatment, and filtering requirements, so that petroleum and other contaminants are prevented from reaching the underlying

aquifer. Therefore, impacts on groundwater quality as a result of accidental spills of petroleum or other contaminants during fuel storage or aircraft-refueling activities are anticipated to be negligible to minor.

4.5.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.5.2.1** and **3.5.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on water resources would be expected as a result of the No Action Alternative. Hydrologic conditions within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.6 Terrestrial Biological Resources

Biological resource issues and concerns include the potential direct, indirect, and cumulative impacts of the Proposed Action and alternatives during the construction and implementation phases. Impacts can be either temporary (reversible) or permanent (irreversible). Direct and indirect impacts are distinguished as follows.

Direct impacts are associated with proposed construction activities (e.g., ground-disturbing activities) and implementation (e.g., aircraft overflights). Potential types of direct impacts include the following:

- Loss of habitat due to vegetation removal during construction
- Temporary loss of habitat during construction from noise, lighting, and human activity
- Potential loss of habitat due to increased noise, including proposed aircraft activities
- Injury or mortality to wildlife or special-status species caused by the action.

Indirect impacts are caused by or result from project-related activities, are usually later in time, and are reasonably foreseeable (e.g., increased likelihood of nonnative, invasive species moving into the area after disturbance). Potential indirect impacts include the following:

- All disturbances from human activity, noise, and lighting that would potentially impact unoccupied suitable habitat for special-status species
- Introduction of new nonnative, invasive species or increased dispersal of existing nonnative, invasive species
- Dispersal of existing nonnative, invasive species
- Increased threats from feral animals
- Adverse impacts from pollutants that are released from construction or military operations.

Determination of the significance of wetland impacts is based on (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the duration of ecological ramifications. Impacts on wetland resources are considered significant if high-value wetlands would be adversely affected.

The level of impact on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern. A habitat perspective is used to provide a framework for analysis of general classes of impacts (i.e., removal of critical habitat, noise, human disturbance).

Ground disturbance and noise might directly or indirectly cause potential impacts on terrestrial biological resources. Direct impacts from ground disturbance were evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Mortality of individuals, habitat removal, and damage or degradation of habitats might be impacts associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could to lead to population declines or local or regional extinction. To evaluate impacts, considerations were given to the number of individuals or critical species involved, amount of habitat affected, relationship of the APE to total available habitat within the region, type of stressors involved, and magnitude of the impacts.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with the USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project.

4.6.1 Alternative 1 – GSN (Preferred Alternative)

4.6.1.1 Construction Phase

Vegetation. Short-term, minor, direct, adverse impacts on vegetation would be expected from construction activities associated with the Alternative 1. A total of 64.8 acres of land would be cleared under the Proposed Action (see **Table 4.6-1**). Most of the land to be cleared includes mowed field, park area, and Tangantangan forest habitat. No limestone forest would be removed. Proposed locations for the fuel tanks at the Saipan port have been previously disturbed; therefore, no adverse impacts are expected at these sites. Under Alternative 1 there are three runway options: (a) full extension on east and west ends to 10,075 feet, (b) extension only on east end to 9,350 feet, and (c) no extension. The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Mowed field habitat, which occurs along the tarmac, runways, taxiways, and disturbed sites, consists of mostly introduced species; therefore impacts on this vegetation community are minor.

Table 4.6-1. Acreages of Vegetation Communities Removed as Part of the GSN Alternative

Proposed Additions/ New Areas	Tangantangan Forest	Mowed Field	Park	Agriculture/ Grazing	Disturbed/ Unmowed
Runway extension (west)	–	4.6	–	–	–
Runway extension (east)	–	4.8	–	–	–
Parking apron and ramp (west)	–	11.2	–	–	–
Parking apron and ramp (east)	6.7	4.9	–	–	–
Hangar	0.4	–	–	–	–
Earth covered magazine	–	–	–	1.0	–
Hot cargo pad	1.1	3.0	–	–	–
Maintenance facility	0.9	–	–	–	–
BEAR site	–	–	12.3	–	–
Operational fuel tanks and hydrant system	0.2	0.3	3.6	–	–
Bulk fuel storage	5.0	–	0.2	–	–
Port fuel site	–	–	–	–	4.6
Total (acres)	**14.3**	**28.8**	**16.1**	**1.0**	**4.6**

Source: HDR

Wildlife. Short-term, minor, direct and indirect, adverse impacts on wildlife would be expected from construction activities associated with the Project. All the terrestrial species listed in **Table 3.6-5** have the potential to be present in the Project Area. Activities that increase traffic and human activity would likely cause disturbance to bird species roosting on grassy edges along the taxiways and runways. Disturbance would amount to flushing of birds from their location to an area of lesser disturbance. Proposed construction activities would displace the bird species and other wildlife from suitable habitat in the proposed Project Area. Smaller, less-mobile species and those seeking refuge in burrows could inadvertently be killed during construction activities; however, long-term, permanent impacts on populations of such species would be less than significant because the species observed in the Project Area are abundant in surrounding areas.

Migratory birds are present in the project areas. The loss of woody vegetation would result in the loss of roosting/nesting areas for some of these bird species. During the nightingale reed warbler surveys, biologists located a black noddy rookery at GSN (see **Figure 3.6-2**). There were approximately 60 active noddy nests located mostly in a large *Casuarina* tree with some in an adjacent flame tree. There were also numerous white terns flying around the rookery, although it was not determined whether the terns were also nesting in the area. The black noddy rookery was located approximately 675 feet south of the proposed bulk fuel storage area, 640 feet south of the proposed operational fuel tanks and hydrant system, 1,115 feet northwest of the proposed maintenance facility, and 1,000 feet north of the proposed west parking apron. No loss of active breeding habitat would be expected and no effects on the rookery would be expected during construction activities due to its distance from proposed activities.

Noise created during construction activities could result in adverse impacts on nearby wildlife. Clearing, grading, paving, and building construction can cause an increase in sound that is well above the ambient level. These impacts would include subtle, widespread impacts from the overall elevation of ambient noise levels. This would result in reduced communication ranges, interference with predator/prey

detection, or habitat avoidance. More intense impacts would include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, age, and sex composition. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can become accustomed (or habituate) to the noise. The rate of habituation to short-term construction is not known. Wildlife could be permanently displaced from the areas where the habitat is cleared and temporarily dispersed from areas adjacent to the project areas during construction periods. Wildlife species inhabiting these sites might be displaced, but would be expected to temporarily move to adjacent less-utilized habitat and then potentially return to the area. Increased mortality of less-mobile species would be expected as the result of unavoidable direct impacts associated with construction activities. Impacts on wildlife would be minor.

Nonnative, invasive plant species are likely to expand ranges and new species are likely in some areas due to the construction activities necessary to support divert capability and exercises. Of particular concern is the potential for the establishment of the brown treesnake (*Boiga irregularis*). The brown treesnake has decimated bird populations on Guam (Wiles et al. 2003). Because the ecosystem on Saipan is biologically similar to that of Guam, establishment of a brown treesnake population on Saipan is likely to have consequences similar to those experienced on Guam. Equipment and materials (e.g., for construction) have the potential to carry and therefore spread brown treesnakes to areas around Saipan, increasing the ability of the snake to establish itself islandwide. There have been 71 credible sightings of brown treesnakes on Saipan since 1982 resulting in 11 captures of live snakes, 8 in the vicinity of the port or airport and 3 in the interior of the island (USFWS 2006). An expert panel was convened by the DOI Office of Insular Affairs in 2004 to assess research and control programs relating to the brown treesnake. The report states that repeated sightings of the brown treesnake on Saipan indicate that an incipient (breeding) population is now present there; at the time of the DOI visit to Saipan in June 2004, about 85 to 90 percent of cargo was being checked (USDOI-OIA 2005). EO 13112 directs agencies to prevent the spread of invasive species in their work. In order to implement this directive, a Hazard Analysis and Critical Control Points (HACCP) plan should be developed and implemented to reduce or eliminate the spread of unwanted species during specific processes or practices or in materials or products (USFWS 2012). Adherence to JTREGMARIANAS Instruction 5090.4, which includes procedures and requirements for inspections of all equipment and gear, would also help minimize the likelihood of brown treesnake introduction during the construction phase of Alternative 1.

Consistent with current brown treesnake interdiction and control, per P.L. 110-417, [Division A], title III, Section 316, October 14, 2008, 122 Statute 4410 and per DOD Defense Transportation Regulations, Chapter 505 protocols, the USAF will commit to implementing 100 percent inspection of all outgoing aircraft from Guam with trained quarantine officers and dog detection teams, which could be supplemented by other pest-control expertise (with appropriate USDA-WS brown treesnake detection training and oversight). Redundant inspections will be conducted on Saipan during project development and training activities. The USAF will also establish snake-free quarantine areas for cargo traveling from Guam to Saipan. The brown treesnake sterile areas will be subject to (1) multiple day and night searches with appropriately trained interdiction canine teams that meet performance standards, (2) snake trapping, and (3) visual inspection for snakes.

Threatened and Endangered Species. Short-term to long-term, direct and indirect, adverse impacts on threatened and endangered species would be expected from construction activities associated with the Alternative 1. There are five threatened and endangered species with the potential to occur in the Alternative 1 Project Area. They are the nightingale reed warbler, Mariana swiftlet, Mariana common moorhen, Micronesian megapode, and the Mariana fruit bat (see **Table 3.6-3**). Due to the absence of mature forest habitat, lack of roosting or foraging trees, and distance from roosting caves, it is unlikely that the Mariana fruit bat, Mariana swiftlet, and Micronesian megapode are present in the Project Area.

Nightingale reed warbler. Short-term, moderate, direct, adverse impacts on the nightingale reed warbler as a result of the Proposed Action include loss of habitat and physical disturbance. Based on the potential habitat for nightingale reed warblers in the Project Area, surveys were conducted to determine the presence of nightingale reed warbler individuals over the course of 10 weeks from January to March, 2012. Indirect, minor, adverse impacts of the project include increased noise and predation. Predation pressure could increase in the Project Area as a result of increasing edge impacts and fragmentation of the habitat. Short-term, direct, minor, adverse impacts from construction noise, pollution, and human presence during project construction would be of less concern than the loss of habitat because the birds in this area are already subjected to these impacts from the GSN.

During construction activities, it is assumed that nightingale reed warblers would relocate to suitable adjacent habitat (tangantangan); however, it is possible that a portion of these birds would be unable to successfully relocate. Some of the birds might not immediately establish territories and/or breeding pairs that could result in reduced breeding activity. The USAF is corresponding and conducting ESA Section 7 Consultation with the USFWS regarding the nightingale reed warbler. The USAF is working with the USFWS to determine potential impacts on the nightingale reed warbler based on survey results, and whether any mitigation would be required to offset potential impacts. Mitigation could include the purchase of mitigation credits from the Saipan Upland Mitigation Bank.

Surveys on Saipan indicate that the nightingale reed warbler population is declining and has declined since surveys were first conducted in 1982 (USFWS 1998b). The most serious threat is the potential for the establishment of the brown treesnake. Sightings of the brown treesnake on Saipan suggest that it might be in the process of becoming established there (Rodda and Savidge 2007). The spread of the brown treesnake to Saipan would likely cause the nightingale reed warbler's extirpation there, leaving only a single, small population on Alamagan (USFWS 2005). Construction activities associated with the Proposed Action could open pathways that could spread invasive species, including the brown treesnake, to habitats for already sensitive species. EO 13112 directs agencies to prevent the spread of invasive species in their work. In order to implement this directive, a HACCP plan should be developed and implemented to reduce or eliminate the spread of unwanted species during specific processes or practices or in materials or products (USFWS 2012). Adherence to JTREGMARIANAS Instruction 5090.4, which includes procedures and requirements for inspections of all equipment and gear, would also help minimize the likelihood of brown treesnake introduction during the construction phase of Alternative 1.

Consistent with current brown treesnake interdiction and control, per P.L. 110-417, [Division A], title III, Section 316, October 14, 2008, 122 Statute 4410 and per DOD Defense Transportation Regulations, Chapter 505 protocols, the USAF will commit to implementing 100 percent inspection of all outgoing aircraft from Guam with trained quarantine officers and dog detection teams, which could be supplemented by other pest-control expertise (with appropriate USDA-WS brown treesnake detection training and oversight) to meet 100 percent inspection goals for both project development and training activities. If required, redundant inspections could be conducted on Saipan during project development and training activities. The USAF could also establish snake-free quarantine areas for cargo traveling from Guam to Saipan. The brown treesnake sterile areas could be subject to (1) multiple day and night searches with appropriately trained interdiction canine teams that meet performance standards, (2) snake trapping, and (3) visual inspection for snakes.

Mariana common moorhen. Although there are no wetlands (moorhen habitat) in the Project Area, there is the potential for short-term, indirect, minor, adverse impacts on moorhens in surrounding water features. There is a constructed storm water catchment that is designed to exhibit standing water permanently for use in emergencies in the northeast section of the GSN. In addition, there is a golf course pond associated with the Coral Ocean Point Golf Course approximately 0.6 miles southwest of the GSN. Mariana common moorhens could be attracted to standing water associated with these features. Data

from the nightingale reed warbler and Mariana common moorhen surveys conducted between February and April 2012 will be provided in the Final EIS once surveys are completed.

Noise created during construction activities could result in short-term, indirect, minor, adverse impacts on moorhens in the area. Clearing, grading, paving, and building construction would cause an increase in sound above the ambient level. This could result in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can habituate to the noise. The impacts of construction noise and human presence during project construction are considered short-term and minor because the birds in this area are already subjected to these impacts from the GSN. Moorhens inhabiting these sites might be displaced, but would be expected to temporarily move to adjacent less-utilized habitat and then potentially return to the area.

Wetlands. Wetlands are attractive to wildlife as water sources and areas of forage. The presence of ephemeral or permanent water sources provides microhabitats that are unique in comparison to the surrounding landscape. Based on the site investigations there are no wetlands in the project area; therefore, no impacts on wetlands are expected from construction.

4.6.1.2 Implementation Phase

Vegetation. Short-term, periodic, direct, minor, adverse impacts on vegetation would be expected from implementation of the Proposed Action. Nonnative, invasive plant species are likely to expand ranges and new species are likely in some areas due to the increase in activities necessary to support Divert Activities. This is unlikely to impact primary limestone forest because all activities are well away from these primary forest areas. Therefore, minor, adverse impacts would be expected. EO 13112 directs agencies to prevent the spread of invasive species in their work. In order to implement this directive, a HACCP plan should be developed and implemented to reduce or eliminate the spread of unwanted species during specific processes or practices or in materials or products (USFWS 2012).

Wildlife. Short-term, periodic, direct, minor, adverse impacts on wildlife would be expected from implementation of the Proposed Action. Aircraft operations could result in some migratory bird airstrikes. Alternative 1 would result in long-term, minor, adverse impacts on BASH wildlife due to additional aircraft operations. Aircraft operations at GSN between March 2010 and March 2011 consisted of 45,956 flights. Alternative 1 would add approximately 2,688 aircraft operations per year, which would be a 5.9 percent increase above the existing number of air operations at GSN. Based on the FAA Strike Database records, there were 6 strikes in 2010–2011. Assuming a 5.9 percent increase in strikes (based on the 5.9 percent increase in air operations), the annual increase in strikes would be approximately 0.35 or approximately one (1) additional strike every 3 years. A WHA was conducted at GSN, which identifies areas of the airfield and the surrounding region that are attractive to wildlife and provides recommendations to remove or modify the attractive features. Implementation of these measures would decrease the likelihood of strikes. These measures will be discussed with and approved by the CPA as required and will be provided in the Natural Resources Management Plan that will be developed to support the Final EIS and ROD.

Long-term, direct, minor, adverse impacts would be expected from the noise generated by operations to support the Divert Activities at GSN. The impacts of noise are considered minor because the wildlife in this area is already subjected to these impacts from the GSN. Behavioral responses reflect a variety of states, from indifference to extreme panic. To some extent, responses are species-specific. However, even within a species, individual animals vary. Often, animals exhibit very subtle and seemingly minor behavioral responses to overflights. Minor responses that are typical of both birds and mammals include head-raising, body-shifting, and turning and orienting towards the aircraft. Animals that are moderately disturbed usually show ‘nervous’ behaviors such as trotting short distances (mammals), standing up with

necks fully extended and sunning the area (mammals), or walking around and flapping wings (birds). When animals are more severely disturbed, escape is the most common response. Perching or nesting birds might flush (fly up from a perch or nest) and circle the area before landing again. Some birds, particularly waterfowl and seabirds, might leave the area if sufficiently disturbed. There are dozens of reports, mostly from national wildlife refuges, of waterbirds flying, diving, or swimming away from aircraft. This is a widespread and common response. Bird flight responses are usually abrupt, and whole colonies of birds often flush together (NPS 1994). Wildlife present would likely move away from these areas, but there are other large areas of similar habitat nearby where they could move to when disturbed.

Threatened and Endangered Species. Short-term, periodic, minor, indirect, adverse impacts on threatened and endangered species would be expected from implementation of the Proposed Action. Aircraft overflights would produce airborne noise. Nightingale reed warblers and Mariana common moorhens could be exposed to noise associated with fixed-wing aircraft overflights (see **Section 3.1**). Exposure to elevated noise levels would be brief (seconds) and would occur over a period of no more than 8 weeks of the year. In addition to sound, birds could react to the shadow of a low-flying aircraft. Many factors contribute to the responses to overflights, some having to do with the species and its particular environment and some having to do with the aircraft stimulus itself. Factors that can influence animal responses include distance to the aircraft, aircraft type, and suddenness of aircraft appearance and frequency of overflights (NPS 1994). The impacts of noise are considered minor because the birds in this area are already subjected to these impacts from the GSN. Section 7 Consultation has been initiated with USFWS regarding the nightingale reed warbler and will be completed prior to the issuance of the Final EIS.

Wetlands. Based on the site investigations there are no wetlands in the project area. No impacts on wetlands would be expected due to activities associated with the implementation phase.

4.6.2 Alternative 2 – TNI

4.6.2.1 Construction Phase

Vegetation. Short-term, minor, direct, adverse impacts on vegetation would be expected from construction activities associated with the Alternative 2. A total of 93.4 acres of land would be cleared under the Proposed Action (see **Table 4.6-2**). Most of the land to be cleared includes mowed field and semi-disturbed Tangantangan forest habitat. No limestone forest would be removed. Proposed locations for the fuel tanks have been previously disturbed; therefore, no adverse impacts are expected at these sites. Under Alternative 2 there are two runway options: (a) full extension on east and west ends to 10,000 feet, and (b) no extension. The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Mowed field habitat, which occurs along the tarmac, runways, taxiways, and disturbed sites, consists of mostly introduced species; therefore impacts on this vegetation community are expected to be minor.

Wildlife. Short-term, minor, direct, adverse impacts on wildlife would be expected from construction activities associated with Alternative 2. All of the terrestrial bird species listed in **Table 3.6-2** have the potential to be present in the Project Area. Proposed construction activities would remove suitable habitat used by these species and displace them to other areas. Construction activities could inadvertently kill small species such as skinks and geckos. Areas adjacent to TNI would be subject to disturbance from the construction noise and general human activity. Species sensitive to noise and activity would disperse to other areas that provide abundant habitat and could return to the area following construction. None of the species are rare based on survey results. Long-term, permanent impacts on populations of wildlife would not likely result.

Table 4.6-2. Acreages of Vegetation Communities Removed as Part of the TNI Alternative

Proposed Additions/ New Areas	Tangantangan Forest	Mowed Field	Agriculture/ Grazing	Tangantangan/ Ironwood Scrub
BEAR site	14.6	1.3	–	–
Bulk fuel storage	10.2	1.4	–	–
Hot cargo and arm/disarm pad	4.7	5.0	–	–
Parking apron	27.6	9.2	–	–
Hangar	1.4	–	–	–
Maintenance facility	0.4	–	–	–
Operational fuel tanks and hydrant system	3.7	–	–	–
Runway extension	–	4.8	7.7	–
Temporary munitions storage area	–	–	–	0.4
Port fuel storage site	–	1.0	–	–
Total (acres)	**62.6**	**22.7**	**7.7**	**0.4**

Source: HDR

Tinian monarch. Tinian monarchs were observed in forested habitat to the north of the TNI during reconnaissance surveys conducted from October 7 to 8, 2011. Although the Tinian monarch was federally delisted in 2004 (69 FR 56367), and delisted by the CNMI government in 2009, this endemic species could be threatened by habitat loss. Construction activities would require the clearing of tangantangan, which provides nesting and foraging habitat for the Tinian monarch. Increased noise and human activity is also anticipated during construction. Adult and juvenile Tinian monarchs foraging or nesting in the direct project area might be displaced. It is anticipated that some of these birds would be able to locate suitable adjacent habitat.

Nonnative, invasive species would affect wildlife or degrade habitat, thus creating indirect impacts of Alternative 2. Movement of construction personnel, equipment, and supplies could result in the movement and spread of invasive plant and animal species to Tinian. The potential establishment of the brown treesnake is of great concern on Tinian. There have been 75 confirmed brown treesnake detections throughout the CNMI as of 2008. There have been eight unconfirmed brown treesnake sightings on Tinian: one reported in February 1990, four reported in 1994, and three reported in 2003. If brown treesnakes were to become established (without immediate suppression) on Tinian as a result of the Proposed Action, the impacts would likely be similar to those experienced on Guam (DON 2010b). EO 13112 directs agencies to prevent the spread of invasive species in their work. In order to implement this directive, a HACCP plan should be developed and implemented to reduce or eliminate the spread of unwanted species during specific processes or practices or in materials or products (USFWS 2012). Adherence to JTREGMARIANAS Instruction 5090.4, which includes procedures and requirements for inspections of all equipment and gear, would also help minimize the likelihood of brown treesnake introduction during the construction phase of Alternative 2.

Consistent with current brown treesnake interdiction and control, per P.L. 110-417, [Division A], title III, Section 316, October 14, 2008, 122 Statute 4410 and per DOD Defense Transportation Regulations, Chapter 505 protocols, the USAF will commit to implementing 100 percent inspection of all outgoing

aircraft from Guam with trained quarantine officers and dog detection teams, which could be supplemented by other pest-control expertise (with appropriate USDA-WS brown treesnake detection training and oversight) to meet 100 percent inspection goals for both project development and training activities. If required, redundant inspections could be conducted on Tinian during project development and training activities. The USAF could also establish snake-free quarantine areas for cargo traveling from Guam to Tinian. The brown treesnake sterile areas could be subject to (1) multiple day and night searches with appropriately trained interdiction canine teams that meet performance standards, (2) snake trapping, and (3) visual inspection for snakes.

Threatened and Endangered Species. No impacts on threatened and endangered species are expected from construction activities associated with Alternative 2. Because there is no proposed removal of limestone forest vegetation and because of the relatively small amount of vegetation community types that would be removed compared to what is available, no impacts on the Mariana fruit bat or megapodes would be expected from construction of Alternative 2. Construction activities would not be expected to affect Mariana moorhens because the project area is not located near suitable habitat. There are no proposed activities that occur in beach areas; therefore, no impacts on sea turtles would be expected.

The brown treesnake is arboreal and is known to eat birds and their eggs. Because the Tinian monarch builds its nest in the understory of the forest, the brown treesnake could easily decimate the population of Tinian monarchs by eating the eggs, juveniles, and adults (USFWS 1998a). During construction activities at TNI, the brown treesnake could be accidentally introduced during the importation of supplies, personnel, and contract-related equipment from Guam, Saipan, or other areas where the snake occurs. EO 13112 directs agencies to prevent the spread of invasive species in their work. In order to implement this directive, an HACCP plan should be developed and implemented to reduce or eliminate the spread of unwanted species during specific processes or practices or in materials or products (USFWS 2012). Adherence to JTREGMARIANAS Instruction 5090.4, which includes procedures and requirements for inspections of all equipment and gear, would also help minimize the likelihood of brown treesnake introduction during the construction phase of Alternative 2.

Consistent with current brown treesnake interdiction and control, per P.L. 110-417, [Division A], title III, Section 316, October 14, 2008, 122 Statute 4410 and per DOD Defense Transportation Regulations, Chapter 505 protocols, the USAF will commit to implementing 100 percent inspection of all outgoing aircraft from Guam with trained quarantine officers and dog detection teams, which could be supplemented by other pest-control expertise (with appropriate USDA-WS brown treesnake detection training and oversight) to meet 100 percent inspection goals for both project development and training activities. Redundant inspections will be conducted on Tinian during project development and training activities. The USAF will also establish snake-free quarantine areas for cargo traveling from Guam to Tinian. The brown treesnake sterile areas will be subject to (1) multiple day and night searches with appropriately trained interdiction canine teams that meet performance standards, (2) snake trapping, and (3) visual inspection for snakes.

4.6.2.2 Implementation Phase

Vegetation. Short-term, periodic, minor, direct, adverse impacts on vegetation would be expected from implementation of Alternative 2. Nonnative, invasive plant species are likely to expand ranges and new species are likely in some areas due to the increase in activities necessary to support Divert Activities This is unlikely to impact primary limestone forest because all activities are well away from these primary forest areas. Therefore, impacts would be less than significant. EO 13112 directs agencies to prevent the spread of invasive species in their work. In order to implement this directive, an HACCP plan should be developed and implemented to reduce or eliminate the spread of unwanted species during specific processes or practices or in materials or products (USFWS 2012).

Wildlife. Aircraft operations could result in some migratory bird airstrikes. Alternative 2 would result in long-term, minor, adverse impacts on BASH wildlife due to additional aircraft operations. Alternative 2 would add approximately 2,688 aircraft operations per year, which would be a 9.9 percent increase above the existing number of air operations at TNI. Because of the lack of wildlife strike data for TNI, it is difficult to project the increase in strikes associated with the increase in air operations. Even with the most conservative estimate of one strike per year, a 9.9 percent increase would result in 0.099 additional strikes/per year or one additional strike every 10 years. A WHA has been conducted at GSN, which identifies areas of the airfield and the surrounding region that are attractive to wildlife and provides recommendations to remove or modify the attractive features. Implementation of these measures would decrease the likelihood of strikes. These measures will be discussed with and approved by the CPA as required and will be provided in the Natural Resources Management Plan that will be developed to support the Final EIS and ROD.

Long-term, direct, minor, adverse impacts would be expected from the noise generated by operations to support the Divert Activities at TNI. Short loud bursts of noise from aircraft LTOs during exercises could impact wildlife; however, exposure to elevated noise levels would be brief (seconds) and would occur over a period of no more than 8 weeks of the year. The impacts of noise are considered minor because the wildlife in this area is already subjected to these impacts from TNI. Wildlife present would be affected and would move away from these areas, but there are other large areas of similar habitat nearby where they could move to when disturbed.

Threatened and Endangered Species. Long-term, indirect, negligible adverse impacts on threatened and endangered species would be expected from implementation of Alternative 2. Because there is no proposed removal of limestone forest vegetation and because of the relatively small amount of vegetation community types that would be removed compared to what is available, no impacts on the Mariana fruit bat or megapodes would be expected from the implementation phase of Alternative 2. Implementation activities would not be expected to affect Mariana moorhens because the Project Area is not near their habitat. There are no proposed activities that occur in beach areas; therefore, no impacts on sea turtles would be expected.

Long-term, indirect, negligible adverse impacts on Tinian monarchs would be expected from implementation of Alternative 2. Tinian monarchs were observed in forested habitat to the north of the airport during reconnaissance surveys conducted from October 7 to 8, 2011. The Tinian monarch could be exposed to noise associated with fixed-wing aircraft overflights (see **Section 3.1** for a description of the noise environment). No noise studies have been conducted specifically on the Tinian monarch; however, noise studies have been conducted on the impacts of military noise on similar species in the Pacific. The study evaluated the responses of Oahu elepaio at the Schofield Barracks Range in Hawai'i to 282 high explosive artillery (60-mm, 105-mm, and 155-mm) and demolition blasts located 328 to 3,281 feet (100 to 1,000 meters) from elepaio nests, ranging in intensity from 81.4 to 116 dB. Short loud bursts of noise from aircraft LTOs during exercises could impact Tinian monarchs; however, exposure to elevated noise levels would be brief (seconds) and would occur over a period of no more than 8 weeks of the year. Tinian monarchs present would be affected and would move away from these areas, but there are other large areas of similar habitat nearby where they could move to when disturbed.

Wetlands. Based on the site investigations there are no wetlands in the project area. No impacts on wetlands would be expected due to activities associated with the implementation phase of Alternative 2.

4.6.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.6.2.1** and **3.6.2.2** would continue. The USAF would not develop or

construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on terrestrial biological resources would be expected as a result of the No Action Alternative. Terrestrial biological resources within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.7 Marine Biological Resources

Impacts on marine sea turtles or marine mammals would be significant if the Proposed Action resulted in any of the following outcomes:

- Permanent loss of habitat
- Temporary loss of habitat that adversely affects a substantial number of a species
- Permanent loss of feeding and breeding areas of a federally listed species
- Temporary loss of feeding and breeding areas that adversely affects a substantial number of individuals of a species
- Substantial interference with movement of any resident species that results in the inability of the species to survive

4.7.1 Alternative 1 – GSN (Preferred Alternative)

4.7.1.1 Construction Phase

No impacts on marine biological resources would occur as a result of the construction phase of Alternative 1. This analysis in this section is based on Runway Option A and is considered the worst-case scenario.

4.7.1.2 Implementation Phase

Sea Turtles. Short-term, periodic, minor, direct, adverse impacts on marine biological resources could occur as a result of the implementation phase of the Alternative 1. Some noise associated take-offs and landings during military exercises would be transmitted into the water. Green sea turtles residing at or near the surface of nearshore waters, or nesting on the beaches of Saipan could be exposed to this noise. In addition, low-flying aircraft passing overhead could create a shadow effect that could induce a reaction in sea turtles (DON 2010a). Exposure to elevated noise levels would be brief (seconds) and would occur over a period of no more than 8 weeks of the year. Under the low, medium, and high noise scenarios, the 65-dB contour would occur over Una Agingan a beach with a documented sea turtle nesting attempt and Una Obyan, a beach with documented sea turtle nests (see **Figures 4.1-1**, **4.1-2**, and **4.1-3**). The analysis in this section is based on Runway Option A and is considered the worst-case scenario, in which the noise contours for the longer runways extend farther over the ocean. Little information regarding sea turtle

reactions to fixed-wing aircraft overflights is available. Based on the sensory biology of sea turtles, sound from low-flying aircraft could be heard by a sea turtle at or near the surface or on land (DON 2010a). Because sea turtles might also rely on visual cues, they might not respond to aircraft overflights based on noise alone. Sea turtles exposed to aircraft overflights might exhibit no response or behavioral reactions such as quick diving. Any behavioral avoidance reaction would be short-term and periodic and would not permanently displace sea turtles or result in physical harm. Noise from take-offs and landings would not result chronic stress because it is unlikely that individual sea turtles would be repeatedly exposed to low-altitude overflights (DON 2010a).

Alternative 1 may affect, but is not likely to adversely affect, green sea turtles.

Marine Mammals. Short-term, periodic, minor, direct, adverse impacts on marine biological resources could occur as a result of the implementation phase of the Alternative 1. Some noise associated take-offs and landings during military exercises would be transmitted into the water. Most of the sound from aircraft is reflected off the surface of the water and only penetrates a small area of aircraft path over the water (Urick 1972). Marine mammals could exhibit a short-term and periodic behavioral response, but not to the extent where natural behavioral patterns would be abandoned or significantly altered. Chronic stress is also not likely to result because it is extremely unlikely that individual animals would be repeatedly exposed to overflights associated with take-offs and landings (DON 2010a). As such, Alternative 1 is not expected to result in Level A or Level B harassment as defined by the MMPA. The analysis in this section is based on Runway Option A and is considered the worst-case scenario, in which the noise contours for the longer runways extend farther over the ocean.

Alternative 1 may affect, but is not likely to adversely affect, ESA-listed marine mammals.

4.7.2 Alternative 2 – TNI

4.7.2.1 Construction Phase

No impacts on marine biological resources would occur as a result of the construction phase of Alternative 2. The analysis in this section is based on Runway Option A and is considered the worst-case scenario.

4.7.2.2 Implementation Phase

Sea Turtles. Short-term, periodic, minor, direct, adverse impacts on marine biological resources could occur as a result of the implementation phase of the Alternative 1. Some noise associated with take-offs and landings during military exercises would be transmitted into the water. Green sea turtles residing at or near the surface of nearshore waters, or nesting on the beaches of Tinian could be exposed to this noise. In addition, low-flying aircraft passing overhead could create a shadow effect that could induce a reaction in sea turtles (DON 2010a). Exposure to elevated noise levels would be brief (seconds) and would occur over a period of no more than 8 weeks of the year. Under the low, medium, and high noise scenarios, noise of 65 dB or higher would not occur over Tinian Harbor beaches, where the highest concentration of green sea turtles occurs on Tinian (see **Figures 4.1-4**, **4.1-5**, and **4.1-6**). The analysis in this section is based on Runway Option A and is considered the worst-case scenario, in which the noise contours for the longer runways extend farther over the ocean.

Little information regarding sea turtle reactions to fixed-wing aircraft overflights is available. Based on the sensory biology of sea turtles, sound from low-flying aircraft could be heard by a sea turtle at or near the surface or on land (DON 2010a). Because sea turtles might also rely on visual cues, they might not respond to aircraft overflights based on noise alone. Sea turtles exposed to aircraft overflights might

exhibit no response or behavioral reactions such as quick diving. Any behavioral avoidance reaction would be short-term and periodic and would not permanently displace sea turtles or result in physical harm. Noise from take-offs and landings would not result chronic stress because it is unlikely that individual sea turtles would be repeatedly exposed to low-altitude overflights. Therefore, Alternative 2 may affect, but is not likely to adversely affect, green sea turtles.

Marine Mammals. Short-term, periodic, minor, direct, adverse impacts on marine biological resources could occur as a result of the implementation phase of the Alternative 2. Some noise associated with take-offs and landings during military exercises would be transmitted into the water. Marine mammals could exhibit a short-term and periodic behavioral response, but not to the extent where natural behavioral patterns would be abandoned or significantly altered. Chronic stress is also not likely to result, because it is extremely unlikely that individual animals would be repeatedly exposed to overflights associated with take-offs and landings (DON 2010a). As such, Alternative 2 is not expected to result in Level A or Level B harassment as defined by the MMPA. The analysis in this section is based on Runway Option A and is considered the worst-case scenario, in which the noise contours for the longer runways extend farther over the ocean.

Alternative 2 may affect, but is not likely to adversely affect, ESA-listed marine mammals.

4.7.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.7.2.1** and **3.7.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No new impacts on marine biological resources would be expected as a result of the No Action Alternative. Under the No Action Alternative in Saipan, the 65-dB contour would occur over Una Agingan but not over Una Obyan (see **Figure 3.1-1**). Under the No Action Alternative in Tinian, the 65-dB contour would not occur over the Tinian Harbor beaches. Marine biological resources within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.8 Cultural Resources

Impact analysis for cultural resources focuses on assessing whether an action alternative has the potential to affect cultural resources that are eligible for listing in the NRHP or have traditional significance for American Indian or other traditional groups.

Under Section 106 of the NHPA, the proponent of the action, PACAF in this case, is responsible for determining whether any historic properties are located in the area, assessing whether the proposed undertaking would adversely affect the resources, and notifying the State Historic Preservation Officer (SHPO, in this case the Historic Preservation Officer of the Commonwealth of the Northern Marianas Islands (CNMI HPO, of any adverse impacts. An adverse effect is any action that might directly or

indirectly change the characteristics that make the historic property eligible for listing in the NRHP. If an adverse effect is identified, the Federal agency (PACAF) consults with the HPO, and with federally recognized American Indian tribes or other recognized affected groups as appropriate, to develop measures to avoid, minimize, or mitigate the adverse impacts of the undertaking. PACAF has already initiated consultation under Section 106 of the NHPA and cultural resources provisions in NEPA with the CNMI HPO on Saipan.

Direct, adverse impacts could occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts generally result from increased use of an area and are harder to quantify.

Impacts on cultural resources are evaluated in terms of the preservation of that resource and are usually considered for the threat of adverse impacts that jeopardize overall preservation. Adverse impacts on NRHP listed or eligible properties are those that result in the loss of their eligibility, usually by compromising the integrity of the resource. To be considered eligible for the NRHP, a cultural resource must possess the majority, if not all, of seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.

Integrity is defined as the authenticity of a property's historic identity, as evidenced by the survival of physical characteristics it possessed in the past, and its capacity to convey information about a culture or people, historic patterns, or architectural or engineering design or technology. Location refers to the place where an event occurred or a property was constructed. Design considers elements such as plan, form, and style of a property. Setting is the physical environment of the property. Materials refer to the physical elements used to construct the property. Workmanship refers to the craftsmanship of the creators of a property. Feeling is the property's ability to convey its historic time and place. Association refers to the link between the property and a historic event or person.

4.8.1 Alternative 1 – GSN (Preferred Alternative)

The analysis in this section is based on Runway Option A and is considered the worst-case scenario. A significant portion of construction and implementation activities under Alternative 1 would occur within the boundaries of the Aslito/Isley Field NRHP-listed historic district and landmark (see **Section 3.8**). The selection of Alternative 1 could, therefore, have adverse impacts on the landmark's contributing historic fabric. The USAF is currently consulting with the CNMI HPO and NPS under Section 106 of the NHPA and cultural resources provisions in NEPA. The USAF is working with the CNMI HPO and NPS to determine potential impacts on cultural resources and what type of mitigation, if any, might be required to offset potential impacts.

4.8.1.1 Construction Phase

Major, direct and indirect, adverse impacts on the contributing historic fabric of the Aslito/Isley Field National Historic Landmark and NRHP-listed District could occur during the construction phase under Alternative 1. The elements contributing to the historic fabric include the 29 sites already recorded (see **Table 3.8.1**), extant historical structures visible in recent satellite imagery (see **Figure 3.8.1**), and possible unrecorded resources associated with the World War II history of GSN. Unrecorded prehistoric sites, if encountered, are less likely to retain sufficient integrity in the disturbed areas around the airport.

Possible major, direct, adverse impacts on cultural resources during construction include demolition, partial destruction, or modification of historic structures or destruction and disturbance of archaeological sites. Such impacts could diminish or destroy the overall integrity of these resources by affecting design, materials, or workmanship. Further, because the NRHP status of the World War II buildings and structures associated the Aslito/Isley Field National Historic Landmark and NRHP-listed District is based on the coherence of the entire district rather than the individual significance and integrity of its contributing elements, impacts on any of the district's contributing elements must be considered in light of the importance of that specific resource to the significance of the district as a whole. Therefore, indirect impacts might also result from new construction by separating the various elements of the district from one another, thus fragmenting the district with detrimental effects on setting, feeling, and association.

4.8.1.2 Implementation Phase

The potential for direct and indirect adverse impacts on the contributing historic fabric of the Aslito/Isley Field National Historic Landmark and NRHP-listed District could occur during the implementation phase under Alternative 1. These include the 29 sites already recorded (see **Table 3.8.1**), extant historical structures visible in recent satellite imagery (see **Figure 3.8.1**), and possible unrecorded resources associated with the World War II history of GSN. Unrecorded prehistoric sites, if encountered, are less likely to retain sufficient integrity in the disturbed areas around the airport. Possible major, direct, adverse impacts on cultural resources during implementation include those resulting from increased traffic, partial destruction or vandalism, looting, and other effects resulting from increased use of the area. Such impacts could diminish or destroy the overall integrity of these resources by affecting design, materials, or workmanship of structures and the location of archaeological materials in the event of looting. Further, because the NRHP status of the World War II buildings and structures associated the Aslito/Isley Field National Historic Landmark and NRHP-listed District is based on the coherence of the entire district, rather than the individual significance and integrity of its contributing elements, impacts on any of the district's contributing elements must be considered in light of the importance of that specific resource to the significance of the district as a whole. Therefore, minor to moderate, indirect, adverse impacts might also occur during the implementation phase due to the presence of extra personnel and material located at GSN during training exercises and responses to emergency events. Large encampments of personnel or storage of material on aprons and runways would have detrimental effects on setting, feeling, and association, although these are more likely to be temporary and are similar to the effects that result from the use of GSN as an international airport.

4.8.2 Alternative 2 – TNI

The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Impacts could occur on known NRHP-eligible historical resources under Alternative 2. In addition, it is likely that impacts could also occur on additional archaeological sites and historic properties that have not been recorded. The USAF is currently consulting with the CNMI HPO and NPS under Section 106 of the NHPA and cultural resources provisions in NEPA. The USAF is working with the CNMI HPO and NPS to determine potential impacts on cultural resources and what type of mitigation, if any, might be required to offset potential impacts.

4.8.2.1 Construction Phase

Construction areas for Alternative 2 are immediately east of the identified boundaries of the Site TN-589, the Japanese-era Gurguan Airfield built in 1944 (Welch and Tuggle 1998). The site has been recommended as eligible for listing on the NRHP (Welch and Tuggle 1998). The site's boundaries were

identified purely from aerial photos (Welch and Tuggle 1998), and it is, therefore, possible that the site could be impacted during construction.

Proposed construction areas for Alternative 2 are also near West Field (Site TN-030), built by U.S. forces between 1944 and 1945 to support B-29 bombers in the Twentieth Air Force XXI Bomber Command 58th Bombardment Wing. The site includes building slabs, B-29 hardstands, and taxiways, and has been recommended as eligible for listing on the NRHP (Welch and Tuggle 1998). The site's boundary is not defined but aerial photographs show that many World War II-era features are within the APE and the boundaries of the modern airport. The modern airport also encompasses Site TN-048, the U.S. Naval Air Base HQ (Welch and Tuggle 1998), which has been recommended as eligible to the NRHP. Sites TN-030 and TN-048 could be impacted by construction activities. Construction could also impact sites Z-611, HQ LAA 18th AAA, and site Z-613, D Battery, 18th AAA, associated with U.S. World War II-era anti-aircraft artillery units (Welch and Tuggle 1998). These two anti-aircraft sites have been recommended as eligible for listing on the NRHP.

Possible major, direct, adverse impacts on cultural resources during construction include demolition, partial destruction, or modification of historic structures or destruction and disturbance of archaeological sites. Such impacts could diminish or destroy the overall integrity of these resources by affecting design, materials, or workmanship. Moderate to major, indirect, adverse impacts might also result from new construction through detrimental effects on setting, feeling, and association of the World War II features associated with TN-30.

4.8.2.2 Implementation Phase

Site TN-589, the NRHP eligible Japanese-era Gurguan Airfield built in 1944 (Welch and Tuggle 1998); West Field (Site TN-030); and Site TN-048, the U.S. Naval Air Base HQ, built by U.S. forces between 1944 and 1945 to support B-29 bombers in the Twentieth Air Force XXI Bomber Command 58th Bombardment Wing could be subject to direct, adverse impacts during the implementation phase under Alternative 2. TN-30 includes building slabs, B-29 hardstands, and taxiways, and has been recommended as eligible for listing on the NRHP (Welch and Tuggle 1998). TN-048 is also considered NRHP eligible. Implementation could also impact sites Z-611, HQ LAA 18th AAA, and site Z-613, D Battery, 18th AAA, associated with U.S. World War II-era anti-aircraft artillery units (Welch and Tuggle 1998). These two anti-aircraft sites have been recommended as eligible for listing on the NRHP.

Other sites that are farther away from actual construction could still face impacts during implementation. Two sites have been previously identified in the Gurguan Point area. The first, called Leprosarium I, was in the area farmed by patients of the leprosarium that was founded in 1948. The site consisted of a 5-acre (20,000-square-meter) area containing a dense surface concentration of prehistoric sherds, the remains of an eight-shaft latte house and scattered latte shaft and capstone fragments, and a low but well-defined mound. The second site, Leprosarium II, was found north of Leprosarium I. The site consisted of a 250-square-yard (200-square-meter) surface sherd scatter and one eight-shaft latte house. Existing maps are not precise, but it is possible that these sites could be impacted by increased activity near TNI during implementation if Alternative 2 is selected.

Four buildings from a Japanese-era NKK sugarcane production facility on Tinian still stand and have been listed on the NRHP: an NKK administration building, ice storage building, and laboratory, and a building known only as the "Japanese structure" that might have been a small store. These four NRHP listed properties are outside of the proposed construction areas, but their relation to road and port improvements could lead to indirect impacts on these resources.

Possible major, direct, adverse impacts on cultural resources during implementation include those resulting from increased traffic, partial destruction or vandalism, looting, and other effects resulting from increased use of the area. Such impacts could diminish or destroy the overall integrity of these resources by affecting design, materials, or workmanship of structures and the location of archaeological materials in the event of looting. Possible minor to moderate, indirect, adverse impacts could also occur due to the presence of large encampments of personnel or storage of material on aprons and runways and their effects on setting, feeling, and association, although these are more likely to be temporary and are similar to the effects that result from use of TNI as an international airport.

4.8.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.8.2.1** and **3.8.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on cultural resources would be expected as a result of the No Action Alternative. Cultural resources within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.9 Recreation

The environmental impacts on recreational resources near a proposed action are assessed based on recreational availability and use. A proposed action would be considered significantly adverse if it were to: substantially impede access to recreational resources, reduce recreational opportunities, cause conflicts between recreational users, or result in the physical deterioration of recreational resources.

- Substantially impede access to recreational resources
- Reduce recreational opportunities
- Cause conflicts between recreational users
- Result in the physical deterioration of recreational resources.

4.9.1 Alternative 1 – GSN (Preferred Alternative)

4.9.1.1 Construction Phase

The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Impacts on recreational resources on Saipan from proposed construction under Alternative 1 would be expected to be short-term, indirect, negligible to minor, and adverse. Recreational resources on Saipan are scattered throughout the island. Construction activities could increase the number of vehicles on roads, increasing travel times to available resources; however, tourists and residents would still have access to recreational opportunities. Construction activities would be within 0.5 miles from the Coral Ocean Point Golf Course, various beaches, cultural attractions described in **Section 3.9.2.1**, and a few

highly used dive spots; however, construction activities would be in areas currently associated with higher noise levels (e.g., GSN airport, Saipan Harbor). Therefore, short-term, direct, negligible, adverse impacts from construction noise would be expected on recreational activities.

4.9.1.2 Implementation Phase

Impacts on recreational resources from implementing Alternative 1 would be expected to be long-term, intermittent, direct, minor to moderate, and adverse. Divert landings could occur for a maximum of 30 days if GSN were to be used as an alternative location to operate aircraft when other locations in the western Pacific become temporarily unavailable. When divert landings would be necessary, noise levels associated with aircraft landings would noticeably increase, and a reduction in the use of recreational facilities near GSN would be expected depending on the severity of the emergency.

The majority of the activities associated with the proposed exercises would occur near GSN. Noise levels associated with the proposed exercises would be expected to increase noticeably, particularly for the recreational resources on the southern tip of the island. However, the number of exercises would not exceed 8 weeks, and exercises would be planned in advance with signs posted and published on a regular basis to inform the public. Military exercises would generally be conducted on land designed for that purpose, and previous military exercises throughout the region have not precluded fishing or recreational use, even during peak fishing season. Unit-level training and Cope North- and Valiant Shield-type exercises would increase the number of takeoffs and landings at GSN. Under the noise Alternative 1-High Scenario as described in **Section 4.1.1.2,** the noise levels at Coral Ocean Point Golf Course and Ladder Beach would increase to 83 and 81 dBA DNL, respectively. Additional minor disturbances to recreational resources near the GSN could occur from aircraft noise. Therefore, long-term, intermittent, direct, moderate adverse impacts on recreational resources would be expected from Alternative 1.

Initial efforts to transfer fuel into the 100,000-bbl bulk storage tank would require the use of six tank trucks working 10-hour shifts for 14 days. During exercises, fuel transfer activity would resume at a similar pace. Traffic along the fuel route would become more congested, and therefore, access to recreational activities across the island would be slightly inhibited; however, access would not be denied. Therefore, long-term, intermittent, minor, adverse impacts would be expected from the use of fuel trucks under Alternative 1.

Under the billeting options described in **Section 2.3.1.2**, up to 700 personnel would either use local facilities and modular trailers or a BEAR kit to conduct airfield support activities during the 8-week exercise period. Long-term, intermittent, negligible, beneficial impacts would be expected from the use of recreational facilities by support personnel while exercises are being conducted.

4.9.2 Alternative 2 – TNI

4.9.2.1 Construction Phase

The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Impacts on recreational resources due to construction on Tinian would be expected to be similar to those described under Alternative 1, but to a greater extent because of the larger construction area associated with Alternative 2. The majority of the recreational resources on Tinian are associated with the Ushi Field-North Field Trail, coastal areas island-wide, and in the vicinity of San Jose Village. Construction activities would increase congestion on north-south thoroughfares on the island, which could inconvenience travelers using these roadways. If Runway Option A is implemented, Broadway Avenue would be rerouted, and access to North Field through 8th Avenue would experience a higher traffic

volume. This would increase travel times to recreational resources. Fewer recreational resources are found in the immediate vicinity of TNI, and therefore impacts from construction noise would be expected to be negligible. Short-term, indirect, negligible to minor, adverse impacts on recreational resources would be expected from Alternative 2.

4.9.2.2 Implementation Phase

Under Alternative 2, impacts on recreational resources from the implementation phase of the proposed action would be expected to be similar to, but less extensive, than those described in Alternative 1. Noise generated from the airfield would increase noise levels within the military area; however, since TNI has few recreational opportunities in the surrounding area, impacts on recreational activities due to divert operations and military or humanitarian exercises would be expected to be long-term, intermittent, direct, negligible to minor, and adverse.

The fuel transfer process for Alternative 2 would be similar to the transfer process described for Alternative 1. Fuel trucks would run for 10 hours per day for 14 days, during exercises. Traffic volumes along the transfer route would increase, and travel to the northern recreational resources would be prolonged. However, visitors and residents would not be denied access to recreational activities. Therefore, long-term, intermittent, minor, adverse impacts would be expected from the use of fuel trucks under Alternative 2.

The BEAR kit option described in **Section 2.3.2.2** would be the only housing option under Alternative 2. Personnel could use recreational facilities on the island during the 8-week exercise period. This would provide a slight increase in use of recreational resources. Therefore, long-term, intermittent, negligible, beneficial impacts would be expected from the use of recreational facilities by support personnel while exercises are being conducted.

4.9.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.9.2.1** and **3.9.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on recreation would be expected as a result of the No Action Alternative. Access to recreational resources within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.10 Land Use

Land Use and Ownership

A comparative methodology is used to determine potential impacts on land use. Facility operations and any construction or modification activities associated with each alternative is examined and compared to existing land use conditions. Impacts are evaluated as they relate to the:

- Compatibility of the proposed activities with existing land use and land use designations at the proposed project sites and in the surrounding areas
- Availability of sufficient land within the appropriate land use zone for the proposed activities.

Land use compatibility is defined here as the ability of two or more land uses to coexist without conflict. Examples of conflicts include interference of proposed activities with existing activities; insufficient availability of facilities, infrastructure, or resources to safely accommodate a proposed activity; and activities resulting in human health and safety issues due to poor siting.

Frequently, compatibility between land uses exists in varying degrees based on the frequency, duration, and intensity of a proposed activity. The land use zone designations preclude proposed activities from being located within a designated zone that would be incompatible with the current or proposed uses. However, an activity could be collocated within a land use zone that it is not normally associated with based on evaluation of its compatibility with nearby activities, including consideration of the availability of facilities and infrastructure, safety of personnel, and sensitive environments. Potential impacts on land use compatibility are based on qualitative assessments. Land disturbance within a given land use zone is not considered a land use impact under these criteria unless the disturbance results from a project that is incompatible with the land use designation.

Coastal Zone and Submerged Lands

Impacts on the coastal zone were evaluated by examining the consistency of the Proposed Action with the APCs on Tinian and Saipan. A CZMA consistency determination was d by the USAF for all Tinian and Saipan proposed actions; CZMA correspondence is included in **Appendix C**.

4.10.1 Alternative 1 – GSN (Preferred Alternative)

4.10.1.1 Construction Phase

Land Use and Ownership

No impacts on land use or land ownership would be expected from construction of the Proposed Action at GSN or the Port of Saipan.

GSN. Construction of any of the runway options, parking apron, temporary munitions storage area, hazardous cargo pad, aircraft hangar, maintenance facility, and fuel tanks at the GSN would occur on lands managed by the CPA and designated as Industrial by the CNMI Zoning Board. According to Article 4 of the Saipan Zoning Law of 2008, the proposed activities at the airport would be consistent with the designated Industrial land use (CNMI Zoning Board 2008). Approved industrial uses include Airport and Wholesale Gas and Fuel. The Airport designation includes "any public or privately owned or operated ground facility designed to accommodate landing and take-off operations of general aircraft." The Wholesale Gas and Fuel designation includes "the use of land for bulk storage and wholesale

distribution of 2,500 or more gallons of flammable liquid…" All of the proposed construction activities would be consistent with stipulations of the Saipan Zoning Law, and no impacts on land use would be anticipated.

The Proposed Action at GSN would also be consistent with the *2002 Saipan Airport Master Plan*. The proposed construction is consistent with the development plans outlined in the plan and would not preclude future development at the airport. No impacts would be anticipated.

Further, the USAF would obtain a right of entry to construct the facilities on public lands and would maintain some of the facilities as common-use facilities for use by the CPA and other airport users. Therefore, no impacts on land use or land ownership would be expected from implementation of the Proposed Action at GSN.

Port of Saipan. Construction of the fuel tanks at the Port of Saipan would occur on lands currently leased by the Federal Government. The land has been zoned by the CNMI Zoning Board as Industrial according to the Saipan Zoning Law of 2008. The Industrial designation includes an approved use for Seaport, which includes bulk fuel storage as a designated use. The proposed activities at the port would be consistent with the designated Industrial use. No impacts on land use or land ownership would be expected from construction or operation of the fuel tanks at the Port of Saipan.

Coastal Zone and Submerged Lands

Construction at the Port of Saipan would occur within the Port and Industrial APC; therefore, negligible, adverse impacts on APCs on Saipan would be anticipated. The USAF has prepared a coastal zone consistency determination for the proposed project and it was submitted with the Draft EIS. **Appendix C** contains the consistency determination correspondence.

4.10.1.2 Implementation Phase

No impacts on land use or land ownership would be expected from implementation of Alternative 1 on Saipan.

4.10.2 Alternative 2 – TNI

4.10.2.1 Construction Phase

Land Use and Ownership

No impacts on land use or land ownership would be expected from construction of the Proposed Action at TNI or the Port of Tinian.

TNI. Construction of either of the runway extension options, parking apron, temporary munitions storage area, hazardous cargo pad, aircraft hangar, maintenance facility, and fuel tanks at the TNI would occur on lands managed by the CPA and designated as urban/built-up by the CNMI DPL. All of the proposed construction activities would be consistent with this designated Industrial land use and no impacts on land use would be anticipated.

The temporary munitions storage area would be located on an area that is a former World War II airfield. The storage area would be developed within the military leased area of Tinian. There are no known agricultural leases in the area. However, displacement of adjacent agricultural out leases might be required because of the explosive QD arcs around the storage area. Access to the site is also along

existing military leased roadways. The terms of the DOD-CNMI lease back agreement provide for termination of the agricultural leases by DLNR and Public lands upon notification of the need for the property by DOD. Termination of any leases could lead to minor impacts onto leaseholders.

The USAF would obtain a right of entry to construct the facilities on public lands and would maintain some of the facilities as common-use facilities for use by the CPA and other airport users. Therefore, no impacts on land use or land ownership would be expected from implementation of the Proposed Action at TNI.

Port of Tinian. Construction of the fuel tanks at the Port of Tinian would occur on lands currently owned and operated by the CPA and designated as urban/built-up by the CNMI DPL. The proposed activities at the port would be consistent with the designated land use. No impacts on land use or land ownership would be expected from construction or operation of the fuel tanks at the Port of Tinian.

Coastal Zone and Submerged Lands

The USAF would be required to apply for a CRM permit for all actions that occur wholly or partially within an APC. Construction at TNI would not occur within any designated APCs; therefore, a CRM permit would not be required for this portion of construction. Construction at the Port of Tinian would occur within the Port and Industrial APC and the Shoreline APC; the USAF will prepare a CRM permit for this portion of construction. Pending completion of this permit and implementation of any potential BMPs identified in the permit, minor, adverse impacts on APCs on Tinian would be anticipated.

The USAF has prepared a coastal zone consistency determination for the proposed project and it was submitted with the Draft EIS. **Appendix C** contains the consistency determination correspondence.

4.10.2.2 Implementation Phase

No impacts on land use or land ownership would be expected from implementation of the Proposed Action on Tinian.

4.10.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.10.2.1** and **3.10.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on land use would be expected as a result of the No Action Alternative. Land use and ownership within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.11 Transportation

Various construction and implementation activities that may lead to transportation impacts were evaluated based on traffic volume and existing LOS. Impacts were considered minor if LOS would not degrade as a result of the additional traffic or if the increase in traffic volume was less than 10 percent. Impacts were considered major if LOS would degrade as a result of the additional traffic and the increase in traffic volumes was greater than 10 percent. Additionally, major impacts could occur with a relatively small traffic volume increase if the existing LOS was 'F.' Short-term impacts to the ground transportation network were considered to be those occurring during construction and immediately thereafter (approximately 1 to 4 year timeframe) and long-term impacts were considered to occur and continue starting from approximately 5 years from start of construction.

Several possible activities associated with the Proposed Action could impact the transportation network, including construction, transporting fuel from the seaport, and the movement of personnel both during construction and subsequent to implementation of the proposed action. The impacts of these activities were qualitatively assessed based on information from the CNMI Comprehensive Master Plan and estimated number of trips generated by the activities associated with the proposed action. The impacts discussed in the subsequent sections are identified as direct, adverse impacts unless otherwise noted.

4.11.1 Alternative 1 – GSN (Preferred Alternative)

4.11.1.1 Construction Phase

Short-term, direct, minor, adverse impacts would be expected on the local transportation network in Saipan due to construction under Alternative 1. Transportation impacts during the construction phase are limited to traffic added to the existing roadway network as a result of construction activities at GSN. The analysis in this section is based on Runway Option A and is considered the worst-case scenario. It is estimated that the number of construction workers associated with the proposed action would not exceed 2,000 at any given time. This maximum number of workers would be limited to several months during the 24- to 36-month construction period. Considerably fewer workers would be required during the remaining months. Based on the limited local construction workforce, it is assumed that at least half of these workers would not be local residents.

It is assumed that the estimated 1,000 local residents would carpool and the average vehicle occupancy would be three to four people. It is estimated that 300 trips would be generated in the morning and 300 trips would be generated in the evening, totaling 600 daily trips as a result of local worker travel during the construction phase.

Non-local workers would most likely be housed in hotels, and buses would be used to transport the workers to and from GSN during the construction phase. Assuming 50 people per bus, 20 round trips (1 trip in each direction) would be required to transport the non-resident workers. This would generate approximately 80 daily trips (20 round trips in the morning and 20 round trips in the afternoon). It is assumed that a majority of the workers would remain on site for all breaks. The hotel district on Saipan is located near the seaport; therefore, it is assumed that the bus route would follow the same route outlined for the fuel trucks destined for the seaport: Chalan Pale Arnold, Chalan Monsignor Guerrero, Tun Herman Pan, and Airport Road (see **Figure 3.11-1** in **Section 3.11**).

In addition to worker travel, construction activities would generate additional traffic resulting from delivery of materials, including concrete, and other miscellaneous trips occurring by inspectors, project managers, and other personnel that visit the site multiple times a day. The number of trips associated with deliveries and miscellaneous trips was estimated as one round trip for every 25 workers on site. During

the peak construction period when 2,000 workers are on site, this would equate to 160 trips per day. These construction-related trips would be dispersed throughout the day. It is anticipated that the worst case of 160 construction-related trips would occur when concrete is being poured. During that time, concrete mixer trucks would account for approximately 100 of the 160 trips. It is estimated that concrete would be delivered 54 days per year to provide the concrete needed for Runway Option A. For the remaining construction days, it is anticipated that substantially fewer construction-related trips would occur.

Table 4.11-1 summarizes the estimated daily trips expected during the construction phase. It should be noted that this is the estimated maximum number of trips expected to occur only for several months during the peak of construction activity.

Table 4.11-1. Estimated Maximum Daily Trips – Alternative 1 Construction Phase

Trip Source	Daily One-Way Trips	Trip Timeframe
Local Worker Transport	600	Morning and afternoon
Non-Local Worker Transport	80	Morning and afternoon
Miscellaneous Trips	160	All day
Total Additional Trips per Day	**840**	

Source: HDR 2012

The daily trips generated during the construction phase have the potential to impact the existing transportation network in two ways: by increasing congestion and delay on local roadways, thereby reducing LOS, and by causing additional stress on roadway surfaces resulting in deterioration (e.g., rutting, cracking, pavement breakup) of the driving surface.

While the transportation network of Saipan is rather limited, it is assumed that the local traffic generated by construction activities would be distributed, preventing major impact on any one roadway. The bus route identified to transport non-local workers consists of primarily four-lane facilities that currently operate with excess capacity; thus, it is anticipated that additional traffic generated during the construction phase would result in only minor increases in delay and no changes to existing LOS. One roadway segment to note is Isa Drive north of Chalan Monsignor Gurerrero. This segment currently operates at LOS D with an ADT of 7,530 vehicles. Capacity of this segment is 10,000 vehicles per day (CNMI DPW 2009). If all construction-generated trips used Isa Drive, vehicular delay would increase, but the segment LOS would not change because the delay increase would not be enough to degrade the LOS. Traffic operations impacts could be lessened by requiring construction activities to begin and end outside of peak travel periods.

According to the CNMI Comprehensive Highway Master Plan, current traffic operations on some roadway segments on the island are at or exceed capacity based on a daily volume analysis. Traffic operations along these segments might be poor during peak periods and poor operations can cause extended peak periods, but failing LOS does not typically mean that the facility is operating poorly during all hours of the day. It is estimated that more than half of the trips generated by the proposed action would occur outside of typical peak hours.

Roadway surfaces have a limited lifespan and deteriorate incrementally over time. The amount of deterioration is in part a function of the materials used to construct the roadway, the amount of vehicular traffic, and the mix of vehicles (trucks vs. cars). The additional vehicular traffic during the construction phase, specifically truck traffic resulting from deliveries, would likely increase the normal deterioration of

the roadways in the vicinity of the proposed action. For roadways that currently carry 20,000 vehicles per day or more, the deterioration would be minor since the additional traffic (at peak construction) would be less than 5 percent of the existing volume. For roadways that carry less than 20,000 vehicles per day, the deterioration would be more pronounced because the additional traffic would be as much as a 30 percent increase over the existing volume. Although deterioration is expected to varying degrees, it is not possible to estimate the extent of the deterioration because current pavement condition and the existing vehicle mix are unknown.

To help prevent potential roadway deterioration, the roadways that would be used for construction could be repaired, overlaid, and reinforced as needed to accommodate the additional traffic prior to the start of substantial construction activities. These routes could also be repaired and overlaid as needed upon completion of construction to restore the pavement condition to pre-construction levels.

Indirect impacts could occur on corridors not directly impacted by the worker bus routes as a result of existing congestion. Some traffic operation impacts could be lessened by requiring a majority of the worker transport activities to occur outside of peak periods.

4.11.1.2 Implementation Phase

Minor, direct, adverse impacts would be expected on the local transportation network in Saipan due to the implementation phase of the Proposed Action under Alternative 1. These impacts are expected on a long-term basis, but would only occur periodically (i.e., 2 weeks at a time) during planned joint military exercises. Transportation impacts as a result of the implementation phase include fuel truck traffic, daily transport of personnel, and miscellaneous trips, including deliveries to and from GSN as a result of the Proposed Action. One 100,000-bbl aviation fuel tank would be constructed at GSN during the construction phase. This tank would be filled from the two 50,000-bbl fuel tanks constructed at the seaport. It is anticipated that 6 fuel trucks (10,000 gallon capacity) making 5 round trips to and from the seaport each day, for 14 days would be necessary to fill the new tank. This would result in 60 additional daily trips. During exercises, it is anticipated the same amount of fuel truck traffic would be necessary to maintain adequate fuel storage at GSN. The proposed truck route is shown in **Figure 3.11-1** in **Section 3.11**.

Temporary billeting for up to 700 personnel would be required to support the Proposed Action. Two options are being considered by the USAF for billeting:

- Housing personnel in commercial lodging
- Using a BEAR kit constructed immediately adjacent to GSN (would not require transport of personnel).

Under the commercial lodging scenario, buses would be used to transport personnel to and from GSN during the implementation phase. Assuming 50 people per bus, approximately 15 round trips would be required to transport personnel. It is assumed that this would generate 60 daily trips (15 round trips in the morning and 15 round trips in the afternoon). The proposed bus route would follow the same route outlined for the fuel trucks destined for the seaport: Chalan Pale Arnold, Chalan Monsignor Guerrero, Tun Herman Pan, and Airport Road (see **Figure 3.11-1** in **Section 3.11**).

In addition to trips associated with fuel delivery and personnel travel, miscellaneous trips are expected to occur for deliveries and other activities associated with the proposed action. It is assumed that one additional round trip would be generated for every 50 personnel. This would equate to approximately 30 additional trips per day.

Table 4.11-2 summarizes the estimated daily trips expected during implementation.

Table 4.11-2. Estimated Maximum Daily Trips – Alternative 1 Implementation Phase

Trip Source	Daily One-Way Trips	Trip Timeframe
Fuel Truck Trips	60	All day
Personnel Transport	60	Morning and afternoon
Miscellaneous Trips	30	All day
Total Additional Trips per Day	**150**	

Source: HDR 2012

The daily trips generated during the implementation phase have the potential to impact the existing transportation network in two ways: by increasing congestion and delay on local roadways, thereby reducing LOS, and by causing additional stress on roadway surfaces resulting in deterioration (e.g., rutting, cracking, pavement breakup) of the driving surface.

According to the CNMI Comprehensive Highway Master Plan current traffic operations on some roadway segments on the island are at or exceed capacity based on a daily volume analysis. Traffic operations along these segments might be poor during peak periods and poor operations can cause extended peak periods, but failing LOS does not typically mean that the facility is operating poorly during all hours of the day. It is estimated that more than half of the trips generated by the proposed action will occur outside of typical peak hours.

Traffic congestion is of concern for one segment of the proposed fuel truck route, Beach Road. Beach Road carries the highest volume of traffic in the vicinity of the proposed action and is currently experiencing some congestion issues. Based on the analysis conducted for the CNMI Comprehensive Master Plan the ADT capacity for this segment is 30,000 vehicles per day and the existing estimated ADT is 39,890 vehicles per day, almost 10,000 vehicles more than capacity. At this level of service, relatively minor increases in traffic can cause major impacts on current traffic operations. The total traffic generated as a result of the proposed action is less than 0.75 percent of the daily traffic on Beach Road and less than half of those trips would use Beach Road. Therefore, it is anticipated that delay and congestion impacts on Beach Road related to the proposed action would be short term and minor.

Based on repairing, overlaying, or reinforcing the roadway surfaces prior to the construction phase, it is assumed that the pavement on the proposed fuel truck route would be adequate to handle additional truck and bus traffic resulting from implementation with negligible roadway deterioration.

4.11.2 Alternative 2 – TNI

4.11.2.1 Construction Phase

Short-term, minor, direct, adverse impacts would be expected on the local transportation network in Tinian due to construction under Alternative 2. Transportation impacts during the construction phase are limited to traffic added to the existing roadway network as a result of construction. The analysis in this section is based on Runway Option A and is considered the worst-case scenario. It is estimated that the number of construction workers associated with the proposed action would not exceed 2,000 at any given time. This maximum number of workers would be limited to several months during the 24- to 36-month construction period. Considerably fewer workers would be required during the remaining months. Based

on the limited local construction workforce, it is assumed that 95 percent of these workers would not be local Tinian residents.

It is assumed that the estimated 100 local residents would carpool and the average vehicle occupancy would be three to four people. It is estimated that 30 trips would be generated in the morning and 30 trips would be generated in the evening, totaling 60 daily trips as a result of local worker travel during the construction phase.

Non-local workers would most likely be housed at the Tinian Dynasty Hotel and Casino (located adjacent to the Tinian Harbor) and modular homes. It is assumed that the modular homes would be constructed within walking distance of TNI. Buses would be used to transport the workers to and from the Tinian Dynasty Hotel and Casino via Broadway during the construction phase (see **Figure 3.11-2** in **Section 3.11**). If lodging for all the workers were provided at the Tinian Dynasty Hotel and Casino and assuming 50 people per bus, approximately 80 round trips (40 round trips in the morning and 40 round trips in the afternoon) would be required to transport the non-resident workers, totaling 160 daily trips. It is assumed that a majority of the workers would remain on site for all breaks.

In addition to worker travel, construction activities would generate additional traffic resulting from delivery of materials including concrete and other miscellaneous trips occurring by inspectors, project managers, and other personnel that visit the site multiple times a day. The number of trips associated with deliveries and miscellaneous trips was estimated as one round trip for every 25 workers on site. During the peak construction period when 2,000 workers are on site, this would equate to 160 trips per day. These construction-related trips would be dispersed throughout the day. It is anticipated that the worst case of 160 construction-related trips would occur when concrete is being poured. During that time, concrete mixer trucks would account for approximately 100 of the 160 trips. It is estimated that concrete would be delivered 99 days per year to provide the concrete needed for Runway Option A. For the remaining construction days it is anticipated that substantially fewer construction-related trips would occur.

Table 4.11-3 summarizes the estimated daily trips expected during the construction phase. It should be noted that this is the estimated maximum number of trips expected to occur only for several months during the peak of construction activity.

Table 4.11-3. Estimated Maximum Daily Trips – Alternative 1 Construction Phase

Trip Source	Daily One-Way Trips	Trip Timeframe
Local Worker Transport	60	Morning and afternoon
Non-Local Worker Transport	160	Morning and afternoon
Miscellaneous Trips	160	All day
Total Additional Trips per Day	**380**	

Source: HDR 2012

The daily trips generated during the construction phase have the potential to impact the existing transportation network in two ways: by increasing congestion and delay on local roadways, thereby reducing LOS and by causing additional stress on roadway surfaces resulting in deterioration (e.g., rutting, cracking, pavement breakup) of the driving surface.

The proposed bus route to transport non-local workers would use Broadway. Broadway currently operates at LOS A with an ADT of 1,470 vehicles. Capacity of this segment is 8,000 vehicles per day

(CNMI DPW 2009). If all construction-generated trips used Broadway, vehicular delay would increase, but the segment LOS would not change because the delay increase would not be enough to degrade the LOS.

One option being considered by the USAF under this alternative is to extend the existing TNI runway. Extension of the runway would require relocation of Broadway; however, Broadway would be relocated prior to construction of the runway extension. Traffic along Broadway would be maintained during construction of relocated Broadway. Minor impacts would be expected for a few days when the existing Broadway route is decommissioned and routed onto the relocated facility.

Roadway surfaces have a limited lifespan and deteriorate incrementally over time. The amount of deterioration is in part a function of the materials used to construct the roadway, the amount of vehicular traffic, and the mix of vehicles (trucks vs. cars). The additional vehicular traffic during the construction phase, specifically truck traffic resulting from deliveries, would likely increase the normal deterioration of the roadways in the vicinity of the proposed action. Although deterioration is expected to varying degrees, it is not possible to estimate the extent of the deterioration because current pavement condition and the existing vehicle mix are unknown.

To help prevent potential roadway deterioration, the roadways that would be used for construction could be repaired, overlaid, and reinforced as needed to accommodate the additional traffic prior to the start of substantial construction activities. Additionally, these routes would be repaired and overlaid as needed upon completion of construction to restore the pavement condition to pre-construction levels.

4.11.2.2 Implementation Phase

Minor, direct, adverse impacts would be expected on the local transportation network in Tinian due to the implementation phase of the Proposed Action under Alternative 2. These impacts are expected on a long-term basis, but would only occur periodically (i.e., 2 weeks at a time) during planned joint military exercises. Transportation impacts as a result of the implementation phase of Alternative 2 include fuel truck traffic and miscellaneous trips including deliveries to and from TNI as a result of the proposed action. One 100,000-bbl aviation fuel tank would be constructed at TNI during the construction phase. This tank would be filled from one 100,000-bbl fuel tank constructed at the seaport. It is anticipated that 6 fuel trucks (10,000 gallon capacity) making 5 round trips to and from the seaport each day, for 14 days would be necessary to fill the airport tank. This would result in 60 additional daily trips. During exercises, it is anticipated the same number of fuel truck traffic would be necessary to maintain adequate fuel storage at TNI. The proposed truck route is shown in **Figure 3.11-2** in **Section 3.11**.

Billeting for this option consists of onsite accommodations, thus the transportation network would not be impacted as a result of personnel transport. In addition to trips associated with fuel delivery, miscellaneous trips are expected to occur for deliveries and other activities associated with the proposed action. It is assumed that one additional round trip would be generated for every 25 personnel. This would equate to approximately 60 additional trips per day.

Table 4.11-4 summarizes the estimated daily trips expected during implementation.

According to the CNMI Comprehensive Highway Master Plan current traffic operations on all island roadway segments are LOS A. While proportionally the additional number of trips could be high for some of the roadway segments, all of the Tinian roadway facilities have substantial excess capacity; therefore, minor impacts are anticipated as a result of the proposed action.

Table 4.11-4. Estimated Maximum Daily Trips – Alternative 1 Implementation Phase

Trip Source	Daily One-Way Trips	Trip Timeframe
Fuel Truck Trips	60	All day
Miscellaneous Trips	60	All day
Total Additional Trips per Day	**120**	

Source: HDR 2012

Based on repairing, overlaying, or reinforcing the roadway surfaces prior to the construction phase, it is assumed that the pavement on the proposed fuel truck route would be adequate to handle additional truck traffic resulting from implementation with negligible roadway deterioration.

4.11.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.11.2.1** and **3.11.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises, unplanned divert landings, humanitarian assistance, and disaster relief in the western Pacific. The USAF would continue to conduct divert emergency landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*, planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area, and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB or GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on ground transportation would be expected as a result of the No Action Alternative. Ground transportation within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.12 Hazardous Materials and Wastes

Impacts associated with hazardous materials or wastes would be considered significant if a proposed action resulted in:

- Noncompliance with applicable Federal or state regulations
- Increases in the amounts generated or procured beyond current waste management procedures and capacities
- The disturbance or creation of contaminated sites that cause negative impacts on human health or the environment Additional adverse impacts include actions that make it more difficult or costly to remediate hazardous substance clean-up sites
- Impacts that include actions that make it more difficult or costly to remediate hazardous substance cleanup sites.

4.12.1 Alternative 1 – GSN (Preferred Alternative)

The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Impacts from Runway Option B and C would be similar to Runway Option A, but less intense due to the reduced amount of ground disturbance.

4.12.1.1 Construction Phase

Hazardous Materials and Hazardous Wastes. Short-term, minor, adverse impacts associated with hazardous materials and hazardous wastes would be expected from the construction activities proposed under Alternative 1. Construction activities would require the use and onsite storage of hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. Additionally, some construction vehicles and heavy equipment would use hazardous materials such as hydraulic fluids and lead-acid batteries. It is anticipated that the quantities of hazardous materials needed during the construction would be minimal, and their use would be limited to the period of construction. All hazardous materials would be stored and handled in accordance with applicable Federal, CNMI, and USAF hazardous materials management regulations.

Construction activities would generate minor quantities of hazardous wastes from the use of hazardous materials. Contractors would be responsible for the storage, handling, and disposal of hazardous wastes in accordance with Federal, CNMI, and USAF hazardous waste management regulations. As such, GSN's RCRA SQG status would not be affected. Because only limited quantities of hazardous wastes would be generated during construction of Alternative 1, the additional hazardous wastes would not be expected to exceed the capacities of existing hazardous waste disposal streams available to Saipan.

No hazardous materials or hazardous wastes are known to be stored within the Alternative 1 areas; therefore, no hazardous materials and hazardous wastes would need to be removed prior to construction.

Petroleum Products. Short-term, minor, adverse impacts on petroleum products would be expected from the construction activities proposed under Alternative 1. Minimal quantities of liquid fuels, such as diesel and gasoline, would be needed to fuel construction vehicles, concrete and material haul trucks, and other equipment. Additionally, construction vehicles and equipment would use minimal quantities of oils and lubricants. Onsite storage of petroleum products would be accomplished through the installation of temporary diesel and gasoline ASTs as necessary. Contractors would obtain an AST Permit to Install and an AST Permit to Operate from the CNMI DEQ for all ASTs needed to support construction. These ASTs would be removed following the completion of construction, and all contractors would use proper BMPs (e.g., secondary containment, inspections, and spill kits) and adhere to Federal, CNMI, and USAF regulations to prevent releases from the ASTs. All petroleum products needed for the construction of Alternative 1 would be delivered to the seaport on Saipan by ship and trucked to GSN. Waste petroleum products would be disposed of through the hazardous waste disposal streams available to contractors on GSN.

To support Alternative 1, upgrades in aircraft refueling capability at GSN would be required. The USAF would construct a standard DOD-designed 2,400-gpm Type III Hydrant Refueling System adjacent to the proposed aircraft parking ramp. This refueling system would tie into the existing refueling infrastructure already available to GSN. Other refueling infrastructure that would be constructed at the airfield includes two 10,000-bbl (42,000-gallon), cut-and-cover tank or AST that would be located near the proposed parking apron, an emergency generator, a transfer pumphouse, pumps, piping, filtration, valves, and a Pantograph/HSV Test Station. Construction of this infrastructure would meet PACAF's operational requirement to provide parking and refueling for 12 primary assigned aircraft.

USAF mission operational mandates require the storage of a 30-day supply of jet fuel on Saipan. To accomplish this mandate, the USAF would construct one 100,000-bbl (420,000-gallon), cut-and-cover tank or AST on GSN-owned property and two 50,000-bbl (210,000-gallon) ASTs with pump, filter, and associated piping on federally leased land at the seaport on Saipan. The applicable owners of each proposed storage tank would obtain an AST Permit to Install from the CNMI DEQ for all ASTs proposed for construction. Impacts from the operation of this refueling infrastructure are discussed in **Section 4.12.1.2**, and impacts with respect to infrastructure improvements are discussed in **Sections 4.11.1.1** and **4.11.1.2**.

Existing Contamination Areas. Short-term, minor, adverse impacts associated with existing contamination areas could be encountered during the construction activities proposed for Alternative 1. While no known areas of contamination have been identified within the Alternative 1 areas, there is the potential for finding contamination at GSN due to the former use of these areas during the Pacific Theater of World War II. Additionally, there is the potential for the discovery of UXO at GSN and the seaport dating from the World War II era. Prior to conducting any soil-disturbing activities, a visual survey of the areas proposed to be disturbed should be conducted. If environmental contamination is identified, construction site plans should be revised to avoid the contamination areas or remediate them as practicable. If environmental contamination is discovered during construction, the contractor should immediately stop work at the affected area, report the discovery to the USAF, property owner, and CNMI, as necessary, and implement appropriate safety measures. Commencement of field activities should not resume in the affected area until the issue was investigated and resolved. The remediation of any existing contamination area would be a long-term, minor, beneficial effect.

Several areas of existing contamination have been identified nearby to the Alternative 1 areas; however, these areas are unlikely to affect Alternative 1 because they are primarily soil contamination sites, except for the Puerto Rico Dump that has soil and groundwater contamination. The Puerto Rico Dump is 200 feet west of and seaward of the Alternative 1 seaport bulk fuel storage area; therefore, it is assumed that any groundwater contamination associated with the Puerto Rico Dump would flow towards the ocean and not impact the Alternative 1 seaport bulk fuel storage area. Additionally, it is assumed that construction work at the Alternative 1 seaport bulk fuel storage area would not impact the underlying groundwater.

Asbestos-Containing Materials. Short-term, minor, adverse impacts associated with ACMs could be encountered during the construction activities proposed for Alternative 1. Because the Alternative 1 areas at GSN are associated with former facilities from the World War II era, there is the potential for asbestos to be present in abandoned utility lines and demolition debris potentially buried in surface or near-surface soils. Prior to conducting any soil-disturbing activities, a visual survey of the proposed disturbance areas should be conducted. If visual asbestos is observed, the applicable sites should be classified as areas with known asbestos-containing soils/materials, and the notification process should be implemented. If visual asbestos is not observed during the visual survey, construction would move forward as planned. However, if any unexpected ACMs or demolition debris are encountered during the soil-disturbing activities, all site work should cease and the site should be re-evaluated. Any ACMs encountered during soil-disturbing activities would be handled in accordance with established Federal, CNMI, and USAF regulations and would be disposed of at an asbestos-permitted landfill. Long-term, minor, beneficial impacts would be expected from the removal of any ACMs.

USAF regulations restrict the use of ACMs for new construction. AFI 32-1023 requires that a substitution study be conducted whenever the use of an ACM in construction, maintenance, or repair is considered. If the study determines that the ACM is superior in cost and performance characteristics, and has minimal actual or potential health hazards, then the ACM should be used. In all other cases, non-ACMs should be used.

Lead-Based Paint. Short-term, minor, adverse impacts associated with LBP could be encountered during the construction activities proposed for Alternative 1. Because the Alternative 1 construction areas at GSN are associated with former facilities from the World War II era, there is the potential for buried debris containing LBP and lead-contaminated soil to be present in surface or near-surface soil. Prior to conducting any soil-disturbing activities, a visual survey of the proposed disturbance areas should be conducted. Should debris containing LBP be discovered during the survey, site preparation, or excavation, work should stop immediately and measures would be taken to secure the area and prevent the release of lead. Debris containing LBP would be removed and disposed of in accordance with applicable Federal and CNMI regulations. Long-term, minor, beneficial impacts would be expected from the removal of any LBP.

Air Force Policy and Guidance on Lead-Based Paint in Facilities, 24 May 1993, states that paint containing more than the regulated amount for nonindustrial facilities (i.e., LBP) will not be used on industrial or nonindustrial facilities; therefore, the structures proposed for construction would not contain LBP. AFI 32-1042, *Standards for Marking Airfields*, states that lead-free pavement marking paints are to be used at airfields; therefore, the proposed airfield pavement areas would not contain LBP.

Polychlorinated Biphenyls. Short-term, negligible, adverse impacts associated with PCBs could be encountered from the construction of Alternative 1. If any potential PCB-containing equipment not labeled PCB-free or missing date-of-manufacture labels requires removal, then this equipment would be removed and handled in accordance with Federal and CNMI hazardous waste regulations. Alternative 1 does not entail building demolition; therefore, the number of equipment possibly containing PCBs that are proposed for removal is limited. Long-term, minor, beneficial impacts would be expected from the removal of any PCB-containing equipment.

Pesticides. No impacts on pesticides would be expected from the construction activities proposed under Alternative 1. Construction activities would not require any significant changes in the quantities of pesticides used or significantly alter pesticide application areas on Saipan.

Radon. No impacts associated with radon would be expected from the construction activities proposed under Alternative 1. Most construction activities would occur outdoors or inside of buildings with ample fresh air circulation during construction. Radon-resistant construction techniques would be implemented during construction to limit the potential for radon intrusion during occupancy.

4.12.1.2 Implementation Phase

Hazardous Materials and Hazardous Wastes. Long-term, minor, adverse impacts associated with hazardous materials and hazardous wastes would be expected from the implementation of Alternative 1. Alternative 1 would increase the number of personnel, aircraft, aircraft maintenance operations, vehicles, and other equipment on Saipan and, specifically, at GSN. This increase in personnel, equipment, and maintenance operations would increase the quantities of hazardous materials, such as hydraulic fluids, lead-acid batteries, solvents, and other chemicals, needed at GSN during the proposed exercises. Most hazardous materials would be stored and used at the proposed aircraft hangar and maintenance facility at GSN. All hazardous materials would be stored and handled in accordance with applicable Federal, CNMI, and USAF hazardous materials management regulations.

The increase in the quantities of hazardous materials needed during the proposed exercises would result in an increase in the quantities of hazardous wastes generated. The additional quantities of hazardous wastes would be mostly generated and stored at the proposed aircraft hanger and maintenance facility at GSN. These hazardous wastes would be disposed of by the USAF and transported to Andersen AFB for disposal through the installation's Defense Reutilization and Marketing Office (DRMO). Implementation

of Alternative 1 might require GSN to reevaluate its RCRA SQG status should any changes in the amounts and types of hazardous wastes stored and generated at GSN exceed SQG threshold limits. All hazardous wastes would be stored, handled, and disposed of in accordance with Federal, CNMI, and USAF hazardous waste management regulations.

Petroleum Products. Long-term, minor to moderate, adverse impacts from petroleum products would be expected due to the implementation of Alternative 1. The demand for petroleum products, such as jet fuel, gasoline, diesel, oils and lubricants, and other miscellaneous petroleum products, would increase during exercises, and additional quantities of these petroleum products would need to be delivered to Saipan by ocean-going tankers. Small amounts of oils and lubricants for aircraft maintenance would likely by delivered via cargo ship or aircraft. The additional quantities of petroleum products that are delivered to Saipan in bulk, such as jet fuel, gasoline, and diesel, would be off-loaded from the tanker vessels using the existing fuel transfer infrastructure available at the seaport on Saipan and stored in the existing and proposed fuel storage tanks.

Alternative 1 would increase the demand for other liquid fuel petroleum products on Saipan. The added military personnel during exercises would require additional truck, car, and bus traffic during the 8 weeks each year when exercises occur. The added vehicle traffic would increase the amounts of gasoline and diesel fuels consumed. Additionally, Alternative 1 would include the construction of two electrical generators. One electrical generator would be a 920-kW generator set with fuel bladder used under the BEAR kit Option. The other generator would provide emergency electrical power to operate the refueling hydrant system. Both electrical generators are assumed to be diesel-fueled and would require periodic diesel deliveries.

Alternative 1 would increase the amounts of oils and lubricants needed at GSN for aircraft- and infrastructure-maintenance operations. The use of oils and lubricants would predominantly occur during the 8 weeks each year when exercises occur, and most oils and lubricants would be stored and used at the proposed aircraft hangar and maintenance facility at GSN. Waste oils and lubricants, including those collected from the proposed oil/water separator, would be disposed of through the hazardous waste disposal streams available to the USAF.

Alternative 1 would increase the amounts of petroleum products used, stored, and transported on Saipan. The additional quantities of petroleum products and liquid fuel storage infrastructure would increase the chance for a release of petroleum products as compared to existing conditions. Additionally, the increase in tanker truck traffic on Saipan would slightly increase the risk of a release due to the added volumes of liquid fuels being transported over public roadways. To limit the potential for a release of petroleum products, all proposed petroleum product storage and transfer infrastructure, including storage tanks, piping, and hydrants, would be constructed new and in accordance with manufacturer design specifications. The applicable owners of each proposed storage tank would obtain an AST Permit to Operate from the CNMI DEQ for all ASTs proposed for use. All petroleum products would be stored and handled in accordance with applicable Federal, CNMI, and USAF management regulations.

Existing Contamination Areas. Prior to beginning construction, all existing contamination areas with the potential to affect Alternative 1 would be identified and then remediated or avoided as practicable. As such, the implementation of Alternative 1 would not affect any existing contamination areas.

Asbestos-Containing Materials. No impacts associated with ACMs would be expected from the implementation of Alternative 1. As noted in **Section 4.12.1.1**, USAF regulations restrict the use of ACMs for new construction. ACM only would be used if a study determines that the ACM is superior in cost and performance characteristics and has minimal actual or potential health hazards.

Lead-Based Paint and Polychlorinated Biphenyls. No impacts associated with LBP and PCBs would be expected from the implementation of Alternative 1. LBP and PCBs would not be used in any of the buildings or infrastructure proposed for construction.

Pesticides. No impacts associated with pesticides would be expected from the implementation of Alternative 1. Implementation of Alternative 1 would not require any significant changes in the quantities of pesticides used or significantly alter pesticide application areas on Saipan.

Radon. Long-term, negligible to minor, adverse impacts associated with radon could be encountered during the implementation of Alternative 1. Although radon-resistant construction techniques would be implemented during construction, it is possible that the proposed facilities would encounter radon intrusion following construction. The USAF would test facilities that have known radon intrusion issues periodically to verify that no unacceptable radon gas buildup occurs. As appropriate, radon gas removal equipment would be installed at buildings that consistently show indoor radon levels greater than 4 pCi/L.

4.12.2 Alternative 2 – TNI

The analysis in this section is based on Runway Option A and is considered the worst-case scenario. Impacts from Runway Option B would be similar to Runway Option A, but less intense due to the reduced amount of ground disturbance.

4.12.2.1 Construction Phase

Hazardous Materials and Hazardous Wastes. Short-term, minor, adverse impacts associated with hazardous materials and hazardous wastes would be expected from the construction activities proposed under Alternative 2. Construction activities would require the use and onsite storage of hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. Additionally, some construction vehicles and heavy equipment would use hazardous materials such as hydraulic fluids and lead-acid batteries. It is anticipated that the quantities of hazardous materials needed during the construction would be minimal, and their use would be limited to the period of construction. All hazardous materials would be stored and handled in accordance with applicable Federal, CNMI, and USAF hazardous materials management regulations.

Construction activities would generate minor quantities of hazardous wastes from the use of hazardous materials. Contractors would be responsible for the storage, handling, and disposal of hazardous wastes in accordance with Federal, CNMI, and USAF hazardous waste management regulations. Because only limited quantities of hazardous wastes would be generated during construction of Alternative 2, the additional hazardous wastes would not be expected to exceed the capacities of existing hazardous waste disposal streams available to Tinian.

No hazardous materials or hazardous wastes currently are stored within the Alternative 2 areas; therefore, no hazardous materials and hazardous wastes would need to be removed prior to construction.

Petroleum Products. Short-term, minor, adverse impacts on petroleum products would be expected from the construction activities proposed under Alternative 2. Minimal quantities of liquid fuels, such as diesel and gasoline, would be needed to fuel construction vehicles, concrete and material haul trucks, and other equipment. Additionally, construction vehicles and equipment would use minimal quantities of oil and lubricants. Onsite storage of petroleum products would be accomplished through the installation of temporary diesel and gasoline ASTs as necessary. Contractors would obtain an AST Permit to Install and an AST Permit to Operate from the CNMI DEQ for all ASTs needed to support construction. These ASTs would be removed following the completion of construction, and all contractors would use proper

BMPs (e.g., secondary containment, inspections, and spill kits) and adhere to Federal, CNMI, and USAF regulations to prevent releases from the ASTs. All petroleum products needed for the construction of Alternative 2 would be delivered to the seaport on Tinian by ship and trucked to TNI. Waste petroleum products would be disposed of through the hazardous waste disposal streams available to contractors on TNI.

To support Alternative 2, construction of jet fuel receiving, storing, and dispensing infrastructure on Tinian would be required. The USAF would construct a standard DOD-designed 2,400-gpm Type III Hydrant Refueling System adjacent to the proposed aircraft parking ramp. Other refueling infrastructure that would be constructed at the airfield includes two 10,000-bbl (42,000-gallon), cut-and-cover tanks or ASTs that would be located near the proposed parking apron, an emergency generator, a transfer pumphouse, pumps, piping, filtration, valves, and a Pantograph/HSV Test Station. Construction of this infrastructure would meet PACAF's operational requirement to provide parking and refueling for 12 primary assigned aircraft.

USAF mission operational mandates require the storage of a 30-day supply of jet fuel on Tinian. To accomplish this mandate, the USAF would construct one 100,000-bbl (420,000-gallon), cut-and-cover tanks or AST on TNI-owned property and one 100,000-bbl (420,000-gallon) AST with pump, filter, and associated piping on federally leased land at the seaport on Tinian. A 10-inch valve compatible with jet fuel also would be constructed at the seaport to pipe jet fuel from the delivery ships to the AST at the seaport. The applicable owners of each proposed storage tank would obtain an AST Permit to Install from the CNMI DEQ for all ASTs proposed for construction. Impacts from the operation of this refueling infrastructure are discussed in **Section 4.12.2.2**, and impacts with respect to infrastructure improvements are discussed in **Sections 4.11.2.1** and **4.11.2.2**.

Existing Contamination Areas. Short-term, minor, adverse impacts associated with existing contamination areas could be encountered during the construction activities proposed for Alternative 2. While no known areas of contamination have been identified within the Alternative 2 areas, there is the potential for finding contamination at TNI due to the former use of these areas as part of the Pacific Theater during World War II. Additionally, there is the potential for the discovery of UXO at TNI and the Tinian seaport dating from the World War II era. Prior to conducting any soil-disturbing activities, a visual survey of the areas proposed to be disturbed should be conducted. If environmental contamination is identified, construction site plans should be revised to avoid the contamination areas or remediate them as practicable. If environmental contamination is discovered during construction, the contractor should immediately stop work at the affected area, report the discovery to the USAF, property owner, and CNMI, as necessary, and implement appropriate safety measures. Commencement of field activities should not resume in the affected area until the issue was investigated and resolved. The remediation of any existing contamination area would be a long-term, minor, beneficial effect.

One Formerly Used Defense Site has been identified more than 2,000 feet from the nearest component of Alternative 2; however, based on its distance, this site is unlikely to affect Alternative 2.

Asbestos-Containing Materials. Short-term, minor, adverse impacts associated with ACMs could be encountered during the construction activities proposed for Alternative 2. Because the Alternative 2 areas at TNI are associated with former development from the World War II era, there is the potential for asbestos to be present in abandoned utility lines and demolition debris potentially buried in surface or near-surface soils. Prior to conducting any soil-disturbing activities, a visual survey of the proposed disturbance areas should be conducted. If visual asbestos is observed, the applicable sites should be classified as areas with known asbestos-containing soils or materials, and the notification process should be implemented. If visual asbestos is not observed during the visual survey, construction would move forward as planned. However, if any unexpected ACMs or demolition debris are encountered during the

soil-disturbing activities, all site work should cease and the site should be re-evaluated. Any ACMs encountered during soil-disturbing activities would be handled in accordance with established Federal, CNMI, and USAF regulations and would be disposed of at an asbestos-permitted landfill. Long-term, minor, beneficial impacts would be expected from the removal of any ACMs.

USAF regulations restrict the use of ACMs for new construction. AFI 32-1023 requires that a substitution study be conducted whenever the use of an ACM in construction, maintenance, or repair is considered. If the study determines that the ACM is superior in cost and performance characteristics, and has minimal actual or potential health hazards, then the ACM should be used. In all other cases, non-ACMs should be used.

Lead-Based Paint. Short-term, minor, adverse impacts associated with LBP could be encountered during the construction activities proposed for Alternative 2. Because the Alternative 2 construction areas at TNI are associated with former development from the World War II era, there is the potential for buried debris containing LBP and lead-contaminated soil to be present in surface or near-surface soil. Prior to conducting any soil-disturbing activities, a visual survey of the proposed disturbance areas should be conducted. Should debris containing LBP be discovered during the survey, site preparation, or excavation, work should stop immediately and measures should be taken to secure the area and prevent the release of lead. Debris containing LBP would be removed and disposed of in accordance with applicable Federal and CNMI regulations. Long-term, minor, beneficial impacts would be expected from the removal of any LBP.

Air Force Policy and Guidance on Lead-Based Paint in Facilities, 24 May 1993, states that paint containing more than the regulated amount for nonindustrial facilities (i.e., LBP) will not be used on industrial or nonindustrial facilities; therefore, the structures proposed for construction would not contain LBP. AFI 32-1042, *Standards for Marking Airfields*, states that lead-free pavement marking paints are to be used at airfields; therefore, the proposed airfield pavement areas would not contain LBP.

Polychlorinated Biphenyls. Short-term, negligible, adverse impacts associated with PCBs could be encountered from the construction of Alternative 2. If any potential PCB-containing equipment not labeled PCB-free or missing date-of-manufacture labels requires removal, then this equipment would be removed and handled in accordance with Federal and CNMI hazardous waste regulations. Alternative 2 does not entail building demolition; therefore, the number of equipment possibly containing PCBs that are proposed for removal is limited. Long-term, minor, beneficial impacts would be expected from the removal of any PCB-containing equipment.

Pesticides. No impacts on pesticides would be expected from Alternative 2. Construction activities would not require any significant changes in the quantities of pesticides used or significantly alter pesticide application areas on Tinian.

Radon. No impacts associated with radon would be expected from the construction activities proposed under Alternative 2. Most construction activities would occur outdoors or inside of buildings with ample fresh air circulation during construction. Radon resistant construction techniques would be implemented during construction to limit the potential for radon intrusion during occupancy.

4.12.2.2 Implementation Phase

Hazardous Materials and Hazardous Wastes. Long-term, minor, adverse impacts associated with hazardous materials and hazardous wastes would be expected from the implementation of Alternative 2. Alternative 2 would increase the number of personnel, aircraft, aircraft maintenance operations, vehicles, and other equipment on Tinian and, specifically, at TNI. This increase in personnel, equipment, and

maintenance operations would increase the quantities of hazardous materials, such as hydraulic fluids, lead-acid batteries, solvents, and other chemicals, needed at TNI. Most hazardous materials would be stored and used at the proposed aircraft hangar and maintenance facility at TNI. All hazardous materials would be stored and handled in accordance with applicable Federal, CNMI, and USAF hazardous materials management regulations.

The increase in the quantities of hazardous materials needed during the proposed exercises would result in an increase in the quantities of hazardous wastes generated. The additional quantities of hazardous wastes would be mostly generated and stored at the proposed aircraft hanger and maintenance facility at TNI. These hazardous wastes would be disposed of by the USAF and transported to Andersen AFB for disposal through the installation's DRMO. Implementation of Alternative 2 might require TNI to obtain an RCRA hazardous waste generator permit and be classified as a hazardous waste generator should the changes in the amounts and types of hazardous wastes stored and generated at TNI meet applicable regulatory thresholds. All hazardous wastes would be stored, handled, and disposed of in accordance with Federal, CNMI, and USAF hazardous waste management regulations.

Petroleum Products. Long-term, minor to moderate, adverse impacts from petroleum products would be expected due to the implementation of Alternative 2. The demand for petroleum products, such as gasoline, diesel, oils and lubricants, and other miscellaneous petroleum products, would increase during exercises, and additional quantities of these petroleum products would need to be delivered to Tinian by ocean-going vessels. Jet fuel, which currently is not delivered to Tinian, would also require delivery to and storage on Tinian. Small amounts of oils and lubricants for aircraft maintenance would likely be delivered via cargo ship or aircraft.

Alternative 2 would increase the demand for other liquid fuel petroleum products on Tinian. The added military personnel during exercises would require additional truck, car, and bus traffic during the 8 weeks each year when exercises occur. The added vehicle traffic would increase the amounts of gasoline and diesel fuels consumed. Additionally, Alternative 2 would include the construction of two electrical generators. One electrical generator would be a 920-kW generator set with fuel bladder used for BEAR Kit billeting; the other generator would provide emergency electrical power to operate the refueling hydrant system. Both electrical generators are assumed to be diesel-fueled and would require periodic diesel deliveries. There would be no changes in the use of 100 Low Lead Aviation Gasoline, which currently is the only aviation fuel available to TNI.

Alternative 2 would increase the amounts of oils and lubricants needed at TNI for aircraft- and infrastructure-maintenance operations. The use of oils and lubricants would predominantly occur during the 8 weeks each year when exercises occur, and most oils and lubricants would be stored and used at the proposed aircraft hangar and maintenance facility on TNI. Waste oils and lubricants, including those collected from the proposed oil/water separator, would be disposed of through the hazardous waste disposal streams available to the USAF.

Alternative 2 would increase the amounts of petroleum products used, stored, and transported on Tinian. The additional quantities of petroleum products and liquid fuel storage infrastructure would increase the chance for a release of petroleum products as compared to existing conditions. Additionally, the increase in tanker truck traffic on Tinian would slightly increase the risk of a release due to the added volumes of liquid fuels being transported over public roadways. To limit the potential for a release of petroleum products, all proposed petroleum product storage and transfer infrastructure, including storage tanks, piping, and hydrants, would be constructed new and in accordance with manufacturer design specifications. The applicable owners of each proposed storage tank would obtain an AST Permit to Operate from the CNMI DEQ for all ASTs proposed for use. All petroleum products would be stored and handled in accordance with applicable Federal, CNMI, and USAF management regulations.

Existing Contamination Areas. Prior to beginning construction, all existing contamination areas with the potential to affect Alternative 2 would be identified and then remediated or avoided as practicable. As such, the implementation of Alternative 2 would not affect existing contamination areas.

Asbestos-Containing Materials. No impacts associated with ACMs would be expected from the implementation of Alternative 2. As noted in **Section 4.12.1.1**, USAF regulations restrict the use of ACMs for new construction. ACM would only be used if a study determines that the ACM is superior in cost and performance characteristics and has minimal actual or potential health hazards.

Lead-Based Paint and Polychlorinated Biphenyls. No impacts associated with LBP and PCBs would be expected from the implementation of Alternative 2. LBP and PCBs would not be used in any of the buildings or infrastructure proposed for construction.

Pesticides. No impacts associated with pesticides would be expected from the implementation of Alternative 2. Implementation of Alternative 2 would not require any significant changes in the quantities of pesticides used or significantly alter pesticide application areas on Tinian.

Radon. Long-term, negligible to minor, adverse impacts associated with radon could be encountered during the implementation of Alternative 2. Although radon-resistant techniques would be implemented during construction, it is possible that the proposed facilities would encounter radon intrusion following construction. The USAF would test facilities that have known radon intrusion issues periodically to verify that no unacceptable radon gas buildup occurs. As appropriate, radon gas removal equipment would be installed at buildings that consistently show indoor radon gas levels greater than 4 pCi/L.

4.12.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.12.2.1** and **3.12.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts associated with hazardous materials and waste would be expected as a result of the No Action Alternative. The quantities of hazardous materials used and the quantities of hazardous wastes generated at GSN and TNI would remain unchanged under the No Action Alternative. The No Action Alternative would result in a continuation of existing conditions.

4.13 Infrastructure and Utilities

Impacts on infrastructure are evaluated based on their potential for disruption, excessive use, or improvement of the existing level of service for transportation systems, utilities, and solid waste management. Impacts might arise from physical changes to utility needs created by either direct or indirect changes related to the Proposed Action. Assessing impacts on utilities entails a determination of utilities that would be used or improved as a result of the Proposed Action. An effect on infrastructure would be significant if the Proposed Action resulted in the following impacts:

- Exceeding the capacity of a utility or transportation artery
- Resulted in a long-term interruption of the utility or transportation artery
- Resulted in a violation of a permit condition
- Resulted in a violation of an approved plan for that utility.

4.13.1 Alternative 1 – GSN (Preferred Alternative)

4.13.1.1 Construction Phase

Airfield. Short-term, direct, moderate, adverse impacts on the airfield would be expected from the disruption to commercial aircraft operations during construction activities. However, these impacts would be minimized by optimizing the scheduling of construction activities and commercial flights to minimize overlap. These impacts would be temporary as the construction phase would be anticipated to last 24 to 36 months. Long-term, direct, moderate, beneficial impacts on the airfield would be expected from improvements to the pavement markings, lighting, navigational aids, parking apron, hazardous cargo pad, and the expansion of Runway Options A or B.

Port. Short-term, direct, negligible, adverse impacts on the port would be expected from disruption caused by construction activities associated with Alternative 1. Long-term, direct, minor, beneficial impacts on the port would be expected from additional jet fuel storage. An aviation fuel line and electrical line would have to be extended to the proposed fuel tanks. Any buried utility lines on the site of the proposed fuel tanks would have to be permanently relocated.

Electrical Supply. Short-term, direct, negligible, adverse impacts on the existing electrical system would be expected from the extension of electrical lines to and the relocation or upgrading of any buried electrical lines within the Project Areas. However, long-term, direct, minor, beneficial impacts would expected from the upgrades provided to the electrical system. Additional short-term, negligible, adverse impacts would be expected from potential power disruptions when new facilities and lighting systems are connected to the power grid and when power lines are deactivated during construction.

It is assumed that the construction contractors would primarily use diesel- or battery-powered equipment. Any construction equipment that is powered via electricity would likely receive power from a portable generator or a temporary electrical panel.

As discussed in **Section 2.3.1.1**, to operate the BEAR kit base on commercial power, a 1,200-kVA, 13.8-kV to 4.16/2.4-kV, pad-mounted transformer would be installed. Primary service to the transformer would require approximately 200 feet of 3-phase, 15-kV cable from the nearest overhead utility to the pad-mounted transformer. This could negatively affect the power supply system due to the potential for a temporary disruption of service. The adverse impacts on the existing electrical system would be decreased if the proposed BEAR kit uses onsite power generation.

Central Heating and Cooling. No impacts on heating or cooling systems would be expected because there are no cooling or heating systems on the project area and Alternative 1 does not include a connection to existing heating and cooling systems.

Natural Gas Supply. No impacts on natural gas would be expected because there is no natural gas infrastructure on the island.

Liquid Fuel Supply. Short-term, direct, negligible, adverse impacts on the liquid fuel supply would be expected from the minimal amounts of petroleum that would be required for construction equipment and

cement and concrete transportation during the proposed construction activities. The required petroleum would be brought on site by contractors and removed when construction activities are complete.

Cement trucking from the Port of Saipan to the commercial concrete supply company would involve five dump trucks driving 7 miles per trip for a total of 150 trips per year. In addition, concrete trucking from the commercial concrete supply company to GSN would involve 10 concrete trucks driving 2 miles per trip for a total of 2,679 trips per year. Therefore, 58,830 miles would be driven transporting cement and concrete per year. The average medium-sized construction truck has a fuel economy of approximately 6.4 miles per gallon of diesel fuel, resulting in an estimated 9,192 gallons of diesel fuel consumed per year for 3 years.

Long-term, direct, major, beneficial impacts on the capacity to receive, store and distribute aviation fuel would result from Alternative 1. The Port of Saipan currently has an aviation fuel storage capacity of 1,134,000 gallons[3]. Alternative 1 would increase the bulk storage capacity of the Port of Saipan by 4,200,000 gallons, almost five times the current capacity. The proposed construction improvements to jet fuel infrastructure at GSN (i.e., storage tanks and fuel hydrant system) would be expected to involve limited disruptions to the existing Jet A fuel system.

Short-term, direct, negligible, adverse impacts on the liquid fuel supply lines at the seaport would be expected during connection of the proposed ASTs to the seaport aviation fuel pipeline.

Water Supply. Short-term, direct, negligible, adverse and long-term, direct, major, beneficial impacts on the water supply would be expected from the temporary shutoff, relocation, extension, upgrade, and connection of water lines during construction. Any existing water pipes within the Project Area would be relocated and upgraded as necessary. The proposed hangar, maintenance facility, and billeting areas would require permanent 2-inch water connections.

Short-term, direct, negligible, adverse impacts on the water supply would be expected from the water used during construction for dust suppression. Saipan residents already lack access to a continuous potable water supply. An estimated 500 gallons/acre/day could be used for dust suppression during construction activities. Alternative 1 would involve about 60.4 acres of construction (based on Runway Option A, which is the worst-case scenario) resulting in the use of about 30,200 gallons of water per day over the course of 24 to 36 months. This is negligible (0.3 percent) compared to the approximate 10 million gallons per day that Saipan produces, 1 million gallons of which is produced within the airport area. Additionally, if non-potable water is available for dust suppression, the effect on the potable water supply would be even less.

Sanitary Sewer and Wastewater Treatment. Short-term, direct, minor, adverse impacts on the sewer system would be expected from the temporary shutoff of sewer lines during the connection of an 8-inch sewer line to the sewer main line at the intersection of Flame Tree Road and Airport Access Road. Existing sanitary sewer pipes within the Alternative 1 area would be relocated and upgraded as necessary. It is assumed that the construction workers would use portable toilets at the site.

Storm Water. Short-term, direct, moderate, adverse impacts on the storm water management system would be expected from construction activities associated with Alternative 1. A temporary increase in storm water runoff, erosion, and sedimentation would be expected during the proposed construction activities. Storm water runoff is already a major environmental concern for Saipan residents. The discharge of storm water runoff from construction activities at GSN and the seaport must be authorized by a construction water permit issued by the USEPA in accordance with the *General Permit for Storm Water*

[3] Each AST has a "safe fill" level of 504,000 gallons limiting the actual storage capacity to 1,008,000 gallons.

Discharges from Construction Activities (i.e., CGP 2012). The permit requires the development and implementation of a construction-specific SWPPP for construction activities at a site totaling 1 acre or more and where storm water discharges from the construction area enter a Municipal Separate Storm Sewer System (MS4) that leads to natural drainage channels or streams classified as surface waters of the United States. An SWPPP approved by the DEQ would be required and must contain a NPDES permit declaration. In addition, the permit requires that discharges from storm water controls be directed to vegetated areas of the site to increase sediment removal and maximize storm water infiltration wherever feasible (USEPA 2012b). This would minimize the temporary increase in storm water runoff, erosion, and sedimentation. In order to get DEQ approval, the construction activities would need to implement BMPs and meet their location-specific storm water quality and quantity requirements. Due to the development of an SWPPP, the vegetated surrounding area of GSN, and the high infiltration rates of the island, the impacts would not be significant.

Construction in the Project Areas would create approximately 2,392,000 ft^2 of new impervious surfaces. Storm water management controls would be designed and implemented consistent with construction storm water permit requirements and the USAF Engineering Technical Letter (ETL) 03-1: *Storm Water Construction Standards* to minimize potential adverse impacts on surface waters associated with the construction of the impervious surfaces. Compliance with USAF ETL 03-1 requires implementation of BMPs to reduce site storm water discharges and pollutant loadings to preconstruction levels or better. A storm water-control site plan would be required and must contain an NPDES permit declaration.

Because this is a Federal project, Alternative 1 would also involve the use of low-impact development strategies to comply with EISA Section 438. Low-impact development strategies include the construction of grass swales or infiltration ditches at the north end of the BEAR kit area to intercept and contain any runoff during heavy rains. Additionally, drywells could be installed at all air conditioning units to prevent muddy and unsafe working conditions around the tents. Lastly, rain barrels, a cistern, or other collection devices could be installed at the larger tents to capture rain water for recycling (AFCEE/PACAF 2010).

Preventive BMPs include limiting stockpiling of materials on site; managing stockpiled materials to minimize the time between delivery and use; covering stockpiled materials with tarps; installing silt fences around material stockpiles, storm water drainage routes, culverts, and drains; installing fabric filters, netting, and mulching around material stockpiles, storm water drainage routes, culverts, and drains; revegetation of disturbed areas with native species as soon as possible upon completion of construction to stabilize topsoil and prevent water erosion; using rip rap in areas susceptible to erosion; and using a sedimentation basin for collection of runoff to allow suspended solids to precipitate out of solution to improve surface water quality.

Communications. Short-term, direct, negligible, adverse impacts on the communications system would occur as the permanent facilities of the Project Area are connected to the existing telephone line system at the airport. Long-term direct minor beneficial impacts would be expected from the proposed upgrades and additions to the existing communications equipment. These improvements could include an ADVON UTC to provide the initial communication capabilities for SITREP reporting; an ATCALS suite of equipment in order to safely conduct high intensity air operations; an ATC facility setup with primary radios, back-up radios, and spares; and multi-channel transceivers (PACAF 2010).

Solid Waste. Short-term, direct, minor, adverse impacts on solid waste management would be expected from the generation of construction debris. Construction debris is generally composed of clean materials, and most of this waste would be recycled because the MSWF uses state-of-the-art waste reduction and diversion technologies and implements recycling programs. However, debris that cannot be recycled would be landfilled, which would be a long-term, irreversible, adverse effect. Contractors hired for the

various construction projects would be responsible for the removal and disposal of their construction wastes generated on site. The estimated amounts of debris that would be generated from the proposed construction activities are provided in **Table 4.13-1.**

Table 4.13-1. Estimated Debris Generated from the Proposed Construction Activities for Alternative 1

Project	Total Square Footage	Multiplier (pounds/ft²)	Debris Generated (pounds)	Debris Generated (tons)
Runway Option A	275,000	1	275,000	138
Parking Apron	900,000	1	900,000	450
Temporary Munitions Storage Area (ECM and Multi-cube)	43,700	4.34	189,658	95
Hazardous Cargo and Arm/ Disarm Pad	195,000	1	195,000	98
Aircraft Hangar	35,100	4.34	152,334	76
Maintenance Facility	6,000	4.34	26,040	13
Jet Fuel Systems	400,400	4.34	1,737,736	869
Billeting	537,000	4.34	2,330,580	1,165
Total	**2,392,200**	**N/A**	**5,806,348**	**2,904**

Source: USEPA 2009

The debris generated from the proposed construction activities associated with Alternative 1 would total an estimated 2,904 tons over a period of 24 to 36 months. Considering that the MSWF can process at least 40,000 tons of solid waste per year and uses state-of-the-art waste reduction and diversion technologies, there is sufficient solid waste processing infrastructure to divert most of the construction debris and landfill the remaining material.

4.13.1.2 Implementation Phase

Airfield. Long-term, direct, negligible, adverse impacts on the airfield would be expected from the increased use of the runway and taxiways. However, the runway extensions would only be used for emergency take-offs and landings and would be striped (and marked) as "unusable" by all commercial aircraft (on a daily basis) and military aircraft (during exercises). The runway extensions would act as part of the 1,000-foot overruns for normal operations, but the overruns would be partially paved under Alternative 1. Based on two LTOs/aircraft/day for 8 weeks/year, Alternative 1 would add approximately 2,688 aircraft operations per year, which would be a 5.9 percent increase above the existing number of air operations at GSN.

Long-term, direct, minor, beneficial impacts on the airfield would be expected due to the increased aircraft parking capacity at the airfield. There would be common use of all new infrastructure improvements except the proposed Maintenance Facility, proposed Aircraft Hangar, proposed BEAR kit, and the proposed Temporary Munitions Storage Area.

Port. No impacts to the port infrastructure would be expected from the implementation of Alternative 1.

Electrical Supply. Long-term, indirect, minor, adverse impacts on electrical supply would be expected because energy demand would increase due to the additional buildings, airfield lighting, and water consumption. The impacts would be considered minor because the central power plant and the Kiya Substation have an electrical capacity well above its current load. Saipan has an electrical generation capacity 12 MW above its peak load. Although GSN's electricity is supplied by the Kiya Substation, which has an electrical capacity of more than double its current load of approximately 16 MW, the generators supplying the Kiya Substation are in poor condition and the additional demand could stress their condition further, thus reducing their long-term reliability. In addition, a more expansive high-voltage transmission backbone would be needed to tap into this potential for many areas of GSN including the proposed BEAR kit area. Extending transmission might be necessary and would result in increased maintenance needs. The increased electrical demand would also affect the goals of the Joint Region Marianas Energy Conservation Instruction to reduce energy consumption by 3 percent every year for a cumulative reduction of 30 percent by 2015.

Powering the BEAR kit with its own 920-kW generator would reduce the impacts on the electrical system expected from Alternative 1. However, it has yet to be determined if the BEAR kit would generate its own power or use commercial power. To operate the BEAR base on commercial power, a 1,200-kVA, 13.8-kV to 4.16/2.4-kV, pad-mounted transformer would be installed. Primary service to the transformer would require approximately 200 feet of 3-phase, 15-kV cable from the nearest overhead utility to the pad-mounted transformer. This would extend the transmission distribution but require additional maintenance to the electrical system. If Alternative 1 uses commercial lodging, there would be no less electrical infrastructure extension and maintenance but there would still be an increase in energy demand.

Minor impacts would be expected because the increase in population and energy demand for exercises would be no more than 8 weeks per year. In addition, the new facilities would be designed in order to achieve LEED Silver certification; therefore, state-of-the-art energy efficiency would be expected. The Joint Region Marianas Energy Conservation Instruction also aims to adopt sustainable design concepts in all new construction.

Central Heating and Cooling. No impacts on central heating or cooling would be expected because there are no central heating or cooling systems on the project areas and the airport has its own separate cooling system. The proposed buildings and tents would use self-contained, electrically powered air conditioning units.

Natural Gas Supply. No impacts on natural gas would be expected because there is no natural gas infrastructure on the island and Alternative 1 does not include the use of natural gas.

Liquid Fuel Supply. Long-term, direct, minor, adverse impacts on jet fuel would be expected from Alternative 1 due to the increase in fuel that would need to be delivered to the island. Approximately 410,667 barrels (17,248,000 gallons) of jet fuel would be needed annually for 56 days of aircraft operations under Alternative 1.

Long-term, direct, minor, adverse impacts on diesel fuel would result from Alternative 1 if the personnel are housed via the proposed BEAR kit. Assuming the 920-kW generator set for the proposed BEAR kit would operate at 75 percent load, 24 hours a day for 8 weeks a year, it would require approximately 64,512 gallons of diesel annually based on a fuel consumption of 48 gallons per hour (gph) (DSS 2011).

The Port of Saipan currently has an aviation fuel storage capacity of 1,134,000 gallons[4]. Alternative 1 would increase the bulk storage capacity of the Port of Saipan by 4,200,000 gallons, almost five times the current capacity.

GSN has two 94,000-gallon ASTs and one 117,600-gallon AST designated for aviation fuel. Due to inspections, upgrades, and repairs, one of the ASTs is out of service at a time for the foreseeable future. Alternative 1 would add 4,200,000 gallons of bulk fuel storage capacity to GSN, increasing the current bulk fuel storage capacity over 20 times (22 times when the larger AST is out of service).

Currently, fuel is transferred from the seaport to GSN via two Bridger trucks (one 9,000-gallon and one 10,000-gallon). Under Alternative 1, this would be increased to six (10,000-gallon) trucks. GSN has a hydrant system consisting of two 600-gpm pumps. Alternative 1 would include the installation of a 2,400-gpm hydrant fuel system with the capacity to refuel four aircrafts at a rate of 600 gpm, resulting in three times the current refueling capacity of GSN.

Water Supply. Long-term, direct, minor, adverse impacts on the water supply would be expected under Alternative 1 due to periodic use of an already strained system. Saipan lacks a continuous potable water supply in areas and the water supply system is highly inefficient. The temporary increase in population (700 personnel for 8 weeks annually) is negligible compared to the 48,220 people that currently populate Saipan. Based on up to 700 personnel using an average of 98 gallons per day per person (USGS 2009b), implementation of Alternative 1 would result in the consumption of up to 68,600 gallons per day, which is 0.7 percent of the water production capacity in Saipan.

The adverse impacts on the water supply would be reduced if the BEAR kit option is selected because rain barrels, cisterns, or other collection devices would be used at the larger tents to recycle rainwater. However, the main water source at the BEAR kit would be an existing water source approximately 2,000 feet away at the intersection of Flame Tree Road and Airport Access Road. At a minimum, a 2-inch waterline would be installed to support the BEAR base from this location. The new facilities would be designed in order to achieve LEED Silver certification; therefore, state-of-the-art water efficiency would be expected. The Joint Region Marianas Energy Conservation Instruction also aims to adopt sustainable design concepts in all new construction.

Sanitary Sewer and Wastewater Treatment. Long-term, indirect, minor, adverse impacts on sanitary sewer and wastewater treatment would be expected from implementation of Alternative 1. The *2009 Comprehensive Economic Development Strategic Plan for the U.S. Commonwealth of the Northern Mariana Islands* highlighted that the existing wastewater and sewer systems need major rehabilitation and upgrades in order be USEPA compliant and achieve sufficiency. An 8-inch sewer line with manholes spaced 350 feet apart would be installed from the BEAR base to the sewer main line at the intersection of Flame Tree Road and Airport Access Road. It is assumed that the constructed facilities would also be connected to the existing sewer system on Saipan. Alternative 1 would add additional input into a deficient wastewater treatment system. However, the additional wastewater resulting from the maximum 700 personnel population increase for only 8 weeks per year would be minor compared to the wastewater produced by Saipan's current population.

Storm Water. Long-term, direct, minor, adverse impacts on storm water would result from Alternative 1. Implementing Alternative 1 would increase impervious surfaces by 2,392,200 ft^2. As a result, there would be an increase in runoff and a reduction of groundwater recharge. Alternative 1 would exacerbate the already insufficient storm water drainage on the island. Storm water from the impervious surfaces of Alternative 1 would be partially handled by the existing ditches, swales, and culverts that transport storm

[4] Each AST has a "safe fill" level of 504,000 gallons limiting the actual storage capacity to 1,008,000 gallons.

water to the 20-million-gallon water-catchment reservoir east of Taxiway D and partially handled via the rain barrels, cisterns, or other collection devices used to collect storm water at the larger tents of the BEAR kit. Alternative 1 would also reduce adverse impacts via implementation and maintenance of the storm water BMPs that would be put in place during the proposed construction activities.

Communications. Long-term, direct and indirect, moderate, beneficial impacts on communications would be expected from the proposed air traffic control upgrades noted in **Section 3.13.1.1**. The proposed communications upgrades would provide GSN much better primary and backup air traffic control communications capabilities.

Solid Waste. Long-term, direct, negligible, adverse impacts on solid waste would be expected from the periodic population increase associated with Alternative 1. The solid waste generated by up to 700 people 8 weeks per year under Alternative 1 would be approximately 0.2 percent of the solid waste generated by the 48,220 people at Saipan 52 weeks per year. Saipan has sufficient solid waste processing infrastructure to divert a considerable amount of solid waste and landfill the remaining material. In addition, recycling bins would be used on site to minimize materials sent to the landfill.

4.13.2 Alternative 2 – TNI

4.13.2.1 Construction Phase

Airfield. Short-term, direct, moderate, adverse impacts on the airfield would be expected from the disruption to commercial aircraft operations during construction activities associated with Alternative 2. However, these impacts would be minimized by optimizing the scheduling of construction activities and commercial flights to minimize overlap. These impacts would be temporary as the construction phase would be anticipated to only last 24 to 36 months. Long-term, direct, moderate, beneficial impacts on the airfield would be expected from improvements to the pavement markings, lighting, navigational aids, parking apron, hazardous cargo pad, and the expansion of Runway Options A or B.

Port. Short-term, direct, negligible, adverse impacts on the port would be expected from the disruption caused by construction activities associated with Alternative 2. Long-term, direct, minor, beneficial impacts on the port would be expected because of additional jet fuel storage capacity. An aviation fuel line and electrical line would have to be extended to the proposed fuel tanks. Any buried utility lines on the site of the proposed fuel tanks would have to be permanently relocated.

Electrical Supply. Short-term, direct, negligible, adverse impacts on the existing electrical system would be expected from the extension of electrical lines to and the relocation or upgrading of any buried electrical lines within the Project Areas. However, long-term, direct, minor, beneficial impacts would expected from the upgrades provided to the electrical system. Additional short-term, negligible, adverse impacts would be expected due to potential power disruptions when new facilities and lighting systems are connected to the power grid and when power lines are deactivated during construction.

It is assumed that the construction contractors would primarily use diesel- or battery-powered equipment. Any construction equipment that is powered via electricity would likely receive power from a portable generator or a temporary electrical panel.

As discussed in **Section 2.3.1.1**, to operate the BEAR kit base on commercial power, a 1,200-kVA, 13.8-kV to 4.16/2.4-kV, pad-mounted transformer would be installed. Primary service to the transformer would require a 3-phase, 15-kV cable from the nearest overhead utility to the pad-mounted transformer. This could negatively affect the power supply system due to the potential for a temporary disruption of

service. The adverse impacts on the existing electrical system would be decreased if the proposed BEAR kit uses onsite power generation.

Central Heating and Cooling. No impacts on central heating or cooling would be expected because there are no central heating or cooling systems on the project areas and the airport has its own separate cooling system.

Natural Gas Supply. No impacts on natural gas would be expected because there is no natural gas infrastructure on the island.

Liquid Fuel Supply. Short-term, direct, negligible, adverse impacts on liquid fuel supply would be expected due to the minimal amounts of petroleum that would be required for construction equipment and cement and concrete transportation during the proposed construction activities. The required petroleum would be brought on site by contractors and removed when construction activities are complete.

Cement trucking from the Port of Tinian to the commercial concrete supply company would involve five dump trucks driving 1.7 miles per trip for a total of 280 trips per year. In addition, concrete trucking from the commercial concrete supply company to TNI would involve 10 concrete trucks driving 2.3 miles per trip for a total of 4,943 trips per year. Therefore 116,069 miles would be driven transporting cement and concrete per year. The average medium-sized construction truck has a fuel economy of approximately 6.4 miles per gallon of diesel fuel, resulting in an estimated 18,136 gallons of diesel fuel consumed per year for 3 years.

Long-term, minor, adverse impacts on jet and diesel fuel would be expected from Alternative 2 due to the increase in fuel that would need to be delivered to the island. TNI has no capacity to receive, store, and distribute A1 jet fuel. The proposed jet fuel infrastructure improvements would be expected to involve no disruptions to commercial aircraft fueling operations. Likewise, the seaport has no A1 jet fuel storage and distribution system, so construction of the proposed ASTs and fuel line at the seaport would not interrupt existing liquid fuel operations. Approximately 410,667 barrels (17,248,000 gallons) of jet fuel would be needed annually for 56 days of aircraft operations under Alternative 2. Assuming the 920-kW generator set for the proposed BEAR kit would operate at 75 percent load, 24 hours a day for 8 weeks a year, it would require approximately 1,536 barrels (64,512 gallons) of diesel annually based on a fuel consumption of 48 gph (DSS 2011), which is only approximately 13 percent of the 12,000-barrel (500,000-gallon) diesel AST at the seaport.

Water Supply. Short-term, direct, negligible, adverse and long-term, direct, major, beneficial impacts on the water supply would be expected from the temporary shutoff, relocation, extension, upgrade, and connection of water lines during construction. Any existing water pipes within the Project Areas would be relocated and upgraded as necessary. The proposed hangar, maintenance facility, and billeting areas would require permanent 2-inch water connections.

Short-term, direct, minor, adverse impacts on the water supply would be expected from the water used during construction for dust suppression. An estimated 500 gallons/acre/day could be used for dust suppression during construction activities. Alternative 2 would involve about 94 acres of construction (based on Runway Option A, which is the worst-case scenario) resulting in about 47,000 gallons of water per day over the course of 24 to 36 months. This is a minor amount (3.7 percent) compared to the 1,260,000 gallons of water produced every day at Tinian.

Sanitary Sewer and Wastewater Treatment. No impacts would be expected from the construction associated with Alternative 2 because residents and businesses on Tinian have individual septic tanks; therefore, there would be no adverse impacts on the sewer system from the temporary shutoff of sewer

lines during construction. It is assumed that the construction workers would use portable toilets at the site.

One or more septic systems would need to be constructed to handle up to 700 personnel for Alternative 2. An Individual Wastewater Disposal System Permit Application from CNMI DEQ would be obtained for each septic system.

Storm Water. Short-term, direct, minor, adverse impacts on the storm water management system would be expected from the construction activities associated with Alternative 2. A temporary increase in storm water runoff, erosion, and sedimentation would be expected during the proposed construction activities. The discharge of storm water runoff from construction activities at TNI and the seaport must be authorized by a separate construction water permit issued by the USEPA in accordance with the *General Permit for Storm Water Discharges from Construction Activities* (i.e., CGP 2012). The permit requires the development and implementation of a construction-specific SWPPP for construction activities at the site totaling 1 acre or more and where storm water discharges from the construction area enter an MS4 system that leads to natural drainage channels or streams classified as surface waters of the United States. An SWPPP approved by the DEQ would be required and must contain an NPDES permit declaration. In addition, the permit requires that discharges from storm water controls be directed to vegetated areas of the site to increase sediment removal and maximize storm water infiltration wherever feasible (USEPA 2012b). This would minimize the temporary increase in storm water runoff, erosion, and sedimentation. In order to get DEQ approval, the construction activities would need to implement BMPs and meet their location specific storm water quality and quantity requirements. Due to the development of a SWPPP, the vegetated surrounding area of TNI, and the high infiltration rates of the island, the impacts would not be significant.

Construction in the Project Areas would create approximately 4,090,800 ft^2 of new impervious surfaces. Storm water management controls would be designed and implemented consistent with construction storm water permit requirements and the USAF ETL 03-1: *Storm Water Construction Standards* to minimize potential adverse impacts on surface waters associated with the construction of the impervious surfaces. Compliance with USAF ETL 03-1 requires implementation of BMPs to reduce site storm water discharges and pollutant loadings to preconstruction levels or better. A storm water-control site plan would be required and must contain an NPDES permit declaration.

Because this is a Federal project, Alternative 2 also would involve the use of low-impact development strategies to comply with EISA Section 438. Low-impact development strategies include the construction of grass swales or infiltration ditches at the north end of the BEAR kit area to intercept and contain any runoff during heavy rains. Additionally, drywells could be installed at all air conditioning units to prevent muddy and unsafe working conditions around the tents. Lastly, rain barrels, a cistern, or other collection devices could be installed at the larger tents to capture rain water for recycling (AFCEE/PACAF 2010).

Preventive BMPs include limiting stockpiling of materials on site; managing stockpiled materials to minimize the time between delivery and use; covering stockpiled materials with tarps; installing silt fences around material stockpiles, storm water drainage routes, culverts, and drains; installing fabric filters, netting, and mulching around material stockpiles, storm water drainage routes, culverts, and drains; revegetation of disturbed areas with native species as soon as possible upon completion of construction to stabilize topsoil and prevent water erosion; using rip rap in areas susceptible to erosion; and using a sedimentation basin for collection of runoff to allow suspended solids to precipitate out of solution to improve surface water quality.

Communications. Short-term, direct, negligible, adverse impacts on the communications system would occur as the permanent facilities of the Project Areas are connected to the existing telephone line system at the airport. Long-term direct minor beneficial impacts would be expected from the proposed upgrades and additions to the existing communications equipment. These improvements could include an ADVON UTC to provide the initial communications capabilities for SITREP reporting; an ATCALS suite of equipment in order to safely conduct high intensity air operations; an ATC facility setup with primary radios, back-up radios, and spares; and multi-channel transceivers (PACAF 2010).

Solid Waste. Short term, direct, moderate, adverse impacts on solid waste management would be expected from the generation of construction debris. Construction debris is generally composed of clean materials, and most of this waste would be recycled. However, debris that is not recycled would be landfilled, which would be considered a long-term, irreversible, adverse effect. Contractors hired for the various construction projects would be responsible for the removal and disposal of their construction wastes generated on site. The estimated amounts of debris generated from the proposed construction activities can be found in **Table 4.13-2.**

Table 4.13-2. Estimated Debris Generated from the Proposed Construction Activities for the GSN Alternative

Project	Total Square Footage	Multiplier (pounds/ft²)	Debris Generated (pounds)	Debris Generated (tons)
Runway Option A	555,000	1	555,000	278
Parking Apron	1,660,000	1	1,660,000	830
Temporary Munitions Storage Area (ECM and Multi-cube)	30,700	4.34	133,238	67
Hazardous Cargo and Arm/Disarm Pad	455,000	1	455,000	228
Aircraft Hangar	35,100	4.34	152,334	76
Maintenance Facility	6,000	4.34	26,040	13
Jet Fuel Systems	680,000	4.34	2,951,200	1,476
Billeting	669,000	4.34	2,903,460	1,452
Total	**4,090,800**	**N/A**	**8,836,272**	**4,420**

Source: USEPA 2009

The debris generated from the proposed construction activities associated with Alternative 2 would total an estimated 4,420 tons over a period of 24 to 36 months. There is a lack of municipal solid waste facilities on Tinian; therefore, 4,420 tons of construction debris would have to be collected and transported off the Island of Tinian using commercial solid waste haulers and commercial barges or ships until a permitted municipal solid waste facility is constructed.

4.13.2.2 Implementation Phase

Airfield. Long-term, direct, negligible, adverse impacts on the airfield would be expected from the increased use of the runway and taxiways. Based on two LTOs/aircraft/day for 8 weeks/year, Alternative

2 would add approximately 2,688 aircraft operations per year, which would be a 9.9 percent increase above the existing number of air operations at TNI.

Long-term, direct, moderate, beneficial impacts on the airfield would be expected at TNI. The Proposed Action would increase the aircraft parking capacity at the airfield. Additionally, if Runway Option A is selected, the runway extension would be available for use by all commercial aircraft (on a daily basis) and military aircraft (during exercises); therefore, aircraft would be able to take off with more fuel because load capability increases with runway length. Consequently, flights to and from locations farther away would be feasible. There would be common use of all new infrastructure improvements except the proposed maintenance facility, proposed aircraft hangar, proposed BEAR kit, and the proposed temporary munitions storage area.

Port. No impacts to the port infrastructure would be expected from the implementation of Alternative 2.

Electrical Supply. Long-term, indirect, minor, adverse impacts on electrical supply would be expected because energy demand would increase due to the additional buildings, airfield lighting, population, and water consumption. The impacts would be considered minor because Tinian has an electrical capacity well above its current load. The energy infrastructure has a maximum capacity of about 20 MW (current load is below 5 MW). In addition, the energy infrastructure is in good condition and is well-maintained. Although an electrical line runs along the east end of the airport property, there is currently no access to commercial power at the project areas (AFCEE/PACAF 2010). A more expansive electrical grid would be needed to tap into this potential for the project areas due to TNI's limited feeder distribution network (CNMI 2011). This expansion would result in slightly increased maintenance needs. The increased electrical demand would also affect the goals of the Joint Region Marianas Energy Conservation Instruction to reduce energy consumption by 3 percent every year for a cumulative reduction of 30 percent by 2015.

Powering the BEAR kit with its own 920-kW generator would reduce the impacts on the electrical supply expected from Alternative 2. However, it has yet to be determined of the BEAR kit would generate its own power or use commercial power. To operate the BEAR base on commercial power, a 1,200-kVA, 13.8-kV to 4.16/2.4-kV, pad-mounted transformer would be installed. Primary service to the transformer would require a 3-phase, 15-kV cable from the nearest overhead utility to the pad-mounted transformer. This would extend the transmission distribution but require additional maintenance to the electrical system.

Minor impacts would be expected because the increase in population and energy demand for exercises would be no more than 8 weeks per year. In addition, the new facilities would be designed in order to achieve LEED Silver certification; therefore, state-of-the-art energy efficiency would be expected. The Joint Region Marianas Energy Conservation Instruction also aims to adopt sustainable design concepts in all new construction.

Central Heating and Cooling. No impacts on central heating or cooling would be expected because there are no central cooling or heating systems in the Project Areas and the airport has its own separate cooling system. The proposed buildings and tents would use self-contained, electrically powered air conditioning units.

Natural Gas Supply. No impacts on natural gas would be expected because there is no natural gas infrastructure on the island and Alternative 2 does not include the use of natural gas.

Liquid Fuel Supply. Long-term, significant, beneficial impacts on the capacity to receive, store, and distribute aviation fuel would result from Alternative 2. Alternative 2 would increase the jet fuel bulk

storage capacity at TNI from nothing to 4,200,000 gallons and include the installation of a 2,400-gpm hydrant fuel system with the capacity to refuel four aircraft at a rate of 600 gpm. Similarly, Alternative 2 would increase the jet fuel bulk storage capacity of the Port of Tinian from nothing to 4,200,000 gallons and would include the installation of a 10-inch valve and fuel line for transferring the fuel from the tanker to the AST. However, Tinian Harbor's breakwater is in very poor condition and the fuel storage improvements would be vulnerable to storm damage.

Water Supply. Long-term, direct, minor, adverse impacts on the water supply would be expected from the implementation of Alternative 2 due to the increase in population (up to 700 personnel). The resulting water demand for exercises would only be on an as-needed basis totaling no more than 8 weeks per year; however, the temporary increase in population is considerable compared the population of Tinian (3,136 people). Based on up to 700 personnel using an average of 98 gallons per day per person (USGS 2009b), implementation of Alternative 2 would result in the consumption of up to 68,600 gallons per day, which is 5.4 percent of the daily water production capacity in Tinian.

The primary source of water for Alternative 2 would be the existing municipal water system; however, rain barrels, cisterns, or other collection devices would be used at the larger tents of the BEAR kit to reduce the demand on the municipal water system. The new facilities would be designed in order to achieve LEED Silver certification; therefore, state-of-the-art water efficiency would be expected. The Joint Region Marianas Energy Conservation Instruction also aims to adopt sustainable design concepts in all new construction.

Sanitary Sewer and Wastewater Treatment. No impacts would be expected on the existing wastewater system because residents and businesses on Tinian have individual septic tanks. Under Alternative 2, one or more septic systems would be used to handle the needs of up to 700 personnel. The septic systems would require long-term maintenance.

Storm Water. Long-term, direct, moderate, adverse impacts on storm water would result from Alternative 2. Implementing Alternative 2 would increase impervious surfaces by 4,090,800 ft^2. As a result, there would be an increase in runoff and a reduction of groundwater recharge. Storm water from the impervious surfaces of Alternative 2 would be partially handled by existing drainage ditches and partially handled via the rain barrels, cisterns, and other collection devices used to collect storm water at the larger tents of the BEAR kit. The remainder of the storm water would sheet flow overland to lower elevations. Lastly, Alternative 2 would include the implementation and maintenance of the storm water BMPs that would be put in place during the proposed construction activities to reduce the adverse impacts of storm water flow from the impervious surfaces.

Communications. Long-term, direct and indirect, moderate, beneficial impacts on communications from the proposed air traffic control upgrades noted in **Section 3.13.1.2**. The proposed communications upgrades would provide TNI much better primary and backup air traffic control communications capabilities.

Solid Waste. Long-term, direct, minor, adverse impacts on solid waste would be expected from the lack of municipal solid waste facilities on Tinian. Therefore, all solid waste would be collected and transported off the Island of Tinian using commercial solid waste haulers and commercial barges or ships until a permitted municipal solid waste facility was constructed. The solid waste generated by up to 700 people 8 weeks per year under Alternative 2 would be approximately 3.4 percent of the solid waste generated by 3,136 people at Tinian 52 weeks per year.

4.13.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.13.2.1** and **3.13.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on infrastructure would be expected as a result of the No Action Alternative. Neither GSN nor TNI would have sufficient infrastructure to increase USAF divert capabilities or accommodate multiple large-frame aircraft. The capacity for the receipt, storage, and distribution of A1 jet fuel would remain limited to nonexistent at the airports and seaports. The usage and condition of the electrical, heating and cooling, natural gas, water, wastewater, storm water, communications, and solid waste management systems would not change under the No Action Alternative. The No Action Alternative would result in a continuation of existing conditions

4.14 Socioeconomics and Environmental Justice

Impacts would be considered significant if the Proposed Action or alternatives resulted in any of the following:

- Substantial change in the local or regional population; and housing, community general services (health, police, and fire services), or social conditions from the demands of additional population/population shifts
- Substantial change in the local or regional economy, employment, or spending or earning patterns
- Disproportionately high and adverse human health and environmental, impacts on minority or low-income populations.

4.14.1 Alternative 1 – GSN (Preferred Alternative)

4.14.1.1 Construction Phase

Population Characteristics. Short-term, minor, adverse impacts on the population of Saipan would result from construction of Alternative 1. The projected timeline for the construction phase is 24 to 36 months based on the runway option selected, and during peak construction less than 2,000 workers would be needed. It is assumed that 2,000 workers would be the peak number of workers required for construction of all runway options, but that this peak quantity of workers would be present for different lengths of time based on the runway option selected. For example, workers would be present on Saipan for the longest time period during construction of Runway Option A. An addition of 2,000 people to Saipan would increase the 2010 population by 3.2 percent; however, it is assumed that the average number of construction workers would generally be lower during non-peak construction periods. Therefore, increases of the Saipan population of up to approximately 3 percent would be experienced during

construction of each runway option, but these increases would need to be sustained for varying lengths of time under each option.

Construction of Runway Options B and C would take less time, 24 to 36 months and 24 months, respectively, than Runway Option A (36 months) and, therefore, construction workers would be present on Saipan for less time than under Option A. Impacts from construction of Runway Options B and C would be expected to be less than those described for Runway Option A.

While the source of these construction workers is unknown, it is assumed that most workers would be from Saipan with Tinian and Rota being secondary sources of workers, and Guam and the Federated States of Micronesia being tertiary sources of workers. It should be noted that in February 2012 a bill was introduced in the U.S. House of Representatives that requires 60 percent of the workers hired for federally funded construction projects in the Northern Marianas costing more than $100,000 to be U.S. workers (Marianas Variety 2012).

In 2005, the construction workforce in the CNMI was approximately 1,650 people with 1,500 people from Saipan and an additional 150 people from other parts of the CNMI. With the high rate of unemployed and underemployed people on Saipan and the CNMI, it is anticipated that local construction workers would be available. However, in 2005, more than 90 percent of the construction workforce were not U.S. citizens, and it is not known how recent federalization of CNMI immigration affected the availability of foreign construction workers. In addition, the overall workforce might be lower than identified in 2005 due to the depression of the CNMI economy in recent years. Therefore, construction workers from outside of the CNMI would be required during peak work periods and for some specialty tasks.

Housing. Short-term, minor to moderate, adverse impact on housing could occur during construction of Alternative 1. It is assumed that 2,000 workers would be the peak number of workers required for construction of all runway options and it is also assumed that the construction phase of the 10,075-foot-long Runway Option (Option A) would require the most time to complete (up to 36 months).

Based on the quantity of construction workers from outside of Saipan, it is anticipated that 250 to 750 hotel rooms would be needed for workers' temporary housing. Local workers from Saipan could return to their residence at the end of the day; however, workers from Guam and the Federated States of Micronesia would need housing. Workers from Tinian and Rota might be able to commute to Saipan daily; however, if this is not feasible, they would also need to be housed on Saipan. Most construction workers could be accommodated in hotels in Saipan, likely in the villages of Garapan and Susupe. Based on the 2010 average hotel occupancy rate of 64.2 percent and assuming a total supply of 3,000 hotel rooms on Saipan, there would an average of 1,074 hotel rooms available at any given time. This should provide sufficient supply of available hotel rooms to temporarily house workers even during peak construction periods, especially if two workers occupied each room. However, the ability of the Saipan hotel market to provide the necessary amount hotel rooms for sustained periods of time would likely decrease the longer the overall duration of construction and the longer the peak level of hotel rooms was needed. Therefore, construction of Option A could result in minor to moderate impacts on housing. Construction contractors would coordinate with local hotels to secure the required number of hotel rooms prior to construction to minimize impacts and avoid supply issues.

Construction of Runway Options B and C would take less time, 24 to 36 months and 24 months, respectively, than Runway Option A (36 months); therefore, construction workers would be present on Saipan for less time than under Option A. Impacts on housing from construction of Runway Options B and C would be expected to be less than those described for Runway Option A.

Economic Characteristics. Short-term, minor, direct and indirect, adverse and short-term, negligible to moderate, direct and indirect, beneficial impacts on the Saipan economy would occur from construction of Alternative 1.

Short-term, negligible to minor, direct and indirect, adverse impacts on the local economy could result from construction activities associated with Alternative 1. Construction activities might cause temporary disruption of airport services that require the intermittent, short-term closure of portions of GSN possibly limiting the use of the runway and other areas of GSN. However, when feasible, all construction activities that would disrupt portions of GSN would occur during normal runway closing hours and non-peak hours (to impact the least amount of flights and GSN customers). If necessary, procedures can also be incorporated to remove construction workers and equipment from the runway when aircraft are landing. All construction activities, the proposed work schedules, and other conditions of construction should be agreed to by the FAA, CPA, and affected commercial airlines and identified in the Safety Management Plan. Based on the type and severity of disruptions at GSN, it could result in loss of revenue from decreased landing and other fees imposed to commercial flights, and possibly an indirect decrease in tourist visitors and effect on the local economy. Construction of Option A would likely result in airport disruptions lasting the longest. However, these impacts could be minimized through an agreement with the FAA, CPA, and commercial airlines and identified in the Safety Management Plan. The plan would identify a mutually agreeable construction schedule that allows for disruptions to occur in non-peak hours and modifications to flight schedules to avoid construction delays.

Installation of the bulk fuel tanks at the Saipan Seaport would not disrupt any port operations; therefore, no adverse economic impact would result from construction at the seaport.

Short-term, moderate, beneficial impacts on the local economy would be expected from construction of Alternative 1. Construction activities would result in increases of employment, purchase of goods and services, and tax revenue. Impacts on economic conditions would be concentrated in Saipan due to the presence of construction workers and locations where materials would be sourced (likely Saipan and Guam). The construction phase of Alternative 1 would require hiring up to 2,000 construction workers for 24 to 36 months, although the duration of construction and the presence of the peak number of workers would vary based on the runway option selected. In addition, it is assumed that the average quantity of workers on Saipan would be lower during non-peak construction periods.

The increase of employment resulting from Alternative 1 would result in increased wages paid. Based on a survey of wages and salaries conducted by the Saipan Chamber of Commerce in 2011, construction and extraction occupations earned average wages ranging from $5.06 per hour to $7.94 per hour with other specialized, technical, and managerial positions earning more (Saipan Chamber of Commerce 2011). Therefore, it is assumed that each worker would be paid at least $202.40 per week. Due to the differences in the overall duration of the construction phase and the varying lengths of time that the peak quantity of construction workers would be needed, Runway Option A would result in the most wages being paid out. Increased wages would, in turn, increase government revenue from employment taxes (wage and salary tax [Chapter 2 tax] and Northern Marianas territorial income tax [NMTIT]). Construction at GSN and the Saipan Seaport would increase demand for and purchase of local and regional supplies, materials, and services. While some materials and supplies might be sourced from Guam, it is anticipated that fuel and some construction supplies (e.g., concrete and structural fill) would be purchased from local distributors. Local contractors would provide services such as construction equipment/vehicle maintenance and disposal of solid, liquid, and hazardous wastes from work sites. Other purchases in the local economy would include spending on hotels for temporary housing, food, and leasing buses to transport workers to and from construction sites. It is likely that sales of construction materials and other goods and services would increase the longer construction lasts and the more workers that are present. Construction of Alternative 1 would result in moderate, beneficial impacts on the Saipan economy.

The influx of new people to Saipan in the form of construction workers could also create a short-term, negligible to minor, indirect, beneficial impact on the local economy by increasing local business sales volume and spending on tourist activities. It is likely that expenditures by foreign construction workers would be minimal as foreign workers send much of their incomes back to their home countries through remittances (U.S. GAO 2000). However, local construction workers from the CNMI might be more inclined to buy products and services in the local economy when they are earning a steady income. Based on the volume of increased sales, there could be secondary increases in employment and income generated from local businesses.

Other potential income for the CNMI Treasury would be realized from the Business Gross Revenue Tax (BGRT) levied on businesses' gross revenues sourced within the CNMI and the corporate NMTIT. Additional tax revenues from fuel, beverage container, alcoholic beverage, and hotel occupancy taxes could also be realized.

The magnitude of impacts on the Saipan economy could differ slightly based on the runway option selected as construction of each option would require differing amounts of materials, goods, and services; and workers would be present on Saipan for varying lengths of time. It is likely that the economic impact would be the most beneficial under Runway Option A because it would require the most materials, goods, and services; and more workers would be needed for the longest periods of time (36 months). Impacts from construction of Runway Options B and C would be expected to be less than those described for Runway Option A because these options would require fewer materials to complete construction, and take less time to complete than Runway Option A.

Public Services. Short-term, moderate, adverse impacts on public services could result from increased demand placed on local health and medical, law enforcement, and firefighting services from the influx of new construction workers to Saipan. If 2,000 non-Saipan residents are hired and brought to the island, it would increase the population by 3 percent; however, it is assumed that the average number of construction workers would generally be lower and some would include existing Saipan residents. It is assumed that 2,000 workers would be the peak number of workers for construction of all runway options, but that this peak quantity of workers would be present on Saipan for different lengths of time based on the option selected. Therefore, Saipan would need to accommodate the increased demands for public services associated with a 3 percent population increase for the longest time under Option A.

Depending on the frequency and level of health services required by new construction workers, it is possible that the CHC would not be able to manage the increased demand adequately due to its current issues including insufficient funding and staffing. However, there are several other medical clinics throughout Saipan that could accommodate the health needs of new construction workers. Similarly, depending on quantity of non-Saipan construction workers hired, the DPS might experience increased demand on law enforcement and firefighting services that would require additional police officers or firefighters. Appropriate levels of security and firefighting services at the construction work sites should be coordinated with DPS and the CPA's police and ARFF.

The magnitude of the impact on public services is based on the largest population increase and not necessarily the duration over which these increases would need to be sustained. Therefore, the impacts on public services would be moderate during construction of all runway options of Alternative 1.

Sociocultural Issues. Short-term, negligible to minor, adverse sociocultural issues could occur during construction of Alternative 1. All construction activities at GSN would occur on land owned by the CPA and leased to the USAF. At the Saipan Seaport, construction would occur on land currently leased by the U.S. government. Therefore, no land would be acquired and no land ownership would be transferred during construction of Alternative 1. Except for some small-scale agriculture occurring on CPA-owned

airport property that would need to stop prior to construction, land currently available to Chamorros and Carolinians and other Saipan residents would not be removed from their use during construction. While the construction phase could require up to 2,000 construction workers during peak work periods, it is likely that a majority of these workers would be from Saipan or the CNMI and be respectful of local culture and customs. Therefore, it is unlikely that there would be any significant conflicts with local residents.

Environmental Justice. Disproportionately high and adverse environmental justice impacts would not be expected during construction of Alternative 1. Approximately 98 percent of the population of Saipan is considered a minority, and between 30 percent and 50 percent of the population is low-income. The Alternative 1 area of impact, which includes Saipan Districts 10 and 11, has disproportionately high minority populations, and District 11 has a disproportionately high low-income population. Possible adverse impacts from construction activities include increased traffic and noise levels, and decreased air quality in Districts 10 and 11. Increased demands on healthcare/medical, law enforcement, and firefighting services could decrease the quality of service at CHC, which could impact all populations on Saipan. Elevated noise levels could be experienced in the vicinity of the construction activities, but a noise level of 74–80 dBA could be intermittently heard at the border of the village of Dandan, which is in District 10. The village of Dandan is the only area that could experience high noise exposure levels; therefore, the minority population living at this location could be disproportionately affected by noise generated from construction activities. However, this impact would be short-term and intermittent, and less than significant.

4.14.1.2 Implementation Phase

Population Characteristics. Long-term, negligible to minor, adverse impacts on Saipan's population would occur as a result of implementation of Alternative 1. Typically 145 to 170 military personnel, but no more than 700 personnel, would be on Saipan for up to 8 weeks per year for proposed military exercises. This quantity of personnel represents a population increase of 0.3 percent to 1.5 percent. Annual exercises could include two 2-week joint military exercises, and other periodic exercises (totaling up to 4 weeks) for divert and humanitarian airlift staging that would occur throughout the year. Because the exercises would not occur during a continuous 8-week period, the population increases would be spread throughout the year, likely in up to 2-week increments. Therefore, implementation of Alternative 1 would cause temporary, intermittent increases in Saipan's population of up to 1.5 percent throughout each year.

No permanent population increases would occur during implementation of Alternative 1. One or two security guards might be hired for the bulk fuel storage/operational fuel tanks and hydrant area, maintenance facility, and other materials stored at GSN when no exercises are occurring. These personnel would be hired from a local company and would live on Saipan. During exercises, additional security would be required for personnel and aircraft at GSN, but this would be supplied by USAF security forces.

Housing. Long-term, minor, adverse impacts on housing could occur if the Commercial Lodging Option is selected during implementation of Alternative 1. Up to 700 personnel, but typically only 145 to 170 personnel, would require housing for several 2-week periods (not to exceed a total of 8 weeks) per year. These personnel would be housed in local hotels, most likely in the villages of Garapan and Susupe. Given the 2010 average hotel occupancy rate of 64.2 percent and assuming a supply of 3,000 hotel rooms on Saipan, there would be on average 1,074 hotel rooms available at any given time. This should provide sufficient supply to house personnel, especially if double occupancy rooms are used. The USAF would also coordinate with hotels to secure the required number of hotel rooms prior to exercises to avoid supply issues.

If the BEAR kit Option is selected, no impacts on housing are expected from the implementation of Alternative 1 because all personnel would be accommodated and fed at the proposed BEAR site.

Economic Characteristics. Both long-term, negligible to minor, direct, adverse and long-term, negligible to minor, direct and indirect, beneficial impacts on the CNMI and Saipan economy would occur from implementation of Alternative 1.

Long-term, negligible to minor, adverse impacts on the local economy could result from conducting military exercises under Alternative 1 at GSN. Exercises, which would occur for up to a total 8 weeks every year, might cause temporary intermittent disruption of airport operations. These disruptions would be minimized by coordination between USAF and GSN to schedule exercises during non-peak airport operating hours (i.e., nighttime hours and between peak morning, afternoon, and evening hours). All implementation activities, including military exercise schedules, would be agreed to by the FAA, CPA, and affected commercial airlines and identified in the Safety Management Plan. While potential disruptions are unlikely to require flight cancellations or decreased flight volumes, they could result in flight delays and other nuisance problems. Nuisance issues could include traffic congestion in airport road network and parking areas, reduction in available parking (if Commercial Lodging Option is selected due to siting of modular trailers for administrative uses), and time delays due to heightened security.

Long-term, negligible to minor, indirect, beneficial impacts on the local economy would result from increased runway capacity at GSN under Runway Options A and B. The longer runways that would result under these options would allow commercial aircraft to increase load capacity and carry more fuel; therefore, more flights from locations farther away would be expected at GSN. Increased flight options could increase the quantity of visitors to Saipan, which might result in increased sales volume in the tourism industry for hotels, dining, and other tourist activities.

Siting of proposed facilities outside the airport fence could result in a long-term, negligible to minor, adverse impact on the local economy due to preclusion of future tourism or other commercial development. All proposed infrastructure at GSN would be sited on CPA property with some facilities inside the airport fence (runway extension, parking aprons, aircraft hangar, hazardous cargo pad/ arm/disarm pad, and munitions storage area), and some outside the airport fence (maintenance facility, BEAR Kit [if BEAR kit Option is selected], bulk fuel storage, and operation fuel tanks and hydrant system). The proposed infrastructure outside the airport fence would be on land designated as "Revenue Support (Non-Aviation)" (i.e., not aviation infrastructure) that could also be used for other commercial airport-support uses such as hotels, car rental facilities, and aviation-related business (CPA 2002, CPA 2011). This area is proposed as a General Aviation Area, which, based on the *Saipan International Airport Master Plan*, should be preserved for future general aviation development; however, it states timing is contingent upon demand for these functions (CPA 2002). Siting of the proposed project infrastructure in these areas would preclude future development by other commercial uses; however, it should be noted that these areas were not developed even during the peak growth periods for the CNMI economy and the tourism industry.

Similarly, siting of the proposed hazardous cargo pad and arm/disarm pad, and munitions storage area would preclude most structure development and land uses on the land within their QD arcs. The areas encompassed by these QD arcs are each designated as "Revenue Support" with the area surrounding the proposed pad being an Industrial Area and that around the munitions storage area an Agriculture/Cultivation Area (CPA 2011). By preventing most development and land uses in these areas, CPA could lose development and lease fees that these planned uses could have provided.

Siting of the bulk fuel tanks at the Saipan Seaport would not disrupt any port operations, thus there would be no adverse economic impact from implementation of Alternative 1 at the seaport.

Long-term, minor, beneficial impacts on the local economy would be expected from implementation of Alternative 1. Impacts on economic conditions would be concentrated in Saipan due to use of GSN for military exercises and the presence of up to 700 additional military personnel. Conducting intermittent exercises could result in increased purchase of goods and services. If the BEAR kit Option is selected, food, fuel (for operation of the BEAR Kit), and other sustainment supplies would be purchased from local distributors. Local contractors would provide services such as disposal of solid, liquid, and hazardous wastes from the BEAR site. If the Commercial Lodging Option is selected, buses to transport personnel to and from GSN and hotels, and modular trailers to house administrative functions would be leased from local businesses. Food would be purchased by military personnel from local retail outlets. Under either billeting option, the USAF would pay to lease land from the CPA, thus the CPA would realize long-term annual revenue increases. Under a mutual use agreement with the CPA, the USAF could work with the CPA to address costs for ongoing maintenance of the proposed infrastructure and additional costs for TSA security program requirements.

Minimal permanent jobs would be directly created due to implementation of Alternative 1. One or two security guards would be hired to watch some of the proposed infrastructure areas at GSN when exercises are not occurring. The increase of employment resulting from Alternative 1 would result in negligible increased wages paid. Based on a survey of wages and salaries in Saipan, the median wage for security guards was $5.03 per hour (Saipan Chamber of Commerce 2011).

Long-term, negligible, beneficial impacts on the local economy could result from increases in tourism spending. Some of the up to 700 military personnel that would be in Saipan for 8 weeks every year could decide to take leave or liberty in Saipan before or after exercises. While the increase in tourism spending from military personnel would likely be minimal as compared to existing visitor expenditures, the increase could result in secondary increases in employment and sales of retail products and services. Increased purchases by personnel could also lead to additional tax revenues from fuel, beverage container, alcoholic beverage, and hotel occupancy taxes.

Public Services. Long-term, minor, adverse impacts on public services could result from increased demand placed on local health/medical, law enforcement, and fire services from the presence of up to 700 military personnel in Saipan and the occurrence of military exercises at GSN. Under the BEAR kit Option, medical care would be provided at the BEAR site by military personnel, and there would be no impact on health care and medical services in Saipan. However, under the Commercial Lodging Option, medical care would be provided by USAF personnel at CHC under an agreement between the military and CHC. Similar to that discussed in **Section 4.14.1.1**, it is possible that CHC would not be able to manage the increased demand for medical services adequately due to insufficient funding and staffing. This issue would be minimized during the implementation phase because USAF personnel would provide the medical staff and supplies. USAF security personnel would accompany the exercises that occur at GSN; therefore, there would be a negligible impact on DPS or CPA law enforcement services. The presence of 700 military personnel and the additional USAF aircraft at GSN could increase ARFF requirements. These increased requirements could be satisfied through negotiated agreements between the USAF and the CPA.

Sociocultural Issues. Long-term, negligible, adverse sociocultural issues could occur during implementation of Alternative 1. All proposed infrastructure at GSN would be sited on airport property owned by the CPA. Facilities would be sited inside and outside of the airport fence. The proposed infrastructure outside the airport fence would be on land designated as "Revenue Support" that could also be used for other commercial uses such as hotels, car rental facilities, and aviation-related business (CPA 2011). Use of this land for Alternative 1 would preclude its future use by Chamorros and Carolinians and other CNMI residents; however, this land has never been developed even when the CNMI's economy was steadily growing. In addition, most land use development within the QD arcs for

the proposed hazardous cargo pad and arm/disarm pad, and the munitions storage area would be precluded for safety reasons. No other land that is currently available for use by Chamorros and Carolinians and other CNMI residents would be removed from their use. No land would be acquired and no land ownership would be transferred during implementation of Alternative 1. The presence of up to 700 military personnel would not create any significant conflicts with local residents as their presence would be intermittent and temporary throughout the year.

Environmental Justice. Disproportionately high and adverse impacts could occur on minority and low-income populations during implementation of Alternative 1 due to noise generation. Effective public participation strategies, such as a neighborhood meeting would be used to inform these populations of potential impacts. Approximately 98 percent of the population of Saipan is considered a minority, and between 30 percent and 50 percent of the population is low-income. The Alternative 1 area of impact, which includes Saipan Districts 10 and 11, has disproportionately high minority populations, and District 11 has a disproportionately high low-income population. Possible adverse impacts from implementation of Alternative 1 include increased traffic and noise levels in Districts 10 and 11. Elevated noise levels, as discussed in **Section 4.1.1.2**, could be experienced in the vicinity of GSN during exercises, which could occur during nighttime hours. This noise impact would represent a disproportionate impact on the disproportionately high minority populations within District 10. The USAF will conduct outreach to the potentially impacted communities to ensure they are engaged in the NEPA process and are part of the mitigation development process, if it is determined that mitigation is required. However, because the Proposed Action is to improve an existing airport, Alternative 1 cannot be moved to another location on the Island of Saipan to avoid potential disproportionately high and adverse impacts on minority and low-income populations. Additionally, this impact would not be significant because it would occur intermittently up to 8 weeks per year.

4.14.2 Alternative 2 – TNI

4.14.2.1 Construction Phase

Population Characteristics. Short-term, moderate to major, adverse impacts on the population of Tinian would result from construction of Alternative 2. The projected timeline for the construction phase is 24 to 36 months based on the runway option selected, and during peak construction less than 2,000 workers would be needed. It is assumed that 2,000 workers would be the peak number of workers required for construction of both runway options, but that this peak quantity of workers would be present for different lengths of time based on the option selected. For example, workers would be present on Tinian longer during construction of Runway Option A (10,000-foot extension) than Runway Option B (no extension option). An addition of 2,000 people to Tinian would increase the 2010 population by 63.8 percent, which would represent a significant increase to the local population. However, it is assumed that the average number of construction workers would generally be less than 2,000 people during non-peak construction periods. Therefore, increases of the Tinian population of up to approximately 64 percent would be experienced during construction of each runway option, but these increases would need to be sustained for different lengths of time under each option. There is precedent for large, temporary population increases on Tinian as approximately 1,800 mostly foreign workers spent 18 months on the island during construction of the Tinian Dynasty Hotel and Casino in the late 1990s (DON 2010d).

The source of the construction workers that would construct Alternative 2 is not known. It is assumed that most workers would be from the CNMI, and the remainder would be from Guam and the Federated States of Micronesia. It should be noted that in February 2012 a bill was introduced in the U.S. House of Representatives that requires 60 percent of the workers hired for federally funded construction projects in the Northern Marianas costing more than $100,000 to be U.S. workers (Marianas Variety 2012). Due to the small population of Tinian and an even smaller quantity of construction workers (approximately 75 in

2005), a majority of the workers would be from off-island. With the high rate of unemployed and underemployed people on Tinian and the CNMI, it is anticipated that local construction workers would be available. However, as discussed in **Section 4.14.1.1**, more than 90 percent of the construction workforce in the CNMI in 2005 were not U.S. citizens, and it is not known how the recent federalization of CNMI immigration and the poor economy have affected the availability of foreign construction workers. Therefore, it is likely that construction workers from outside of the CNMI would be required during peak work periods and for some specialty tasks.

Housing. Short-term, moderate to major, adverse impact on housing could occur during the construction phase of Alternative 2. It is assumed that 2,000 workers would be the peak number of workers required for construction of Runway Option A (10,000-foot extension) and Runway Option B (no extension option), but this peak quantity of workers would be present for different lengths of time based on the option selected. It is also assumed that construction of Runway Option A would require more time to complete (up to 36 months) than construction of the Runway Option B (24 months).

Because a majority of the construction workers would be from outside of Tinian, temporary housing would need to be secured for most workers, which could be up to 2,000 people. Local workers from Tinian could return to their residence at the end of the day; however, workers from Guam and the Federated States of Micronesia would need housing. Workers from Saipan and Rota might be able to commute to Tinian daily; however if this is not feasible they would also need to be housed on Tinian. Depending on the quantity of workers requiring housing, it is assumed that approximately 700 to 800 could be housed at the Tinian Dynasty Hotel and Casino in double occupancy rooms, but the remainder would be housed in temporary modular housing that would need to be installed at an appropriate location on Tinian. Because there is currently not sufficient housing stock to house all proposed workers needed to construct Alternative 2, the impact on housing would be moderate to major. The ability of the Tinian hotel market to provide the necessary amount hotel rooms and modular housing units for sustained periods of time would decrease the longer construction lasts and the longer the peak level of hotel rooms/housing units was needed. Therefore, construction of Runway Option B would likely result in moderate impacts while Runway Option A could result in major impacts on housing. In order to minimize impacts, prior to construction, the construction contractor would coordinate with the Tinian Dynasty Hotel and Casino to secure the required number of hotel rooms, and with a local business to install modular housing units to avoid supply issues.

Economic Characteristics. Short-term, minor to moderate, direct and indirect, adverse and short-term, moderate to major, direct and indirect, beneficial impacts on economies of Tinian and the CNMI would occur from construction of Alternative 2.

Short-term, negligible, direct and indirect, adverse impacts on the local economy could result from construction at TNI that might cause temporary disruption of airport services. Because TNI currently only services commuter aircraft operations, there would be no need to close the runway (even during construction of Runway Option A) and construction work could occur simultaneously with existing aircraft operations. When feasible, all construction activities that would disrupt portions of TNI would occur during normal runway closing hours and non-peak hours so as to impact the least amount of flights and TNI customers. All construction activities, the proposed work schedules, and other conditions of construction should be agreed to by the FAA, CPA, and affected commercial airlines and identified in the Safety Management Plan. It is assumed that the construction phase of Runway Option A would require the most time to complete (up to 36 months) and construction of the Runway Option B would require less time (24 months). Therefore, construction of Runway Option A of Alternative 2 would result in the longest airport disruptions, and could result in short-term, negligible, adverse impacts. Impacts could be minimized under agreement with the FAA, CPA, and commercial airlines and identified in the Safety Management Plan. The plan would identify a mutually agreeable construction schedule to minimize

disruptions at TNI. If the Runway Option B is selected, it is anticipated that there would be few airport disruptions and no adverse economic impacts.

Extension of the TNI runway and rerouting of Broadway Avenue under Runway Option A could result in long-term, moderate, adverse economic impacts on local farmers and ranchers that would be displaced. While the CPA owns some land east of Broadway Avenue on which construction would occur, additional acres of LBA land would be required. This LBA land is currently used for cattle grazing, and agriculture/grazing leases and permits may need to be terminated. This permit revocation and the displacement of ranches would create an economic hardship on the affected ranchers. This impact could be minimized by providing the affected ranchers with grazing permits for comparable locations elsewhere in the LBA. Extension of the runway and rerouting of Broadway Avenue could also result in delays for delivery trucks and persons traveling north to visit cultural and historic sites, but this would not result in an adverse impact on the local economy. The rerouted portion of Broadway would be constructed prior to closing the existing Broadway route. The runway would not be extended and Broadway Avenue would not be rerouted under Runway Option B; therefore, no economic impacts on local farmers and ranchers would occur.

Installation of the bulk fuel tanks at the Tinian Seaport would not disrupt any port operations; thus, there would be no adverse economic impact from construction at the seaport.

Short-term, moderate to major, beneficial impacts on the local economy would be expected from construction of Alternative 2. Construction activities would result in increases of employment, purchase of goods and services, and tax revenue. Impacts on economic conditions would occur in Tinian due to the presence of construction workers and in Saipan or Guam where most construction materials would be sourced. The construction phase of Alternative 2 would require hiring of up to 2,000 construction workers for 24 to 36 months. The increase in employment resulting from Alternative 2 would result in increased wages paid. Based on a survey of wages and salaries in Saipan, construction and extraction occupations earned average wages ranging from $5.06 per hour to $7.94 per hour with other specialized, technical, and managerial positions earning more (Saipan Chamber of Commerce 2011). Therefore, it is assumed that each worker would be paid at least $202.40 per week. Due to the differences in the overall duration of the construction phase and the length of time that the peak quantity of construction workers would be needed, Runway Option A would result in the most wages being paid out and Runway Option B the least. Increased wages would in turn increase government revenue from employment taxes (wage and salary tax [Chapter 2 tax] and NMTIT).

Construction at TNI and the Tinian Seaport would increase demand for and purchase of local and regional supplies, materials, and services. Most supplies, such as construction supplies and materials (e.g., concrete and structural fill), would need to be purchased in Saipan or Guam and shipped to Tinian. However, some supplies including food, water, and fuel could be purchased from local businesses. Local contractors would provide services such as construction equipment/vehicle maintenance; bus transportation of workers; and disposal of solid, liquid, and hazardous wastes from work sites. In addition, the need for temporary housing would require renting many rooms at the Tinian Dynasty Hotel and Casino and coordination with local contractors to obtain modular housing units to house the remaining workers. It is likely that sales of construction materials and other goods and services would be higher during construction of Runway Option A because the construction phase would be longer and the peak level of workers would be needed for a longer period of time. Because the Tinian economy is relatively small, these differences would affect the magnitude of beneficial impacts. Therefore, if Runway Option A is selected, construction of Alternative 2 would result in major, beneficial impacts on the Tinian economy. Construction of Runway Option B under Alternative 2 would result in slightly less sales of materials, goods, and services; it would result in a moderate, beneficial impact on the local economy.

The influx of up to 2,000 additional people to Tinian in the form of construction workers could also create a short-term, moderate to major, beneficial impact on the local economy by increasing local business sales volume and spending on tourist activities. It is likely that expenditures by foreign construction workers would be minimal as foreign workers send much of their incomes back to their home countries through remittances (U.S. GAO 2000). However, local construction workers from the CNMI might be more inclined to buy products and services in the local economy when they are earning a steady income. Based on the volume of increased sales, there could be secondary increases in employment and income generated from local businesses. Based on the relatively small Tinian economy, the magnitude of impacts would differ based on the runway option selected (i.e., overall construction duration and quantity of workers). Therefore it is likely that the impact would be moderate under Runway Option B and major under Runway Option A.

Other potential income for the CNMI Treasury would be realized from the BGRT levied on businesses' gross revenues sourced within the CNMI and the corporate NMTIT. Additional tax revenues from fuel, beverage container, alcoholic beverage, and hotel occupancy taxes could also be realized.

Public Services. Short-term, major, adverse impacts on public services could result from increased demand placed on local health/medical, law enforcement, and firefighting services from the influx of new construction workers to Tinian. The demand on these services created by the addition of up to 2,000 people, or a 64 percent increase above the 2010 population, would be significant. However, it is assumed that the average number of construction workers would generally be lower and would include some existing Tinian residents. It is assumed that 2,000 workers would be the peak number of workers for construction of both runway options, but that this peak quantity of workers would be present on Tinian for different lengths of time based on the option selected. Therefore, Tinian would need to accommodate the increased demands for public services associated with a 64 percent population increase for the longest time under Runway Option A, and the shortest time under Runway Option B.

Due to the existing tenuous state of the Tinian Health Center, it would not be able to adequately manage the increased demand. In order to minimize the impacts on the Tinian Health Center, the construction contractor might be required to bring additional medical personnel to Tinian during peak construction work periods. Similarly, the DPS would experience increased demands for law enforcement and firefighting services. While there is precedent for continuing to provide adequate police and firefighting services during periods when the island's population experiences large increases (i.e., during construction of the Tinian Dynasty Hotel and Casino), it is likely that a small number of contracted civilian security and fire personnel might be required to offset the increased demand during construction of Alternative 2. Appropriate levels of security and fire services at the construction work sites would be coordinated with DPS and the CPA's police and ARFF.

The magnitude of the impact on public services is based on the largest population increase and not necessarily the duration over which these increases would need to be sustained. Therefore, the impacts on public services would be moderate during construction of both runway options of Alternative 2.

Sociocultural Issues. Short-term, minor, adverse sociocultural impacts could occur during construction of Runway Option A of Alternative 2. Most construction activities at TNI would occur on public land managed by the CPA and leased to the USAF. However, construction of Runway Option A and the associated rerouting of Broadway Avenue would occur on land within the LBA, and require the termination of agriculture/grazing leases and permits in the LBA east of the runway. This impact of removing land from current and future use by Chamorros and Carolinians and other Tinian residents could be minimized by providing the affected ranchers comparable leases elsewhere in the LBA. The runway would not be extended and Broadway Avenue would not be rerouted under Runway Option B;

therefore, this construction option would not result in sociocultural impacts due to the removal of grazing land.

At the Tinian Seaport, construction would occur on CPA land leased by the USAF. Therefore, no land would be acquired and no land ownership would be transferred during construction of Alternative 2.

While construction would bring up to 2,000 people to Tinian during peak work periods, it is likely that a majority of these workers would be from the CNMI and respectful of local culture and customs. Therefore, it is unlikely that there would be any significant conflicts with local Tinian residents. However, there are historical reports of conflicts between construction workers and local residents during construction of the Tinian Dynasty Hotel and Casino (DON 2010d). These conflicts could be minimized by contracting additional security personnel to supplement the existing law enforcement provided by the DPS.

Environmental Justice. Disproportionately high and adverse environmental justice impacts would not be expected during construction of Alternative 2. Short-term, moderate, adverse environmental justice impacts could occur during construction of Alternative 2 due to significantly increased population that would result in housing shortage and increased demands on health care/medical, law enforcement, and firefighting services. Between 98 and 99 percent of the population of Tinian is considered a minority, and between 28 and 35 percent of the population is low-income. The Alternative 2 area of impact, which includes Tinian District 2, has a disproportionately high minority population. Possible adverse impacts from construction activities include increased traffic and noise levels, decreased air quality, and increased population. During peak work periods, 2,000 workers would be moved to Tinian resulting in a 63.8 percent increase of population. This level of population increase would, in turn, increase demands on health care/medical, law enforcement, and firefighting services. The Tinian Health Center is currently operating at decreased capacity due to personnel and funding shortages; a potential increase in demand of approximately 64 percent would not be manageable and could decrease the quality of service at the health care center, which could impact minority populations. Increases in demand for these services could be minimized by requiring the construction contractor to hire additional medical, security, and firefighting personnel to supplement the existing staff during peak construction periods. Therefore, the impact on minority populations would be less than significant.

4.14.2.2 Implementation Phase

Population Characteristics. Long-term, minor, adverse impacts on Tinian's population would occur as a result of implementation of Alternative 2. Typically 145 to 170 personnel, but no more than 700 personnel, would be on Tinian for up to 8 weeks per year for proposed military exercises. This quantity of personnel represents a population increase of 4.6 percent to 22.3 percent. Because the annual exercises would not occur during a continuous 8-week period, the population increases would be spread throughout the year, likely in 2-week increments. Therefore, implementation of Alternative 2 would cause temporary, intermittent increases in Tinian's population throughout each year.

No permanent population increases would occur during implementation of Alternative 2. One or two security guards might be hired for the bulk fuel storage/operational fuel tanks and hydrant area, maintenance facility, and other materials stored at the proposed project area when no exercises are occurring. These personnel would be hired from a local company and would be Tinian residents. During exercises, additional security would be required for personnel and aircraft at TNI, but this would be supplied by USAF security forces.

Housing. No impacts on housing are expected from the implementation of Alternative 2 because all military personnel would be accommodated and fed at the proposed BEAR site.

Economic Characteristics. Long-term, negligible to moderate, direct, adverse and long-term, negligible to minor, direct and indirect, beneficial impacts on the CNMI and Tinian economy would occur from implementation of Alternative 2.

Long-term, negligible, adverse impacts on the local economy could result from conducting military exercises under Alternative 2 at TNI. Exercises, which would occur for up to 8 weeks every year, might cause temporary intermittent disruption of airport operations. These disruptions would be minimized by coordination between the USAF and TNI to schedule exercises during non-peak airport operating hours (i.e., nighttime hours and between peak morning, afternoon, and evening hours). All implementation activities, including military exercise schedules, would be agreed to by the FAA, CPA, and affected commercial airlines and identified in the Safety Management Plan. While potential disruptions are unlikely to require flight cancellations or decreased flight volume, they could result in flight delays and other nuisance problems. Nuisance issues could include traffic congestion and time delays due to heightened security.

Extension of the TNI runway and rerouting of Broadway Avenue (under Runway Option A) could result in a long-term, moderate, adverse impact on the local economy due to the displacement of local farmers and ranchers. Additional acres of LBA land, which is currently used for cattle grazing under agriculture/grazing permits and leases, would be required for runway extension and road rerouting. This impact could be minimized by providing the affected ranchers leases elsewhere in the LBA. If Runway Option B is selected, these adverse impacts would not occur.

Extension of the TNI runway under Runway Option A could result in long-term, negligible to minor, indirect, beneficial impacts on the local economy. The longer runway that would result under this option would allow commercial aircraft to increase load capacity and carry more fuel; therefore, more flights from locations farther away could be expected at TNI. Increased flight options could increase the quantity of visitors to Tinian, which might result in increased sales volume in the tourism industry for hotels, dining, and other tourist activities.

Siting of the bulk fuel tanks at the Tinian Seaport would not disrupt any port operations; thus, there would be no adverse economic impact from implementation of Alternative 2 at the seaport.

Long-term, minor, beneficial impacts on the local economy would be expected from implementation of Alternative 2. Impacts on economic conditions would be concentrated in Tinian due to use of TNI for military exercises and to the presence of up to 700 additional military personnel. Conducting intermittent exercises could result in increased purchase of goods and services. Food, fuel (for operation of the BEAR Kit), and other sustainment supplies would be purchased from local distributors. Local contractors would provide services such as disposal of solid, liquid, and hazardous wastes from the BEAR site. Additionally, the USAF would pay to lease land from the CPA for the proposed infrastructure; thus, the CPA would realize long-term annual revenue increases. Under a mutual use agreement with the CPA, the USAF could work with the CPA to address costs for ongoing maintenance of the proposed infrastructure and additional costs for TSA security program requirements.

Minimal permanent jobs would be directly created due to implementation of Alternative 2. One or two security guards would be hired to watch the proposed infrastructure at TNI when exercises are not occurring. The increase of employment resulting from Alternative 2 would result in negligible increased wages paid. Based on a survey of wages and salaries in Saipan, the median wage for security guards was $5.03 per hour (Saipan Chamber of Commerce 2011).

Long-term, minor, beneficial impacts on the local economy could result from increases in tourism spending. Some of the 700 military personnel in Tinian for 8 weeks every year could decide to take leave

or liberty in Tinian before or after exercises. While the increase in tourism spending from military personnel is unknown, it would likely amount to a noticeable increase over current spending. This increased tourism spending could result in secondary increases in employment and sales of retail products and services. Increased purchases by personnel could also lead to additional tax revenues from fuel, beverage container, alcoholic beverage, and hotel occupancy taxes.

Public Services. Long-term, negligible, adverse impacts on public services could result from increased demand placed on local law enforcement and firefighting services from the presence of up to 700 military personnel in Tinian and the occurrence of military exercises at TNI. USAF security personnel would accompany the exercises that occur at GSN; therefore, there would be a negligible impact on DPS or CPA law enforcement services. The presence of 700 military personnel and the additional USAF aircraft at TNI could increase ARFF requirements. These increased requirements could be satisfied through negotiated agreements between the USAF and the CPA. Medical care would be provided at the BEAR site by military personnel; therefore, implementation of Alternative 2 would not result in impacts on health care and medical services in Tinian.

Sociocultural Issues. Long-term, negligible, adverse sociocultural issues could occur during implementation of Alternative 2. While, some existing grazing permits held by Tinian residents within the LBA would need to be terminated in order to extend the runway and reroute Broadway Avenue, these affected ranchers would be offered permits in other comparable areas of the LBA. No other land that is currently available for use by Chamorros and Carolinians or other Tinian residents would be removed from their use. No land would be acquired and no land ownership would be transferred during implementation of Alternative 2. The presence of up to 700 military personnel would not create any significant conflicts with local residents as their presence would be intermittent and temporary throughout the year.

Environmental Justice. Disproportionately high and adverse impacts could occur on minority and low-income populations during implementation of Alternative 2. Between 98 and 99 percent of the population of Tinian is considered a minority, and between 28 and 35 percent of the population is low-income. Possible adverse impacts from implementation of Alternative 2 include increased traffic and noise levels and adverse economic impacts on ranchers in District 2. Under the high aircraft operation scenario, noise levels of 65–80 dBA could be experienced within land in District 2 during exercises (including during nighttime hours). This noise impact would represent a significant disproportionate impact on the high minority populations within District 2. The Tinian ranchers who would be displaced by the implementation of Alternative 2 would be disproportionately impacted because their grazing rights in the leased land areas would end, which would adversely affect their incomes. However, because the Proposed Action is to improve an existing airport, Alternative 2 cannot be moved to another location on the Island of Tinian.

4.14.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.14.2.1** and **3.14.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM,

Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

No impacts on socioeconomics or environmental justice would be expected as a result of the No Action Alternative. Socioeconomics within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions.

4.15 Human Health and Safety

Any increase in safety risks would be considered an adverse impact on health and safety. An impact would be considered significant if a proposed action would result in the following:

- Substantially increase risks associated with the safety of construction personnel, contractors, military personnel, or the local community
- Substantially hinder the ability to respond to an emergency
- Introduce a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

4.15.1 Alternative 1 – GSN (Preferred Alternative)

4.15.1.1 Construction Phase

Contractor Health and Safety. Short-term, minor, adverse impacts on health and safety could occur during the proposed construction activities. Construction activities pose an increased risk of construction-related accidents, but this level of risk would be managed by adherence to established Federal and CNMI safety regulations. Workers would be required to wear protective gear such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Construction areas would be fenced and appropriately marked with signs to prevent trespassing. Construction equipment and associated trucks transporting material to and from the project sites could be directed to roads and streets that have a smaller volume of traffic. Contractors would be required to establish and maintain health and safety programs for their employees.

Military Health and Safety. No health and safety impacts on military personnel would occur because they would not be involved with the construction, beyond some oversight visits.

Public Health and Safety. No health and safety impacts on the public would be expected under Alternative 1. As previously noted, construction areas would be fenced and appropriately marked with signs to prevent trespassing. Construction activities would be coordinated with GSN personnel to ensure the ability of the Aircraft Rescue and Fire Fighting unit to respond to emergencies.

Airfield Safety. Short-term, minor, adverse impacts on airfield safety could occur during construction activities. All construction activities would be coordinated with GSN personnel to prevent airfield obstructions and safety hazards. Some construction activities could be scheduled to avoid existing aircraft operations.

The proposed airfield facilities would be constructed in accordance with UFC 3-260-01, *Airfield and Heliport Planning and Design,* and DOD, USAF, and FAA criteria, as applicable.

Refer to **Section 4.3** for information on safety impacts from the additional aircraft operations at GSN associated with Alternative 1. Refer to **Section 4.6** for information regarding BASH at GSN.

Explosive Safety. The proposed construction activities would not involve the storage or handling of explosive materials; therefore, there would be no explosive safety concerns.

4.15.1.2 Implementation Phase

Contractor Health and Safety. Long-term, negligible, adverse impacts on contractor health and safety could occur during implementation of Alternative 1. The primary contractor activities would involve transporting and handling Jet A1 fuel for aircraft operations and diesel fuel for the BEAR kit. The risks associated with these activities would be managed by mandatory training and adherence to established Federal and CNMI safety regulations. Workers would be required to wear protective gear such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Fuel vehicles would use an established, safe route to transport the fuel. Contractors would be required to establish, maintain, and comply with health and safety programs for their employees.

Military Health and Safety. Long-term, minor, beneficial impacts on military health and safety would be expected due to improved and expanded facilities for divert landings, joint exercises, and training for humanitarian/disaster relief activities. These activities already occur, but the improved and expanded facilities specifically designed for these activities would improve safety.

Public Health and Safety. Long-term, negligible, adverse impacts on public health and safety would be expected under the implementation phase of Alternative 1. Based on two LTOs/aircraft/day for 8 weeks/year, Alternative 1 would add approximately 2,688 aircraft operations per year, which would be a 5.9 percent increase above the existing number of air operations at GSN. This increase in air operations would have a negligible effect on the ability of the Aircraft Rescue and Fire Fighting unit to respond to aircraft emergencies.

Airfield Safety. Long-term, minor, beneficial impacts on airfield safety would be expected under the implementation phase of Alternative 1. Additional apron space, airfield lighting, and a partially paved overrun would provide a safer airfield environment. Refer to **Section 4.3** for information on safety impacts from the additional aircraft operations at GSN. Refer to **Section 4.6** for information regarding BASH at GSN.

Explosive Safety. Long-term, negligible, adverse impacts on explosive safety would be expected under the implementation phase of Alternative 1 due to the storage and handling of ordnance. However, QD arcs and administrative policies would dramatically reduce the hazards associated with these activities. Additionally, a fence should surround the proposed munitions storage area to assist in preventing unauthorized entry to this facility.

4.15.2 Alternative 2 – TNI

4.15.2.1 Construction Phase

Contractor Health and Safety. Short-term, minor, adverse impacts on health and safety could occur during construction activities. Construction activities pose an increased risk of construction-related accidents, but this level of risk would be managed by adherence to established Federal and CNMI safety regulations. Workers would be required to wear protective gear such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Construction areas would be fenced and appropriately marked with signs to prevent trespassing. Construction equipment and associated trucks transporting material to and from the project sites could be directed to roads and streets that have a smaller volume of traffic. Contractors would be required to establish and maintain health and safety programs for their employees.

Military Health and Safety. No health and safety impacts on military personnel would occur because they would not be involved with the construction, beyond some oversight visits.

Public Health and Safety. No health and safety impacts on the public would be expected under Alternative 2. As previously noted, construction areas would be fenced and appropriately marked with signs to prevent trespassing. Construction activities would be coordinated with TNI personnel to ensure the ability of the Aircraft Rescue and Fire Fighting unit to respond to emergencies.

Airfield Safety. Short-term, minor, adverse impacts on airfield safety could occur during construction activities. All construction activities would be coordinated with TNI personnel to prevent airfield obstructions and safety hazards. Some construction activities could be scheduled to avoid existing aircraft operations.

The proposed airfield facilities would be constructed in accordance with UFC 3-260-01, *Airfield and Heliport Planning and Design,* and DOD, USAF, and FAA criteria, as applicable.

Refer to **Section 4.3** for information on safety impacts from the additional aircraft operations at TNI. Refer to **Section 4.6** for information regarding BASH at GSN.

Explosive Safety. The proposed construction activities would not involve the storage or handling of explosive materials; therefore, there would be no explosive safety concerns.

4.15.2.2 Implementation Phase

Contractor Health and Safety. Long-term, negligible, adverse impacts on contractor health and safety could occur during implementation of Alternative 2. The primary contractor activities would involve transporting and handling Jet A1 fuel for aircraft operations and diesel fuel for the BEAR kit. The risks associated with these activities would be managed by mandatory training and adherence to established Federal and CNMI safety regulations. Workers would be required to wear protective gear such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Fuel vehicles would use an established, safe route to transport the fuel. Contractors would be required to establish, maintain, and comply with health and safety programs for their employees.

Military Health and Safety. Long-term, minor, beneficial impacts on military health and safety would be expected due to improved and expanded facilities for divert landings, joint exercises, and training for humanitarian/disaster relief activities. These activities already occur, but the improved and expanded facilities specifically designed for these activities would improve safety.

Public Health and Safety. Long-term, minor, adverse impacts on public health and safety would be expected under the implementation phase of Alternative 2. Based on two LTOs/aircraft/day for 8 weeks/year, Alternative 2 would add approximately 2,688 aircraft operations per year, which would be a 9.9 percent increase above the existing number of air operations at TNI. This increase in air operations would have a minor effect on the ability of the Aircraft Rescue and Fire Fighting unit to respond to aircraft emergencies.

Airfield Safety. Long-term, minor, beneficial impacts on airfield safety would be expected under the implementation phase of Alternative 2. Additional apron space, airfield lighting, and a partially paved overrun would provide a safer airfield environment.

Refer to **Section 4.3** for information on safety impacts from the additional aircraft operations at TNI. Refer to **Section 4.6** for information regarding BASH at TNI.

Explosive Safety. Long-term, negligible, adverse impacts on explosive safety would be expected under the implementation phase of Alternative 2 due to the storage and handling of ordnance. However, QD arcs and administrative policies would dramatically reduce the hazards associated with these activities. Additionally, a fence should surround the proposed munitions storage area to assist in preventing unauthorized entry to this facility.

4.15.3 No Action Alternative

Under the No Action Alternative, neither Alternative 1 nor Alternative 2 would occur and the existing conditions discussed in **Sections 3.15.2.1** and **3.15.2.2** would continue. The USAF would not develop or construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft and associated support personnel for periodic exercises and unplanned divert landings and humanitarian assistance and disaster relief in the western Pacific. The USAF would continue to conduct divert landings at appropriate airports (i.e., GUM, GSN, and GRO) in accordance with *36th Wing Instruction 13-204, Airfield Operations Instructions*; planned joint military exercises would continue to take place using Andersen AFB and surrounding airspace and range area; and humanitarian airlift staging would continue to use existing airfields such as Andersen AFB and GUM, Guam. The No Action Alternative would provide no benefit or detriment to the existing conditions currently experienced on Saipan and Tinian.

Human health and safety within the proposed project areas would remain unchanged. The No Action Alternative would result in a continuation of existing conditions. Adverse impacts on human health and safety would continue to be expected as a result of the potential for planes to overrun the runway and the inability to handle munitions safely during emergency landings.

5. Cumulative and Other Effects

5.1 Definition of Cumulative Effects

CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

CEQ guidance in considering cumulative effects states that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects whose effects coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).

To identify cumulative effects, the analysis needs to address two fundamental questions:

1. Does a relationship exist such that affected resource areas of the Proposed Action or alternatives might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If such a relationship exists, then does an EA or EIS reveal any potentially significant effects not identified when the Proposed Action is considered alone?

Section 5.2 presents those actions or projects that are temporally or geographically related to the Proposed Action and, as such, have the potential to result in cumulative impacts. The cumulative impacts analysis in **Section 5.3** discusses the potential cumulative impacts of these actions, some of which are in early planning stages. The cumulative impact assessment is based on available information at the time of development of this EIS and might not include potential mitigation measures for these actions.

5.2 Past, Present, and Reasonably Foreseeable Future Actions

A cumulative project list was developed to identify projects on Saipan, Tinian, or in the region in general, based on readily available information. The projects list is provided in **Table 5.2-1**. The most substantial projects from the cumulative projects list include the Establishment and Operation of an ISR/Strike Capability Project on Andersen AFB; the Guam and the MIRC improvements; the Guam and CNMI Military Relocation; the Mariana Islands Training and Testing (MITT); improvements at the GSN, TNI, and Tinian harbor; and other local development projects on each island. Each of these projects either had master plans or NEPA documents prepared describing the proposed actions. A brief description of these projects is provided below.

5.2.1 DOD-Related Development in the Region

Mariana Island Range Complex, Department of the Navy, 2010. This project consists of military training and RDT&E training activities within the Mariana Islands (DON 2010a). An EIS/OEIS was prepared for the MIRC by the DON and a ROD was issued in 2010. The MIRC consists of the ranges, airspace, and ocean areas surrounding the ranges that make up the Study Area. The MIRC and the Study Area are the same geographical areas. The study area described in the MIRC EIS/OEIS does not include the sovereign territory (including waters out to 12 NM) of the Federated States of Micronesia.

Table 5.2-1. List of Past, Present, and Reasonably Foreseeable Future Actions

Lead Agency or Proponent	Project Name/ Location	Area of Interest	Construction Year	Status	Description	Timeframe*	Reason for Dismissal
DOD-Related Regional Projects							
U.S. Forces Japan (USFJ)	Guam Aviation Training Relocation (GATR)	Region	TBD	TBD.	GATR being conducted in the MIRC as part of USFJ Transformation & Realignment Operations.	P	Currently training levels are contained within the MIRC EIS.
Department of Navy (DON)/Naval Facilities Engineering Command, Pacific (NAVFACPAC)	Mariana Island Range Complex	Region	2011	FEIS May 2010.	Covers proposed action and alternatives for continued use of the MIRC.	P	Retained.
DON/JGPO	Guam and CNMI Military Relocation	Region	TBD	FEIS July 2010 ROD for Marine relocation to Guam, training on Tinian, and AMDTF construction and operations, September 2010. Decision deferred on CVN and Live Fire Training Ranges on Guam.	Relocation of Marines from Okinawa. Project notionally includes infrastructure construction, beddown, and training of personnel on Guam; training activities on Tinian; CVN Berthing on Guam; and the location and operation of an Army Ballistic Missile Defense System on Guam.	P – Note: SEIS for Live Fire Training Range on Guam NOA to be completed in accordance with 9th Circuit Court decision.	Retained.
USAF/36 WG PACAF	ISR/Strike	Region	2007–2016	ROD signed 2007.	Basing of four unmanned aerial reconnaissance aircraft and 12 refueling aircraft at Andersen AFB and accommodating 48 fighter and six bomber aircraft on a rotational basis. An additional 2,400 personnel would be based at Andersen AFB.	P	Retained.
DON/U.S. Pacific Fleet	Mariana Islands Training and Testing (MITT)	Region	TBD	NOI released September 2011.	Conduct military training and testing activities within the MITT Study Area.	RF	Retained.
Naval Air Warfare (NAVAIR) beddown of Broad Area Maritime Surveillance (BAMS)	Proposed BAMS Beddown at Andersen AFB	Region	2013–2015	TBD.	Construction of an additional hangar and the beddown of up to 22 BAMS aircraft at Andersen AFB. BAMS Training is covered in the MIRC.	RF	Retained.
Other Regional Projects							
U.S. Congress	Marianas Trench National Marine Monument Visitor Center	Region	TBD	Unsigned.	A bill was introduced in March 2011 to authorize the Secretary of the Interior to establish and operate a visitor facility to fulfill the purposes of the Marianas Trench Marine National Monument. As of September 2011, the bill has been referred to Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs. (H.R. 1207 2012)	RF	This is a plan or policy, not development.

Lead Agency or Proponent	Project Name/ Location	Area of Interest	Construction Year	Status	Description	Timeframe*	Reason for Dismissal
Other Regional Projects (continued)							
U.S. Department of Homeland Security	Russian Visa Waiver Program	Region	N/A	Program has been approved and is in progress.	A program was approved to allow tourists from Russia to visit Guam without travel visas. An increase in tourism is expected across the Marianas and an increased visitor market is expected. (Guam PDN 2012)	P	This is a plan or policy and not specific development.
CNMI Government-DPW	Primary and Secondary Road Resurfacing and Hazard Elimination	Regional-Saipan and Tinian (Discussed under each island)	Unknown	Unknown.	This includes the construction, resurfacing, and repaving of primary and secondary roads that are in dire need of repair and rehabilitation. This project will also allow for the elimination of hazard materials, rights-of-way, debris, some curb and gutters, and other hazardous and safety problems. (CNMI Department of Commerce 2009)	RF	Retained.
Saipan Projects							
CNMI Government	Legalization of Casino Gaming	Saipan	N/A	Unsigned.	As of 21 December 2011, a bill is being reviewed by the CNMI government that would permit casino gaming in Saipan (Saipan Tribune 2011c).	RF	This is a plan or policy, not development.
CNMI Government-CUC and DOI	Geothermal Power Development	Saipan	2012–2020	Exploratory drilling has commenced.	An Australian energy company was awarded a concession by CUC for geothermal power development and would sell electricity to the transmission grid. Drilling will occur first to confirm geothermal activity and flow (Proactive Investors 2012).	P	Retained.
CNMI Government-CUC	Solar Power Development	Saipan	2012–2020	One contract awarded to Chinese solar development company.	Two solar energy proposals are being reviewed and will be awarded contracts. The two projects are expected to produce an additional 15 to 20 MW for Saipan's power grid (Saipan Tribune 2012)	P	Retained.
CNMI Government-DPW	Saipan Water System Improvements	Saipan	2012–2020	U.S. Public Health Service is upgrading system.	Designed to meet a USEPA stipulated order, this project will provide focus and direction to meet CWA and SDWA requirements in Saipan on the existing water quality outputs. (CNMI Department of Commerce 2009)	P	Retained.
CNMI Government-CPA	GSN Public Announcement System	Saipan	2012	Underway.	GSN currently has a public announcement system that does not work. The airport needs a new public announcement system to meet emergencies and general call announcements. (CNMI Department of Commerce 2009)	P	Retained.
CNMI Government-DPW	Water/Waste Water System for Saipan	Saipan	2012–2020	Underway.	This is a U.S. Federal Court ordered project. The existing waste water / sewer system needs major rehabilitation and USEPA compliance upgrades. (CNMI Department of Commerce 2009)	P	Retained.

Lead Agency or Proponent	Project Name/ Location	Area of Interest	Construction Year	Status	Description	Timeframe*	Reason for Dismissal
Saipan Projects (continued)							
CNMI Government-DPW	Replace Traffic Lighting System, Saipan	Saipan	2012–2015	Underway.	The existing traffic lighting system on Saipan is old and sometimes works intermittently. This project aims to correct deficiencies and add safety to traffic flow. (CNMI Department of Commerce 2009)	P	Retained.
CNMI Government-CPA	GSN Fuel Storage Facility	Saipan	2012	Currently unfunded.	GSN is the largest of the CNMI and has the capability to refuel large aircraft. The need for expanding the fuel farm facility is to help provide an opportunity for competition and lower prices to help stimulate more international air service and tourism as requested by airlines. (CNMI Department of Commerce 2009)	RF	Retained.
CNMI Government-CHC	Improvement of CHC	Saipan	2012	Underway.	This project is to repair, improve and upgrade the main and auxiliary medical facilities in Saipan. (CNMI Department of Commerce 2009)	P	Retained.
Tinian Projects							
CNMI Government-CPA	ILS for TNI	Tinian	2012	Canceled.	The Municipality of Tinian believes that an ILS is necessary to bring more tourists to the island and remove a level of danger for large aircraft. "The funds are there. Need to expedite the process." (CNMI Department of Commerce 2009)	RF	This project has been cancelled because a GPS system is scheduled to be installed in 2013.
CNMI Government-CPA	TNI Fuel Farm	Tinian	2012–2020	Currently unfunded.	In order to be a "complete" facility that can accommodate various types of aircraft flying direct from Asia, TNI will need refueling capability. (CNMI Department of Commerce 2009)	RF	Retained.
CNMI Government-CPA	Tinian Seaport Rehabilitation	Tinian	2012–2020	Currently unfunded.	Repairing the seawall is critical to maintaining the long-term continuous and safe use of the port. This project will require planning, environmental studies and construction. (CNMI Department of Commerce 2009)	RF	Retained.
CNMI Government-CPA	Tinian Seaport Rehabilitation – Dredging	Tinian	2015–2020	Currently unfunded.	Currently the waterway has a 28-foot draft which is sufficient to meet the local needs. This dredging project has been separated from the other aspects of the Tinian Seaport Rehabilitation because any dredging beyond 28 feet is required by the military, not the CNMI/Tinian needs. (CNMI Department of Commerce 2009)	RF	Retained.
Private Developers	Casino Resort Development	Tinian	TBD	TBD.	Proposed development of a casino resort by Neo Gold Wings and Marianas Resort Development Co. (MRDC) (Saipan Tribune 2011b). There are five gaming licenses that are available for the Island of Tinian. One license is currently issued to the Tinian Dynasty. The other four licenses are available; two are planned for Neo Gold Wings and MRDC.	RF	Retained.

*Timeframe Key: RC = Recently Completed; P = Present; RF = Reasonably Foreseeable

The proposed action would result in critical enhancements to increase training capabilities (especially in the undersea and air warfare areas) that are necessary if the military services are to maintain a state of military readiness commensurate with the national defense mission. The proposed action primarily focuses on the development and improvement of existing training capabilities in the MIRC, and would not include any military construction projects. However, the proposed action does not involve extensive changes to the MIRC facilities, activities, or training capabilities, nor does it involve an expansion of the existing MIRC property or airspace requirements. It does not involve the redeployment of Marine Corps or Air Force personnel or assets, carrier berthing capability, or deployment of strategic missile defense assets to the Marianas.

Governing procedures for the use of training areas, ranges, and airspace operated and controlled by the Commander U.S. Naval Forces, Marianas (such as instructions and procedures for the use of Guam, Saipan, Tinian, Rota and FDM) are included in Commander Navy Region Marianas Instruction 3500.4 (Marianas Training Handbook). This guidance identifies specific land use constraints to enable protection of environmental resources during military training in the MIRC. These procedures would continue to be followed. Modification and augmentations of these procedures are being discussed among stakeholders. No new types of training would be required that would warrant new procedures in the MIRC EIS/OEIS (DON 2010b).

In summary, the MIRC ROD establishes the MIRC and the training that occurs jointly within the MIRC. Training that occurs within the MIRC includes those exercises that would initiate at the airport or airports being proposed for improvements within this Divert EIS.

Guam and CNMI Military Relocation, DON, 2010. This project includes the relocation of Marines from Okinawa. An EIS was prepared by the DON and Joint Guam Program Office (JGPO) and a ROD was issued in 2010 (DON 2010b). This relocation is proposed to occur during the same timeframe as a proposed wharf construction in Guam's Apra Harbor to support U.S. Navy transiting nuclear aircraft carriers. A U.S. Army Air and Missile Defense Task Force (AMDTF) is also proposed for Guam to protect against the threat of harm from ballistic missile attacks. The main components of the proposed actions are as follows:

- ***Marine Corps Relocation***
    - Develop and construct facilities and infrastructure to support approximately 8,600 Marines and their 9,000 dependents relocated from Okinawa (Japan) to Guam.
    - Develop and construct facilities and infrastructure to support training and operations on Guam and Tinian for the relocated Marines.
- ***Navy Apra Harbor***
    - Construct a new deep-draft wharf with shoreside infrastructure improvements creating the capability in Apra Harbor, Guam, to support a transient nuclear-powered aircraft carrier.
- ***Army AMDTF***
    - Develop facilities and infrastructure on Guam to support relocating approximately 600 military personnel and their 900 dependents to establish and operate an AMDTF.
- ***Utilities***
    - Alternatives to accommodate the increase demand on existing utilities and roadway infrastructure are considered.

Establishment and Operation of an ISR/Strike Capability, Andersen AFB, Guam, Department of the Air Force, 2006. This project includes the establishment of an ISR/Strike operational capability in the Western Pacific, in four phases, over an approximate 16-year period beginning in fiscal year 2007. The ISR/Strike capability would consist of fighter, aerial refueling, bomber, unmanned aerial vehicle aircraft, and support personnel. The ISR/Strike EIS was finalized in 2006 and a ROD was issued in January 2007 (USAF 2006).

Andersen AFB was identified as the installation best suited to host the ISR/Strike capability. The average airfield operations would increase from 235 to 297 as a result of the action. The increase in aircraft events into and out of Andersen AFB requires improved range infrastructure to accommodate this increased training tempo, newer aircraft, and weapon systems commensurate with ISR/Strike force structure. There would be increased activity on all the current training areas supporting Air Force activities. Land acquisition is not proposed.

There would be construction to support approximately 3,000 additional personnel, including 190 family housing units. The Air Force would beddown and operate two squadrons and three training programs at Northwest Field, concurrent with ISR/Strike capability (addressed in a separate environmental assessment).

As part of the ISR/Strike mitigation plan, a new Habitat Management Unit of 148 acres (60 hectares) would be established as a mitigation measure for impacts on biological resources. This mitigation plan would include the following:

- Development of an ungulate control plan
- Ungulate exclusion fencing
- Funding for a full-time wildlife management specialist position
- Planting of trees that are important to the Mariana fruit bat or the Marianna crow
- A noise study.

The Air Force was able to address the cumulative impacts of establishing an ISR/Strike Capability in their EIS (USAF 2006) relative to a host of other cumulative projects identified.

The ISR/Strike ROD establishes the strike group, including 12 aerial refueling tankers, and beddown aircraft at Andersen AFB which would be used during Divert activities and exercises.

Mariana Island Testing and Training (MITT), Department of the Navy, U.S. Pacific Fleet, Undated. This proposed project includes conducting military training and testing activities within the MITT Study Area. The training is needed to meet the U.S. Navy's statutory responsibilities described in Title 10 U.S.C. § 5062 to achieve and maintain military readiness. The EIS/OEIS is being prepared to renew current regulatory permits and authorizations. The MITT Study Area includes the training and testing locations in the western Pacific, including the existing MIRC area, the high seas, and Apra Harbor.

Proposed Broad Area Maritime Surveillance (BAMS) Beddown, USAF, 36WG, Undated. This proposed project includes the construction of an additional hangar and the beddown of up to 22 BAMS aircraft at Andersen AFB. The facilities (hangars) for the BAMS would be adjacent to the Global Hawk hangars. BAMS Training is covered in the MIRC EIS/OEIS.

5.2.2 Other Local and Regional Development

5.2.2.1 Saipan

Road Resurfacing and Hazard Elimination. This includes the construction, resurfacing, and repaving of primary and secondary roads that are in dire need of repair and rehabilitation. This project will also allow for the elimination of hazard materials, rights-of-ways, debris, some curb and gutters, and other hazardous and safety problems. This project will also allow for the purchase of additional road signs, street markings, reflectors, school and pedestrian crossing markings, and other road safety features. Saipan has the largest amount of existing roadway infrastructure among the three islands within the CNMI. The draft 2008 CNMI Highway Comprehensive Master Plan identifies two short-term goals of (1) implementing a Roadway Pavement and Delineation Maintenance and Improvement Program and (2) Roadway Classifications.

On Saipan, the following long-range projects are recommended:

- Construct new bridge and connection along Route 36
- Upgrade and pave Lau Lau Road to Kagman
- Realign Texas Road and modify Middle Road and Monsignor Guerrero to a 4-leg intersection
- Realign Micro Beach Road between Beach Road and Middle Road. Widen roadway to provide a third lane that would become a westbound left-turn lane, and add bike lanes. Add pedestrian pathway to Micro Beach Road
- Widen Beach Road from Quartermaster Road to Gualo Rai Road
- Construct pedestrian facilities and bike lanes on Middle Road
- Upgrade drainage along Chalan Monsignor Guerrero near Chalan Tun Herman Pan Road
- Widen Beach Road from Chalan Monsignor Guerrero to Afetna and install two-way left-turn lane in median (CNMI Department of Commerce 2009).

Geothermal Power Development. An Australian energy company was awarded a concession by CUC for geothermal power development and would sell electricity to the transmission grid. Drilling will occur first to confirm geothermal activity and flow. If geothermal activity is satisfactorily confirmed, additional geological and feasibility studies will be performed. Locations for the studies have not yet been identified. Funding has been secured from the U.S. Government for the geothermal exploration (Proactive Investors 2012).

Solar Power Development. Two solar energy proposals are being reviewed and will be awarded contracts. Once awarded, the two projects are expected to produce an additional 15 to 20 MW for Saipan's power grid. One contract has been awarded to a Chinese solar development company. No additional details on the second contract or locations for development are available (Saipan Tribune 2012).

Saipan Water System Improvements. Designed to meet an USEPA stipulated order, this project will provide focus and direction to meet CWA and SDWA requirements on Saipan on the existing water quality (CNMI Department of Commerce 2009).

GSN Public Announcement System. GSN currently has a public announcement system that does not work. The lack of the system inhibits the airport's ability to communicate with passengers and employees

both on a daily basis and emergency situations. An emergency announcement system is needed to meet FAA standards. This project recently received $1 million in grant funding (CNMI Department of Commerce 2009).

Water/Wastewater System. This is a U.S. Federal Court-ordered project. The existing wastewater/sewer system needs major rehabilitation and USEPA compliance upgrades; water quality also needs to be improved. The current water quality is unacceptable and the CNMI is subject to fines if it does not start the process of compliance. An EA has not yet been completed for this project (CNMI Department of Commerce 2009).

Replace Traffic Lighting System. The existing traffic lighting system on Saipan is antiquated and sometimes works intermittently. In the past, it has been a source of concern for the safety of the public and pedestrians. Due to the corrosive nature of island air, the internal components of the traffic system are subject to accelerated deterioration. This project aims to correct deficiencies and add safety to traffic flow (CNMI Department of Commerce 2009).

GSN Fuel Facility Expansion. GSN is the largest of the CNMI and does have the capability to refuel large aircraft. Expanding the fuel farm facility would help provide an opportunity for competition and lower prices to help stimulate more international air service and tourism as requested by airlines (CNMI Department of Commerce 2009).

Improve the Commonwealth Health Center. This project is to repair, improve, and upgrade the main and auxiliary medical facilities on Saipan. The CHC facility on Saipan is the state's primary caregiving facility for citizens, tourists, and other visitors to the CNMI. The facilities need to be repaired and upgraded in order to accommodate the needs of the medical community. This upgrade will not only add value to the building, but also improve the equipment, medical infrastructure, and other related needs of the operation (CNMI Department of Commerce 2009).

5.2.2.2 Tinian

Road Resurfacing and Hazard Elimination. This includes the construction, resurfacing, and repaving of primary and secondary roads that are in dire need of repair and rehabilitation. This project will also allow for the elimination of hazard materials, rights-of-ways, debris, some curb and gutters, and other hazardous and safety problems. This project will also allow for the purchase of additional roads signs, street markings, reflectors, school and pedestrian crossing markings, and other road safety features. The draft 2008 CNMI Highway Comprehensive Master Plan provides a full analysis of recommended improvements and cost/benefit analysis. The plan identifies two short-term goals of (1) implementing a Roadway Pavement and Delineation Maintenance and Improvement Program and (2) Roadway Classifications.

The following long-term projects are identified for Tinian:

- Upgrade and pave roadways and construct pedestrian facilities in San Jose Village
- Upgrade and improve Broadway from Route 201 south to Limestone Forest Trail (CNMI Department of Commerce 2009).

TNI Fuel Farm. In order to be a "complete" facility that can accommodate various types of aircraft flying direct from Asia, TNI will need refueling capability. Having a facility on Tinian will also potentially help reduce the cost of aviation fuel, facilitating travel (CNMI Department of Commerce 2009).

Tinian Seaport Rehabilitation. The Tinian seaport is critical to Tinian. The existing breakwater was built after World War II and has deteriorated over time. It does not protect the harbor from large swells and storm damage to dock facilities. In its current state, a large storm could destroy the existing seawall and will add additional cost to dredge the harbor repeatedly. Repairing the seawall is critical to maintaining the long-term continuous and safe use of the port. This project will require planning, environmental studies, and construction. A continuing decline in the current state of the seawall will cause more economic damage to the island. A state of emergency was declared for the harbor in 2007 when part of Tinian transportation infrastructure nearly collapsed due to severe storm damage and failure to repair damages immediately (CNMI Department of Commerce 2009).

Tinian Seaport Rehabilitation- Dredging. The Tinian Seaport serves as the major mode of transportation of goods and services for Tinian. The port will also be the main conduit to move heavy equipment and military goods into Tinian if DOD uses Tinian for military training exercises. Currently the waterway has a 28-foot draft which is sufficient to meet the local needs. This dredging project has been separated from the other aspects of the Tinian Seaport Rehabilitation because any dredging beyond 28 feet is required by the military, not the CNMI/Tinian needs. This project requires a plethora of planning and environmental studies and has a level of high costs. However, it is critical to every aspect of this island's economy (CNMI Department of Commerce 2009).

Casino Resort Development. There are five gaming licenses that are available for the Island of Tinian. One license is currently issued to the Tinian Dynasty, the existing hotel casino. The other four licenses are available and tentatively proposed and planned for development, but on hold due to immigration changes and downturn of the economy. Two projects are specifically planned, including the development of casino resorts by Neo Gold Wings and Marianas Resort Development Co. (MRDC). MRDC plans to lease 337 acres (136.5 hectares) of public land on Tinian to build the $300-million Matua Bay Casino Resort on Tinian, which includes an 18-hole championship golf course and hotel casino (Saipan Tribune 2011b). Phase I of MRDC's project will be completed after an initial investment of more than $170 million. It will involve the construction of a 300-room hotel casino, with 100 full suites and 200 junior suites, four full-service restaurants, a spa, wedding chapel, shopping arcade, and a convention facility that will accommodate 600 people. The initial phase, expected to take 16 to 24 months, will also culminate in a completion of an 18-hole championship golf course, the first on the Island of Tinian. Phase II of the project will involve the construction of luxury bungalows and additional rooms at the hotel casino (Saipan Tribune 2007). Details of the Neo Gold Wings development are not yet developed or released.

5.3 Cumulative Effects Analysis

5.3.1 Noise

Short- and long-term, minor to moderate, adverse, cumulative impacts on the noise environment would be expected.

This EIS addresses the ground movements and immediate approaches and departures at the airport alternative locations during unit-level training and exercises. Actual air warfare and air logistics training (i.e., above 10,000 feet) are addressed by the MIRC EIS, for which a ROD was issued. This EIS does not propose or analyze increased air operations beyond what is addressed by the MIRC EIS (DON 2010). In addition, this EIS addresses the potential increase in civilian operations from the airfield improvements that would occur under the alternatives. As discussed in **Sections 4.1.1.2** and **4.1.2.2**, the aircraft operations under the Baseline Scenario were increased by 15 percent to account for this potential increase. Therefore, no cumulative impacts would be expected on the noise environment due to the air operations discussed in this EIS and the MIRC EIS.

The ISR/Strike EIS establishes the strike group, including 12 aerial refueling tankers, and beddown aircraft at Andersen AFB that would be used during divert activities and exercises. Since the aircraft analyzed in the ISR/Strike EIS would be used during divert exercises, there would be no cumulative impacts on the noise environment from air operations of these aircraft.

5.3.1.1 Alternative 1 – GSN (Preferred Alternative)

Short-term, minor to moderate, adverse, cumulative noise impacts could occur. Numerous construction projects are proposed on Saipan. At this time, many of these projects do not have definitive locations or construction dates. Under Alternative 1, vehicle traffic would increase on a short-term basis during construction activities and on a long-term, periodic basis with the delivery of fuel. Fuel truck deliveries would occur during a 14-day period initially and then throughout the 8 weeks of anticipated operations each year. The additional truck traffic would use existing roadways commonly used by similar delivery trucks on each island. The increase of roadway vehicles as compared to existing average daily traffic on these roadways would not present a significant increase in current noise levels. However, the increase of traffic analyzed in this EIS combined with construction vehicles from potential projects on Saipan could result in periodic minor to moderate, adverse, cumulative impacts on the noise environment, depending on the location of the site and the construction date.

In the Feasibility Assessment for the Establishment of Special Use Airspace for Marine Corps Training Activities on the islands of Guam, Tinian, and Pagan, October 2011, one of alternatives includes the construction of four firing ranges on the northern end of Tinian. The proposed ranges would affect GSN aircraft approach procedures. This could impact noise levels around the airport since aircraft arriving at GSN could be required fly at different elevations if the approach procedures were changed.

5.3.1.2 Alternative 2 – TNI

Short-term, minor to major, adverse cumulative noise impacts could occur. Numerous construction projects are proposed on Tinian. At this time, many of these projects do not have definitive locations or construction dates. Under Alternative 2, vehicle traffic would increase on a short-term basis during construction activities and on a long-term, periodic basis with the delivery of fuel. Fuel truck deliveries would occur during a 14-day period initially and then throughout the 8 weeks of anticipated operations each year. The additional truck traffic would use existing roadways commonly used by similar delivery trucks on each island. The increase of roadway vehicles as compared to existing average daily traffic on these roadways would not present a significant increase in current noise levels. However, the increase of traffic analyzed in this EIS combined with construction vehicles from potential projects on Tinian could result in periodic minor to moderate, adverse, cumulative impacts on the noise environment, depending on the location of the site and the construction date.

Intermittent, long-term, moderate, adverse cumulative impacts on noise could occur. In the JGPO EIS, the proposed military aircraft operations were compared to the number of existing operations at TNI. The JGPO EIS listed a range of percentage increases under that proposed action, with the greatest increase at 14 percent with the CH-46; it was stated that the noise impacts would be less than significant under this scenario. An analysis of the increase in DNL noise contours at TNI was not completed for the JGPO EIS. The increase in aircraft operations discussed in the JGPO EIS combined with increase in aircraft operations discussed in this EIS would increase noise levels around TNI if both projects were implemented. In addition, military training from these projects would occur at the same time. Therefore, adverse cumulative impacts on the noise environment from military training would be expected to be periodic and moderate.

The JGPO EIS shows small arms range noise contours in the Leaseback Area, which is north of TNI. Under Alternative 2–Medium and High Scenarios in this EIS, the noise contours at TNI would overlap with the small arms range noise contours shown in the JGPO EIS. This overlap would occur north of TNI in the Leaseback Area, which is military property. Consequently, noise-sensitive populations would not be impacted in this region.

Two casino resorts are planned on land leased to Neo Gold Wings and MRDC. Property leased to Neo Gold Wings is southeast of TNI and property leased to MRDC is directly south of TNI. Under Alternative 2–Medium Scenario, both of these properties are within the 65 and 70 dBA DNL noise contours. Under Alternative 2–High Scenario, these properties are within the 65 to 80 dBA DNL noise contours. USAF guidelines do not recommend constructing resorts within the 75 to 80+ dBA DNL noise contours. Within the 65 to 74 dBA DNL noise contours, resorts are generally considered compatible but with restrictions.

5.3.2 Air Quality

Short- and long-term, minor, adverse cumulative impacts on local and regional air quality would be anticipated from implementation of the Proposed Action. Cumulative impacts from proposed airfield operations were already analyzed in the ISR/Strike EIS and the MIRC EIS

5.3.2.1 Alternative 1 – GSN (Preferred Alternative)

Saipan is within the CNMI and is designated as attainment/unclassifiable for all criteria pollutants. All proposed construction projects under Alternative 1 would have short-term, minor, adverse cumulative impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would generate air emissions during construction include the primary and secondary road resurfacing and hazard elimination, water system improvements, water/wastewater system, airport fuel storage facility, and Commonwealth Health Center improvements would generate criteria air pollutant emissions. Even if construction activities from these other regional actions were to occur at the same time as Alternative 1, no significant cumulative impacts on local and regional air quality would occur.

All proposed operational actions under Alternative 1 would have periodic, minor, adverse cumulative impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would result in new sources of air emissions during the operation phase of Alternative 1 include the water/wastewater system (process emissions) and the airport fuel storage facility (process emissions). Even if operational activities from these other regional actions were to occur at the same time as Alternative 1, no significant cumulative impacts on local and regional air quality could occur.

5.3.2.2 Alternative 2 – TNI

Tinian is within the CNMI and is designated as attainment/unclassifiable for all criteria pollutants. All proposed construction projects under Alternative 2 would have short-term, minor, adverse cumulative impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would generate air emissions during construction include primary and secondary road resurfacing and hazard elimination, airport fuel farm, and casino resort development. Even if construction activities from these other regional actions were to occur at the same time as Alternative 2, no significant cumulative impacts on local and regional air quality would occur.

All proposed operational actions under Alternative 2 would have periodic, minor, adverse cumulative impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would result in new sources of air emissions during the operational phase of Alternative 2 include the Guam and CNMI

Military Relocation EIS military training (firing ranges, off-road vehicle emissions), airport fuel farm (process emissions), and casino resort development (process emissions). Even if operational activities from these other regional actions were to occur at the same time as Alternative 2, no significant cumulative impacts on local and regional air quality could occur.

5.3.3 Airspace Management and Airfield Operations

Minor to moderate, adverse, cumulative impacts would be expected on airspace and airfield operations from the proposed action. For this analysis, elements of the proposed action—including runway dimensions, aircraft parking apron size, airfield hours of operations, IFR capabilities, hazardous cargo areas, arm/de-arm pads, aircraft refueling capabilities, munitions storage area, arresting systems, ATC services, and CPA services—were considered in relation to other past, present, and reasonably foreseeable future actions. Past and present actions on Saipan and Tinian were included in the description of the existing environment and the potential effects of implementing the proposed action and alternatives are discussed in **Section 4.3**.

This section concentrates on the potential for cumulative impacts on airspace and airfield operations as a result of the proposed action when implemented along with reasonably foreseeable future actions. **Table 5.3-1** identifies the reasonably foreseeable future actions that could affect airspace and airfields on Saipan and Tinian. A discussion of the potential cumulative effects associated with each alternative follows.

Table 5.3-1. Reasonably Foreseeable Future Actions that Impact Airspace and Airfields

Project	Description
NAVAIR Proposed BAMS Beddown at Andersen AFB	Construction of an additional hangar and the beddown of up to 22 BAMS aircraft at Andersen AFB. BAMS Training is covered in the MIRC.
CNMI Government - CPA GSN Fuel Storage Facility	GSN is the largest of the CNMI and does have the capability to refuel large aircraft. The need for expanding the fuel farm facility is to provide an opportunity for competition and lower prices to help stimulate more air international air service and tourism as requested by the airlines.
CNMI Government - CPA ILS for TNI	The Municipality of Tinian believes that an ILS is necessary to bring more tourists to the island and remove a level of danger for large aircraft. Larger international aircraft require the ILS. The funds for this project have been set aside by the Tinian Mayor's office.
CNMI Government - CPA TNI Fuel Farm	In order to accommodate various types of aircraft flying directly from Asia, TNI will need refueling capability. Having a fuel farm facility on Tinian will also potentially help reduce the cost of aviation fuel, facilitating travel.

5.3.3.1 Alternative 1 – GSN (Preferred Alternative)

Under Alternative 1, each proposed construction and implementation activity has a short-term, minor to moderate, direct, adverse impact on airspace and airport operations as a result of temporary airfield obstructions or from possible airspace obstruction. Long-term, direct, moderate, beneficial impacts on the airspace and airfield would be expected from implementation of the jet fuel receiving, storage, and distribution system.

Direct impacts on airfield operations from construction would be short-term, with the location changing within the construction footprint throughout the construction activities. Simultaneous construction activities by DOD, as a part of the proposed action and by the CPA to improve fuel storage and dispersing facilities, could result in short-term, moderate impacts on airfield operations. Adequate planning and coordination between the construction activity and CPA would reduce most moderate, adverse impacts to a minor level. Resulting facilities (e.g., hangar, fuel tanks) would require evaluation under the requirements of FAR Part 77 and subsequent possible modification of approach procedures to address obstacle clearance. Fuel capacity requirements driving the size of the fuel tanks for multiple actions could affect required procedure modification.

Long-term, direct, moderate, adverse cumulative impacts on airspace and airfield operations would be expected from implementation of the Proposed Action. In the Feasibility Assessment for the Establishment of Special Use Airspace for Marine Corps Training Activities on the islands of Guam, Tinian, and Pagan, October 2011, one of alternatives includes the construction of four firing ranges on the northern end of Tinian. The proposed ranges would affect GSN aircraft approach procedures, which could increase potential delays to commercial air traffic and would require increased ATC support to maintain requirements of the existing airspace parameters. Adverse impacts would be minimized and manageable through close coordination between military trainers, CPA, and ATC; restructured airspace to address overlap of controls on airspace by the various activities; and the installation of radar capabilities on Tinian. Without restructured airspace, increased NAVAIDs and local ATC presence, moderately adverse cumulative impacts on civilian aviation could occur as a result of this increased military air traffic in the area.

5.3.3.2 Alternative 2 – TNI

Cumulative impacts from the proposed action's construction activities on Tinian would be similar to those identified for Alternative 1 – GSN. Short- and long-term, direct, minor to moderate, adverse cumulative impacts on airspace and airfield operations would be expected. Several construction projects are planned for Tinian, such as Marines Corps relocation, casino resort development, and defense training (which would require clearing, construction, and live-fire ranges); however, construction activities would have a minor to moderate impact on TNI air operations because only small commuter aircraft operate out of TNI. Additionally, flexibility in timing of commuter flights and the ability to establish routine timing for the commuter flights, in close coordination with the construction planners, would reduce potential impacts.

In the Feasibility Assessment for the Establishment of Special Use Airspace for Marine Corps Training Activities on the islands of Guam, Tinian, and Pagan, October 2011, one of alternatives includes the construction of four firing ranges on the northern end of Tinian. The proposed ranges would affect GSN aircraft approach procedures which could increase potential delays to commercial air traffic and would require increased ATC support to maintain requirements of the existing airspace parameters. Adverse impacts would be minimized and manageable through close coordination between military trainers, CPA, and ATC; restructured airspace to address overlap of controls on airspace by the various activities; and with the installation of radar capabilities on Tinian. Without restructured airspace, increased NAVAIDs and local ATC presence, moderately adverse cumulative impacts on civilian aviation could occur as a result of this increased military air traffic in the area.

5.3.4 Geological Resources and Soils

5.3.4.1 Alternative 1 – GSN (Preferred Alternative)

Individually, all construction and utility installation activities could have short-term, negligible to minor, adverse impacts as a result of vegetation removal, compaction of surrounding soils, and increased soil erosion and sedimentation. Cumulatively, impacts on geological resources would be expected to be short- and long-term, minor to moderate, and adverse. Direct impacts on topography, geology, and soils from construction would be localized to the site that is being developed. Implementation of erosion- and sediment-control BMPs would be expected to limit potentially adverse, cumulative impacts. All new facilities would be designed in accordance with the CNMI's Building Safety Code, which would cumulatively reduce potential for adverse impacts following a seismic event or during a typhoon.

Soil surveys should be conducted prior to any ground-disturbing activities. Prior to construction activities in areas of possible contamination, soils would be sampled to determine the extent of contamination, and remediated in accordance with laws and regulations. If results of the sampling indicated the presence of contamination, remediation efforts would take place prior to commencement of construction activities. The handling, storage, transportation, and disposal of hazardous substances would be conducted in accordance with applicable laws and regulations. Long-term, beneficial, cumulative impacts would occur from the removal of contaminated soils.

5.3.4.2 Alternative 2 – TNI

Cumulatively, impacts on geological resources would be expected to be short- and long-term, minor to moderate, and adverse. Cumulative impacts under Alternative 2 would be similar to, but greater than, those described for Alternative 1 as more land would likely be disturbed as a result of Marines Corps relocation, casino resort development, and defense training, which require clearing, construction (introduction of impervious surfaces), and live-fire ranges. Live-fire ranges would probably involve grading so an appropriate line-of-sight could be obtained, and soil could be excavated for installation of stationary and moving targets. Grading and compaction of soil would result in disturbance of soil structure, resulting in increased storm water runoff and erosion and sedimentation.

5.3.5 Water Resources

5.3.5.1 Alternative 1 – GSN (Preferred Alternative)

Short-term, minor, adverse, cumulative impacts on the water resources of Saipan could occur from earth-disturbing construction activities from Alternative 1 and other past, present, and reasonably foreseeable actions. An increase in earth-disturbing activities would increase potential for soil erosion and sedimentation within fresh water bodies and nearshore waters on Saipan. Implementation of soil erosion and sedimentation controls and storm water pollution prevention at construction sites would minimize the potential for adverse impacts from individual construction sites and, therefore, reduce potential cumulative impacts on water resources.

Long-term, minor to moderate, cumulative, adverse impacts on groundwater could occur from the overall increases in impervious surfaces on Saipan from the Proposed Action and other past, present, and reasonably foreseeable actions. Alternative 1 could result in the addition of 2,392,200 ft^2 (54.9 acres) of impervious surfaces. Additional proposed future construction projects on Saipan, including the GSN fuel facility expansion and road construction and resurfacing on the island, would result in additional impervious surfaces on the island and the increased prevention of rainwater infiltration into the underlying aquifer. In addition, construction activities could introduce pollutants into the underlying

aquifer due to accidental spills of petroleum or other pollutants. Adherence to Section 438 of the EISA and the CNMI DEQ/Guam Stormwater Management Manual would help mitigate these cumulative adverse impacts on groundwater supply and quality.

5.3.5.2 Alternative 2 – TNI

Short-term, minor, adverse, cumulative impacts on water resources at Tinian could occur from earth-disturbing construction activities from Alternative 2 and other past, present, and reasonably foreseeable actions. An increase in earth-disturbing activities would increase potential for soil erosion and sedimentation within fresh water bodies and nearshore waters on Tinian. Implementation of soil erosion and sedimentation controls and storm water pollution prevention at construction sites would minimize the potential for adverse impacts from individual construction sites and, therefore, reduce potential cumulative impacts on water resources.

Long-term, moderate, cumulative, adverse impacts on groundwater could occur from the overall increases in impervious surfaces on Tinian. Alternative 2 would result in the addition of 4,090,800 ft^2 (93.9 acres) of impervious surfaces. Additional proposed future construction projects on Tinian, including the TNI fuel farm, road construction and resurfacing, and casino resort development on the island, would result in additional impervious surfaces on Tinian and the increased prevention of rainwater infiltration into the underlying aquifer. In addition, construction activities could introduce pollutants into the underlying aquifer due to accidental spills of petroleum or other pollutants. Adherence to Section 438 of the EISA and the CNMI DEQ/Guam Stormwater Management Manual would help mitigate these cumulative adverse impacts on groundwater supply and quality.

5.3.6 Terrestrial Biological Resources

5.3.6.1 Alternative 1 – GSN (Preferred Alternative)

No cumulative impacts on vegetation would be expected. Other projects are ongoing or reasonably foreseeable on Saipan. There could be some overlap in the schedules of construction activities for Alternative 1 and those of other planned construction projects. Impacts on vegetation associated with other projects could occur. However, Alternative 1 is not expected to impact native vegetation, and, therefore, would not contribute to cumulative impacts on vegetation at GSN.

Short- and long-term, minor, adverse, cumulative impacts on wildlife and threatened and endangered species could occur. If construction projects overlap, this could also result in increased ambient noise levels. Wildlife could be permanently displaced from the areas and temporarily dispersed from areas adjacent to the project areas during periods of construction activities. Nightingale reed warbler habitat and potentially reed warbler territories would be affected by Alternative 1. Impacts will be determined based on ongoing surveys and consultation with USFWS, but loss of nightingale reed warbler habitat is anticipated. Other ongoing and reasonably foreseeable projects on Saipan might also result in loss of tangantangan and other suitable nightingale reed warbler, which would have a long-term, adverse, cumulative impact. However, mitigation would be implemented for loss of any active nightingale reed warbler territories determined to occur in the Project Area; therefore, Alternative 1 would be expected to have a minor contribution to cumulative impacts on nightingale reed warblers.

5.3.6.2 Alternative 2 – TNI

No cumulative impacts on vegetation would be expected. Other projects are ongoing or reasonably foreseeable on Tinian. There could be some overlap in the schedules of construction activities for Alternative 2 and those of other planned construction projects. Impacts on vegetation associated with

other projects could occur. However, Alternative 2 is not expected to impact native vegetation, and, therefore, would not contribute to cumulative impacts on vegetation at TNI.

Short- and long-term, minor, adverse, cumulative impacts on wildlife could occur. If construction projects overlap, this could also result in increased ambient noise levels. Wildlife could be permanently displaced from the areas and temporarily dispersed from areas adjacent to the project areas during periods of construction activities. There are no known threatened and endangered species on Tinian. Although growth and development can be expected to continue outside of the airport and within the surrounding natural areas, cumulative adverse impacts on these resources would not be expected. Alternative 2 would not contribute to cumulative impacts on threatened and endangered species when combined with other projects.

5.3.7 Marine Biological Resources

5.3.7.1 Alternative 1 – GSN (Preferred Alternative)

Sea Turtles. Intermittent, short-term, negligible, adverse cumulative impacts on sea turtles would occur under Alternative 1. Some of the DOD redevelopment projects in the region could result in increases in noise from low-flying aircraft or other training activities. These include activities associated with MIRC, operation of ISR/Strike Capability, and MITT activities. While these activities have the potential to result in an increase in noise over the nearshore waters and beaches of Saipan, this impact is expected to be negligible. As with the noise associated with take-offs and landings under Alternative 1, it is unlikely that low-flying aircraft associated with these projects would result in more than a negligible increase in noise over the beaches where sea turtles nest in Saipan. As such, Alternative 1 would have a negligible contribution to cumulative impacts.

Marine Mammals. Intermittent, short-term, negligible, adverse cumulative impacts on marine mammals would occur under Alternative 1. Some of the DOD redevelopment projects in the region could result in increases in noise from low-flying aircraft or other training activities. These include activities associated with MIRC, operation of ISR/Strike Capability, and MITT activities. While these activities have the potential to result in an increase in noise over the nearshore waters Saipan, this impact is expected to be negligible. It is extremely unlikely that individual animals would be repeatedly exposed to low-altitude overflights. As such, Alternative 1 would have a negligible contribution on cumulative impacts.

5.3.7.2 Alternative 2 – TNI

Sea Turtles. Intermittent short-term, negligible, adverse cumulative impacts on sea turtles would occur under Alternative 2. Some of the DOD redevelopment projects in the region could result in increases in noise from low-flying aircraft or other training activities. These include activities associated with MIRC, operation of ISR/Strike Capability, and MITT activities. Additionally, Tinian seaport redevelopment could result in an increase in noise in the immediate beaches and nearshore waters. While these activities have the potential to result in an increase in noise over the nearshore waters and beaches of Tinian, this impact is expected to be negligible. The largest concentration of sea turtles occurs at Tinian Harbor; however, Alternative 2 is not expected to result in an increase in noise at Tinian Harbor. As such, Alternative 2 would have a negligible contribution to cumulative impacts.

Marine Mammals. Intermittent, short-term, negligible, adverse cumulative impacts on marine mammals would occur under Alternative 2. Some of the DOD redevelopment projects in the region could result in increases in noise from low-flying aircraft or other training activities. These include activities associated with MIRC, operation of ISR/Strike Capability, and MITT activities. Additionally, Tinian seaport redevelopment and dredging could result in an increase in noise in the immediate beaches and nearshore

waters. It is extremely unlikely that individual animals would be repeatedly exposed to low-altitude overflights of this project, the DOD redevelopment projects, and the noise associated with Tinian seaport redevelopment. As such, Alternative 2 would have a negligible contribution to cumulative impacts.

5.3.8 Cultural Resources

Evaluation of cumulative impacts on cultural resources involves consideration of NRHP-eligible or listed resources' response to change and capacity to withstand stress; determination of stresses that would be placed on such resources by the proposed construction and implementation activities; and comparison of these impacts to a baseline condition assessment of those resources (i.e., their current condition). As presented in **Section 3.8**, cultural resources within the study area consist of prehistoric and historic archaeological sites, historic engineering features, and historic architecture. It is therefore pertinent to discuss, in a general way, the relative susceptibility of these types of resources to change and their capacity to withstand stress. While all of these resource types are susceptible to destruction during construction, their susceptibility to indirect and long-term impacts differ considerably. While the specific processes of site transformation over time are debated by archaeologists, for conservation and preservation purposes, archaeological sites can be thought of as high-entropy, low-energy structures compared to low-entropy, high-energy structures, such as standing historic architecture. Therefore, archaeological sites are relatively stable in the absence of direct disturbance whereas standing structures are less so.

Most of the long-term impacts on cultural resources from the proposed divert activities would result from increased use of the study area during training exercises as emergencies requiring actual diversion of personnel and equipment would, by definition, be rare. Nevertheless, in both cases, long-term impacts on historic fabric could develop from increased numbers of take-offs and landings by aircraft; increased ground vehicular traffic, especially between fuel ports and the airfields; and increased numbers of military and civilian personnel living and working in the study area during divert activities and training exercises.

5.3.8.1 Alternative 1 – GSN (Preferred Alternative)

Cumulative impacts on prehistoric archaeological sites are not expected. There are no known NRHP-eligible, pre-contact archaeological sites in the study area that are threatened directly by construction-phase activities, and none are likely to exist given the tremendous amount of disturbance that occurred in the area as a result of World War II and subsequent construction at the airport. However, any as yet unknown pre-contact archaeological sites that might exist in the study area are unlikely to be threatened over time by the types of secondary effects that would be expected from implementation of Alternative 1.

Alternative 1 could contribute to long-term, indirect, adverse cumulative impacts on historical resources associated with the Japanese and U.S. occupations prior to, during, and immediately following WWII. Most of the historic structures in the Isley/Aslito field historic district and landmark are far enough away from the divert activity and training exercise areas proposed under Alternative 1 that long-term, cumulative impacts on these structures are expected to be minimal. There are, however, two exceptions: (1) the proposed parking aprons along the north side of GSN's runways, and (2) the proposed BEAR-kit site at the north end of an existing soccer field between Flame Tree and Airport Roads. In both cases the impacted resources are concrete air raid bunkers associated with the Japanese military build-up before World War II and defense during World War II. Six such structures lie in very close proximity to the proposed parking aprons while two lie at one edge of the field that is proposed for the BEAR-kit site. Direct avoidance of these resources is already planned during construction and implementation. However, the structures are susceptible to secondary impacts from vibration-related deterioration due to heavy aircraft traffic at the parking aprons and increased vehicle traffic and personnel presence at the

BEAR-kit site. In addition, the latter could face an increased risk of vandalism from military and civilian personnel stationed at the BEAR-kit site during divert activities and training exercises. Further, the district as a whole faces increased fragmentation of its constituent parts from development. This process is already well underway from continued improvements for commercial air travel at GSN. However, impacts on the district's overall cohesiveness from divert-related construction and implementation activities are possible.

5.3.8.2 Alternative 2 – TNI

Alternative 2 has the potential to contribute to long-term, direct and indirect, adverse, cumulative impacts on historic and archaeological resources. Potential cumulative impacts would involve damage to the four NRHP-listed historic structures in San Jose due to increased heavy vehicle traffic associated with fuel and other supply traffic from the harbor to the airport. This possibility would be evaluated by determining the actual proximity of supply truck routes from Tinian's harbor to TNI and comparing the magnitude of traffic volumes and weights under current conditions and under the conditions to current traffic volumes and weights. If the change is minor, or if the historic structures are sufficient distance from the truck routes to result in no adverse impacts, there would be no cumulative impacts on historic structures in San Jose under Alternative 2. In addition, military use of TNI could have cumulative impacts on the Japanese-era Gurguan Airfield historic site, the U.S. WWII-era West Field site, and the WWII-era U.S. Naval Air Base HQ, the HQ LAA 18th AAA, and the D Battery, 18th AAA site. These sites could face an increased risk of vandalism from military and civilian personnel stationed at the site during divert activities and training exercises. These sites are also susceptible to secondary impacts from vibration-related deterioration due to heavy aircraft traffic at the airport. Finally, cumulative impacts are possible on unrecorded archaeological sites and historic structures in the project area, which has not been completely surveyed for archaeological or architectural resources. This issue will be resolved through archaeological and historic building surveys prior to construction.

5.3.9 Recreation

5.3.9.1 Alternative 1 – GSN (Preferred Alternative)

Short-term, minor, adverse, cumulative impacts and long-term, minor, beneficial cumulative impacts could occur from construction activities. Alternative 1 would generally be consistent with the present and foreseeable use of recreational activities when combined with other projects, such as road resurfacing and hazard elimination, MIRC exercises, or GSN fuel facility expansion as part of the Comprehensive Economic Development Strategic Plan for the CNMI. Short-term, cumulative, minor, adverse, impacts on recreational resources could occur if multiple construction projects associated with road resurfacing, upgrading the lighting system, construction described in Alternative 1, and other construction projects were to occur simultaneously. Travel time to recreational resources could be increased, which could inconvenience tourists. Once completed, an increase in the number of travelers on newly constructed roads could occur; however, access to recreational resources would still be possible and, once completed, proposed roadway improvements could reduce travel times to available recreational resources, resulting in long-term, minor, beneficial cumulative impacts on recreational resources. Alternative 1 would have a negligible contribution to these long-term, beneficial impacts.

Long-term, minor to moderate, beneficial and adverse, cumulative impacts would be expected on recreational resources from GSN fuel facility expansion associated with the Comprehensive Economic Development Strategic Plan and Alternative 1. An increased fuel capacity would allow GSN to refuel a larger number of planes, which could increase international air service and tourism. Recreational resources throughout the island would subsequently become more frequently used; therefore, long-term, moderate, beneficial, cumulative impacts would be expected.

5.3.9.2 Alternative 2 – TNI

Short-term, minor, adverse, cumulative impacts could occur if construction associated with roadway improvements, airport and seaport upgrades (as proposed in Alternative 2 and other development projects), and casino development were to occur simultaneously. Travel time to recreational resources could be increased; however, access to recreational activities would not be restricted.

As projects are completed (e.g., construction of roadway improvements, fuel upgrades at the airport and seaport, casino development), long-term, moderate, beneficial, cumulative impacts on recreational resources would be expected. Having an increased fuel capacity would reduce travel costs and could increase the use of the airfield. An increase in the use of recreational resources could be expected due to the increase in travelers to the island. Casino resort development would increase the number of tourists and recreational opportunities on Tinian. Lodging on the island would expand and the initial phase of casino development would bring an 18-hole championship golf course to the island.

Intermittent, long-term, minor to moderate, adverse, cumulative impacts would be expected on recreational resources from the exercises described in the MIRC EIS, JGPO EIS, and Alternative 2. Restricting access to recreational resources during training activities and the noise associated with those activities could result in a reduction of recreational activities. Training activities would not occur year-round; however, cumulative exercises on Tinian would be more frequent that those on Saipan.

Long-term, minor, adverse, cumulative impacts on recreational resources associated with increased noise levels at TNI would be similar to, but less substantial than those described for Alternative 1, due to the lower number of recreational resources near the airport.

5.3.10 Land Use

5.3.10.1 Alternative 1 – GSN (Preferred Alternative)

No cumulative impacts on land and submerged land use in Saipan would occur. Alternative 1 is consistent with the Saipan Zoning Law of 2008.

5.3.10.2 Alternative 2 – TNI

No cumulative impacts on land and submerged land use in Tinian would occur. Alternative 2 would be consistent with the CNMI DPL land use designations.

5.3.11 Transportation

5.3.11.1 Alternative 1 – GSN (Preferred Alternative)

Saipan has the largest roadway network in the Mariana Islands. Most roadways operate at an acceptable LOS. The exception is Beach Road north of As Perdido Road, which operates at LOS E or F. Pavement conditions on Saipan tend to be poor as a result of drainage issues and the use of coral and acidic-based pavement materials (CNMI DPW 2009). Short-term, minor to moderate, adverse, cumulative impacts and long-term, minor to moderate, adverse, cumulative impacts would be expected on ground transportation in Saipan.

Individually, all ongoing and reasonably foreseeable construction activities on Saipan could have short-term, negligible to minor, adverse impacts on the local transportation network. Impacts on transportation during construction activities include increased traffic congestion from workers commuting

to and from the job site, and increased delivery of goods and miscellaneous trips needed to support construction activities. Additionally, road maintenance and construction would be expected to result in lane or road closures, temporarily increasing traffic congestion and delays while active construction is occurring. Projects occurring at the same time and in the same vicinity have the greatest potential for adverse, cumulative impacts on the transportation network. Short-term, minor to moderate, adverse, cumulative impacts on transportation systems could occur.

Specific short-term road improvements along the proposed fuel truck route include the following (CNMI DPW 2009):

- Intersection modifications at Chalan Monsignor Guerrero and Chalan Pale Arnold
- Intersection modifications at Chalan Monsignor Guerrero and Beach Road
- Intersection modifications at Chalan Pale Arnold and Navy Hill Road
- Intersection modifications at Tun Herman Pan and Flame Tree Drive
- Intersection modifications at Beach Road and Chalan Monsignor Martinez
- New traffic signal installation at the intersection of Beach Road and Tun Segundo Street
- Pedestrian crossing relocation on Chalan Pale Arnold near Commonwealth
- Mid-block or signalized crosswalk additions on Beach Road
- Speed enforcement on Chalan Monsignor Guerrero and Chalan Pale Arnold
- Hazard elimination along Route 30 (Chalan Pale Arnold).

Specific long-range road improvements along the proposed fuel truck route include the following (CNMI DPW 2009):

- Construct pedestrian facilities and bike lanes along Chalan Pale Arnold
- Upgrade drainage along Chalan Monsignor Guerrero near Chalan Tun Herman Pan Road
- Widen Beach Road from Chalan Monsignor Guerrero to Afetna to install two-way left-turn lane
- Upgrade and improve Route 35 (Chalan Tun Herman Pan).

Other short- and long-term transportation improvements are also planned in the vicinity of the proposed fuel truck route. These road improvement projects would result in long-term, minor to moderate, beneficial impacts on the Saipan transportation network by increasing road safety and capacity. However, no cumulative beneficial impacts would be expected as a result of implementing the Proposed Action under Alternative 1. Ongoing or reasonably foreseeable projects that would be expected to dramatically increase the population have not been identified in this analysis, but the population has increased over the past few decades. It is reasonable to assume that population will continue to increase, independent of implementation of Alternative 1, and any population increase would add to existing road congestion. Planned road improvements would help accommodate some population growth. The long-term, periodic traffic increases associated with Alternative 1 would have a minor, adverse contribution to cumulative impacts on the Saipan transportation network.

5.3.11.2 Alternative 2 – TNI

All roadways in Tinian operate at LOS A. Pavement conditions tend to be poor as a result of drainage issues and the use of coral and acidic-based pavement materials (CNMI DPW 2009). Short-term, minor to moderate, adverse, cumulative impacts and long-term, minor to moderate, beneficial, cumulative impacts would be expected on ground transportation in Tinian. Long-term, adverse, cumulative impacts would be minor.

Individually, all construction activities on Tinian could have short-term, negligible to minor, adverse impacts on the local transportation network. Impacts on transportation during construction-type activities include increased traffic congestion from workers commuting to and from the job site and increased delivery of goods and miscellaneous trips needed to support construction activities. Additionally, road maintenance and construction would be expected to result in lane or road closures, temporarily increasing traffic congestion and delays while active construction is occurring. Projects occurring at the same time and in the same vicinity have the greatest potential for adverse impacts on the transportation network. Short-term, minor to moderate, adverse impacts on transportation systems could occur.

Specific short-term road improvements include implementing a directional and guide sign program in San Jose Village, which is in the vicinity of the proposed fuel truck route. Long-term road improvement projects include upgrading and improving Broadway (south of the proposed fuel truck route); upgrading and paving roadways and constructing sidewalks in San Jose Village (near proposed fuel truck route); and upgrading major roadways in Lower Pina, Marpo, and Carolinas (east of fuel truck route) (CNMI DPW 2009). These road improvement projects would result in long-term, minor to moderate, beneficial impacts on the Tinian transportation network by increasing road safety and capacity. However, no cumulative beneficial impacts would be expected due to implementing the Proposed Action under Alternative 2. In addition to the implementation phase associated with Alternative 2, several projects are planned on Tinian that could result in increased roadway use, including the casino development and the relocated Marine Corps training and operations. However, since all roadways operate at an acceptable LOS and have substantial excess capacity, it is anticipated that long-term, cumulative impacts from increased traffic would be minor.

5.3.12 Hazardous Materials and Wastes

5.3.12.1 Alternative 1 – GSN (Preferred Alternative)

Short- and long-term, minor, adverse cumulative impacts associated with hazardous materials, hazardous wastes, and petroleum products would be expected from Alternative 1. Implementation of many of the projects identified in **Table 5-1** would require increased quantities of hazardous materials and petroleum products to be delivered, stored, and used on Saipan on a short-term basis during construction and on a long-term basis during facility operations. Increases in hazardous materials, hazardous wastes, and petroleum products when combined with the effects from Alternative 1 would not be significant. No cumulative impacts would result with respect to existing contamination areas, ACMs, LBP, PCB, pesticides, and radon.

5.3.12.2 Alternative 2 – TNI

Short- and long-term, minor, adverse cumulative impacts associated with hazardous materials, hazardous wastes, and petroleum products would be expected from Alternative 2. Implementation of many of the projects identified in **Table 5-1** would require increased quantities of hazardous materials and petroleum products to be delivered, stored, and used on Tinian on a short-term basis during construction and on a long-term basis during facility operations. A proposed project to construct an airport fuel farm at TNI to accommodate various types of commercial and private aircraft flying direct from Asia would provide TNI with additional jet fuel storage capacity and possibly jet fuel transfer infrastructure beyond that proposed under Alternative 2. Increases in hazardous materials, hazardous wastes, and petroleum products when combined with the effects from or Alternative 2 would not be significant. No cumulative impacts would result with respect to existing contamination areas, ACMs, LBP, PCB, pesticides, and radon.

5.3.13 Infrastructure and Utilities

5.3.13.1 Alternative 1 – GSN (Preferred Alternative)

Long-term, moderate, adverse and beneficial, cumulative impacts on several infrastructure resources would be expected. Intermittent, short-term, minor, adverse, cumulative impacts might also occur for utility interconnections during construction.

Implementation of Alternative 1 would contribute to long-term, moderate, beneficial, cumulative impacts on the infrastructure at the airfield, the communications system at GSN, and the aviation fuel supply system at the seaport and GSN.

The electrical system, storm water drainage and conveyances, wastewater system, and water supply system are in poor condition and require upgrades. There are ongoing or reasonably foreseeable projects to address some of these issues. Future projects to improve the electrical system include geothermal, wind, and solar power development. Additionally, P.L. 15-87 promotes the integration of renewable energy sources into the grid distribution system on Saipan (DON 2010a). The water/wastewater system will be undergoing planned upgrades until 2020. The water supply system is also going planned upgrades until 2020 to meet CWA and SDWA requirements. CNMI DEQ's storm water management regulations and BMPs help to control the storm water management issues. It is possible that development projects and increases in population on Saipan would increase the burden on the electrical, storm drainage, wastewater, and water supply systems, resulting in short-term, minor to moderate, adverse, cumulative impacts. However, it is anticipated that ongoing and reasonably foreseeable improvements to these infrastructure systems will help meet current and future demand and also improve utility reliability. Overall, long-term, minor to moderate, beneficial, cumulative impacts are anticipated from improvements.

Alternative 1 and other development projects would result in short- and long-term, minor, adverse cumulative impacts on the solid waste system. There would be no anticipated cumulative impacts on the heating and cooling and natural gas systems.

5.3.13.2 Alternative 2 – TNI

Long-term, moderate, adverse and beneficial, cumulative impacts on several infrastructure resources would be expected. Intermittent, short-term, minor, adverse, cumulative impacts might also occur for utility interconnections during construction.

Implementation of Alternative 2 and other ongoing and reasonably foreseeable projects would contribute to long-term, moderate, beneficial, cumulative impacts on TNI and seaport, airport communications system, and aviation fuel supply and refueling capability.

Tinian's electrical system is in good condition. Implementation of Alternative 2 and other ongoing and reasonably foreseeable projects (e.g., new casinos) would result in short- and long-term, minor, adverse cumulative impacts on the electrical system, particularly if several additional casinos open.

The water supply system on Tinian is sufficient; however, approximately 50 percent of the water supply is lost due to leaks in the system. Implementation of Alternative 2 and other ongoing and reasonably foreseeable projects (e.g., new casinos) would result in short- and long-term, minor, adverse cumulative impacts on the water supply system.

Storm water management is a major concern on Tinian. Past development activities on the island have resulted in storm water management issues. New development projects (e.g., new casinos) have the potential to result in short- and long-term, minor, adverse cumulative impacts on storm water management. CNMI DEQ's storm water management regulations and BMPs would help to control the storm water management issues.

All solid waste on Tinian is shipped off island for disposal. Implementation of Alternative 2 and ongoing and reasonably foreseeable projects would result in short- and long-term, moderate, adverse, cumulative impacts on the solid waste system.

Tinian has septic systems throughout the island; therefore, there would be no cumulative impacts on the wastewater system. Additionally, there would be no anticipated cumulative impacts on the heating and cooling and natural gas systems.

5.3.14 Socioeconomics and Environmental Justice

5.3.14.1 Alternative 1 – GSN (Preferred Alternative)

Socioeconomics

Population Characteristics. Short-term, adverse, cumulative impacts could occur. None of the projects considered in this cumulative analysis would directly result in significant permanent increases to the populations of Saipan, except perhaps casino resort development. Similar to Alternative 1, several development projects would likely result in short-term temporary and long-term periodic population increases in Saipan. The quantity and source of construction workers used for development projects are not known. However, due to the small workforces on Saipan it is likely that foreign workers would make up portions of the workforce on each project. If construction for Alternative 1 overlapped temporally with construction of other development projects, there could be a cumulative impact due to the combined temporary population increases.

Housing. Short-term, adverse, cumulative impacts could occur. The quantity and source of construction workers for all ongoing and reasonably foreseeable projects are not known. However, it is likely that foreign workers would make up portions of the construction workforce on each project, and these workers would need temporary housing. Saipan has a larger supply of possible housing than Tinian, although there is a limited supply of hotels and other housing units on both islands. If construction of the Proposed Action occurred simultaneous to the construction of other development projects, there would be a cumulative impact on housing due to possible shortages.

Economic Characteristics. Construction of other projects and the Proposed Action would result in short-term and long-term beneficial cumulative impacts on the economy of Saipan due to increases in employment and spending on goods and services. Indirect beneficial impacts would likely result from secondary increased spending from the increased population (construction workers and long-term personnel), and economic advantages of the increased efficiency and enhancement of infrastructure on Saipan. Therefore, combination of Alternative 1 with other cumulative projects would result in significant short-term and long-term, beneficial, cumulative impacts on the local economy.

Public Services. Short-term, adverse, cumulative impacts could occur. Most ongoing and reasonably foreseeable projects, including Alternative 1, would have adverse impacts on public services due to the associated short- and long-term population increases. Population increases would increase demand for public services such as medical, law enforcement, and firefighting services. These services, particularly medical care, are currently strained on Saipan, and it is anticipated that the services would not be able to

adequately manage additional demand. Cumulative impacts on public services would result from the construction and implementation of Alternative 1 combined with other projects.

Sociocultural Issues. Negligible to minor, adverse, cumulative impacts could occur. Alternative 1 would not have a significant impact on sociocultural issues. Some of the proposed activities would occur on land that could otherwise be used by local residents, and it would contribute to temporary and periodic population increases that could stress the local communities. Other cumulative projects could result in significant impacts on sociocultural issues in Saipan due to large influxes of temporary foreign workers and permanent displacement of local residents from areas. Cumulative impacts on sociocultural issues would occur, but it is not anticipated that these impacts would be significant.

Environmental Justice

Based on 2000 U.S. Census data, approximately 98 percent or more of the total populations of Saipan and Tinian are considered minority populations, while 28 percent to 50 percent of each island's population is low-income. The specific areas of impact for each cumulative project are not known; however, there is the potential under Alterative 1 for there to be disproportionately high and adverse impacts on minority or low-income populations due to an increase in aircraft noise. Therefore, there is the potential for disproportionately high and adverse cumulative impacts on minority or low-income populations.

5.3.14.2 Alternative 2 – TNI

Socioeconomics

Population Characteristics. Short-term, adverse, cumulative impacts could occur. Cumulative impacts under Alternative 2 would be similar to, but greater than, those described for Alternative 1. If several large construction projects overlapped temporally with Alternative 2 on Tinian, there could be a cumulative impact due to the combined temporary population increases.

Housing. Short-term, adverse, cumulative impacts could occur. Cumulative impacts under Alternative 2 would be similar to, but greater than, those described for Alternative 1. There is a smaller supply of possible housing on Tinian than Saipan, and a limited supply of hotels and other housing units on both islands. If several large construction projects overlapped temporally with Alternative 2 on Tinian, there could be adverse cumulative impacts because the existing housing supply is very low and would not be able to support increases needed for large construction projects.

Economic Characteristics. Short- and long-term beneficial impacts would be expected. Cumulative impacts under Alternative 2 would be similar to, but greater than, those described for Alternative 1. Alternative 2 could also result in adverse impacts on the local economy due to airport disruptions during construction and implementation, and from the 10,000-foot-long Runway Option that would require rerouting of Broadway and possible displacement of local ranchers. Combination of the adverse impacts of the Proposed Action with other cumulative projects would result in cumulative impacts. Cumulative impacts could occur on Tinian where other projects, including the training activities under the Guam and CNMI Military Relocation, would also periodically or permanently displace persons and place restrictions on land use that prevent its beneficial economic use.

Public Services. Short-term, adverse, cumulative impacts could occur. Cumulative impacts under Alternative 2 would be similar to those described for Alternative 1.

Sociocultural Issues. Negligible to minor, adverse, cumulative impacts could occur. Cumulative impacts under Alternative 2 would be similar to those described for Alternative 1.

Environmental Justice

Based on 2000 U.S. Census data, approximately 98 percent or more of the total populations of Saipan and Tinian are considered minority populations, while 28 percent to 50 percent of each island's population is low-income. The specific areas of impact for each cumulative project are not known; however, disproportionately high and adverse impacts on minority and low-income populations are not expected under Alternative 2. Therefore, disproportionately high and adverse cumulative impacts on minority or low-income populations are also not expected.

5.3.15 Human Health and Safety

5.3.15.1 Alternative 1 – GSN (Preferred Alternative)

Implementation of Alternative 1, when added to other past, current, and future projects, would result in various short-term and long-term cumulative impacts on health and safety. Short-term, minor, adverse, cumulative impacts could occur during construction, when activities necessary to construct the proposed airport and seaport infrastructure would accumulate with impacts from other projects under construction at Saipan at the same time. The short-term cumulative impacts would generally be on contractor health and safety and airfield safety from activities such as those that increase contractor exposure to hazardous work environments and hazardous materials, increase local construction traffic accessing sites, and create temporary airfield obstructions and changes. Adherence to OSHA, USAF AFOSH, and local regulations would minimize the potential for adverse effects on construction workers. Adherence to DOD, USAF, and FAA regulations and policies would reduce the adverse effects on airfield safety. Alternative 1 would not result in short-term, cumulative impacts on military health and safety, public health and safety, and explosive safety.

Long-term, adverse and beneficial, cumulative impacts on health and safety would be expected from the operational activities associated with Alternative 1. Long-term, negligible, adverse, cumulative impacts on contractor health and safety, public health and safety, and explosive safety could occur. Construction activities within QD safety zones must be coordinated with appropriate airfield or weapons safety personnel to ensure the safety of construction workers. Implementation of many of the projects identified in **Table 5-1** would result in long-term maintenance and repair of infrastructure by contactors and increases in aircraft and vehicle traffic on the island. Long-term, minor, beneficial, cumulative impacts on military health and safety and airfield safety would be expected from improvements at the airfield, including communications enhancements.

5.3.15.2 Alternative 2 – TNI

Short-term, minor, adverse, cumulative impacts from Alternative 2 could occur during construction, when activities necessary to construct the proposed airport and seaport infrastructure would accumulate with impacts from other projects under construction at Tinian at the same time. Similar to Alternative 1, the short-term, cumulative effects from Alternative 2 would generally be on contractor health and safety and airfield safety from activities such as those that increase contractor exposure to hazardous work environments and hazardous materials, increase local construction traffic accessing sites, and create temporary airfield obstructions and changes. Alternative 2 would not result in short-term, cumulative impacts on military health and safety, public health and safety, and explosive safety.

Long-term, adverse and beneficial, cumulative impacts on health and safety would be expected from the operational activities associated with Alternative 2. Long-term, negligible, adverse, cumulative effects on contractor health and safety and explosive safety could occur. Construction activities within QD safety zones must be coordinated with appropriate airfield or weapons safety personnel to ensure the safety of

construction workers. Implementation of many of the projects identified in **Table 5-1** would result in long-term maintenance and repair of infrastructure by contactors and increases in aircraft and vehicle traffic on the island, particularly from casino resort development. Long-term, minor, beneficial, cumulative impacts on military health and safety would be expected from improvements at the airfield, including communications enhancements. Long-term, minor, adverse, cumulative impacts on public health and safety and airfield safety would primarily be associated with the increased air traffic associated with the casino resort development.

5.4 Unavoidable Adverse Effects

Unavoidable adverse impacts would result from implementation of any of the alternatives. Minor, adverse impacts on soils, storm water management, vegetation, wildlife, air quality, the noise environment, and traffic congestion would be unavoidable during construction activities but not significant.

5.5 Relationship Between Short-Term Uses and Long-Term Productivity

Short-term uses of the biophysical components of the human environment include direct impacts, usually related to construction activities, which occur over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

This EIS identifies potential short-term, adverse impacts on the natural environment as a result of construction activities. These adverse impacts include noise emissions, air emissions, soil erosion, storm water runoff into surface water, and increased traffic. The long-term and essentially permanent loss of vegetation and soil to impervious surfaces would have irreversible and irretrievable impacts on natural resources. However, development of either the GSN or TNI would be expected to increase the long-term economic productivity of either Saipan or Tinian while protecting and preserving historical importance of the islands and their cultural resources.

5.6 Irreversible and Irretrievable Commitments of Resources

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended and facilities have been decommissioned. A commitment of resources is related to use or destruction of nonrenewable resources, and the impacts that loss will have on future generations.

Improvement and periodic use of the airport or airports selected would involve the irreversible and irretrievable commitment of materials, energy, terrestrial biota and soil, landfill space, and human resources. The impacts on these resources would be permanent.

Materials. Material resources irretrievably used for airport improvements would include steel, concrete, and other building materials. Such materials are not in short supply and would not be expected to limit other unrelated construction activities. The irretrievable use of material resources would not be considered significant.

Energy. Energy resources used for the Proposed Action and airport improvements would be irretrievably lost. These include fossil fuels (e.g., gasoline, diesel, natural gas) and electricity. During construction and utilization of the airport, gasoline and diesel fuel would be used for the operation of construction vehicles, transportation vehicles, and equipment. Overall, consumption of energy resources would not

place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Terrestrial Biota and Soils. Airport improvements would result in some irretrievable loss of wildlife habitat and soil resources. This result would be a permanent loss or conversion.

Landfill Space. The generation of construction debris and subsequent disposal of that debris in a landfill would be an irretrievable, adverse impact. Construction contractors would be expected to recycle, to the greatest extent possible, any debris that is generated. Recycling wastes would reduce irretrievable impacts on landfills. However, any waste that is generated by the Proposed Action that is disposed of in a landfill would be considered an irretrievable loss of that landfill space.

Human Resources. The use of human resources for construction is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources represents employment opportunities and is considered beneficial.

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8. Acronyms and Index

8.1 Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
A5U	Strategy, Policy, and Requirements Division
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Material
ADT	average daily traffic
AFB	Air Force Base
AFH	Air Force Handbook
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFPD	Air Force Policy Directive
AGE	Aerospace Ground Equipment
AGL	Above Ground Level
AIP	Agreed Implementation Plan
ALSF	approach lighting system with sequenced flashing
AMC	Air Mobility Command
AMDTF	U.S. Army Air and Missile Defense Task Force
AOR	Area of Responsibility
APC	Area of Particular Concern
APE	area of potential effect
AQCR	air quality control region
ARFF	Airport Rescue and Firefighting
ARTA	Aircraft Rescue Training Area
ARTCC	Air Route Traffic Control Center
AST	Aboveground Storage Tank
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
AWI	Air Wing Instruction
BAMS	Broad Area Maritime Surveillance
BASH	Bird/Wildlife Aircraft Strike Hazard
bbl(s)	barrel(s)
BEAR	Basic Expeditionary Airfield Resources
BFOL	Bomber Forward Operating Location
BGRT	Business Gross Revenue Tax
BMP	Best Management Practice
C&D	Construction and Development
CAA	Clean Air Act
CEDS	Comprehensive Economic Development Strategic
CEQ	Council on Environmental Quality
CERAP	FAA Center Radar Approach Control
CFR	Code of Federal Regulations
CGP	Construction General Permit
CHC	Commonwealth Health Center
ChST	Chamorro Standard Time
cm	centimeters
CMC	Commonwealth Code
CNMI	Commonwealth of the Northern Mariana Islands
CO	carbon monoxide
CO_2	carbon dioxide
CPA	Commonwealth Ports Authority
CRM	Coastal Resources Management
CTAF	Common Traffic Advisory Frequency
CUC	Commonwealth Utilities Corporation
CWA	Clean Water Act
CZ	clear zones
CZMA	Coastal Zone Management Act
DAWR	Division of Aquatic and Wildlife Resources
dBA	A-weighted decibel
DDESB	Department of Defense Explosive Safety Board
DEQ	Division of Environmental Quality

DLNR	Department of Lands and Natural Resources
DME	Distance Measuring Equipment
DNL	Day-Night Average Sound Level
DOD	Department of Defense
DOI	Department of the Interior
DON	Department of the Navy
DOT	Department of Transportation
DPL	Department of Public Lands
DPS	Department of Public Safety
DPW	Department of Public Works
DRMO	Defense Reutilization and Marketing Office
ECM	Earth-Covered Magazine
ECU	Environmental Control Unit
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
ELG	Effluent Limitation Guideline
EMUA	Exclusive Military Use Area
EO	Executive Order
ERS	Economic Restoration Summit
ESA	Endangered Species Act
ESCP	Erosion-and-sediment-control plan
ETL	Engineering Technical Letter
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FDM	Farrallon de Medinilla
FEMA	Federal Emergency Management Agency
FIR	Flight Information Region
FIRM	Flood Insurance Rate Map
FOD	foreign object debris
FPPA	Farmland Protection Policy Act
FR	Federal Register
ft^2	square feet
ft^3	cubic feet
FY	Fiscal Year
GATR	Guam Aviation Training Relocation
GEPA	Guam Environmental Protection Agency
GHG	greenhouse gas
gph	gallons per hour
gpm	gallons per minute
GRO	Rota International Airport
GSN	Francisco C. Ada Saipan International Airport
GUM	A.B. Won Pat International Airport
GVW	gross vehicle weight
HACCP	Hazard Analysis and Critical Control Points
HE	Harvest Eagle
HF	Harvest Falcon
HIES	Household, Income, and Expenditures Survey
HIRL	Runway Edge Lights, High Intensity
HPO	Historic Preservation Office
HSV	Hydrant Servicing Vehicle
HUD	Department of Housing and Urban Development
IBB	U.S. Government International Broadcasting Bureau
IBD	Inhabited Building Distance
ICE	Internal Combustion Engines
IFR	Instrument Flight Rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
ILS	Instrument Landing System
INRMP	Integrated Natural Resources Management Plan
IO	Isolated Occurrences
ISR/Strike	Intelligence, Surveillance, Reconnaissance, and Strike
J4	Joint Region Marianas Regional Engineer
JDF	Japanese Defense Force
JGPO	Joint Guam Program Office
JLOTS	Joint Logistics Over the Shore
JSF	Joint Strike Fighter

JTREG MARIANAS	Joint Region Marianas
kg	kilogram
km	kilometers
km^2	square kilometers
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
LBA	Leaseback Area
LBP	Lead-based Paint
LFB	low flyby
LFP	low flight pattern
LOC	Localizer
LOS	level of service
LTO	landing and takeoff
MAJCOM	Major Command
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
MARFORPAC	Marine Corps Forces Pacific
MBTA	Migratory Bird Treaty Act
mg/m^3	milligrams per cubic meter
mi^2	square miles
MIMC	Military Integration Management Committee
MIRC	Mariana Island Range Complex
MIRL	Runway Edge Lights, Medium Intensity
MITT	Mariana Islands Training and Testing
MLA	Military Lease Area
mm	millimeters
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
MOUT	Military Operations in Urban Terrain
mph	miles per hour
MRDC	Marianas Report Development Co.
MS4	Municipal Separate Storm Sewer System
MSDS	Material Safety Data Sheet
MSWF	Marpi Solid Waste Facility
MW	Megawatts
MWh	Megawatt Hours
NAAQS	National Ambient Air Quality Standards
NAVAID	Navigational Aid
NAVAIR	Naval Air Warfare
NAVFAC PAC	Naval Facilities Engineering Command, Pacific
NDB	Non-Directional Beacon
NEO	non-combatant evacuation operation
NEPA	National Environmental Policy Act
NEW	Net Explosive Weight
NHLS	National Historic Landmark System
NHPA	National Historic Preservation Act
NKK	Nanyo Kohatsu Kabushiki Kaisha
NM	nautical miles
NM^2	square nautical miles
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRIS	National Register Information System
NSPS	New Source Performance Standards
O_3	ozone
OEIS	Overseas Environmental Impact Statement
OFZ	Obstacle Free Zone
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Administration
P.L.	Public Law

PA	Programmatic Agreement
PACAF	Pacific Air Forces
PAPI	precision approach path indicator
Pb	lead
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
PM_{10}	Particulate Matter 10 microns in diameter
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter
PMIC	Pacific Marine Industrial Corporation
ppb	parts per billion
PPE	Personal Protection Equipment
ppm	parts per million
PSD	Federal Prevention of Significant Deterioration
PTR	Public Traffic Route
PVASI	Pulsating Visual Approach Slope Indicator
QD	Quantity-Distance
QDR	Quadrennial Defense Review
RCRA	Resource Conservation and Recovery Act
REIL	Runway End Identifier Lights
ROD	Record of Decision
ROPU	Reverse Osmosis Purification Unit
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RT	Revenue Tons
SAF/IE	Assistant Secretary of the Air Force for Installations, Environment and Logistics
SARS	severe acute respiratory syndrome
SCC	Source classification codes
SDC	Secondary Distribution Center
SDWA	Safe Drinking Water Act
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMS	Safety Management System
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SQG	Small Quantity Generator
SSPP	Strategic Sustainability Performance Plan
SUA	Special Use Airspace
SWPPP	Storm Water Pollution Prevention Plan
TERPS	Terminal instrument procedures
TGO	touch and go
TIM	Time-in-mode
TMDL	Total Maximum Daily Load
TNI	Tinian International Airport
TPH	Total Petroleum Hydrocarbon
tpy	Tons per year
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
UFC	Unified Facilities Criteria
UNICOM	universal communication
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USDA-WS	U.S. Department of Agriculture-Wildlife Services
USEPA	U.S. Environmental Protection Agency
USFJ	United States Forces Japan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps
yds^3	cubic yards
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
WHA	Wildlife Hazard Assessments
WHMP	Wildlife Hazard Management Plan
WTO	World Trade Organization

8.2 Index

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APPENDIX A

Cooperating Agency Requests and Acceptance Letters



Cooperating Agency Request Letter to the Department of the Navy and U.S. Marine Corps
September 20, 2011

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

20 SEP 2011

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT)

FROM: SAF/IEE

SUBJECT: Cooperating Agency (CA) Request for the Proposed U.S. Air Force Environmental Impact Statement (EIS) for Divert Activities and Exercises, Commonwealth of the Northern Mariana Islands

The Air Force requests Navy and Marine Corps formal participation in preparation of its Divert Activities and Exercises, Commonwealth of the Northern Mariana Islands EIS as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations, 40 CFR §1501.6, Cooperating agencies.

As a cooperating agency, the Air Force requests that you participate in various portions of the EIS development as may be required. Specifically, the Air Force requests your support as a Cooperating Agency by:

(a) Participating in scoping, review, and hearing processes;
(b) Making staff support available to enhance interdisciplinary analysis and review;
(c) Assuming responsibility, upon request, for developing information and preparing analyses on topics for which the Navy and/or Marine Corps has special expertise; and,
(d) Responding, in writing, to this request.

Air Force staff will contact Navy and Marine Corps staffs to address specific details of this cooperating agency relationship. To avoid unnecessary delays in the NEPA process, the Air Force must have timely support from cooperating agencies. In turn, the Air Force will ensure it provides the necessary information and related materials in a timely fashion to enable your agency to complete its review and respond promptly. Should you or your staff have questions regarding this memo, our points of contact are Mr. Jack Bush, Bases and Units (AF/A7CI), (703) 614-0237, email jack.bush@pentagon.af.mil; and Mr Les Reed, Office of the Deputy General Counsel (Environment & Installations), (703) 614-8071, email les.reed@pentagon.af.mil.

TIMOTHY K. BRIDGES
Deputy Assistant Secretary
(Environment, Safety & Occupational Health)

cc:
SAF/IEI/GCN
HQ AF/A4/7/8
HQMC I&L & DC/A
HQ PACAF/A5/A7

Cooperating Agency Request Letter to Department of Interior, Office of Insular Affairs
October 21, 2011

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

SAF/IEE
1665 Air Force Pentagon
Washington, DC 20330-1665

21 OCT 2011

Mr. Anthony Babauta
Assistant Secretary
U.S. Department of the Interior, Office of Insular Affairs
1849 C Street, NW
Washington, DC 20240

Dear Mr. Babauta:

The Air Force requests your formal participation in the preparation of an Environmental Impact Statement (EIS) for the Divert Activities and Exercises, Guam and Commonwealth of the Northern Mariana Islands as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations, 40 CFR § 1501.6 *Cooperating Agencies*.

As a cooperating agency, the Air Force requests your office participate in various portions of the EIS development as may be required. Specifically the Air Force asks for your support as a Cooperating Agency by:

a. Responding, in writing, to this request;
b. Participating in the scoping process;
c. Assuming responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which you have special expertise; and,
d. Making staff available for interdisciplinary reviews.

To avoid unnecessary delays in the NEPA process, the Air Force must have timely support from cooperating agencies. In turn, the Air Force will ensure it provides the necessary information and related materials in a timely fashion to enable your agency to complete its review and respond promptly. Should you or your staff have any questions regarding this letter, our point of contact is Mr. Mark Petersen, (808) 449-1078, Mark.Petersen@hickam.af.mil.

Sincerely,

TIMOTHY K. BRIDGES
Deputy Assistant Secretary of the Air Force
(Environment, Safety, & Occupational Health)

cc:
SAF/IEI
SAF/GCN
HQ USAF/A7C
HQ USAF/A3O
HQ PACAF/A7PI
ALCOM/J42

Cooperating Agency Request Letter to Department of Interior, U.S. Fish and Wildlife Service
October 21, 2011

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

21 OCT 2011

SAF/IEE
1665 Air Force Pentagon
Washington, DC 20330-1665

Mr. Daniel M. Ashe
Director
U.S. Department of the Interior, U.S. Fish and Wildlife Service
1849 C Street, NW
Washington, DC 20240

Dear Mr. Ashe:

The Air Force requests your formal participation in the preparation of an Environmental Impact Statement (EIS) for the Divert Activities and Exercises, Guam and Commonwealth of the Northern Mariana Islands as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations, 40 CFR § 1501.6 *Cooperating Agencies*.

As a cooperating agency, the Air Force requests your office participate in various portions of the EIS development as may be required. Specifically, the Air Force asks for your support as a Cooperating Agency by:

a. Responding, in writing, to this request;
b. Participating in the scoping process;
c. Assuming responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which you have special expertise; and,
d. Making staff available for interdisciplinary reviews.

To avoid unnecessary delays in the NEPA process, the Air Force must have timely support from cooperating agencies. In turn, the Air Force will ensure it provides the necessary information and related materials in a timely fashion to enable your agency to complete its review and respond promptly. Should you or your staff have any questions regarding this letter, our point of contact is Mr. Mark Petersen, (808) 449-1078, Mark.Petersen@hickam.af.mil.

Sincerely,

TIMOTHY K. BRIDGES
Deputy Assistant Secretary of the Air Force
(Environment, Safety, & Occupational Health)

cc:
SAF/IEI
SAF/GCN
HQ USAF/A7C
HQ USAF/A3O
HQ PACAF/A7PI
ALCOM/J42

Cooperating Agency Request Letter to Federal Aviation Administration
October 21, 2011

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

SAF/IEE
1665 Air Force Pentagon
Washington, DC 20330-1665

21 OCT 2011

Ms. Elizabeth L. Ray
Director, Airspace Services
Mission Support Services
Federal Aviation Administration
800 Independence Ave., SW, Suite 400 East
Washington, DC 20591

Dear Ms. Ray:

The Air Force requests your formal participation in the preparation of an Environmental Impact Statement (EIS) for the Divert Activities and Exercises, Guam and Commonwealth of the Northern Mariana Islands as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations, 40 CFR § 1501.6 *Cooperating Agencies*.

As a cooperating agency, the Air Force requests your office participate in various portions of the EIS development as may be required. Specifically, the Air Force asks for your support as a Cooperating Agency by:

a. Responding, in writing, to this request;
b. Participating in the scoping process;
c. Assuming responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which you have special expertise; and,
d. Making staff available for interdisciplinary reviews;

To avoid unnecessary delays in the NEPA process, the Air Force must have timely support from cooperating agencies. In turn, the Air Force will ensure it provides the necessary information and related materials in a timely fashion to enable your agency to complete its review and respond promptly. Should you or your staff have any questions regarding this letter, our point of contact is Mr. Mark Petersen (808) 449-1078, Mark.Petersen@hickam.af.mil.

Sincerely,

TIMOTHY K. BRIDGES
Deputy Assistant Secretary of the Air Force
(Environment, Safety, & Occupational Health)

cc:
SAF/IEI
SAF/GCN
HQ USAF/A7C
HQ USAF/A3O
HQ PACAF/A7PI
ALCOM/J42

Cooperating Agency Response Letter from the Department of the Navy
November 4, 2011

DEPARTMENT OF THE NAVY

OFFICE OF THE ASSISTANT SECRETARY
(ENERGY, INSTALLATIONS & ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON DC 20350 - 1000

NOV - 4 2011

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE (ENVIRONMENT, SAFETY AND OCCUPATIONAL HEALTH)

SUBJECT: Cooperating Agency Request for the Proposed U.S. Air Force Environmental Impact Statement for Divert Activities and Exercises, Commonwealth of the Northern Mariana Islands

The Department of the Navy agrees to participate as a Cooperating Agency in the preparation of the U.S. Air Force Divert Activities and Exercises, Commonwealth of the Northern Mariana Islands Environmental Impact Statement (EIS). As a Cooperating Agency the Department of the Navy agrees to:

- Participate in scoping, review and hearing processes;
- Make staff support available to enhance interdisciplinary analysis and reviews;
- Upon request, develop information and prepare analyses on topics for which the Navy and/or Marine Corps has special expertise.

The Navy and Marine Corps points of contact to support this cooperating agency relationship are: Ms. Sue Goodfellow, Ph.D., Head, Planning and Conservation Section, Headquarters, U.S. Marine Corps (GF/MCI-COM), (571) 256-2781, email: sue.goodfellow@usmc.mil and Mr. Neil Sheehan, Environmental Planning Program Manager, Commander Pacific Fleet, (808) 474-7836, email: neil.a.sheehan@navy.mil.

The Department of the Navy appreciates being afforded this opportunity to participate as a cooperating agency and looks forward to working closely with the Air Force on this important environmental planning effort.

Sincerely,

Donald R. Schregardus
Deputy Assistant Secretary of the Navy
(Environment)

Copy to:
OPNAV N45
ADC I&L/GF

Cooperating Agency Response Letter from the Federal Aviation Administration
November 15, 2011

U.S. Department
of Transportation
Federal Aviation
Administration

NOV 15 2011

Timothy K. Bridges
Deputy Assistant Secretary of the Air Force
(Environment, Safety, & Occupational Health)
US Department of the Air Force
SAF/IEE
1665 Air Force Pentagon
Washington, DC 20330-1665

Dear Mr. Bridges:

Thank you for your letter requesting the Federal Aviation Administration participate as a cooperating agency in the environmental impact statement (EIS) for the Divert Activities and Exercises, Guam and Commonwealth of the Northern Mariana Islands.

The FAA is pleased to participate in the EIS process in accordance with the National Environmental Policy Act of 1969 as amended, and its implementing regulations. Since the proposal involves special use airspace (SUA), the FAA will cooperate following the guidelines described in the Memorandum of Understanding (MOU) between the FAA and the Department of Defense Concerning SUA Environmental Actions, dated October 4, 2005.

Modification of the SUA resides under the jurisdiction of the Western Service Center, Operations Support Group, Renton, WA. The Western Service Center will be the primary focal point for matters related to both airspace and environmental matters. Mr. John Warner is the Manager of the Operations Support Group. FAA Order 7400.2, Chapter 32 indicates the airspace and environmental processes should be conducted in tandem as much as possible; however, they are separate processes. Approval of either the aeronautical process or the environmental process does not automatically indicate approval of the entire proposal. I have enclosed Appendix 2, 3, and 4 of FAA Order 7400.2 for additional details.

A copy of the incoming correspondence and this response is being forwarded to Mr. Warner of the Western Service Center, Operations Support Group. Mr. Warner can be contacted at (425) 203-4500 for further processing of your proposal.

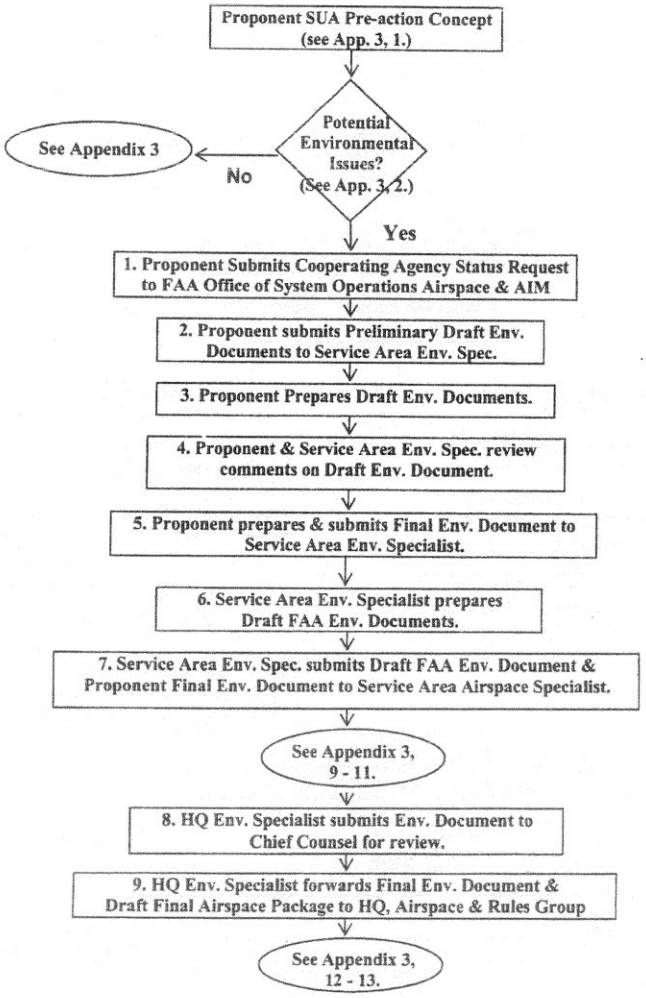
Sincerely,

Dennis E. Roberts
Director, Airspace Services
Air Traffic Organization

3 Enclosures

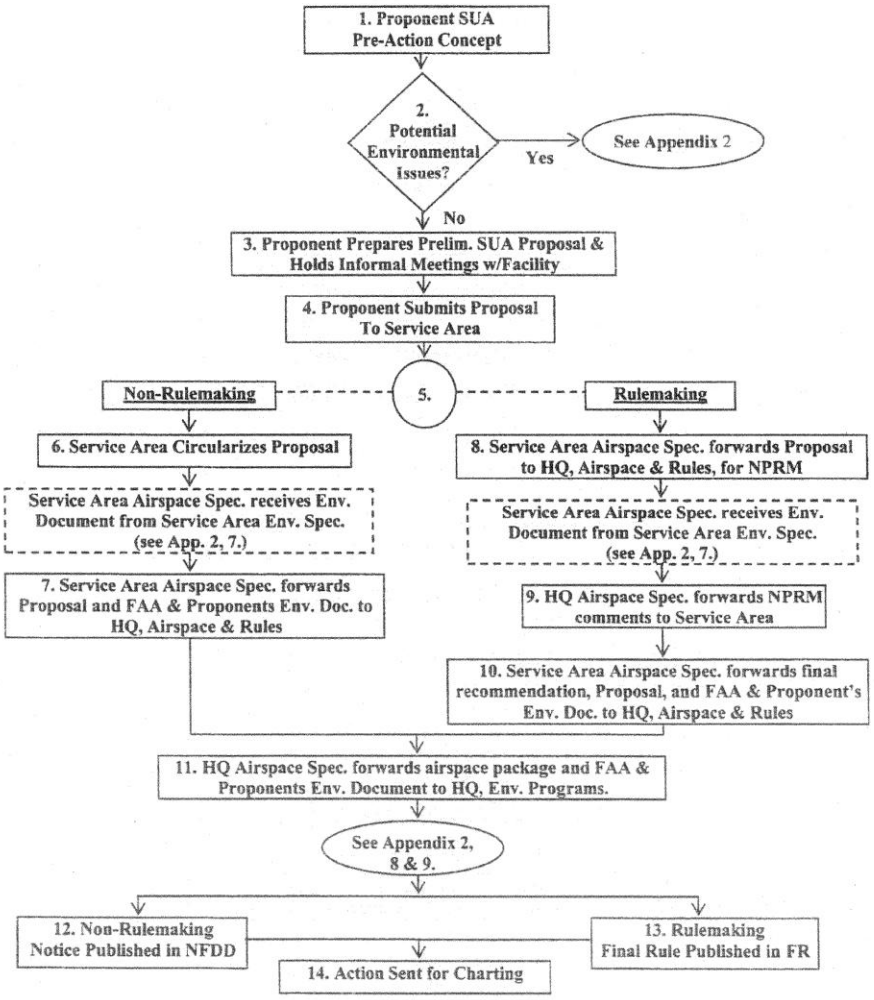
Appendix 2. Procedures For Processing SUA Actions Environmental Process Flow Chart

(This Chart is for use with Appendix 4 and the numbers correlate to the numbers in the Environmental column of that table.)



Appendix 3. Procedures For Processing SUA Actions Aeronautical Process Flow Chart

(This Appendix is for use with Appendix 4 and the numbers correlate to the numbers in the Aeronautical column of that table.)



Appendix 4. FAA Procedures for Processing SUA Actions Aeronautical and Environmental Summary Table

(The aeronautical and environmental processes may not always occur in parallel.)
(This Appendix is for use with Appendix 2 and Appendix 3, and the numbers correlate to numbers on those charts.)

(See note below.)

AERONAUTICAL	ENVIRONMENTAL
1. Proponent shall present to the Facility a Pre-draft concept (i.e., new/ revisions to SUA needed or required).	1. Proponent shall discuss with the Service Area, at the earliest time, the potential for environmental impacts associated with the proposal.
	2. If there is the potential for environmental impacts, Proponent shall make a request to the FAA for a Cooperating Agency (CA) status when Proponent decides to initiate the environmental process. Proponent shall forward the request to the Director of the System Operations Airspace and AIM. The Director will transmit the request to the Environmental Programs Group who prepares and forwards the response to Proponent. The Environmental Programs Group will send a courtesy copy of the response to the responsible Service Area. The Service Area environmental specialist works as the FAA point of contact throughout the process in development of any required environmental documentation.
	3. Proponent submits a Preliminary Draft EA or EIS to the Service Area environmental specialist. The Service Area environmental specialist shall provide comments, in consultation with the airspace specialist and the Environmental Programs Group, back to Proponent.

2. Proponent forwards the aeronautical proposal to the FAA Service Area for review and processing by the airspace specialist.	4. Proponent prepares a Draft EA or EIS with a 45-day public comment period. As the FAA CA point of contact, the Service Area environmental specialist reviews the associated draft environmental documentation to ensure that the Proponent addressed adequately all environmental concerns submitted on the Preliminary Draft. If required, the Service Area environmental specialist forwards the draft environmental documentation to the Environmental Programs Group for review and comment by the headquarters environmental specialist and the Office of Chief Counsel.
3. The Service Area airspace specialist, in accordance with this order, determines the type of airspace action(s) necessary, either Non-Rulemaking or Rulemaking. FAA Service Area and Proponent determine if informal Airspace Meetings are required.	
For Non-Rulemaking:	
4. The Service Area airspace specialist sends out a circularization with a 45-day public comment period. The Service Area airspace specialist reviews and prepares, in consultation with the Proponent, responses to the aeronautical comments from the study and circularization in accordance with Chapter 21 of this order.	5. The Proponent reviews comments received on their Draft EA/FONSI or EIS and prepares their responses to the comments, in consultation with the FAA and other cooperating agencies, if necessary, and in accordance with Chapter 32 of this order.
	6. Proponent prepares and submits their Final EA/FONSI or EIS/ROD to the Service Area environmental specialist.
	7. The Service Area environmental specialist prepares a Draft FAA FONSI/ROD or Draft FAA Adoption Document/ROD.
	8. The Service Area environmental specialist submits the Draft FAA FONSI/ROD or Draft FAA Adoption Document/ROD and the Proponent's Final EA/FONSI or EIS/ROD to the Service Area airspace specialist for inclusion with the airspace proposal package.
5. The Service Area airspace specialist then sends the completed package containing the aeronautical proposal, response to comments, Proponent's Final EA/FONSI, and the Draft FAA FONSI/ROD to the Headquarters Airspace and Rules Group with their recommendation.	

For Rulemaking:	
6. The Service Area airspace specialist sends the proposal to the Airspace and Rules Group who prepares a Notice of Proposed Rulemaking (NPRM). The Headquarters Airspace and Rules Group submits the NPRM for publication in the Federal Register with a 45-day comment period in accordance with Chapter 2 of this order.	
7. The Headquarters airspace specialist sends comments received on the NPRM to the Service Area airspace specialist for resolution.	
8. The Service Area airspace specialist then sends the completed package containing the response to comments, final service area recommendation, the proposal, Proponent's Final EA/FONSI or EIS/ROD, and the Draft FAA FONSI/ROD or Draft FAA Adoption Document/ROD to the Headquarters Airspace and Rules Group for preparation of the Final Rule.	
9. The Headquarters airspace specialist forwards the draft final rule package or draft non-rulemaking case summary (NRCS) with all supporting documentation to the Headquarters Environmental Programs Group for review (after all aeronautical comments have been resolved).	9. The Headquarters environmental specialist reviews the package for environmental technical accuracy; then submits the environmental documentation to the Office of the Chief Counsel, Airports and Environmental Law Division, for legal sufficiency review (having collaborated throughout the process).
	10. The Chief Counsel's environmental attorney's comments are incorporated into the final FAA environmental decision and signed by Headquarters Environmental Programs Group Manager. The package is then returned to the Headquarters Airspace and Rules Group.
10. For Non-rulemaking: The non-rulemaking action is published in the National Flight Data Digest. 11. For Rulemaking: The Final Rule is published in the Federal Register. The Final Rule will contain a reference to the decision rendered and location of documentation for the associated environmental process.	

Consult the following documents throughout the process for further information:

- Council on Environmental Quality Regulations for Implementing the National Environmental Policy Act (NEPA), 40 CFR Parts 1500-1508
- FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures"
- FAA Order 7400.2, "Procedures for Handling Airspace Matters," Part 5
- FAA Order 7400.2, Chapter 32, "Environmental Matters" and the associated appendixes (for specific SUA environmental direction)

NOTE: The time periods below are for a non-controversial aeronautical proposal and its associated environmental process. The time periods are for FAA review/processing only. Times for proponent and/or environmental contract support processing must be added.

ENVIRONMENTAL: The estimated time of completion for EA processing is 12 to 18 months or, for EIS processing, 18 to 36 months.

AERONAUTICAL (Non-Rulemaking): A minimum 4 months is required from submission of the Formal Airspace Proposal by the Proponent to the Service Area through completion of the circularization process. Additionally, a minimum of 6 months is required from submission of the Formal Airspace Proposal by the Service Area to Headquarters through completion of the charting process.

AERONAUTICAL (Rulemaking): A minimum 6 weeks for Service Area processing, and a minimum of 9 months to complete rulemaking once the formal package is received at Headquarters.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
2012-TA-0018

MAR 2 3 2012

Mr. Mark Petersen
HQ-PACAF, D-306/A7PI
25 E Street
JB Pearl Harbor-Hickam, HI 96853-5412

Subject: Request for the U.S. Fish and Wildlife Service (Service) to be a Cooperating Agency for the Divert Activities and Exercises, Guam and the Commonwealth of the Mariana Islands, Environmental Impact Statement (EIS).

Dear Mr. Peterson:

This is in response to the letter dated 21 October, 2011, from Mr. Timothy Bridges requesting the Service to be a cooperating agency on the preparation of the subject EIS. Current staffing and workload constraints preclude our ability to accept this request, thus, we respectfully decline cooperating agency status.

The Service recognizes the importance of our collaboration in the development of the EIS, and in the section 7 consultation required under the Endangered Species (ESA) of 1973 (16 U.S.C. 1531 *et seq.*), as amended. The Service will continue to provide technical assistance with regard to biological surveys and impact assessment aspects of draft EIS documents, and to respond to Air Force requests for information. The Service will continue to work collaboratively with the Air Force and assist you with ensuring that the best available scientific information is used in the EIS, and that impacts to ESA-listed species and other natural resources are avoided and minimized.

If you have any questions or concerns regarding this consultation, please contact Rachel Rounds, Fish and Wildlife Biologist (phone: 808-792-9400, email: rachel_rounds@fws.gov).

Sincerely,

Loyal Mehrhoff
Field Supervisor

TAKE PRIDE® IN AMERICA

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APPENDIX B

ESA Section 7 Consultation Supporting Documentation



Request for Section 7 Early Consultation/Meeting
July 7, 2011

"Ingoglia, Mark Civ USAF PACAF A7AN/A7AN" <Mark.Ingoglia@hickam.af.mil>

07/07/2011 07:00 AM To
<Earl_Campbell@fws.gov>

cc
"Leong, Robert Civ USAF PACAF A7PI/A7PI" <Robert.Leong@hickam.af.mil>, "Duffy, Christopher G LtCol USAF PACAF A7/A7P" <christopher.duffy@hickam.af.mil>, "Grannis, William E Civ USAF PACAF A7/A7AV" <William.Grannis@hickam.af.mil>, "Hong, Julie Y CTR USAF PACAF A7PI/A7PI" <Julie.Hong@hickam.af.mil>
Subject
RE: FA8903-08-D-8771-0135: EIS for Divert Activities and Exercises USFW early consultation/meeting request

Aloha Earl,

The Air Force is preparing an EIS for the Pacific Air Force Divert Activities and Exercises in Guam and Commonwealth of the Northern Mariana Islands (CNMI) (hereinafter referred to as the "Divert EIS"). The purpose of the Divert EIS is to identify and assess the potential impacts associated with the proposed development and expansion of existing airfields in the Mariana Islands on U.S. territory in proximity of the Philippine Sea. As always, early and open discussions with your agency is the best way to accomplish this task in a timely manner.

The proposed airfield improvements would be designed to increase joint military exercises, humanitarian assistance, and disaster relief capability for northeast Asia. The USAF intends to meet its mission needs through expansion of an existing FAA-regulated airport which should minimize any potential effects on species of concern in the Marianas. The initial planning for this document is underway and I was hoping to meet with you and/or other members of the USFW staff to pre-brief you on this EIS. We anticipate pre-NOI notification of the Congressional delegations and the Governors of Guam and CNMI in mid-August and public scoping to be held on Guam and the three main CNMI islands in October 2011.

To assure we have touched base with your agency early (as always, it's an "aggressive schedule'), we are suggesting an initial meeting with the Air Force on or about 14 or 15 July 2011. I know you have been designated as the deputy for your office so I'm not sure you are the appropriate point of contact. Please confirm that you are appropriate contact for USFWS and let me know if your office can accommodate that schedule, or if an alternative date is preferred as travel arrangements will have to be made for whatever date is selected.

Thanks in advance,

mi

J. Mark Ingoglia, Chief
PACAF Environmental Branch
DSN 449-1077
808 449-1077

Response to Request for Section 7 Early Consultation/Meeting
July 8, 2011

-----Original Message-----
From: Earl_Campbell@fws.gov [mailto:Earl_Campbell@fws.gov]
Sent: Friday, July 08, 2011 1:45 PM
To: Ingoglia, Mark Civ USAF PACAF A7AN/A7AN
Cc: Duffy, Christopher G LtCol USAF PACAF A7/A7P; Hong, Julie Y CTR USAF PACAF A7PI/A7PI; Leong, Robert Civ USAF PACAF A7PI/A7PI; Grannis, William E Civ USAF PACAF A7/A7AV; Loyal_Mehrhoff@fws.gov
Subject: MTG 1 PM July 15 ?: EIS for Divert Activities and Exercises USFW early consultation/meeting request

Mark:

Could we meet on Friday, July 15th at 1 PM at the Pacific Islands Fish and Wildlife Office? I can get a conference room and a PowerPoint projector. Loyal Mehrhoff, my Field Supervisor, will try to attend the meetings. I'll be attending the meeting as well as several biologists who would be working on future regulatory review.

aloha,

earl w. campbell, ph.d.
assistant field supervisor, invasive species & marianas terrestrial issues
interagency brown treesnake working group coordinator
usfws - pacific islands fish and wildlife office
300 ala moana blvd., room 3 - 122
p.o. box 50088,
honolulu, hawaii 96817

808.792.9414 office phone
808.226.6076 cell phone
earl.campbell@fws.gov e-mail

APPENDIX C

CZMA Compliance Supporting Documentation



Coastal Zone Management Act (CZMA) Consistency Determination: Negative Determination Notice

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

MAY 18 2012

MEMORANDUM FOR MS. RITA C. CHONG
DIRECTOR, COASTAL RESOURCES MANAGEMENT OFFICE
COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS
P.O. BOX 10007
SAIPAN, MP 96950

FROM: HQ PACAF/A7
25 E Street, Suite D-306
JBPH-H, HI 96853

SUBJECT: Coastal Zone Management Act (CZMA) Consistency Determination:
Negative Determination Notice for Divert Activities and Exercises

1. Headquarters Pacific Air Forces (HQ PACAF) wishes to inform you of its negative determination under the CZMA regarding the subject proposed action. The Draft Environmental Impact Statement (DEIS) for Divert Activities and Exercises, (Atch 1) proposes federal action to improve an existing airport or airports and associated infrastructure in support of expanding mission requirements in the western Pacific.

2. HQ PACAF proposes to construct facilities and infrastructure at an existing airport or airports to support a combination of cargo, fighter, and tanker aircraft with associated personnel to support periodic joint military exercises and humanitarian assistance and disaster relief (HADR) efforts during times of need. Occasional emergency divert landings could also occur at the proposed improved airport. This action considers both the Saipan International Airport and the Tinian International Airport. HQ PACAF considers the Saipan Airport to be the preferred alternative location as outlined in the Draft EIS. (Atch 2)

3. The DEIS explains the details associated with our proposed action and we refer you to the executive summary for an overview of the proposed action.

4. Should you or your staff have any questions regarding this proposed action, please contact my POC, Mr. Mark Petersen at (808) 449-1078, or at mark.petersen.1@us.af.mil.

FOR KARL S. BOSWORTH
Director, Installations and Mission Support

2 Attachments:
1. Draft EIS for Divert Activities and Exercises, Guam and CNMI
2. Summary of the Proposed Action

Summary of the Proposed Action

Section 2.1 of the draft Divert Activities and Exercises EIS describes the proposed action, which includes the following:

1. **Construction Phase**. The KC-135 Stratotanker (KC-135) aircraft is indicative of tanker or cargo aircraft used by the USAF in the western Pacific. The KC-135 aircraft is being used as the design aircraft for cargo and tanker aircraft in the EIS. The following elements would be designed and then constructed or improved at the selected airport or airports:

    a. *Runway* - Potential extension of the runway up to 10,000 feet in order to meet optimal KC-135 requirements as identified by PACAF Strategy, Policy and Requirements Division. Options that would expand the runway to less than 10,000 feet, or not at all are also analyzed.

    b. *Parking apron* - The parking aprons at the airport selected for expansion would need to meet design requirements for KC-135 aircraft.

    c. *Associated pavement markings, lighting, and navigational aids*- All pavement markings, lighting, and navigational aids would be installed, upgraded, or relocated, as appropriate.

    d. *Temporary munitions storage area*- The temporary munitions storage area would mainly be used to store munitions safely from diverted aircraft until the aircraft could return to its place of origin, or proceed to its planned destination.

    e. *Hazardous cargo pad and arm/disarm pad*- The hazardous cargo pad would mainly be used to safely handle munitions or other hazardous cargo from diverted aircraft until the aircraft could return to its place of origin, or planned destination. The arm/disarm pad would be used to perform final safety checks on aircraft before takeoff by aircraft maintenance personnel. The arm/disarm pad would also be used to perform initial safety checks on aircraft after landing. The hazardous cargo pad could be designed and constructed to double as an arm/disarm pad.

    f. *Aircraft hangar*- The hangar would be a closed structure to store aircraft awaiting maintenance or being repaired.

    g. *Maintenance facility* – The maintenance facility would be used as an Aircraft Maintenance Unit/Aircraft Spares Management and for storage to assist aircraft at the proposed airfield.

    h. J*et fuel receiving, storage, and distribution infrastructure*- USAF proposes to maintain a 30-day supply of jet fuel to be able to provide fuel to aircraft through a hydrant system. In order to maintain the 30-day supply of jet fuel, a combination of fuel tanks including bulk storage and smaller operating tanks would be required. The ability to receive jet fuel on the island and ability to transfer it to the airfield would also be required.

    i. *Billeting*- Temporary billeting, including medical, transportation, and dining services, would be required for the personnel supporting aircraft operations.

2. **Implementation Phase**. It is assumed that any mix of joint fighter, cargo, and tanker aircraft, not to exceed the design capabilities of the airport, could be diverted to or exercised from the airport

or airports selected for improvements. KC-135s would remain the design aircraft for the implementation phase. The following activities would occur at the selected airport or airports:

a. *Unscheduled/unplanned divert landings*- Unscheduled aircraft landings, also known as "divert" landings would occur; divert landings would occur at these airports if other locations in the western Pacific, for example Andersen Air Force Base (AFB), are unavailable for landing, such as during emergencies or natural disasters.

b. *Unscheduled/unplanned humanitarian airlift staging*- Humanitarian airlift staging, including non-combatant evacuation operations (NEOs), would also occur at the airport or airports proposed for improvements in the event of an emergency or disaster.

c. *Military exercises*- A limited number of scheduled joint, combined, and unit-level military training activities and exercises, as described and analyzed in the Mariana Islands Range Complex (MIRC) EIS, for which a Record of Decision (ROD) was issued on July 20, 2010, would occur. It is assumed that both unit-level training and joint military exercises would each take place annually for a combined total of 60 days per year at the airport or airports selected for improvement. This EIS addresses only the ground movements and immediate approaches and departures at the airport or airports selected for development (e.g., take-offs and landings) during unit-level training and exercises. Actual air warfare and air logistics training (i.e., above 10,000 feet) are addressed by the MIRC EIS, for which a ROD was issued on July 20, 2010.

d. J*et fuel receiving, storage, and distribution*- A fuel delivery system, jet fuel storage, and means of fuel resupply would be required for the airport or airports selected for improvements. The ability to store fuel and transfer fuel from the receiving port to the airfield would be developed.

e. *Billeting*- Temporary billeting, including medical, transportation, and dining services, would be required for the personnel supporting aircraft operations. This could be accomplished by using under utilized local hotels or temporary facilities consisting of tents and other support on or near airport property.

Pursuant to Section 7 of P.L. 3-47 [2 CMC Section 1513] federal lands in the CNMI are excluded from the CNMI Coastal Resource Management Program. The proposed fuel tank location at the Saipan harbor would be on federal property and would be constructed with adequate containment in accordance with all applicable standards and requirements. The proposed temporary munitions storage area at the Tinian alternative site would be located within the Military Leased Area on Tinian. No "spillover impacts" on the coastal zone would be anticipated from either of these proposed facilities.

The USAF evaluated whether the construction phase and implementation phase of the Proposed Action at GSN or TNI would have reasonably foreseeable direct or indirect effects on any coastal use or resource of the coastal zone of the CNMI. The USAF determined that with the measures in place that are outlined in the table of required permits and consultations in the attached EIS, that the proposed action would be consistent to the maximum extent practicable with the enforceable policies of the CNMI Coastal Resource Management Program. The USAF would comply with permitting and consultation requirements ensuring consistency with the CNMI Coastal Resources Management Program.

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APPENDIX D

NHPA Section 106 Consultation Supporting Documentation



Section 106 Consultation Request Letter
February 1, 2012

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

FEB 0 1 2012

MEMORANDUM FOR MR. JOHN PALACIOS
HISTORIC PRESERVATION OFFICER
DIVISION OF HISTORIC PRESERVATION
DEPARTMENT OF COMMUNITY AND CULTURAL AFFAIRS
PO BOX 500090 CK OR CALLER BOX 10007
SAIPAN, MP 96950

FROM: HQ PACAF/A7
25 E Street, Suite D-306
JBPH-H, HI 96853

SUBJECT: Environmental Impact Statement and Section 106 Consultation for Improvements Related to U.S. Air Force (USAF), Pacific Air Forces (PACAF), Divert Activities and Exercises, Francisco C. Ada/Saipan International Airport, Saipan and Tinian International Airport, Tinian, Commonwealth of the Northern Mariana Islands

1. My office is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) to evaluate possible infrastructure improvements at Francisco C. Ada/Saipan International Airport (GSN) and/or Tinian International Airport (TNI). These improvements would facilitate proposed USAF use of one or both airfields. This NEPA evaluation will comply with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800. USAF will conduct Section 106 consultation concurrently with development of the EIS as recommended by NEPA's implementing regulations, Title 40 Code of Federal Regulations (CFR) Part 1502.25(a). In accordance with 36 CFR Part 800.3(c), this letter initiates our Section 106 coordination for this undertaking.

2. We are still in the planning stages. Given the potential for impact to important cultural resources, USAF seeks consultation with the Commonwealth Historic Preservation Office (HPO) and other interested parties so concerns can be identified early in project planning. USAF seeks consultation on determining the Area of Potential Effect (APE) for cultural resources at both GSN and TNI. We also seek input for designing appropriate cultural resources survey strategies to catalog historic properties in the APE.

3. The proposed improvements involve construction of facilities and infrastructure to support cargo, fighter, and tanker aircraft and associated support personnel for periodic divert landings, joint military exercises, and humanitarian assistance. The undertaking is needed since there is no airfield on U.S. territory in proximity of the Philippine Sea designed and designated to provide strategic capabilities when needed and humanitarian airlift for natural disasters. USAF is considering two action alternatives for the undertaking to include improvements at GSN and TNI. Existing capabilities at each of these airfields will play a major role in determining what improvements need to be made and thus the extent of the undertaking. USAF may also choose to employ some combination of the proposed action elements at both airfields to meet the objective.

Attachment 1: Proposed Schedule for Divert Activities and Exercises Section 106 Consultation

1. USAF provides HPO information describing conceptual project plans in Feb 2012.
2. Once HPO has had an opportunity to review the conceptual project plans, the USAF will work with HPO to determine appropriate APEs for the Saipan (GSN) and Tinian (TNI) project alternatives. USAF proposes 30 days for completion of negotiations. Our anticipated completion date is 15 Mar 2012.
3. USAF will prepare and submit a draft cultural resources report to HPO for review. USAF proposes a 30 day review period for HPO. Our anticipated submittal date is 30 Mar 12. Upon receipt of comments from HPO, USAF will prepare and submit a final draft, scheduled for no later than 30 Jun 2012.
4. If the USAF, in consultation with HPO, determines the undertaking will have adverse effects on historic properties, USAF will invite the ACHP to join in the Section 106 consultations with the goal of entering into a PA by 28 Sep 2012.

4. HDR Inc. has been contracted to support development of the EIS. HDR Inc. archaeologists and architectural historians found Isley Field Historic District listed on the National Register of Historic Places. Isley Field Historic District encompasses numerous architectural and engineering features within and near the modern boundaries of GSN on Saipan. While most of the contributing elements to the district are visible, well-documented, and, therefore, easily avoided by construction and implementation activities, secondary impacts are possible.

5. Pursuant to 36 CFR 800.5, the USAF will consult with HPO to determine if the undertaking will have adverse effects to historic properties in the APEs. If the parties agree that historic properties will suffer adverse effects, the USAF will consult the Advisory Council on Historic Preservation (ACHP) as prescribed in 36 CFR 800.6 with the goal of entering into a Programmatic Agreement (PA) to address these issues and any others that might arise through the Section 106 consultation process. If the parties agree the undertaking has no effect or no adverse effect on historic properties, the USAF will notify ACHP of the finding and conclude Section 106 consultations. A proposed schedule for this Section 106 consultation is attached.

6. If you have any questions regarding this consultation, please contact my Cultural Resources Manager, Mr. William Grannis at (808) 449-4049, or by email at william.grannis@us.af.mil.

KARL S. BOSWORTH, Colonel, USAF
Director, Installations and Mission Support

cc: Barbara Alberti, National Park Service, Superintendent War in the Pacific National Historical Park, Guam, and American Memorial Park, CNMI

Attachment:
Proposed Schedule

Response to Section 106 Consultation Request Letter
February 9, 2012

From: Melvin LO Faisao (DCCA-GMAIL) [mailto:mlof65@gmail.com]
Sent: Wednesday, February 08, 2012 2:09 PM
To: 'Grannis, William E Civ USAF PACAF A7/A7AV'; John D. Palacios-HPO Compliance Supervisor; 'Mertie T. Kani (HPO)'
Cc: Hokanson, Jeffrey H; Lynch, Edward J; Edwards, Matthew; Pyle, Stephen G; Jennings, Michael H; Gallison, James D; Fischer, Ben C; mtkani@cmnihpo.net; jdcamacho@cmnihpo.net; 'Melvin Faisao (DCCA)'; 'Melvin Faisao'; 'Gilbert J. Birnbrich Chief of the Civil Division'; 'Frank Rabauliman'; Rita Chong-CRMO
Subject: FW: Section 106 Consultation for Improvements Related to PACAF Divert Activities and Exercises, CNMI
Importance: High

2/9/2012 6:04:55 AM

Dear Ms. Mertie Kani (Administrator, Div. HPO):

Please review the attachment and provide an official correspondence for my concurrence to the request stated therein. In addition, see e-mail message thread below. Please expedite ASAP!

Melvin Faisao
Secretary, DCCA
SHPO, CNMI

-----Original Message-----
From: Grannis, William E Civ USAF PACAF A7/A7AV
[mailto:William.Grannis@hickam.af.mil]
Sent: Thursday, February 09, 2012 4:37 AM
To: jdpalacios1@hotmail.com; MLof65@gmail.com
Cc: Hokanson, Jeffrey H; Lynch, Edward J; Edwards, Matthew; Pyle, Stephen G; Michael.Jennings@hdrinc.com; James.Gallison@hdrinc.com; Benjamin.Fischer@hdrinc.com; mtkani@cmnihpo.net; jdcamacho@cmnihpo.net
Subject: Section 106 Consultation for Improvements Related to PACAF Divert Activities and Exercises, CNMI

Hafa Adai Mr. Palacios and Mr. Faisao,

I hope this message finds you well. As you are aware, the HQ Pacific Air Forces has initiated an Environmental Impact Statement (EIS) for Divert Activities and Exercises, CNMI. The EIS is evaluating alternatives that include proposed infrastructure improvements at Saipan International Airport and Tinian International Airport. Concurrently, we would like to initiate Section 106 consultation with your office. Attached you will find the letter from our HQ Pacific Air Forces/A7 with regards to the Divert Activities Exercises EIS and Section 106 consultation. A hard copy of this letter is in the mail. This letter is addressed to Mr. Palacios as he was the primary contact that the HDR project team interacted with during a recent trip to Saipan. We understand that Mr. Faisao is now the Historic Preservation Officer.

Should you have any questions, please don't hesitate to contact us. We would appreciate any info you can provide on who we should be working directly with during the consultation and any preferred methods of communication and contact information.

I am the Natural/Cultural Resources Manager at HQ PACAF/A7. The cultural resources project team from HDR Environmental, Operations and Construction, Inc. is copied here. We look forward to engaging with you on this effort.

Respectfully,

Bill

William Grannis
Environmental Program Manager
HQ PACAF/A7AV
DSN:(315)449-4049
COM:(808)449-4049

Request for HPO and NPS Review of Draft Phase I Cultural Resources Report
April 16, 2012

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

16 APR 2012

MEMORANDUM FOR MS. MERTIE KANI
HPO ACTING DIRECTOR
DIVISION OF HISTORIC PRESERVATION
DEPARTMENT OF COMMUNITY AND CULTURAL AFFAIRS
SAIPAN, MP 96950

FROM: HQ PACAF/A7AV
25 E Street, Suite B-206
Joint Base Pearl Harbor-Hickam HI 96853-5420

SUBJECT: Request for Review of Draft Phase I Cultural Resources Survey Supporting the Environmental Impact Statement for Divert Activities and Exercises on Saipan Commonwealth of the Northern Mariana Islands

1. As indicated in the previously provided memo from our Director, Installations and Mission Support, dated 1 Feb 12, the US Air Force is preparing an Environmental Impact Statement (EIS) for Divert Activities and Exercises. The Francisco C. Ada/Saipan International Airport is one of the alternatives being considered in the EIS. To address data gaps related to this alternative, the Air Force has conducted a survey of historic resources and is pleased to submit the subject draft survey report for your review.

2. The study area is contained within the boundaries of the NRHP-listed Isley Field Historic District (NRIS No.: 81000667), which itself is included in the Saipan Landing Beaches, Aslito/Isley Field and Marpi Point National Historic Landmark (NHLS No.: 85001789). As such, the U.S. Air Force evaluated these resources according to whether or not they constitute contributing elements of the Historic District/National Historic Landmark. Results of this evaluation are provided in the attached report.

3. Request your comments or concurrence by 20 May 12. Should you have any questions or concerns, please contact me at (808) 449-4049, or by email at william.grannis@us.af.mil.

WILLIAM GRANNIS
Environmental Program Manager,
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Attachment: Draft Phase I Cultural Resources Survey Report

cc:
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APPENDIX E

Air Quality Calculations and Modeling



Summary	Summarizes total emissions by calendar year for Alternative 1 - Construction Phase (GSN).
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Haul Truck On-Road	Estimates emissions from hauling construction materials to the project site.

Summary of Air Quality Emissions from Divert EIS - Alternative 1 - Construction Phase (GSN)

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Construction Combustion	18.08	2.33	7.83	1.21	1.26	1.22	2,083.77
Construction Fugitive Dust	-	-	-	-	107.45	8.90	-
Construction Commuter	8.81	8.77	79.32	0.10	0.83	0.53	10,518.55
Haul Truck On-Road	17.73	12.82	52.11	1.40	21.09	5.48	4,489.83
TOTAL	***44.63***	***23.92***	***139.27***	***2.71***	***130.64***	***16.13***	***17,092.15***

Annual Summary of Air Quality Emissions from Divert EIS - Alternative 1 - Construction Phase (GSN)*

	Point and Area Sources Combined						
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2 (metric tons)
CY 01	14.88	7.97	46.42	0.90	43.55	5.38	5697.38
CY 02	14.88	7.97	46.42	0.90	43.55	5.38	5697.38
CY 03	14.88	7.97	46.42	0.90	43.55	5.38	5697.38

* Construction duration is estimated to be 36 months and the emissions are assumed to be distributed evenly over the construction period.

Combustion Emissions - Alternative 1 (GSN)

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, and CO_2 due to Construction

Assumptions

When multiple options exist under the general construction activites the most conservative value will be used to quantify air emission.

General Construction Activities	Area Disturbed (ft^2)
Construct Aircraft Hangar	35,100 ft^2
Construct Maintenance Facility	6,000 ft^2
Construct Jet Fuel System (operational, Bulk and at the Port of S	400,400 ft^2
Construct Billeting	775,400 ft^2
Construct Hazardous Cargo Pad and Arm/Disarm Pad	195,000 ft^2
Construct Maximum Runway Extension	275,000 ft^2
Construct Parking Apron	900,000 ft^2
Construct Temporary Munitions Storage Area (TCM and Multi Cu	43,700 ft^2

Total General Construction Area:	1,411,900	ft^2	
	32.4	acres	
Total Demolition Area:	0	ft^2	
	0.0	acres	
Total Pavement Area:	1,218,700	ft^2	
	28.0	acres	
Total Disturbed Area:	2,630,600	ft^2	
	60.4	acres	
Construction Duration:	36	months	
1 Yr Project Construction Activity:	240	days/yr	Assume 12 months, 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	6	249.847	15.462	94.259	4.997	15.273	14.815	29649.158
Paving Equipment	3	136.102	7.817	55.735	2.722	8.328	8.078	16871.871
Demolition Equipment	1	31.808	1.886	12.584	0.636	1.923	1.865	3703.074
Building Construction	3	118.189	9.389	52.147	9.349	8.487	8.233	13393.535
Air Compressor for Architectural Coating	3	10.722	1.120	4.696	0.753	0.928	0.900	1079.320
Architectural Coating**			96.841					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.
**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994
Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	2,630,600	60.39	6	(from "Grading" worksheet)
Paving:	1,218,700	27.98	45	
Demolition:	0	0.00	0	
Building Construction:	1,411,900	32.41	240	
Architectural Coating	1,411,900	32.41	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1,499.08	92.77	565.56	29.98	91.64	88.89	177,895
Paving	6,079.22	349.17	2,489.51	121.58	372.00	360.84	753,610
Demolition	-	-	-	-	-	-	0
Building Construction	28,365.35	2,253.46	12,515.26	2,243.77	2,036.91	1,975.80	3,214,448
Architectural Coatings	214.44	1,959.21	93.93	15.07	18.56	18.00	21,586
Total Emissions (lbs):	**36,158.09**	**4,654.61**	**15,664.25**	**2,410.41**	**2,519.11**	**2,443.53**	**4,167,540**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	36,158.09	4,654.61	15,664.25	2,410.41	2,519.11	2,443.53	4,167,540
Total Project Emissions (tons)	18.08	2.33	7.83	1.21	1.26	1.22	2,083.77

Construction Fugitive Dust Emissions - Proposed Action (Phase 1 - Current, Annual)

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
$PM_{2.5}$ Emissions			
$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	28.0	acres

General Construction Activities (0.19 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	32.4	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	141.01	70.50	14.10	7.05
General Construction Activities	73.90	36.95	3.70	1.85
Total	**214.91**	**107.45**	**17.80**	**8.90**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule - Proposed Action (Phase 1 - Current, Annual)

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 60.4 acres/yr (from Combustion Worksheet)
Qty Equipment: 19.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	60.39	7.55
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	60.39	29.52
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	30.20	30.45
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	30.20	12.49
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	60.39	21.18
TOTAL								101.19

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 101.19
Qty Equipment: 19.00
Grading days/yr: 5.33

Construction/Staff Commuter Emissions - Alternative 1 (GSN)

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2011-2015 are used

The average roundtrip commute for a construction/staff worker =	40	miles
Number of construction days =	240	days
Number of construction/Staff workers (daily) =	2000	people

Note: None

Passenger Vehicle Emission Factors for Year 2011-2016 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008.
Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**17628.307**	**17548.575**	**158644.933**	**206.875**	**1669.993**	**1051.800**	**21037101.087**
tons	**8.814**	**8.774**	**79.322**	**0.1034**	**0.8350**	**0.5259**	**10518.551**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

No Statistical Area Available for GSN

				Point Source Emissions						Area Source Emissions (Non-Point and Mobile Sources)					
Row #	State	County	Tier-1	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO	NOx	PM_{10}	$PM_{2.5}$	SO_2	VOC
No Data Available															
Grand Total				0	0	0	0	0	0	0	0	0	0	0	0

SOURCE:
http://www.epa.gov/ttn/chief/eiinformation.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2002)
Site visited on 02 February 2012.

No Air Quality Control Region Identified

	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
CNMI	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
CNMI DEQ	0	0	0	0	0	0

Construction/Haul Truck Emissions - Alternative 1 (GSN)

Emissions from hauling construction supplies, demoliton debris, fill, and excavated material are estimated in this spreadsheet.

Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Concrete Mixing and Dump Truck Assumptions:
Dump trucks carry 11 cubic yards of material per trip.
Concrete mixing trucks carry 10 cubic yards of material per trip.
The average distance from the port to Commercial Concrete Supply Company is 7 miles; therefore, dump trucks will travel 14 miles round trip.
The average distance from the Commercial Concrete Supply Company (CCSC) to the project site is 2 miles; therefore, concrete trucks will travel 4 miles round trip.

Fill Materials Assumptions:
Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to the materials source is 20 miles; therefore, building material haul trucks will travel 40 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of demoltion debris =	0	cubic yards	No Demolition in the Proposed Action
Amount of concrete transported from port to CCSC =	1,674	cubic yards	
Amount of concrete transported from CCSC to project site =	26,797	cubic yards	
Amount of fill material =	665,000	cubic yards	Amount of fill material required for runway construction. The borrow pits are located 4 miles from the project site, a haul truck will travel 8 miles round trip.
Amount of Excavation Materials for New Buildings =	627,511	cubic yards	Construction area multiped by depth of disturbance which is assumed to be 12
Amount of Building Materials =	470,633	cubic yards	Construction area multipled by 9 feet.

Number of dump trucks required (port to CCSC) =	153	heavy duty diesel haul truck trips, Cells rounded up
Number of concrete mixing trucks required (CCSC to project site) =	2680	heavy duty diesel haul truck trips,Cells rounded up
Number of trucks required (Borrow Pits) =	33,250	heavy duty diesel haul truck trips
Number of trucks required (Building Materials) =	54,908	heavy duty diesel haul truck trips
Miles per trip (port to CCSC) =	14	miles
Miles per trip (CCSC to project site) =	4	miles
Miles per trip (Borrow Pits) =	8	miles
Miles per trip (Building Materials) =	40	miles

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.500**	**4.7000**	**19.10**	**0.512**	**7.7**	**2.01**	**1646**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**35,468.88**	**25,646.73**	**104,223.93**	**2,793.86**	**42,180.68**	**10,968.07**	**8,979,655.41**
tons	**17.73**	**12.82**	**52.11**	**1.40**	**21.09**	**5.48**	**4,489.83**

Example Calculation: NO_x emissions (lbs) = 60 miles per trip * 8787.5 trips * NO_x emission factor (g/mile) * lb/453.6 g

Summary	Summarizes total emissions by calendar year for Alternative 1 - Implementation Phase (GSN).
Airfield Operations	Aircraft operations consist of taxi, take-off and landings (sorties or LTOs), touch-and-go operations (TGOs), and low flybys (LFB) by base aircraft.
Fuel Truck and Commuter Vehicle Emissions	Estimates emissions for workers and operational vehicles commuting to the site of the Proposed Action.
Fuel Transfer Emissions	Fuel loading operations under the Proposed Action involves the loading of fuel into tanker trucks and aircraft.
Internal Combustion Engine (ICE) Emissions	Estimates Emissions from Internal Combustion Engines (e.g Generators)
Fuel Storage Tanks	Estimates emissions from Above Ground Storage Tanks.

Criteria Pollutant and VOC Emissions Summary for Alternative 1 - Implementation Phase (GSN) (tons/year)

Source Category	PM10	PM2.5	CO	NOx	SOx	VOCs
Airfield Operations*	0.423	0.419	1.661	0.024	0.096	0.218
Fuel Truck and Commuter Vehicle Emissions	0.04306	0.03444	0.51397	2.15436	0.00206	0.11774
Fuel Transfer	N/A	N/A	N/A	N/A	N/A	0.339
ICE	1.824	1.824	5.538	25.701	1.700	2.073
Fuel Storage Tanks	N/A	N/A	N/A	N/A	N/A	1.383
Total Criteria and VOC Pollutant Emissions (tons/year)	**2.29**	**2.28**	**7.71**	**27.88**	**1.80**	**4.13**

*Highest emission value from either proposed aircraft mix extreme

Greenhouse Gas (GHG) Emissions Summary for Alternative 1 - Implementation Phase (GSN) (metric tonnes/year)

Source Category	CO_2 (lb/year)	CO_2 (kg/year)	CO_2 (metric tonne/year)
Airfield Operations*	388,888,889	176,400,000	176,400
Fuel Truck and Commuter Vehicle Emissions	485,571	220,255	220
Fuel Transfer	0	0	0
ICE	1,906,838	864,942	865
Fuel Storage Tanks	0	0	0
Total GHG Emissions	**391,281,298**	**177,485,197**	**177,485**

DATA - Airfield Operations for Alternative 1 - Implementation Phase (GSN)

For purposes of establishing the worst case scenario the maximum number allowed at one time for each aircraft scenario will be used to calculate airfield operational emissions. 12 aircraft (KC-135) and 24 fighters(F-22)), are the two worst case scenarios which will be used during this analysis.
It is assumed that each aircraft would take off and land twice each day during exercises

Landing and takeoff (LTO) and touch and go (TGO) Cycles Estimation

Description	Quantity
Weeks of Exercises	8
Days of Exercises	56
# of LTO's per exercise day	2
# of TGO's per exercise day	0
# of KC-135 (Worst Case Scenario)	12
# of F-22 (Worst Case Scenario)	24
# of KC-135 LTO's per year	24
# of F-22 LTO's per year	48
# of KC-135 TGO's per year	0
# of F-22 TGO's per year	0

Legend
Input Data

Airfield Activity Data (Worst Case Scenario)

							Fiscal year 1	
Aircraft Model	Aircraft Model Used to Match to Available Emission Factors	Engine Model	# Engines	APU Model	# APUs	Notes	LTO Cycles	TGO Cycles
F-22	F-22	F119-PW-100	2	G250	1		48	0
KC-135	KC-135-R	F108-CF-100	4				24	0

Emission factors from AFCEE 2009 Mobile Emissions Guide, Table 1-2, Table 1-4

Emission Factors (EFs) and Constants - Airfield Operations for Alternative 1 - Implementation Phase (GSN)

Aircraft Criteria Pollutant Emission Factors

						Emission Factors in lb Pollutant per 1000 lb Fuel Burned						
Aircraft Model	Engine Model	# Eng.	Reference Thrust Mode	LTO/TGO Thrust Mode	Fuel Flow (lb/hr)	PM10	PM2.5	CO	NO_X	SO_2	VOCs	TIM
F-22	F119-PW-100	2	Idle	Idle	1377	2.49	2.24	48.2	3	1.4	6.48	29.8
F-22	F119-PW-100	2	Approach	Approach	2740	2	1.8	7.9	6.6	1.4	0.29	3.5
F-22	F119-PW-100	2	Intermediate	Climbout	10100	1.41	1.27	2.1	12.4	1.4	0.48	0.8
F-22	F119-PW-100	2	Military	Takeoff	18612	1.12	1.01	0.8	19.8	1.4	0	0.4
KC-135	F108-CF-100	4	Idle	Idle	1136	9.08	8.99646	27.19	3.94	1.4	0.92	47.7
KC-135	F108-CF-100	4	Approach	Approach	2547	1.55	1.53574	6.39	6.96	1.4	0.04	5.2
KC-135	F108-CF-100	4	Intermediate	Climbout	5650	0.65	0.64402	1.61	13.53	1.4	0.03	2.5
KC-135	F108-CF-100	4	Military	Takeoff	6458	1.59	1.57537	0.63	15.28	1.4	0.03	0.7

Emission factors from AFCEE 2009 Mobile Emissions Guide, Table 1-2, Table 1-4

Emission Factors (EFs) and Constants - Airfield Operations for Alternative 1 - Implementation Phase (GSN)

APU Emission Factors

			APU Emission Factors in lb Pollutant per hour						
Aircraft Model	# APU	APU Model	PM10	PM2.5	CO	NO_X	$S0_2$	VOCs	APU (hr)
F-22	1	G250	No emissions data available.						

Default Time-In-Mode	Typical Duration by Mode (minutes)					
Aircraft Type	Taxi/Idle-out	Takeoff	Climbout	Approach	Taxi/Idle-in	Total
KC-135	32.8	0.7	2.5	5.2	14.9	56.1
F-22 (Combat USAF)	18.5	0.4	0.8	3.5	11.3	34.5

Emission factors from AFCEE 2009 Mobile Emissions Guide, Table 1-8

Greenhouse Gas Emission Factors

Units	CO_2
kg/gal fuel	9.80
kg/lb fuel	1.43

Reference: Table 3-6 "GHG Emission Factors for Aircraft LTO Cycle"
AFMC Interim GHG Inventory Guidance, AFCEE, February 2009.

Conversion of CH4 and N2O to CO2 Equivalent (CO2e)

Pollutant	Multiplier	CO_2e
CO_2	* 1 =	

Ref: Table A-5, AFMC Interim Greenhouse Gas Inventory Guidance, AFCEE, February 2009.

Calculations - Airfield Operations for Alternative 1 - Implementation Phase (GSN)

Criteria Pollutant and VOC Emissions per LTO by Aircraft Type

Calculated as the sum of the products of [(minutes) * (fuel flow/minute) * (lbs pollutant/lb fuel)] for each of the thrust modes
Plus [(APU hr) * (lb/hr)] for each pollutant, for those aircraft that are equipped with APUs

			Emission in lb Pollutant per LTO						
Reported Aircraft Model	APU	Fuel (lb)	PM10 (lb)	PM2.5 (lb)	CO (lb)	NOx (lb)	SOx (lb)	VOCs (lb)	APU
F-22	1	2205.0	4.7	4.2	69.2	14.5	3.1	9.1	G250
KC - 135	0	5738.5	35.3	34.9	105.6	37.7	8.0	3.4	

			Emission in lb Pollutant per TGO					
Reported Aircraft Model		Fuel (lb)	PM10 (lb)	PM2.5 (lb)	CO (lb)	NOx (lb)	SOx (lb)	VOCs (lb)
F-22		837.2	1.3	1.2	3.3	10.4	1.2	0.2
KC - 135		2126.0	2.5	2.4	7.3	23.5	3.0	0.1

Total Criteria Pollutant and VOC Emissions for maximum LTO's by Aircraft Type

Reported Aircraft Model	APU	Total LTO's	Fuel (gal)	PM10 (tons)	PM2.5 (tons)	CO (tons)	NOx (tons)	SOx (tons)	VOCs (tons)	APU
F-22	1	48	105,839.0	0.11	0.10	1.66	0.02	0.07	0.22	G250
KC - 135	0	24	137,723.5	0.42	0.42	1.27	0.01	0.10	0.04	
Worst Case Scenario			**137,723.52**	**0.42**	**0.42**	**1.66**	**0.02**	**0.10**	**0.22**	

Total Criteria Pollutant and VOC Emissions for maximum TGOs by Aircraft Type

Reported Aircraft Model		Total TGO's	Fuel (lb)	PM10 (lb)	PM2.5 (lb)	CO (lb)	NOx (lb)	SOx (lb)	VOCs (lb)
F-22		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KC - 135		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Calculations - Airfield Operations for Alternative 1 - Implementation Phase (GSN)

Greenhouse Gas Emission

Assume 300,000 gallons per day for 60 days.

Quantity (gallons)	Fuel Type	CO_2 (kg)	CO_2 (metric tonne)
18,000,000	JP-8	176,400,000	176,400

DATA - Fuel Truck and Commuter Vehicle Emissions for Alternative 1 - Implementation Phase (GSN

Given: Six 10,000 gal Fuel Trucks will take 14 days at 10hrs/day to provide initial fill from Saipan port to Saipan International Airport (Site of Proposed Action). The six 10,000 gallon Fueld trucks will operate 10hrs/day for the duration of the exercises. The total exercise time is 8 weeks (56 days), therefore the fuel trucks will operate an additional 42 days after the initial fill.

Under the commercial lodging option fourteen busses will transport a total of 700 personnel 4 trips/day for a total of 56 trips/day for 8 weeks.

Assumptions: A Gross Vehicle Weight (GVW) of 36,200 lbs will be used, based off of an 84 passenger Blue Bird bus.

Assume fuel truck GVW > 60,000 lbs since fuel load alone is 83,400 lbs.

Assume fuel trucks travel at 55 miles per hour

Assume 40 miles per roundtrip for busses.

Vehicle Weight Classes for Which Emission Factors are Published

Vehicle Category	Description	SCC
LDGV	Light-Duty Gasoline Vehicles (i.e., passenger cars) does not include SUVs, vans or pickups	A2201001000
LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs GVW - includes pickup trucks, sport utility vehicles and vans)	A2201020000
LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVW - includes pickup trucks, sport utility vehicles and vans)	A2201040000
HDGV2B	Class 2b Heavy-Duty Gasoline Vehicles (8501-10,000 lbs GVW)	A2201070000
HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs GVW)	A2201070000
HDGV8A	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs GVW)	A2201070000
LDDV	Light-Duty Diesel Vehicles (Passenger Cars)	
LDDT34	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs GVW)	A2230002000
HDDV2B	Class 2b Heavy-Duty Diesel Vehicles (8501-10,000 lbs GVW – includes pickup trucks)	A2230070000
HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs GVW)	A2230070000
HDDV8A	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)	A2230070000
HDDV8B	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	A2230070000
MC	Motorcycles	A2201080000

Emission Factors - Fuel Truck and Commuter Vehicle Emissions for Alternative 1 - Implementation Phase (GSN

Emission Factors for Calendar Year 2013

		Emission Factors in grams per Mile[a]								
Vehicle Class	Model Year	PM_{10}	$PM_{2.5}$	CO	NOx	SOx	VOCs	CO2	Fugitive PM_{10}	Fugitive $PM_{2.5}$
HDDV8A*	2000	0.2	0.19	2.87	12.18	0.01	0.66	1544.1	0.05	0.01
HDDV8B**	2000	0.2	0.19	3.45	13.85	0.02	0.78	1615.2	0.05	0.01

* Low Altitude Emission Factors for Heavy Duty Diesel Vehicles Class 8a

**Low Altitude Emission Factors for Heavy Duty Diesel Vehicles Class 8b

a) Emission factors from Appendix A of Air Emissions Factor Guide to Air Force Mobile Sources, AFCEE, December 200

Greenhouse Gas Emission Factors for Calendar Year 2013

Vehicle Class	Fuel Econ (mpg)[a]	(gal/mi)	CO2 kg/gal	Emission Factors g/mi CO2[b]
LDGV	24.1	0.041	8.81	365.6
LDGT1	17.2	0.058	8.81	512.2
LDGT2	17.2	0.058	8.81	512.2
HDGV	9.5	0.105	8.81	927.4
LDDT	19.0	0.053	10.15	534.2
HDDV	7.2	0.139	10.15	1,409.7

a) Table 3.5 "Fuel Economy by Vehicle Class" Air Force Materiel Command Interim Greenhouse Gas Inventory Guidance, February 2009. Fuel economy factors suggested in Table 4-51 of the AF IERA 2003 guidance document are comperable, but correspond to 1995 model year vehicles
CH4 and N2O emission factors are from Table 3.3 of AFMC 2009.

b) CO2 is estimated from the fuel use per mile using the emission factors:
8.81 kg/gal gasoline
10.15 kg/gal diesel
from Table 3.2 "CO2 Vehicle Emission Factors for Method 1 (GRP) by Fuel Type'
Air Force Materiel Command Interim Greenhouse Gas Inventory Guidance, February 2009.

Conversion of CH4 and N2O to CO2 Equivalent (CO2e)

Pollutant	Multiplier	CO2e
CO2	* 1 =	

Ref: Table A-5, AFMC Interim Greenhouse Gas Inventory Guidance, AFCEE, February 2009.

Also agrees with Table B.1 of The Climate Registry "General Reporting Protocol", Version 1.1, May 2008.

Emission Calculations - CFuel Truck and Commuter Vehicle Emissions for Alternative 1 - Implementation Phase (GSN

Miles for Commuter Emissions for 8 week training exercise

Vehicle Class	Speed Miles/hour	Miles/Trip	Total Trips/Day	Hours/Day	Total Days	Total Miles
HDDV8A - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)		40	56		56	125,440
HDDV8B - Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	55			10	56	30,800

Criteria and VOC Emissions for Commuters

Vehicle Class	Model Year	Annual Miles	Criteria Pollutant Emissions (tons/year)					
			PM_{10}	$PM_{2.5}$	CO	NOx	SOx	VOCs
HDDV8A - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)	2000	125,440	0.035	0.028	0.397	1.684	0.001	0.091
HDDV8B - Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	2000	30,800	0.008	0.007	0.117	0.470	0.001	0.026
Total			**0.043**	**0.034**	**0.514**	**2.154**	**0.002**	**0.118**

Particulate emissions include exhaust, brake wear, tire wear. Assume paved road.

Greenhouse Gas Emissions for Commuters

Vehicle Class	Annual Miles	Annual Gal	GHG Pollutant Emissions (lb/year)	GHG Pollutant Emissions (metric tonne/year)
			CO2	CO2
HDDV8A - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)	125,440	17,422	389,849.11	176.84
HDDV8B - Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	30,800	4,278	95,721.88	43.42
Total			**485,570.99**	**220.26**

Emission Calculations Method - Fuel Truck and Commuter Vehicle Emissions for Alternative 1 - Implementation Phase (GSN)

Calculation Method: Equation 4-1 , AFCEE 2009, Mobile Emissions Guide

EP = VMTVehCat * EFPolVehCat * 0.002205

Where,
EP = Emissions of each individual pollutant (lb/yr)
VMTVehCat = Annual vehicle miles traveled by each vehicle category (LDGV, LDGT1, LDDV, etc.) (mi/yr)
EFPolVehCat = Emission factor of each pollutant for each vehicle category (g/mi)
0.002205 = Factor for converting grams to pounds (g/lb).

DATA - Fuel Loading Emissions for Alternative 1 - Implementation Phase (GSN)

Given:

Total Exercise Days (8 weeks)	56
Initial Fuel Fill Days	14
Remaining Fuel Fill Days	42
Total # of Fuel Trucks	6
Total Gallons per Fuel Truck	10,000
Trips per day per Fuel Truck	5
1 bbl conversion to gallons	42
Total Fuel (gal) during Initial Fill	4,200,000
Total Fuel (gal) during Remaining Exercise	12,600,000
Total Fuel (gal) during Exercise (8 Weeks)	16,800,000

Proposed Action Fuel Loading Operations

Location	Description	Fuel Type	Fuel Transferred (gal)	Category
Flightline	Loading Aircraft from Hydrants	JP-8	16,800,000.0	Loading
Seaport, Loading Racks (50,000 bbl tank 1)	Loading Refueler Trucks	JP-8	8400000	Loading
Seaport, Loading Racks (50,000 bbl tank 2)	Loading Refueler Trucks	JP-8	8400000	Loading

Emission Factors - Fuel Loading Emissions for Alternative 1 - Implementation Phase (GSN)

JP-8 emission factors (lb/Mgal)	Dispensing Splash	Loading Bottom fill	
Molecular Weight =	130		AP-42 Table 7.1-2 dated 11/06
True Vapor Pressure (psia) =	0.011		AP-42 Table 7.1-2 dated 11/06 @ 70F (annual avg.)
Dispensing Displacement losses =	0.0487	0.020	AP-42 Section 5.2 dated 6/08 Equation (1)
Spillage =	0.7		AP-42 Table 5.2-7 dated 6/08
Total =	0.749		

Emission Calculations - Fuel Loading Emissions for Alternative 1 - Implementation Phase (GSN)

Location	Description	Fuel Type	Fuel Transferred (gal)	Displaced Vapor (lb)	Spillage (lb)	Total VOC (lb)	Total VOC (ton)
Flightline	Loading Aircraft from Hydrants	JP-8	16,800,000	338.9	0	338.9	0.169
Seaport, Loading Racks (50,000 bbl tank 1)	Loading Refueler Trucks	JP-8	8,400,000	169.4	0	169.4	0.085
Seaport, Loading Racks (50,000 bbl tank 2)	Loading Refueler Trucks	JP-8	8,400,000	169.4	0	169.4	0.085
Total			**33,600,000**	**678**	**0**	**678**	**0.339**

Emission Calculations Method - Fuel Loading Emissions for Alternative 1 - Implementation Phase (GSN)

Displacement emissions for Diesel and JP-8 were estimated using Equation (1) from AP-42 Section 5.2, Transportation and Marketing of Petroleum Liquids, dated 6/08

$$L_L = 12.46\ (SPM)/T$$

Where

L_L = Loading loss in lb/10^3 gal

S = Saturation Factor 1.45 for splash loading, 0.6 for bottom loading

M = molecular weight,

T = temperature of bulk liquid (assume average annual ambient temperature)

DATA - Internal Combustion Engine Emissions for Alternative 1 - Implementation Phase (GSN)

Given:

Generator Peak Demand (kW)	920
Generator Operating Time - 8 weeks (hrs)	1344

Emission Factors

Pollutant	Emission Factor (lb/10^3 gal)	Emission Factor (lb/10^3 hp-hr) (lb/hp-hr)
Criteria Pollutants		
CO	130.0	6.7
NO_x	604.0	31.0
PM	42.5	2.2
PM_{10}	42.5	2.2
SO_x	39.7	2.1
TOC	49.3	2.5
CO_2		1.15

EF's obtained from AFCEE 2009 except CO2 was obtained from AP-42, all assume JP-8 EF's are similar to Diesel EF's

Emissions Calculation - Internal Combustion Engine Emissions for Alternative 1 - Implementation Phase (GSN)

	Criteria Pollutant Emissions (tons/year)					
	CO	NOx	PM	PM10	SOx	TOC
Description	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)
920 kW Generator Set	5.54	25.70	1.82	1.82	1.70	2.07

	GHG Pollutant Emissions	
Description	CO_2 (lbs)	CO_2 (tons)
920 kW Generator Set	1,906,838	864.94

AFCEE Stationary Source Air Emissions Inventory Guidance, Dec 2009, Equation 32-4

Epol = (PD x 1.341 x OT/1000) x EF Equation 32-4

Where

Epol = Emissions of a particular pollutant (lb/yr)

PD = Peak demand of the generator (kW)1.341 = Factor for converting "kW" to - "hp"

OT = Operating time of the generator (hr)

1000 = Factor for converting - "hp-hr" to - "10^3 hp-hr"

EF = Emission Factor (lb/10^3 hp-hr).

DATA - Fuel Storage Tank Emissions for Alternative 1 - Implementation Phase (GSN)

Fuel storage tank emissions were estimated using the U.S. EPA TANKS storage tank emissions calculation software (Version 4.0.9d). The emissions calculations algorithms in the TANKS program are based on Chapter 7 of EPA's AP-42. In order to estimate HAP emissions from tanks, the VOC estimates generated by the TANKS software are subdivided into the chemical fractions in the fuel liquid and vapor. The following mixtures and speciation profiles were used to describe JP-8 fuel in TANKS. This profile was obtained from the AFCEE 2009 Stationary Source Guide.

Emission Calculations Summary from TANKS*

Tank Type	Throughput	Working Loss (lbs)	Breathing Loss (lbs)	VOC Total (lbs)	VOC Total (tons)
Tank 1 (Seaport)- 50,000 bbl, cut and cover or AST	8400000	428.42	237.56	665.98	0.33
Tank 2 (Seaport)- 50,000 bbl, cut and cover or AST	8400000	428.42	237.56	665.98	0.33
Tank 3 (Airport) - 100,000 bbl, cut and cover or AST	16800000	856.84	577.78	1,434.62	0.72
Total		**1713.68**	**1052.9**	**2766.58**	**1.38**

*See the following references for TANKS printouts. (SM11 - TANKS) & (SM12 - TANKS)

Summary	Summarizes total emissions by calendar year for Alternative 2 - Construction Phase (TNI).
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Haul Truck On-Road	Estimates emissions from hauling construction materials to the project site.

Summary of Air Quality Emissions from Divert EIS - Alternative 2 - Construction Phase (TNI)

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Construction Combustion	25.758	3.014	11.115	1.640	1.781	1.727	2,982.524
Construction Fugitive Dust	-	-	-	-	178.204	15.406	-
Construction Commuter	8.814	8.774	79.322	0.1034	0.835	0.526	10,518.551
Haul Truck On-Road	22.640	16.370	66.527	1.783	26.924	7.001	5,731.771
TOTAL	***57.21***	***28.16***	***156.96***	***3.53***	***207.74***	***24.66***	***19,232.85***

Annual Summary of Air Quality Emissions from Divert EIS - Alternative 2 - Construction Phase (TNI)*

	Point and Area Sources Combined						
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2 (metric tons)
CY 01	19.07	9.39	52.32	1.18	69.25	8.22	6410.95
CY 02	19.07	9.39	52.32	1.18	69.25	8.22	6410.95
CY 03	19.07	9.39	52.32	1.18	69.25	8.22	6410.95

* Construction duration is estimated to be 36 months and the emissions are assumed to be distributed evenly over the construction period.

Combustion Emissions - Alternative 2 (TNI
Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, and CO_2 due to Construction

Assumptions
When multiple options exist under the general construction activites the most conservative value will be used to quantify air emission.

General Construction Activities	**Area Disturbed (ft^2)**
Construct Aircraft Hangar	35,100 ft^2
Construct Maintenance Facility	6,000 ft^2
Construct Jet Fuel System (Operational, Bulk and at the Port of Tinian)	680,000 ft^2
Construct Billeting	669,000 ft^2
Construct Hazardous Cargo Pad and Arm/Disarm Pad	455,000 ft^2
Construct Maximum Runway Extension	555,000 ft^2
Construct Parking Apron	1,660,000 ft^2
Construct Temporary Munitions Storage Area (ECM and Multi Cube)	30,700 ft^2

Total General Construction Area:	1,845,100	ft^2	
	42.4	acres	
Total Demolition Area:	0	ft^2	
	0.0	acres	
Total Pavement Area:	2,245,700	ft^2	
	51.6	acres	
Total Disturbed Area:	4,090,800	ft^2	
	93.9	acres	
Construction Duration:	36	months	
1 Yr Project Construction Activity:	240	days/yr	Assume 12 months, 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.
c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.
d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	9	374.771	23.193	141.389	7.495	22.910	22.222	44473.737
Paving Equipment	5	226.836	13.029	92.892	4.537	13.880	13.464	28119.784
Demolition Equipment	1	31.808	1.886	12.584	0.636	1.923	1.865	3703.074
Building Construction	4	157.585	12.519	69.529	12.465	11.316	10.977	17858.047
Air Compressor for Architectural Coating	4	14.296	1.493	6.262	1.005	1.237	1.200	1439.093
Architectural Coating**			110.705					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	4,090,800	93.91	6	(from "Grading" worksheet)
Paving:	2,245,700	51.55	49	
Demolition:	0	0.00	0	
Building Construction	1,845,100	42.36	240	
Architectural Coating	1,845,100	42.36	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEAI
Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of squa
feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservativ
The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 20
MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a heig
of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remov
Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demoliti
The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is know

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	2,248.63	139.16	848.33	44.97	137.46	133.33	266,842
Paving	11,160.35	641.01	4,570.29	223.21	682.92	662.43	1,383,493
Demolition	-	-	-	-	-	-	0
Building Construction	37,820.47	3,004.62	16,687.02	2,991.70	2,715.88	2,634.41	4,285,931
Architectural Coatings	285.93	2,243.96	125.23	20.09	24.75	24.00	28,782
Total Emissions (lbs):	**51,515.37**	**6,028.74**	**22,230.88**	**3,279.97**	**3,561.00**	**3,454.17**	**5,965,049**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	51,515.37	6,028.74	22,230.88	3,279.97	3,561.00	3,454.17	5,965,049
Total Project Emissions (tons)	25.76	3.01	11.12	1.64	1.78	1.73	2,982.52

Construction Fugitive Dust Emissions - Proposed Action (Phase 1 - Current, Annua

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	51.6	acres

General Construction Activities (0.19 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	42.4	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	259.83	129.92	25.98	12.99
General Construction Activities	96.58	48.29	4.83	2.41
Total	**356.41**	**178.20**	**30.81**	**15.41**

General Construction Activities Emission Facto

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.*Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule - Proposed Action (Phase 1 - Current, Annual)

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 93.9 acres/yr (from Combustion Worksheet)
Qty Equipment: 29.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	93.91	11.74
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	93.91	45.91
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	46.96	47.35
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	46.96	19.42
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	93.91	32.94
TOTAL								157.36

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 157.36
Qty Equipment: 29.00
Grading days/yr: 5.43

Construction/Staff Commuter Emissions - Alternative 2 (TNI)

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2011-2015 are used.

The average roundtrip commute for a construction/staff worker =	40	miles
Number of construction days =	240	days
Number of construction/Staff workers (daily) =	2000	people

Note: None

Passenger Vehicle Emission Factors for Year 2011-2016 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**17,628.307**	**17,548.575**	**158,644.933**	**206.875**	**1,669.993**	**1,051.800**	**21,037,101.087**
tons	**8.814**	**8.774**	**79.322**	**0.103**	**0.835**	**0.526**	**10,518.551**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

No Statistical Area Available for TN

				Point Source Emissions						Area Source Emissions (Non-Point and Mobile Sources)					
Row #	State	County	Tier-1	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO	NOx	PM_{10}	$PM_{2.5}$	SO_2	VOC
No Data Available															
Grand Total				0	0	0	0	0	0	0	0	0	0	0	0

SOURCE:
http://www.epa.gov/ttn/chief/eiinformation.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2002)
Site visited on 02 February 2012.

No Air Quality Control Region Identified

	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
CNMI	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
CNMI DEQ	0	0	0	0	0	0

Construction/Haul Truck Emissions - Alternative 2 (TNI)

Emissions from hauling construction supplies, demoliton debris, fill, and excavated material are estimated in this spreadsheet.

Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Concrete Mixing and Dump Truck Assumptions:
Dump trucks carry 11 cubic yards of material per trip.
Concrete mixing trucks carry 10 cubic yards of material per trip.
The average distance from the port to Commercial Concrete Supply Company is 1.7 miles; therefore, dump trucks will travel 3.4 miles round trip.
The average distance from the Commercial Concrete Supply Company (CCSC) to the project site is 2.3 miles; therefore, concrete trucks will travel 4.6 miles round trip.

Fill Materials Assumptions:
Haul trucks carry 20 cubic yards of material per trip.
The average distance from the project site to the materials source is 20 miles; therefore, building material haul trucks will travel 40 miles round trip.
Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

Amount of demoltion debris =	209,170	cubic yards	No Demolition in the Proposed Action
Amount of concrete transported from port to CCSC =	3,089	cubic yards	
Amount of concrete transported from CCSC to project site =	49,426	cubic yards	
Amount of fill material =	665,000	cubic yards	Amount of fill material required for runway construction. The borrow pits are located 4 miles from the project site, a haul truck will travel 8 miles round trip.
Amount of Excavation Materials for New Buildings =	820,044	cubic yards	Construction area multiped by depth of disturbance which is assumed to be 12 feet.
Amount of Building Materials =	615,033	cubic yards	Construction area multipled by 9 feet.

Number of dump trucks required (port to CCSC) =	281	heavy duty diesel haul truck trips, Cells rounded up
Number of concrete mixing trucks required (CCSC to project site) =	4943	heavy duty diesel haul truck trips, Cells rounded up
Number of trucks required (Borrow Pits) =	33,250	heavy duty diesel haul truck trips
Number of trucks required (Building Materials) =	71,754	heavy duty diesel haul truck trips
Miles per trip (port to CCSC) =	3.4	miles
Miles per trip (CCSC to project site) =	4.6	miles
Miles per trip (Borrow Pits) =	8.0	miles
Miles per trip (Building Materials) =	40.0	miles

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.50**	**4.70**	**19.10**	**0.51**	**7.73**	**2.01**	**1,645.60**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**45,280.02**	**32,740.94**	**133,053.60**	**3,566.67**	**53,848.39**	**14,001.98**	**11,463,542.07**
tons	**22.64**	**16.37**	**66.53**	**1.78**	**26.92**	**7.00**	**5,731.77**

Example Calculation: NO_x emissions (lbs) = 60 miles per trip * 8787.5 trips * NO_x emission factor (g/mile) * lb/453.6 g

Summary Summarizes total emissions by calendar year for Alternative 2 - Implementation Phase (TNI).

Airfield Operations Aircraft operations consist of taxi, take-off and landings (sorties or LTOs), touch-and-go operations (TGOs), and low flybys (LFB) by base aircraft.

Fuel Truck and Commuter Vehicle Emissions Estimates emissions for workers and operational vehicles commuting to the site of the Proposed Action.

Fuel Transfer Emissions Fuel loading operations under the Proposed Action involves the loading of fuel into tanker trucks and aircraft.

Internal Combustion Engine (ICE) Emissions Estimates Emissions from Internal Combustion Engines (e.g Generators)

Fuel Storage Tanks Estimates emissions from Above Ground Storage Tanks.

Criteria Pollutant and VOC Emissions Summary for Alternative 2 - Implementation Phase (TNI) (tons/year

Source Category	PM10	PM2.5	CO	NOx	SOx	VOCs
Airfield Operations*	0.42	0.42	1.66	0.45	0.10	0.22
Fuel Truck and Commuter Vehicle Emissions	0.04	0.03	0.51	2.15	0.00	0.12
Fuel Transfer	N/A	N/A	N/A	N/A	N/A	0.34
ICE	1.96	1.96	5.95	27.61	1.83	2.23
Fuel Storage Tanks	N/A	N/A	N/A	N/A	N/A	1.97
Total Criteria and VOC Pollutant Emissions (tons/year)	**2.43**	**2.41**	**8.12**	**30.21**	**1.92**	**4.87**

*Highest emission value from either proposed aircraft mix extreme

Greenhouse Gas (GHG) Emissions Summary for Alternative 2 - Implementation Phase (TNI) (metric tonnes/year

Source Category	CO_2 (lb/year)	CO_2 (kg/year)	CO_2 (metric tonne/year)
Airfield Operations*	388,888,889	176,400,000	176,400
Fuel Truck and Commuter Vehicle Emissions	485,571	220,255	220
Fuel Transfer	0	0	0
ICE	2,048,145	929,038	929
Fuel Storage Tanks	0	0	0
Total GHG Emissions	**391,422,605**	**177,549,293**	**177,549**

DATA - Airfield Operations for Alternative 2 - Implementation Phase (TNI)

For purposes of establishing the worst case scenario the maximum number allowed at one time for each aircraft scenario will be used to calculate airfield operational emissions. 12 aircraft (KC-135) and 24 fighters(F-22)), are the two worst case scenarios which will be used during this analysis.
It is assumed that each aircraft would take off and land twice each day during exercises

Landing and takeoff (LTO) and touch and go (TGO) Cycles Estimation

Description	Quantity
Weeks of Exercises	8
Days of Exercises	56
# of LTO's per exercise day	2
# of TGO's per exercise day	0
# of KC-135 (Worst Case Scenario)	12
# of F-22 (Worst Case Scenario)	24
# of KC-135 LTO's per year	24
# of F-22 LTO's per year	48
# of KC-135 TGO's per year	0
# of F-22 TGO's per year	0

Legend
Input Data

Airfield Activity Data (Worst Case Scenario)

Aircraft Model	Aircraft Model Used to Match to Available Emission Factors	Engine Model	# Engines	APU Model	# APUs	Notes	Fiscal year 1 LTO Cycles	Fiscal year 1 TGO Cycles
F-22	F-22	F119-PW-100	2	G250	1		48	0
KC-135	KC-135-R	F108-CF-100	4				24	0

Emission factors from AFCEE 2009 Mobile Emissions Guide, Table 1-2, Table 1-4

Emission Factors (EFs) and Constants - Airfield Operations for Alternative 2 - Implementation Phase (TNI)

Aircraft Criteria Pollutant Emission Factors

						Emission Factors in lb Pollutant per 1000 lb Fuel Burned						
Aircraft Model	Engine Model	# Eng.	Reference Thrust Mode	LTO/TGO Thrust Mode	Fuel Flow (lb/hr)	PM10	PM2.5	CO	NO_X	SO_2	VOCs	TIM
F-22	F119-PW-100	2	Idle	Idle	1377	2.49	2.24	48.2	3	1.4	6.48	29.8
F-22	F119-PW-100	2	Approach	Approach	2740	2	1.8	7.9	6.6	1.4	0.29	3.5
F-22	F119-PW-100	2	Intermediate	Climbout	10100	1.41	1.27	2.1	12.4	1.4	0.48	0.8
F-22	F119-PW-100	2	Military	Takeoff	18612	1.12	1.01	0.8	19.8	1.4	0	0.4
KC-135	F108-CF-100	4	Idle	Idle	1136	9.08	8.996464	27.19	3.94	1.4	0.92	47.7
KC-135	F108-CF-100	4	Approach	Approach	2547	1.55	1.53574	6.39	6.96	1.4	0.04	5.2
KC-135	F108-CF-100	4	Intermediate	Climbout	5650	0.65	0.64402	1.61	13.53	1.4	0.03	2.5
KC-135	F108-CF-100	4	Military	Takeoff	6458	1.59	1.575372	0.63	15.28	1.4	0.03	0.7

Emission factors from AFCEE 2009 Mobile Emissions Guide, Table 1-2, Table 1-4

APU Emission Factors

			APU Emission Factors in lb Pollutant per hour						
Aircraft Model	# APU	APU Model	PM10	PM2.5	CO	NO_X	$S0_2$	VOCs	APU (hr)
F-22	1	G250	No emissions data available.						

Default Time-In-Mode

	Typical Duration by Mode (minutes)					
Aircraft Type	Taxi/Idle-out	Takeoff	Climbout	Approach	Taxi/Idle-in	Total
KC-135	32.8	0.7	2.5	5.2	14.9	56.1
F-22 (Combat USAF)	18.5	0.4	0.8	3.5	11.3	34.5

Emission factors from AFCEE 2009 Mobile Emissions Guide, Table 1-8

Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O	CO_2e
kg/gal fuel	9.80	0.00180	0.00040	9.96
kg/lb fuel	1.43	0.00026	0.00006	1.45

Reference: Table 3-6 "GHG Emission Factors for Aircraft LTO Cycle"
AFMC Interim GHG Inventory Guidance, AFCEE, February 2009.

Conversion of CH4 and N2O to CO2 Equivalent (CO2e)

Pollutant	Multiplier	CO_2e
CO_2	* 1 =	

Ref: Table A-5, AFMC Interim Greenhouse Gas Inventory Guidance, AFCEE, February 2009.

Calculations - Airfield Operations for Alternative 2 - Implementation Phase (TNI)

Criteria Pollutant and VOC Emissions per LTO by Aircraft Type

Calculated as the sum of the products of [(minutes) * (fuel flow/minute) * (lbs pollutant/lb fuel)] for each of the thrust modes.
Plus [(APU hr) * (lb/hr)] for each pollutant, for those aircraft that are equipped with APUs.

			Emission in lb Pollutant per LTO						
Reported Aircraft Model	APU	Fuel (lb)	PM10 (lb)	PM2.5 (lb)	CO (lb)	NOx (lb)	SOx (lb)	VOCs (lb)	APU
F-22	1	2205.0	4.7	4.2	69.2	14.5	3.1	9.1	G250
KC - 135	0	5738.5	35.3	34.9	105.6	37.7	8.0	3.4	

Criteria Pollutant and VOC Emissions per TGO by Aircraft Type

Calculated as the sum of the products of [(minutes) * (fuel flow/minute) * (lbs pollutant/lb fuel)]
for each of the thrust modes, with no idle time, and no APU emissions.

		Emission in lb Pollutant per TGO						
Reported Aircraft Model		Fuel (lb)	PM10 (lb)	PM2.5 (lb)	CO (lb)	NOx (lb)	SOx (lb)	VOCs (lb)
F-22		837.2	1.3	1.2	3.3	10.4	1.2	0.2
KC - 135		2126.0	2.5	2.4	7.3	23.5	3.0	0.1

Total Criteria Pollutant and VOC Emissions for maximum LTO's by Aircraft Type

Reported Aircraft Model	APU	Total LTO's	Fuel (gals)	PM10 (tons)	PM2.5 (tons)	CO (tons)	NOx (tons)	SOx (tons)	VOCs (tons)	APU
F-22	1	48	105,839.0	0.1	0.1	1.7	0.3	0.1	0.2	G250
KC - 135	0	24	137,723.5	0.4	0.4	1.3	0.5	0.1	0.0	
Worst Case Scenario			**137,723.52**	**0.42**	**0.42**	**1.66**	**0.45**	**0.10**	**0.22**	

Total Criteria Pollutant and VOC Emissions for maximum TGOs by Aircraft Type

Reported Aircraft Model		Total TGO's	Fuel (lb)	PM10 (lb)	PM2.5 (lb)	CO (lb)	NOx (lb)	SOx (lb)	VOCs (lb)
F-22		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KC - 135		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Greenhouse Gas Emission

Assume 300,000 gallons per day for 60 days.

Quantity (gallons)	Fuel Type	CO_2 (kg)	CO_2 (metric tonne)
18,000,000	JP-8	176,400,000	176,400

DATA - Fuel Truck and Commuter Vehicle Emissions for Alternative 2 - Implementation Phase (TNI)

Given: Six 10,000 gal Fuel Trucks will take 14 days at 10hrs/day to provide initial fill from Saipan port to Saipan International Airport (Site of Proposed Action). The six 10,000 gallon Fueld trucks will operate 10hrs/day for the duration of the exercises. The total exercise time is 8 weeks (56 days), therefore the fuel trucks will operate an additional 42 days after the initial fill.

Under the commercial lodging option fourteen busses will transport a total of 700 personnel 4 trips/day for a total of 56 trips/day for 8 weeks.

Assumptions: A Gross Vehicle Weight (GVW) of 36,200 lbs will be used, based off of an 84 passenger Blue Bird bus.

Assume fuel truck GVW > 60,000 lbs since fuel load alone is 83,400 lbs.

Assume fuel trucks travel at 55 miles per hour

Assume 40 miles per roundtrip for busses.

Vehicle Weight Classes for Which Emission Factors are Published

Vehicle Category	Description	SCC
LDGV	Light-Duty Gasoline Vehicles (i.e., passenger cars) does not include SUVs, vans or pickups	A2201001000
LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs GVW - includes pickup trucks, sport utility vehicles and vans)	A2201020000
LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVW - includes pickup trucks, sport utility vehicles and vans)	A2201040000
HDGV2B	Class 2b Heavy-Duty Gasoline Vehicles (8501-10,000 lbs GVW)	A2201070000
HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs GVW)	A2201070000
HDGV8A	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs GVW)	A2201070000
LDDV	Light-Duty Diesel Vehicles (Passenger Cars)	
LDDT34	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs GVW)	A2230002000
HDDV2B	Class 2b Heavy-Duty Diesel Vehicles (8501-10,000 lbs GVW – includes pickup trucks)	A2230070000
HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs GVW)	A2230070000
HDDV8A	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)	A2230070000
HDDV8B	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	A2230070000
MC	Motorcycles	A2201080000

Emission Factors - Fuel Truck and Commuter Vehicle Emissions for Alternative 2 - Implementation Phase (TNI)

Emission Factors for Calendar Year 2013

		Emission Factors in grams per Mile [a]								
Vehicle Class	Model Year	PM_{10}	$PM_{2.5}$	CO	NOx	SOx	VOC_s	CO2	Fugitive PM_{10}	Fugitive $PM_{2.5}$
HDDV8A*	2000	0.2	0.19	2.87	12.18	0.01	0.66	1544.1	0.05	0.01
HDDV8B**	2000	0.2	0.19	3.45	13.85	0.02	0.78	1615.2	0.05	0.01

* Low Altitude Emission Factors for Heavy Duty Diesel Vehicles Class 8a

**Low Altitude Emission Factors for Heavy Duty Diesel Vehicles Class 8b

a) Emission factors from Appendix A of Air Emissions Factor Guide to Air Force Mobile Sources, AFCEE, December 2009

Greenhouse Gas Emission Factors for Calendar Year 2013

Vehicle Class	Fuel Econ (mpg)[a]	(gal/mi)	CO2 kg/gal	Emission Factors g/mi CO2[b]
LDGV	24.1	0.041	8.81	365.56
LDGT1	17.2	0.058	8.81	512.21
LDGT2	17.2	0.058	8.81	512.21
HDGV	9.5	0.105	8.81	927.37
LDDT	19.0	0.053	10.15	534.21
HDDV	7.2	0.139	10.15	1409.72

a) Table 3.5 "Fuel Economy by Vehicle Class" Air Force Materiel Command Interim Greenhouse Gas Inventory Guidance, February 2009. Fuel economy factors suggested in Table 4-51 of the AF IERA 2003 guidance document are comperable, but correspond to 1995 model year vehicles.
CH4 and N2O emission factors are from Table 3.3 of AFMC 2009.

b) CO2 is estimated from the fuel use per mile using the emission factors:
8.81 kg/gal gasoline
10.15 kg/gal diesel
from Table 3.2 "CO2 Vehicle Emission Factors for Method 1 (GRP) by Fuel Type"
Air Force Materiel Command Interim Greenhouse Gas Inventory Guidance, February 2009.

Conversion of CH4 and N2O to CO2 Equivalent (CO2e)

Pollutant	Multiplier	CO2e
CO2	* 1 =	

Ref: Table A-5, AFMC Interim Greenhouse Gas Inventory Guidance, AFCEE, February 2009.

Also agrees with Table B.1 of The Climate Registry "General Reporting Protocol", Version 1.1, May 2008.

Emission Calculations - Fuel Truck and Commuter Vehicle Emissions for Alternative 2 - Implementation Phase (TNI)

Miles for Commuter Emissions for 8 week training exercises

Vehicle Class	Speed Miles/hour	Miles/Trip	Total Trips/Day	Hours/Day	Total Days	Total Miles
HDDV8A - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)		40	56		56	125,440
HDDV8B - Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	55			10	56	30,800

Criteria and VOC Emissions for Commuters

Vehicle Class	Model Year	Annual Miles	Criteria Pollutant Emissions (tons/year)					
			PM_{10}	$PM_{2.5}$	CO	NOx	SOx	VOCs
HDDV8A - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)	2000	125,440	0.03	0.03	0.40	1.68	0.00	0.09
HDDV8B - Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	2000	30,800	0.01	0.01	0.12	0.47	0.00	0.03
Total			**0.04**	**0.03**	**0.51**	**2.15**	**0.00**	**0.12**

Particulate emissions include exhaust, brake wear, tire wear. Assume paved road.

Greenhouse Gas Emissions for Commuters

Vehicle Class	Annual Miles	Annual Gal	GHG Pollutant Emissions (lb/year)	GHG Pollutant Emissions (metric tonnes/year)
			CO2	CO2
HDDV8A - Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs GVW)	125,440	17,422	389,849.11	176.84
HDDV8B - Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs GVW)	30,800	4,278	95,721.88	43.42
Total			**485,570.99**	**220.26**

Emission Calculations Method - Fuel Truck and Commuter Vehicle Emissions for Alternative 2 - Implementation Phase (TNI)

Calculation Method: Equation 4-1 , AFCEE 2009, Mobile Emissions Guide

EP = VMTVehCat * EFPolVehCat * 0.002205

Where,
EP = Emissions of each individual pollutant (lb/yr)
VMTVehCat = Annual vehicle miles traveled by each vehicle category (LDGV, LDGT1, LDDV, etc.) (mi/yr)
EFPolVehCat = Emission factor of each pollutant for each vehicle category (g/mi)
0.002205 = Factor for converting grams to pounds (g/lb).

DATA - Fuel Loading Emissions for Alternative 2 - Implementation Phase (TNI)

Given:

Total Exercise Days (8 weeks)	56
Initial Fuel Fill Days	14
Remaining Fuel Fill Days	42
Total # of Fuel Trucks	6
Total Gallons per Fuel Truck	10,000
Trips per day per Fuel Truck	5
1 bbl conversion to gallons	42
Total Fuel (gal) during Initial Fill	4,200,000
Total Fuel (gal) during Remaining Exercise	12,600,000
Total Fuel (gal) during Exercise (8 Weeks)	16,800,000

Proposed Action Fuel Loading Operations

Location	Description	Fuel Type	Fuel Transferred (gal)	Category
Flightline	Loading Aircraft from Hydrants	JP-8	16,800,000.0	Loading
Seaport, Loading Racks (50,000 bbl tank 1)	Loading Refueler Trucks	JP-8	8400000	Loading
Seaport, Loading Racks (50,000 bbl tank 2)	Loading Refueler Trucks	JP-8	8400000	Loading

Emission Factors - Fuel Loading Emissions for Alternative 2 - Implementation Phase (TNI)

JP-8 emission factors (lb/Mgal)	Dispensing Splash	Loading Bottom fill	
Molecular Weight =	130		AP-42 Table 7.1-2 dated 11/06
True Vapor Pressure (psia) =	0.011		AP-42 Table 7.1-2 dated 11/06 @ 70F (annual avg.)
Dispensing Displacement losses =	0.0487	0.020	AP-42 Section 5.2 dated 6/08 Equation (1)
Spillage =	0.7		AP-42 Table 5.2-7 dated 6/08
Total =	0.749		

Emission Calculations - Fuel Loading Emissions for Alternative 2 - Implementation Phase (TNI)

Location	Description	Fuel Type	Fuel Transferred (gal)	Displaced Vapor (lb)	Spillage (lb)	Total VOC (lb)	Total VOC (tons)
Flightline	Loading Aircraft from Hydrants	JP-8	16,800,000	338.9	0	338.9	0.17
Seaport, Loading Racks (50,000 bbl tank 1)	Loading Refueler Trucks	JP-8	8,400,000	169.4	0	169.4	0.08
Seaport, Loading Racks (50,000 bbl tank 2)	Loading Refueler Trucks	JP-8	8,400,000	169.4	0	169.4	0.08
Total			**33,600,000**	**678**	**0**	**677.75**	**0.34**

Emission Calculations Method - Fuel Loading Emissions for Alternative 2 - Implementation Phase (TNI)

Displacement emissions for Diesel and JP-8 were estimated using Equation (1) from AP-42 Section 5.2, Transportation and Marketing of Petroleum Liquids, dated 6/08

$L_L = 12.46 (SPM)/T$

Where

L_L = Loading loss in lb/10^3 gal

S = Saturation Factor 1.45 for splash loading, 0.6 for bottom loading

M = molecular weight,

T = temperature of bulk liquid (assume average annual ambient temperature)

DATA - Internal Combustion Engine Emissions for Alternative 2 - Implementation Phase (TNI)

Given:

Generator Peak Demand (kW)	920
Generator Peak Demand (kW)	550
BEAR KIT Generator Operating Time - (hrs)*	1344
Emergency Generator Operating Time - (hrs)**	83.3

*Assume BEAR KIT Generator Operates 24/7 for 8 weeks

**Assume Standard Potential to Emit of 500hrs/year or 41.6hrs/month for 2 months

Emission Factors

Pollutant	Emission Factor (lb/10^3 gal)	Emission Factor (lb/10^3 hp-hr) (lb/hp-hr)
Criteria Pollutants		
CO	130.0	6.7
NOX	604.0	31.0
PM	42.5	2.2
PM10	42.5	2.2
SOX	39.7	2.1
TOC	49.3	2.5
CO_2		1.2

EF's obtained from AFCEE 2009 except CO2 was obtained from AP-42, all assume JP-8 EF's are similar to Diesel EF's

Emissions Calculation - Internal Combustion Engine Emissions for Alternative 2 - Implementation Phase (TNI)

	Criteria Pollutant Emissions (tons/year)					
Description	**CO (tons)**	**NOx (tons)**	**PM (tons)**	**PM10 (tons)**	**SOx (tons)**	**TOC (tons)**
920 kW Generator Set	5.54	25.70	1.82	1.82	1.70	2.07
550 kW Generator	0.21	0.95	0.07	0.07	0.06	0.08
550 kW Generator	0.21	0.95	0.07	0.07	0.06	0.08
Total	**5.95**	**27.61**	**1.96**	**1.96**	**1.83**	**2.23**

Emissions Calculation - Internal Combustion Engine Emissions for Alternative 1 - Implementation Phase (GSN)

	GHG Pollutant Emissions (lb/year)		
Description	**CO_2 (lbs)**	**CO_2 (kg/year)**	**CO_2 (metric tonne/year)**
920 kW Generator Set	1,906,838	864,942	865
550 kW Generator	70,654	32,048	32
550 kW Generator	70,654	32,048	32
Total	**2,048,145**	**929,038**	**929**

AFCEE Stationary Source Air Emissions Inventory Guidance, Dec 2009, Equation 32-4

Epol = (PD x 1.341 x OT/1000) x EF Equation 32-4

Where

Epol = Emissions of a particular pollutant (lb/yr)

PD = Peak demand of the generator (kW)1.341 = Factor for converting "kW" to - "hp"

OT = Operating time of the generator (hr)

1000 = Factor for converting - "hp-hr" to - "10^3 hp-hr"

EF = Emission Factor (lb/10^3 hp-hr).

DATA - Fuel Storage Tank Emissions for Alternative 2 - Implementation Phase (TNI)

Storage tank emissions were estimated using the U.S. EPA TANKS storage tank emissions calculation software (Version 4.0.9d). The emissions calculations algorithms in the TANKS program are based on Chapter 7 of EPA's AP-42. In order to estimate HAP emissions from tanks, the VOC estimates generated by the TANKS software are subdivided into the chemical fractions in the fuel liquid and vapor. The following mixtures and speciation profiles were used to describe JP-8 fuel in TANKS. This profile was obtained from the AFCEE 2009 Stationary Source Guide.

Emission Calculations Summary from TANKS*

Tank Type	Throughput	Working Loss (lbs)	Breathing Loss (lbs)	VOC Total (lbs)	VOC Total (tons)
Tank 1 (Seaport)- 100,000 bbl, cut and cover or AST	16,800,000	856.84	577.78	1,434.62	0.72
Tank 2 (Airport)-10,000 bbl, cut and cover or AST	8,400,000	428.42	105.76	534.18	0.27
Tank 3 (Airport) - 10,000 bbl, cut and cover or AST	8,400,000	428.42	105.76	534.18	0.27
Tank 4 (Airport) - 100,000 bbl, cut and cover or AST	16,800,000	856.84	577.78	1,434.62	0.72
Total		**2,570.52**	**1,367.08**	**3,937.60**	**1.97**

*See the following references for TANKS printouts. (SM12 - TANKS) & (SM13 - TANKS)