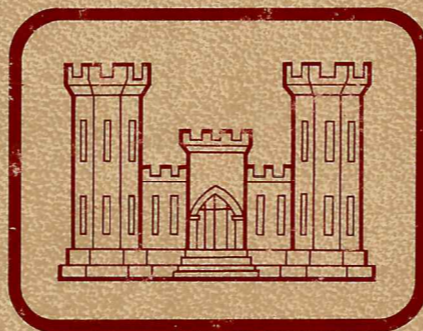


FORT McCOY, WISCONSIN

TERRAIN ANALYSIS



PREPARED BY

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CARTOGRAPHIC AND REPRODUCTION SUPPORT BY
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UNDER THE DIRECTION OF
THE TERRAIN ANALYSIS CENTER
U.S. ARMY ENGINEER TOPOGRAPHIC LABORATORIES
FORT BELVOIR, VIRGINIA 22060

DECEMBER 1981

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TERRAIN ANALYSIS

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I INTRODUCTION

BACKGROUND

The requirement for this terrain analysis of Fort McCoy was stated in message P241854Z, Oct 75, from the Commander, FORSCOM to the Office Chief of Engineers (OCE), Department of Army, Subject: "Terrain Analysis of Selected FORSCOM Installations." The FORSCOM requirement identified 13 installations (later amended to include a total of 17) including Fort McCoy, and cited topical coverage to be included in the studies. Responsibility for management and supervision of the program developed in response to the FORSCOM requirement was assigned by OCE to the Terrain Analysis Center (TAC), US Army Engineer Topographic Laboratories. At FORSCOM request, TAC responsibility also includes technical supervision and direction of FORSCOM troop units assigned to the program.

Scope and content of the topical coverage included in the FORSCOM requirement were developed jointly between representatives of TAC and FORSCOM Headquarters. Analytical and cartographic specifications for the studies were developed by TAC, coordinated with OCE and concurred in by FORSCOM Headquarters.

PURPOSE

In stating the requirements for terrain analysis of selected installations, FORSCOM indicated that the purpose of the program is to assist military planners in future stationing decisions. To achieve this purpose, planners must obtain an appreciation of the on-post terrain that includes among many other things, knowledge of the suitability for conducting field training exercises involving maneuverability of troops and military vehicles. The degree of maneuverability that can be achieved is a function of several terrain factors including slope, surface configuration, soils, vegetative cover, and surface drainage, all of which are treated in the studies.

Planners concerned with troop stationing also need certain off-post information such as statistics on housing, schools, hospitals, and public utilities in urban areas near installations, as well as pertinent data on airfields and ports in the vicinity. These things are also treated in the studies.

Since the program under which this study was prepared is intended to serve troop stationing requirements, the support provided by the program to environmental requirements is only incidental. While some of the information contained in the studies may be useful as environmental base line data, the studies are by no means complete environmental inventories of the kind required in support of environmental impact assessments.

SCOPE

In scope, the terrain analysis is a compendium of available data on the pertinent natural and man-made features of the reservation and an evaluation of their effects on tactical military operations. The program does not include basic research to fill gaps in these data although some short-term field investigations were performed to obtain ground truth and a general overall appreciation of terrain elements. Therefore, the scope of the analysis is limited primarily to those factors which have been documented by other authorities and to the results of analysis and evaluation of those factors by senior terrain analysts for topics such as cross-country movement, cover and concealment and water resources.

The terrain analysis preparation process has necessarily involved analytical judgement in the selection of pertinent source data, resolution of data conflicts, recognition of interrelationships not previously made explicit, and the application of remote sensing to update certain critical, time-variant data such as vegetative cover and man-made features including roads, airfields, and facilities constructed outside of the cantonment areas.

LIMITATIONS

The study naturally reflects limitations in the quality, amount, and currency of the source data on which it is based. Numerous field interviews and selective use of remote sensing were employed in an effort to assure presentation of the latest and best information. Within the relatively complex topical scope of the analysis, however, there are a number of aspects on which source data have not been generated with the focus or recency desired to meet objectives fully. As noted under Scope the study effort was not designed to include basic research as a means of filling gaps in data.

By design, the presentation is cast at a level of data coverage consistent with stated objectives. Users interested in deeper pursuit of data are referred to the List of Sources in the back of the study.

PRESENTATION

Maximum use of graphic presentation has been made throughout the terrain analysis. Supporting text is, as far as practicable, in tabular format keyed to the related graphics which follow. The primary map scale is 1:50,000. For Urban Areas (Cantonment Area) the scale of the map is 1:11,500 and for Off-Post Features the map scale is 1:1,000,000.

STUDY AREA

The Fort McCoy military reservation covers 242 square kilometers (93,779 acres) in Monroe County of western Wisconsin, approximately 48 kilometers (30 miles) east of La Crosse and the Mississippi River. La Crosse is the largest city in the immediate area, with a 1978 estimated population of 51,150. The installation can be reached by Interstate 90, U.S. 16, and Wisconsin Highway 21; also, there is Volk Field (Air National Guard) at Camp Douglas and La Crosse Municipal Airport nearby.

The configuration of surface features consists primarily of smooth, nearly level plains with moderately rugged hills located mainly in two east-west ranges; elevations range from 248 meters (815 feet) above sea level where the La Crosse river leaves the reservation to 442 meters (1450 feet) near Greenfield Fire Tower. About 75% of the reservation is covered by deciduous and coniferous forests and scrub; short grasses cover about 15%, particularly in the northwestern part; and scattered swamps and wetlands, some small to medium lakes, and barren and built-up areas cover the remainder. The reservation is drained primarily by the La Crosse River and its tributaries, which flow generally westward and southwestward; only a small area near the northern boundary drains into the Black River through Clear Creek and several other small streams. During the long, cold winter, most of the streams are snow covered and frozen with ice thicknesses up to several inches. Snow cover is persistent, generally between 0.6 and 0.9 meters (2 to 3 feet) from December through March. During the spring thaw, flooding is not a significant problem, as the soils are well drained; the lowest water is during late summer and early fall.

II DESCRIPTION AND MILITARY ASPECTS OF TERRAIN

A. SURFACE CONFIGURATION

Fort McCoy is the Driftless Area of the Central Lowland physiographic province. In the south, hilly, severely dissected high plains are oriented generally east-west separating the primarily flat to gently rolling low plains of the Silver Creek drainage basin from the central section of the reservation. South of Silver Creek basin is an area of moderately dissected high plains. The central part of the reservation is characterized by moderate to highly dissected high plains on the eastern and western sides of a gently rolling, well-drained, low plains. The northern part consists of a heavily eroded, narrow belt of east-west trending high plains and flat to gently rolling swampy low plains drained by northwesterly flowing tributaries of Ranch Creek and Clear Creek.

MAP UNIT	LANDFORM TYPE	LANDFORM DESCRIPTION AND DISTRIBUTION	ELEVATIONS
	Low Plains	Flat to gently rolling plains cover about 80% of the reservation. Flattest areas are along drainageways and in scattered, small marshy depressions. Slopes most commonly 3% to 8%, but between 0% and 3% on flood plains, and up to 15% along upper reaches of streams and adjacent to high plains. Interstream areas generally between 15 m and 40 m (49 to 131 ft) above adjacent valley bottom; relief ranges from less than 10 m (33 ft) near West Silver Lake to about 50 m (164 ft) in the east-central portion of the reservation.	Mostly between 225 m and 280 m (738 and 918 ft) above sea level. Lowest elevation is 250 m (820 ft) near the airfield in the southwest. Highest elevation is 332 m (1090 ft) south of Alderwood Lake at grid coordinate 880826.
	High Plains	Moderate to highly dissected hilly plains and low ridgelines cover about 20% of the reservation. Ridgelines of the high plains in north and south trend generally east-west, narrow interstream areas are crossed by low passes. In the central part, on the east and west, ridgelines of hilly plains trend generally north-south; dissection is greatest in the east. Slopes are largely between 15% and 30% and reach up to 45% in the east; slopes adjacent to the low plains are mainly from 8% to 15%. Interstream areas are generally between 80 m and 110 m (262 to 361 ft) above valley bottom; relief ranges from 70 m (230 ft) east of Upper Pass to 130 m (426 ft) near Greenfield fire tower.	Mostly between 305 m and 395 m (1000 and 1296 ft) above sea level. Lowest elevation in the southern high plains is 274 m (900 ft) at grid coordinate 845704. Highest elevation is 427 m (1400 ft) at grid coordinate 919711. Lowest elevation is the east-central high plains is 281 m (920 ft) at grid coordinate 865779. Highest elevation is 442 m (1450 ft) at Greenfield fire tower, grid coordinate 900794. Lowest elevation in the northern high plains is 268 m (880 ft) at grid coordinate 813768. Highest elevation is 392 m (1290 ft) at grid coordinate 814863.

SELECTED PASSES

	GRID COORDINATE	ELEVATION	WIDTH
Lower Pass	827711	286 m (938 ft)	77 m (252 ft)
Upper Pass	859723	317 m (1038 ft)	13 m (41 ft)
Lafayette Pass	858717	317 m (1038 ft)	125 m (410 ft)
Raymore Pass	876718	326 m (1069 ft)	102 m (335 ft)
N1 Pass	820838	326 m (1069 ft)	50 m (164 ft)
N2 Pass	847850	33 m (109 ft)	19 m (62 ft)
N3 Pass	900875	357 m (1170 ft)	125 m (410 ft)

B. SURFACE DRAINAGE

Much of the surface drainage on Fort McCoy originates within the boundaries of the installation. Approximately 80 percent of the fort lies within the River Basin, 20 percent within the Black River Basin, and less than one percent within the Wisconsin River Basin. All of these rivers eventually flow westward into the Mississippi River. Of the ten named streams on post, seven are within the La Crosse River watershed. The La Crosse River flow southwestward across the central reservation for 17.7 kilometers (11 miles). Silver Creek joins the La Crosse River off post after flowing westward across the northern part of the reservation to join the Black River off post.

There are no gaging stations on Fort McCoy. The nearest station is on the La Crosse River near West Salem, 54.7 kilometers (34 stream miles) downstream of Fort McCoy. Discharge measurements given in the table below were determined by the floating chip method with the exception of Silver Creek, which was computed by flow meter. All measurements were taken in a wetter-than-average year and whenever possible from the lower third of the stream investigated. Ground water discharge and recharge are very important in maintaining the year-round stream flows, supplying about 66 percent of the annual flow. The remaining 34 percent is supplied by surface run-off, with peaks during periods of heavy rain and snowmelt in the spring. These periods of heavy runoff are usually compressed into only a few weeks per year.

Because flood stage estimates are valid only near gaging stations and long term records are not available, it would not be possible to make accurate predictions of flood levels at Fort McCoy. The Little La Crosse River, near Leon, has a highest recorded stage of about 1.6 meters (5.3 feet), which is considered equivalent to a 100 year flood. This would be analogous to the La Crosse River on Fort McCoy, but at about three-fourths the magnitude. Because stream flows are not excessive on Fort McCoy, flooding of any consequence rarely occurs.

There are no designated fords on Fort McCoy. Those previously used have been converted to culverts. All traffic is encouraged to use bridges whenever possible to prevent damage to fish spawning.

All Lakes on Fort McCoy are man-made impoundments with dams ranging in length from 46 meters (150 feet) to 98 meters (320 feet). All dams are classified as earthen and construction materials either silt/clay or clay/rock. The lakes usually freeze over by late November and thaw usually occurs in March. The thickness of ice may reach about .549 meters (1.8 feet) by January.

The accuracy of most figures in the Drainage Characteristics and Lake, and Ponds and Reservoirs tables can be supported by stream and lake inventory reports prepared by the Directorate of Facilities Engineering. Where figures were not available, estimates were given by staff members of the Land Management Branch, Directorate of Facilities Engineering, Fort McCoy.

B. SURFACE DRAINAGE (Continued)

DRAINAGE CHARACTERISTICS

DRAINAGE CATEGORIES	GENERAL	REGIME	WIDTH	BANKS	BOTTOMS	DEPTH	VELOCITY AND DISCHARGES
WATERCOURSES							
<u>La Crosse River Drainage Basin</u>							
La Crosse River	Large perennial stream meanders southwestward across center of reservation in a wide valley. Swamps border both banks along most of lower reaches.	High water, late March through mid-April. Low water, July through August. Stream will not freeze over until temperature falls to at least -18° to -20° F (usually in January) and thaws usually occurs by mid-March. Ice thickness averages 3.8 to 5 cm (1.5 to 2 in.).	Averages about 10 m (33 ft) with variations of ±3 m (10 ft) through length.	Slopes generally steep with heights up to 4 m (13 ft).	Primarily sand and silt with significant amounts of bedrock in middle reaches. Gradient generally < 1%.	Averages about 0.4 m (1.4 ft) but frequent pools occur with depths up to 1.5 m (5 ft).	Average velocity of about 0.3 to 0.4 m/sec (1.0 to 1.4 ft/sec). Discharge is estimated to be 4.7 m ³ /sec (166 ft ³ /sec).
Silver Creek	Perennial stream meanders westward over gently rolling low plains feeding into the La Crosse River at Angelo Pond (off-post). Some swamps border the middle reaches.	High and low water same as above. Surface runoff more influential to water levels than ground water. Stream usually freezes over by mid to late January and thaws early to mid March. Ice thickness averages 3.8 to 5 cm (1.5 to 2 in.).	Averages about 4.6 m (15 ft).	Slopes generally steep with heights up to 9 m (30 ft).	Mostly sand with small amounts of silt and rock. Gradient generally < 1%.	Averages about 0.25 m (0.8 ft). Scattered pools considerably deeper. Channel siltation sometimes occurs.	Average velocity of about 0.4 m/sec (1.4 ft/sec). Discharge is estimated to be 0.6 m ³ /sec (20 ft ³ /sec).
Tarr Creek	Perennial stream meanders westward across south central part of reservation. Stream flows through cantonment area into La Crosse River and is bordered by swampy areas in some places, particularly in lower reaches.	High and low water same as above.	Averages about 3.6 m (12 ft).	Little slope with heights of 0 to 1 m (0 to 3 ft).	Same as above.	Averages about 0.3 m (1 ft) with scattered pools of 0.6 to 0.9 m (2 to 3 ft). Channel siltation sometimes occurs.	Average velocity of about 0.5 m/sec (1.7 ft/sec). Discharge is estimated to be 0.6 m ³ /sec (20 ft ³ /sec).
Stillwell Creek	Small perennial stream flows northwestward over flat to gently rolling plains. Stream originates on post, flows through cranberry bog area, and joins the Tarr River just south of the cantonment area.	High and low water same as above. Water level more dependent on ground water recharge/discharge than surface runoff. Stream usually freezes over by mid to late January and thaws early to mid March. Ice thickness averages 3.8 to 5 cm (1.5 to 2 in.).	Averages about 1.5 m (5 ft).	Slopes very steep (about 45 to 90°) with heights of 0.6 to 3 m (2 to 10 ft).	Generally sand with some gravel. Gradient generally < 1%.	Averages about 0.2 to 0.3 m (0.7 to 1 ft). Scattered pools considerably deeper.	Average velocity of about 1.8 to 2.4 m/sec (6 to 8 ft/sec). Discharge is estimated to be less than 0.1 m ³ /sec (3 ft ³ /sec).
Squaw Creek	Perennial stream meanders southwestward across center of post, mostly over gently rolling low plains to join the La Crosse River just west of the cantonment area.	High and low water same as above.	Averages about 2 m (6.5 ft).	Slopes very steep (about 45 to 90°) with heights of 0.6 to 3 m (2 to 10 ft).	Same as above.	Averages about 0.4 m (1.4 ft). Scattered pools considerably deeper.	Average velocity of about 0.3 m/sec (1.0 ft/sec). Discharge is estimated to be 0.26 m ³ /sec (9.1 ft ³ /sec).
Swamp Creek	Small intermittent stream originating in a swamp north of Big Sandy Lake. Stream flows out of swamp westward for about 3.2 km (2 mi) to Silver Creek.	High and low water same as above.	Same as above.	Slopes nearly vertical with heights of 0.3 to 0.9 m (1 to 3 ft).	Mostly sand with some silt and rock. Gradient generally < 1%.	Averages about 0.2 to 0.3 m (0.8 to 1 ft) in lower reaches. Upper reaches usually intermittent.	Velocity very low, less than 0.1 m/sec (0.3 to 0.5 ft/sec). Discharge is estimated to be 0.14 m ³ /sec (5.0 ft ³ /sec).
Sparta Creek	Small perennial stream originating off post and flowing westward over flat, low-lying plains. Stream joins Tarr Creek just east of the cantonment area.	High and low water same as above.	Averages about 4 m (13 ft).	Slopes moderately steep (30 to 60°) with heights of 0.9 m (1 to 3 ft).	Mostly sand. Gradient generally < 1%.	Generally averages less than 0.1 m (0.2 to 0.4 ft).	Average velocity of about 0.2 to 0.4 m/sec (0.7 to 1.4 ft/sec). Discharge is estimated to be 0.14 m ³ /sec (5.0 ft ³ /sec).
<u>Black River Drainage Basin</u>							
Clear Creek	Perennial stream which originates in a swamp on the north part of the post and flows westward over relatively flat land, emptying into North (Habelman) Flowage.	High and low water same as above.	Averages about 3.3 m (11 ft).	Slopes nearly vertical with heights of 0.3 to 0.9 m (1 to 3 ft).	Mostly sand and silt. Gradient generally < 1%.	Averages about 0.15 to 0.2 m (0.5 to 0.7 ft).	Average velocity of about 0.5 to 0.8 m/sec (1.7 to 2.5 ft/sec). Discharge is estimated to be 0.4 m ³ /sec (14.1 ft ³ /sec).
Ranch Creek	Small perennial stream originating on post and flowing northward across north boundary.	High and low water same as above.	Averages about 2.1 m (7 ft).	Slopes nearly vertical with heights of 0.9 to 1.5 m (1 to 3 ft).	Same as above.	Generally averages less than 0.1 m (0.2 to 0.4 ft).	Average velocity of about 0.7 to 0.9 m/sec (2.3 to 3.0 ft/sec). Discharge is estimated to be 0.23 m ³ /sec (8.1 ft ³ /sec).
Showen Creek	Small perennial stream originating on post and flows northwestward over low-lying gently rolling plains. Parts of stream may become intermittent during periods of extreme low water. Stream flows into North (Habelman) Flowage just east of north post boundary.	High and low water same as above.	Averages about 1.2 m (4 ft).	Slopes nearly vertical with heights of 0.9 to 1.5 m (3 to 5 ft).	Mostly sand with some gravel. Gradient generally < 1%.	Same as above.	Velocity very low, less than 0.1 m/sec (0.1 to 0.3 ft/sec). Discharge is estimated to be less than 0.1 m ³ /sec (2.6 ft ³ /sec).
	Mostly perennial tributaries flowing over gently rolling low plains. Most streams either originate in or are bordered by swampy areas.	High and low water same as above.	Averages vary between 0.5 and 2.7 m (1.5 and 9 ft).	Slopes nearly vertical with heights of 0.3 to 0.9 m (1 to 3 ft).	Vary from sand combinations of sand, silt, rock and/or gravel. Gradients of 2 streams are about 1.3% while others are < 1%.	Varies from about 0.1 to 0.3 m (0.3 to 1 ft). Scattered pools considerably deeper.	Most velocities are very low, less than 0.1 m/sec (0.1 to 0.3 ft/sec). Discharges also estimated to be very low, ranging from less than 0.1 m ³ /sec (0.5 ft ³ /sec) to a maximum on one stream of 0.14 m ³ /sec (4.8 ft ³ /sec).

STANDING BODIES OF WATER

(SEE LAKES, PONDS AND RESERVOIRS TABLES)

WET AREAS

Swamps and Marshes	Mostly perennial swamps, usually considered at least 80% wooded. Wetlands are not concentrated in any particular area on post but fairly evenly distributed. Predominant wetlands are located along the La Crosse River and on the vicinities of Big Sandy Lake and Hazel Dell Lake.	High and low water same as above except surface usually freezes over in November and thaws by about late March. Ice thickness may reach 60.96 cm (24 in.) by January and often freezes to bottom.	Areas vary from a few square meters to over 1 square kilometer (247 acres). Dimensions of individual areas will vary with periods of high and low water.	Swamps and marshes usually merge gradually into higher terrain.	A layer of organic material usually underlain by fine sand or coarse sand.	Generally less than 0.6 m (2 ft). Maximum known depth is 1.4 m (4.5 ft).	With the exception of stream channels running through the swamps, water movement is usually imperceptible and discharge is seldom measurable.
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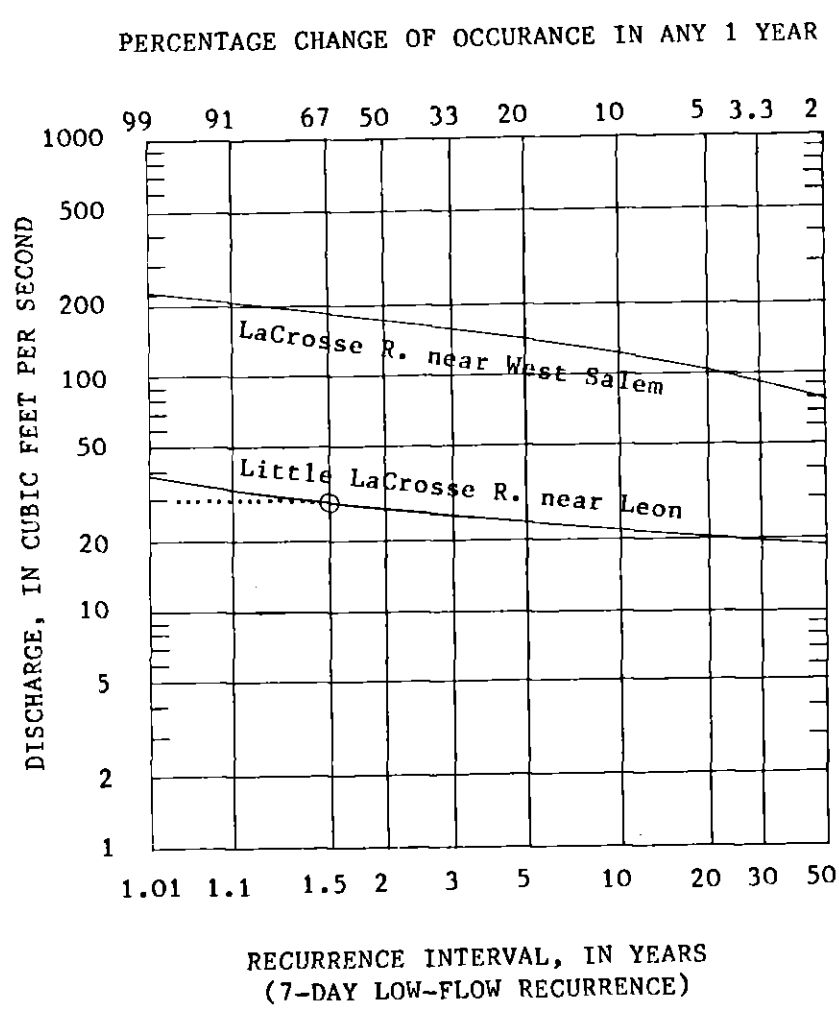
B. SURFACE DRAINAGE (Continued)

LAKES, PONDS AND RESERVOIRS

MAP NUMBER	NAME	GRID COORDINATES	AREA (APPROXIMATE) HECTARES (ACRES)	MAXIMUM DEPTH (APPROXIMATE) METERS (FEET)	HEIGHTS (APPROXIMATE) METERS (FEET)	BOTTOMS	REMARKS
1	East Silver Lake	884687	2.62 (6.5)	2.9 (9.5)	3.0 to 6.1 (10 to 20)	Sand and Silt	2.9 m (9.5 ft) high earthen dam. Horizontal underdrain with vertical riser. Steep banks. About 6.4 hectares (16.0 acres) of adjoining wetlands.
2	Squaw Lake	838772	6.19 (15.3)	5.3 (17.5)	0.9 to 2.4 (3 to 8)	Sand and Rock	5.3 m (17.5 ft) high earthen dam. Horizontal underdrain with vertical riser. West bank considerably higher than others. About 2.6 hectares (6.4 acres) of adjoining wetlands.
3	West Silver Lake	825691	2.0 (5.0)	1.4 (4.5)	0.9 (3)	Silt and Rock	3.0 m (10 ft) high earthen dam. Lake substantially filled with sand and silt. About 43 hectares (205 acres) of adjoining wetlands.
4	Alderwood Lake	877841	4.5 (11.0)	2.0 (6.6)	0.6 (2)	Silt and Rock	2.0 m (6.7 ft) high earthen dam. Horizontal underdrain with vertical riser. About 147 hectares (365 acres) of adjoining wetlands.
5	Stillwell Pond	889732	2.5 (6.1)	2.9 (9.5)	0.9 to 1.2 (3 to 4)	Silt and Rock	3.0 m (10 ft) high earthen dam. Hypo-lymmetic control device.
6	Squaw Creek Pond	877782	1.6 (4.0)	1.8 (6.0)	3.0 (10)	Sand	3.7 m (12 ft) high earthen dam. Hypo-lymmetic control device. 2.6 hectares (6.4 acres) of adjoining wetlands.
7	Swamp Pond	830698	1.2 (3.0)	2.4 (8.0)	0.3 (1)	Silt and Rock	2.4 m (8 ft) high earthen dam. Gravel spillway. About 78 hectares (192 acres) of adjoining wetlands.
8	Wac Pond	851755	1.5 (3.8)	1.8 (6.0)	0.6 to 3.0 (2 to 10)	Sand	2.7 m (9 ft) high earthen dam. Hypo-lymmetic control device. Also known as Tarr Lake. About 23 hectares (58 acres) of adjoining wetlands.
9	Hazell Dell Pond	897857	0.9 (2.3)	1.8 (6.0)	0 to 0.3 (0 to 1)	Silt and Rock	2.4 m (8 ft) high earthen dam. Concrete spillway. About 6.5 hectares (16 acres) of adjoining wetlands.
10	Upper Sparta Road	888755	1.9 (4.8)	2.9 (9.5)	1.2 (4)	Silt and Rock	2.9 m (9.5 ft) high earthen dam. Horizontal underdrain with vertical riser. About 23 hectares (58 acres) of adjoining wetlands.
11	Lower Sparta Road	884756	1.8 (4.5)	2.1 (7.0)	1.2 (4)	Silt and Rock	2.1 m (7 ft) high earthen dam. About 23 hectares (58 acres) of adjoining wetlands.
12	West Sandy Lake	816682	4.0 (10)	3.8 (12.5)	0.3 to 2.4 (1 to 8)	Sand	No structure. Ground water in borrow pit. Southeast bank considerably higher than others.
13	Sandy Lake	829683	5.3 (13.0)	3.0 (10.0)	1.5 (5)	Sand	No structure. Ground water on borrow pit. About 2.6 hectares (6.4 acres) of adjoining wetlands.
14	Big Sandy Lake	858687	7.7 (19.0)	6.2 (20.2)	1.5 (5)	Sand	No structure. Ground water in borrow pit.
15	North (Habelman)	865903	37.6 (93.0)	5.2 (17.0)	0 (0)	Silt and Rock	Total area approximately 85 hectares (211 acres). 38 hectares (93 acres) within post boundaries. About 31 hectares (76 acres) of adjoining wetlands.

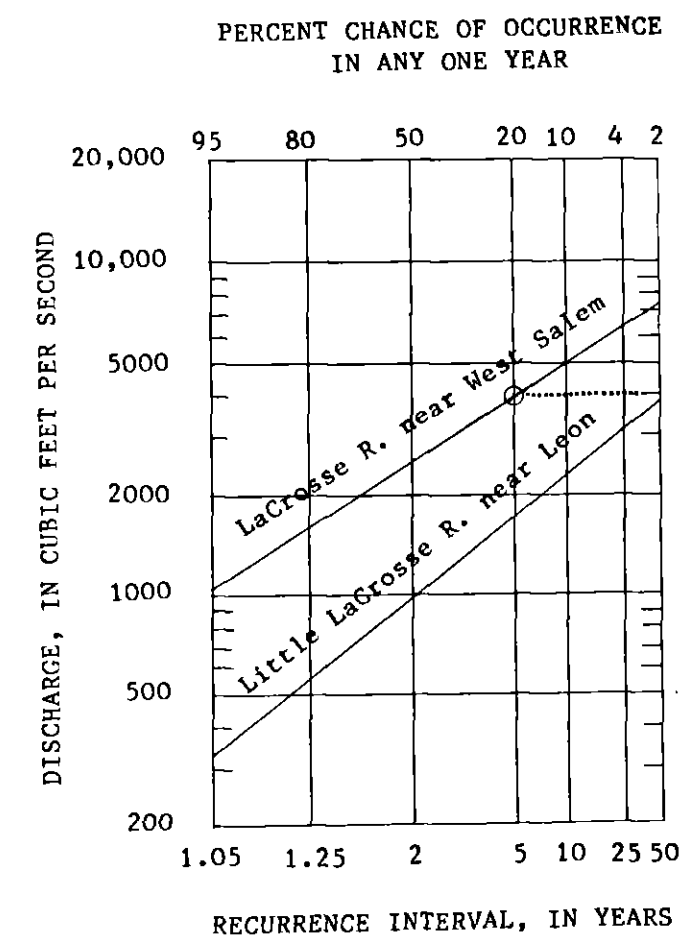
LOW-FLOW AND FLOOD-FLOW RECURRENCE

LOW-FLOW RECURRENCE



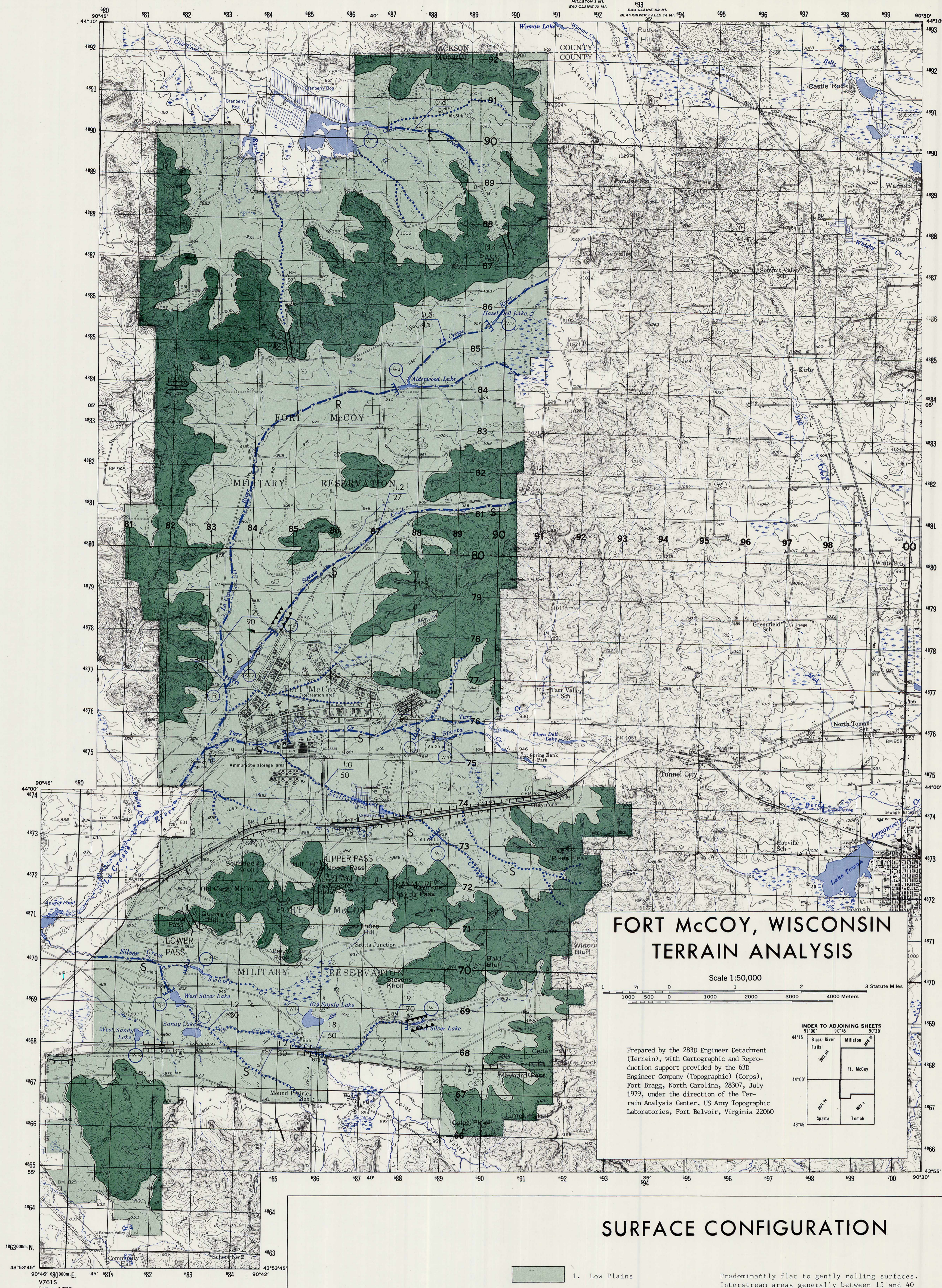
Example: A minimum average discharge of 30 cfs for 7 consecutive days can be expected on the Little LaCrosse River near Leon an average of once in 1.5 years and has a 67-percent chance of occurring in any one year.

FLOOD-FLOW RECURRENCE



Example: A peak discharge of 4000 cfs can be expected on the LaCrosse River near West Salem an average of once in 5 years and has a 20-percent chance of occurring in any one year.

Note: Low flow and flood flow curves based on log Pearson type III frequency analysis of annual instantaneous peaks for the period 1934-1968.
Source: USGS



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000
 1 1/2 0 1 2 3 Statute Miles
 1000 500 0 1000 2000 3000 4000 Meters

INDEX TO ADJOINING SHEETS
 44°15' Black River Falls Millston
 44°00' Ft. McCoy
 43°45' Sparta Tomah

Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060

SURFACE DRAINAGE

- Watercourse Width (Bank to bank gap width) *
- 3-10 meters
 - < 3 meters
 - Bank Height (meters) and Slope (degrees)
 - Bottom Characteristics
 - R = Rock
 - S = Sand
 - Earth Dam
 - Rapids or Falls
 - Lakes, Reservoirs or Ponds
 - Swamp or Marsh
- * Mainly perennial and major intermittent streams measured.
 NOTE: Numbers refer to entries in table.

- 1. Low Plains
- 2. High Plains
- Side Hill Cut
- Through Cut
- Fill

Predominantly flat to gently rolling surfaces. Interstream areas generally between 15 and 40 meters above adjacent stream valley bottoms; slopes are generally 0 to 8% and reach up to 15% near high plains.

Predominantly moderate to highly dissected hilly to rocky plains. Low ridges largely 80 to 110 meters above adjacent stream valley bottoms; slopes are generally 15 to 30%, locally some slopes up to 45%.

- Escarpment
- Pass

C. WATER RESOURCES

1. SURFACE WATERS

The surface water resources on Fort McCoy provides abundant fresh water year-round. Stream flows remain fairly constant throughout the year due to a limited seasonal fluctuation of ground water recharge.

The La Crosse River, the largest stream on the reservation, flows in a southwesterly direction draining a major portion of the installation. Two smaller river systems drain the areas north and south of the La Crosse Basin. The water in the La Crosse River and its tributaries is generally soft, alkaline, and clear to light brown in color. In the northern basin, several small streams flow into a lake, the North (Habelman) Flowage; water in this basin is usually soft, and light brown in color, with the pH varying among streams. In the south, the water in Silver Creek and its tributaries is usually soft to medium hard, alkaline, and clear to light brown in color.

Maximum runoff on Fort McCoy generally occurs from late March through mid-April; minimum runoff occurs from July through August. Because of severe winters, ice occurs on the surfaces of lakes and streams with thicknesses of 0.2 to 0.5 m (0.5 to 1.5 ft), limiting availability to the water.

Water quality, in general, is considered to be good on Fort McCoy. There is very little impact on water quality by the discharge of the sewage treatment plant on the reservation near the La Crosse River. Agricultural runoff produced in the headwaters areas outside the fort is the major concern of water quality. The Tarr Creek and the Silver Creek, both major streams originating in agricultural areas, are subject to a siltation problem.

Very few measurements are available on quantity and quality of waters in the streams and lakes on Fort McCoy. Estimates on discharge and quantities of available water are approximations from estimates given by the Directorate of Facilities Engineering at the reservation. Low and high extremes of stream discharge may occasionally exceed the ranges given in the table.

SOURCE	QUANTITY	QUALITY	DEVELOPMENT OF SOURCE
STREAMS			
LaCrosse River - largest stream on post flowing southwesterly over North Impact Area and exiting post southwest of cantonment area.	Enormous quantities of water available, usually exceeding 40,000 LPM (15,000,000 GPD). Volumes decreasing upstream of Alderwood Lake. Large to Very Large quantities, between 400 and 40,000 LPM (150,000 and 15,000,000 GPD) can be expected in upper reaches north of Alderwood Lake.	Very soft to medium hard water, alkaline, clear to light brown in color. Major source of pollution is inadequately treated sanitary waste, however stream conditions are not yet considered unfavorable. Class II trout stream.	Access to stream is generally good because of numerous adjacent roads and road crossings. Certain areas, however, are restricted because of dense vegetation, steep banks, and marshy areas.
Silver Creek - flows westerly over south post, joining the LaCrosse River at Angelo Pond (off post). There are two impoundments on this stream.	Very Large quantities available, between 4,000 and 40,000 LPM (1,500,000 and 15,000,000 GPD). Decreasing quantities available in upper reaches beyond East Silver Lake.	Water is medium hard, alkaline, and light brown in color. Stream sedimentation and siltation, resulting from agricultural runoff in its tributaries is major quality problem. Class II - Class III trout stream.	Access to stream is generally good because of adjacent roads, however, dense vegetation and marshy banks restrict access in certain areas.
Tarr Creek - flows westerly over central post and southern portion of cantonment area.	Very Large quantities of water available, between 4,000 and 40,000 LPM (1,500,000 and 15,000,000 GPD).	Water is soft, clear and alkaline. Similar siltation problems exist as in Silver Creek, however eight siltation basins were installed in 1968 to help alleviate the problem. Class II trout stream.	Other than access by adjacent roads, entrance to water points is limited due to dense vegetation heavy canopy cover, and marshy banks.
Stillwell Creek - flows northwesterly over south post and is a tributary of the Tarr Creek.	Very Large quantities of water available, between 4,000 and 40,000 LPM (1,500,000 and 15,000,000 GPD). Decreasing quantities available upstream from Stillwell Pond.	Water is soft, clear, and alkaline. No known source of pollution. Class II trout stream.	Access to stream is limited in upper reaches by dense forest and in lower reaches by dense mixed scrub.
Squaw Creek - flows southwesterly north of cantonment area and joins the LaCrosse River just west of the cantonment area. There are two impoundments on this stream.	Very Large quantities of water available, between 4,000 and 40,000 LPM (1,500,000 and 15,000,000 GPD). Decreasing quantities available in extreme northern reaches.	Water is soft, alkaline, and light brown in color. Water is generally of high quality with no known source of pollution. Class I trout stream.	Other than access by adjacent roads, entrance to water points is limited due to dense vegetation and marshy banks in certain areas.
Swamp Creek - small tributary of Silver Creek which flows in a westerly direction from the middle of the south impact area towards the western boundary. One impoundment is located on this stream.	Very Large quantities of water available, between 4,000 and 40,000 LPM (1,500,000 and 15,000,000 GPD).	Water is soft, alkaline, and light brown in color. No known source of pollution. Class II trout stream.	Other than access by adjacent roads, entrance to water points is limited due to dense vegetation and marshy banks in certain area.
Sparta Creek - flows westerly over east post and joins the Tarr Creek east of the cantonment area. There are two impoundments located on this stream.	Very Large quantities of water available, between 4,000 and 40,000 LPM (1,500,000 and 15,000,000 GPD).	Water is soft, alkaline, and clear. No known source of pollution. Class II trout stream.	Other than access by adjacent roads, entrance to water points is limited due to dense vegetation.
Clear Creek - flows northwesterly over north post emptying into North (Habelman) Flowage.	Very Large quantities of water available, between 4000 and 40,000 LPM (1,500,000 and 15,000,000 gpd). Decreasing quantities in extreme upper reaches.	Water is soft, alkaline, and light brown in color. For that portion of stream on post, there is no known source of pollution. Class II trout stream.	Other than one unimproved dirt road crossing, access is limited due to dense scrub.
Ranch Creek - flows north over north post emptying into North (Habelman) Flowage.	Very Large quantities of water available in lower reaches, between 4000 and 40,000 LPM (1,500,000 and 15,000,000 gpd). Moderate to Large quantities of water available in extreme upper reaches, between 40 and 4000 LPM (15,000 and 1,500,000 gpd).	Water is soft, neutral, and medium brown in color. For that portion of stream on post, there is no known source of pollution. Class II trout stream.	With the exception of one adjacent dirt road near upper reaches, access is limited due to dense vegetation.
Shoven Creek - small stream flows northwesterly over north post emptying into North (Habelman) Flowage.	Large quantities of water available, between 400 and 4000 LPM (150,000 and 1,500,000 gpd). Very Large quantities, between 4000 and 40,000 LPM (1,500,000 and 15,000,000 gpd). May be present during wet season and periods of high water.	Water is soft, acid, and light brown in color. No known source of pollution.	Other than one unimproved dirt road crossing, access is limited due to dense scrub.
Other streams - includes seven unnamed streams flowing various directions throughout post. With the exception of two, all are contained within post boundaries.	Quantities of available water range from Moderate to Very Large, between 40 and 40,000 LPM (15,000 and 15,000,000 gpd). Average quantities are Large, between 400 and 4000 LPM (150,000 and 1,500,000 gpd).	Most streams are soft water. pH ranges from 6.7 to 7.8 with an average of about 7.3. Color also varies between clear and medium brown. There are no known sources of pollution for these streams on post.	Access is generally limited due to one or more of the following factors: steep or marshy banks, forests, and dense scrub.
LAKES, PONDS AND RESERVOIRS			
East Silver Lake - small impoundment located on southeast corner of post. Silver Creek enters this lake from the east and exits to the west.	Estimated volume of 18,500 m ³ (4,888,800 gal).	Water is medium hard, alkaline, clear and has a high transparency.	Other than a road over dam, access is limited due to dense vegetation on upper and lower shorelines.
Squaw Lake - long narrow impoundment located west of cantonment area. Squaw Creek enters lake from the northeast and exists to the southwest.	Estimated volume of 166,700 m ³ (44,042,100 gal).	Water is soft, alkaline, medium brown in color, and has a low transparency.	Adjacent road and limited vegetation provide fairly good access. Lake is currently used for military bridge training.
West Silver Lake - impoundment located on southwest portion of post. Silver Creek enters from the southeast and exits to the northwest.	Estimated volume of 9900 m ³ (2,615,600 gal).	Water is medium hard, alkaline, turbid, and has a low transparency. Lake is substantially filled with sand and silt.	Because of siltation problems, lake would not be suitable for use as a water source.
Alderwood Lake - impoundment located on the LaCrosse River, east of North Impact Area. LaCrosse River enters lake in northeast fork and exists to the west. Another small tributary enters lake at its south fork.	Estimated volume of 57,000 m ³ (15,059,400 gal).	Water is soft, acid, light brown in color and has a low transparency.	Dense vegetation on northeast side limit access. Access is best on lower end where vegetation is primarily grass. Lake has previously been used as a water point for troops in the field as a water point.
Stillwell Pond - small impoundment located on Stillwell Creek, which enters from the southeast and exists to the northwest.	Estimated volume of 42,700 m ³ (11,281,300 gal).	Water is soft, neutral, clear and has a low transparency.	Other than northeast end, where entrance is limited by dense scrub, access is good. Lake has previously been used by troops in the field as a water point.
Squaw Creek Pond - small impoundment located north of Squaw Lake. Squaw Creek enters lake from northeast and exists to the southwest.	New dam has recently increased volume to an estimated 55,500 m ³ (14,663,100 Gal).	Water is soft, acid, clear and has a low transparency.	Steep banks of 3 m (10 ft) limit access to lake.
Swamp Pond - small impoundment located on Swamp Creek. Creek enters from the east and exists to the west.	Estimated volume of 12,900 m ³ (3,408,200 gal).	Water is soft, acid, light brown in color and has a low transparency.	Accessibility is good from adjacent road to the west, becoming limited in the east by mixed scrub.
Wac (Tarr) Pond - small impoundment located in cantonment area. Tarr Creek enters from the east and exists to the west.	Estimated volume of 28,400 m ³ (7,503,300 gal).	Water is medium hard, acid, clear and has a high transparency.	Low banks and grassy area provide easy access on north side.
Hazel Dell Lake - small impoundment located on north post. LaCrosse River enters lake from northeast and exists to the southwest.	Estimated volume of 8800 m ³ (2,325,000 gal).	Water is soft, slightly acid, clear and has a high transparency.	Other than western side where shore is open and grass covered, access is limited because of dense vegetation and marshy area. Lake has previously been used as a water point for troops in the field.
Upper Sparta Pond - impoundment on Sparta Creek immediately upstream from Lower Sparta Pond. Creek enters from east and exists to west.	Estimated volume of 20,100 m ³ (5,310,400 gal).	Water is soft, slightly acid, clear and has a high transparency.	Access is generally limited because of mixed scrub and/or marshy conditions.
Lower Sparta Pond - impoundment on Sparta Creek immediately downstream from Upper Sparta Pond. Creek enters from the east and exists to the west.	Estimated volume of 16,100 m ³ (4,253,600 gal).	Water is soft, acid, light brown in color and has a moderate transparency.	Access is generally limited because of mixed scrub and/or marshy conditions.
Sandy, Big Sandy, and West Sandy Lakes - impoundments located on southwest portion of post. All are filled borrow pits.	Data on average depths not available. Surface areas are 5.3 Hectares (13.0 acres), 7.7 Hectares (19.0 acres), and 4.0 Hectares (10.0 acres) respectively.	Water is soft, turbid, and has a low transparency. pH varies between lakes from acid to alkaline.	All lakes have shores with some grass covered areas and low banks. Accessibility should not be a problem.
North (Habelman) Flowage - large impoundment on north post only partially on installation	Data on average depths not available. Approximately 37.6 Hectares (93 acres) are within post boundaries.	Water is soft, acid, light brown in color and has a low transparency.	Lack of adjacent roads, dense forests and mixed scrub severely limit accessibility to water points on post.

C. WATER RESOURCES (continued)

1. SURFACE WATERS (continued)

* Definitions of trout streams are as follows:

Class I	- Good water conditions, high natural reproduction, suitable density of wild trout, little or no stocking of hatchery fish.
Class II	- Good water condition, some natural reproduction but not sufficient to maintain a completely wild fishery. Moderate to heavy stocking of hatchery fish is necessary to assure satisfactory fishing.
Class III	- Marginal water conditions for sustaining trout populations on a year-round basis. Continual trout stocking at specific time intervals is necessary to provide fishing throughout the trout season.

Development of water intake points becomes severely limited December through March when ice and snow may occur on surfaces of lakes and with thickness of up to 0.5 m (1.5 ft).

Definitions of underlined terms are as follows:

<u>Quantity Term</u>	<u>Liters Per Minute (LPM)</u>	<u>Gallons Per Day (GPD)</u>
Enormous	More than 40,000 LPM	More than 15,000,000 GPD
Very Large	4,000 to 40,000 LPM	1,500,000 to 15,000,000 GPD
Large	400 to 4000 LPM	150,000 to 1,500,000 GPD
Moderate	40 to 400 LPM	15,000 to 150,000 GPD

USER NOTES:

For permissible concentrations of impurities in military water supplies, see Field Water Supply, TM 5-700, July 1967, paragraph 19, or other applicable manuals or regulations.

CHEMICAL DATA-LA CROSSE RIVER, VICINITY OF FORT McCOY

Grid Coordinate	Sample Source	Date Sampled	BOD mg/L	Temp. °C.	pH	DO mg/L	MFFCC Per 100 ML.
831751	Camp McCoy Bridge	1 OCT 70	1.5	13	7.4	9.7	40
		13 OCT 70	1.5	12	7.5	10.0	10
		5 NOV 70	3.0	9	6.8	11.0	40
828748	Sewage Treatment Plant Outfall	3 SEP 70	5.5		7.1	(S.S.=15)	3300
		1 OCT 70	3.0	16	7.6		1100
		13 OCT 70	3.5	13	7.8		
825742	County Highway "BB"	1 OCT 70	1.0	14	7.5	10.1	20
		13 OCT 70	1.0	12	7.6	10.1	10
		5 NOV 70	3.0	8	7.0	11.2	100

Quality Terms: BOD - Biological Oxygen Demand, the measurement of the dissolved oxygen used by microorganisms in the biochemical oxidation of the organic matter.
 DO - Dissolved oxygen, the amount of dissolved oxygen in the water.
 MFFCC - Fecal coliform count, indicates density of coliform organisms.
 SS - Suspended Solids, solids mixed with and generally imparting a cloudy appearance to water, sewage or other liquids.

Source: Wisconsin DNR (1971)

C. WATER RESOURCES

2. GROUND WATER

Ground water is perennially plentiful on Fort McCoy. Abundant amounts of water from alluvial material are generally of poor quality, while those from the sandstone formations below the alluvium are usually of good quality. Fluctuations in the ground water level are negligible, with an average rise of 0.40 meters (1.3 ft) during a wet year and a drop of 0.37 meters (1.2 ft) during a dry year.

Alluvial material and sandstone bedrock on Fort McCoy are both extremely permeable, and a large portion of the annual precipitation percolates rapidly into these units. Sandy soils have abundant pore spaces, high specific yields and good infiltration and percolation qualities. These characteristics provide the circumstances for the numerous springs and the high base levels of streams. Sandy soil, shallow soil mantles and low gradients help cause the high ground water levels.

Wells which reach ground water level in the Cambrian sandstone have a median depth of 76 meters (250 ft) within the boundaries of Fort McCoy. Drilling sites are readily accessible. Bogs are a common obstacle in the lowlands, but many flat, dry areas are available in the hills above.

Two other sources of ground water on the reservation are the crystalline basement rock and the Prairie du Chien Formation. The Crystalline basement rock provides little fresh water. The Prairie du Chien (dolomite) formation is of very limited areal extent on Fort McCoy and provides even less fresh water. The outcrop centers on grid coordinates 900795. It contains some "perched" water. Neither of these units provides enough fresh water to warrant further tabular treatment.

Chlorination of the ground water is necessary for disinfection and elimination of odor, and dosing with lime and sodium metaphosphate is necessary for softening.

MAP UNIT

QUANTITY AND SOURCE

DEPTH

QUALITY

DEVELOPMENT OF SOURCES

1 Large quantities of poor quality water are available from alluvium. These highly permeable surficial deposits absorb about 66 percent of the available precipitation. Water percolates rapidly through the alluvium and into the sandstone aquifer. The alluvium is (0 to 70 meters) thick and consists of deposits of sand and gravel that are usually (0 to 7.62 meters) thick. These deposits have a maximum reported yield reported. The yield of wells in the alluvium is relative to the thickness of the deposits. A deposit of about (15.25 meters) thick usually yields 200 to 300 GPM. Wells in isolated deposits (1.5 to 7.62 meters) thick yield 5 to 15 GPM.

Surficial deposits of sand and gravel have a thickness of 0 to 70 meters. Well depths are 3.35 to 59.13 meters below the surface. Isolated deposits of buried sand and gravel usually 0 to 7.62 meters thick generally are 9.14 to 38.4 meters below the surface. The depth to this alluvial aquifer exceeds 30.48 meters along the LaCrosse River and Tarn Creek.

The sand and gravel aquifer is especially susceptible to contamination, because rapid recharge may carry large amounts of contaminants. Due to the extreme permeability of this aquifer contamination from the surface may enter some wells by seepage through leaky casings of poorly sealed wells. Farming activity around Fort McCoy may result in nitrates being washed into this aquifer in sufficient quantities to approach the U.S. Public Health Services allowable maximum of 45 mg/l.

Many of the off-post domestic well supplies are from this aquifer. Only three wells are known to yield as much as 70 GPM from these deposits; some municipalities in the area use wells yielding as little as 25 GPM. Many wells in this aquifer have been closed down due to the low yield obtained and replaced by wells into the sandstone aquifer. Most of the water obtained from this aquifer is used during very dry weather to water the cranberry bogs and other crops of the region.

The standard for iron is equaled or exceeded in several wells in the alluvium aquifer and poses minor water treatment problems. Water from this aquifer should not be considered safe unless so treated. It would be better to use the sandstone aquifer because water is less expensive to treat and occurs at relatively shallow depths.

2 Large quantities of good quality water are available from sandstone of the Dresbach, Franconian and Trempealeau formations. The maximum reported yield is 304 GPM. There are layers of shale in these formations which support "perched" water, but these sources are not considered to be productive. The sandstone aquifer is under-utilized regionally having a capacity far in excess of current demands.

The thickness of this unit varies from 0 to 365.76 meters (0 to 1200 feet) where the aquifer is more than 15.25 meters (50 feet) thick, yields are generally 200 - 500 GPM. Well depths are 7.62 to 335.28 meters (25 to 1100 feet) with a median depth of 76.2 meters (250 feet). The specific capacity ranges from 1 to 30 GPM per foot of drawdown with a median of 5 GPM per foot drawdown.

The water is good quality. Chemical constituents are primarily calcium, magnesium, and bicarbonate ions, derived primarily from solution of carbonate rocks. The water ranges from moderately hard to very hard. The presence of iron poses minor water treatment and use problems. The hardness of this water ranges from 100 mg/l in the north end of Fort McCoy to 300 mg/l in the south end. 70% of samples exceeded 120 mg/l (hard) and 60% exceed 180 mg/l (very hard). The occurrence of excessive iron and manganese concentration is too localized to be predictable. The U.S. Army and EPA water quality criteria for drinking water are 0.30 mg/l for iron and 0.50 mg/l for manganese, above which taste may be objectionable and staining may be a problem. The regional median iron concentration of this Cambrian sandstone aquifer at 0.35 mg/l, exceeds the standards by 17%.

Fort McCoy has three separate domestic water supply systems using this aquifer. The first was installed in 1929 to serve the cantonment area of Old Camp McCoy, and with later additions serves the present Family Housing Area on South Fort. The Airfield water supply system, also on the South Fort, also serves the Outdoor Swimming Pool facility located northeast of the Airfield. The South Fort systems have four wells with 140 GPM pumps and a rated capacity of 942 KGD. The Field Maintenance Hangar at the Airfield has a separate non-potable fire protection system consisting of a well, pump, and 300,000 gallon reservoir, completed in 1975. The principal water supply system installed in 1942 serves the cantonment area. The supply components include thirteen ten-inch bedrock wells with 300 GPM pumps and a rated capacity of 5616 KGD. Two of the wells in this aquifer are presently not used due to sand pumpage and iron content. This aquifer is under-utilized regionally, having a capacity far in excess of current demands. The sites most likely to produce little difficulty in well-drilling are flat benches, terraces and valley bottoms.

Sodium, sulfate and chloride concentrations are quite low in this aquifer. Except for anomalous samples, the maximum concentrations recorded were only 14% to 48% of the standard of 250 mg/l for sulfate and chloride. Nitrate concentrations are also generally low in this aquifer. The alluvium is highly susceptible to nitrate pollution which eventually enters the sandstone aquifer. The median concentration of nitrate is only 1.5 - 5.2 mg/l, but eight local wells were reported in 1973 to have a range of 10 - 32 mg/l indicating the importance of periodic testing to avoid possible health problems.

*Definition of underlined terms is as follows.

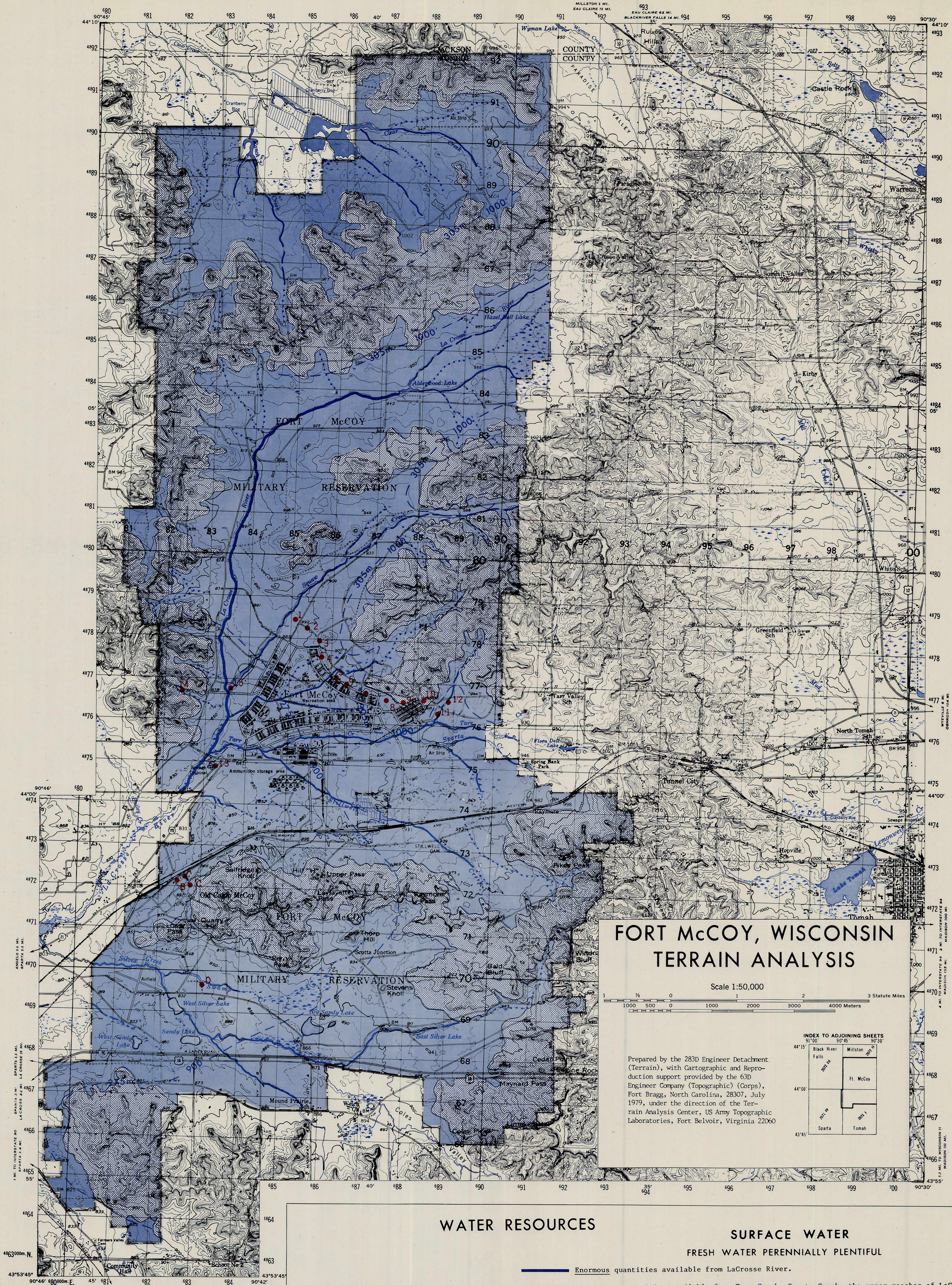
QUANTITY TERM	LITERS PER MINUTE (LPM)	GALLONS PER DAY (GPD)
Large	400 to 4000 LPM	150,000 to 1,500,000 GPD

+For purposes of this study mg/l may be taken as roughly equivalent to parts per million (ppm).

SUMMARY OF DATA FROM SELECTED WELLS.

WATER QUALITY PARAMETER "In milligrams per liter except for color, specific conductance and pH."	WELL NUMBER 1	WELL NUMBER 5	WELL NUMBER 6	WELL NUMBER 9	WELL NUMBER 10	WELL NUMBER 12	WELL NUMBER 14
Alkalinity, as CaCO ₃	84.6	67.8	38.8	68.8	68.9	104.0	170.0
pH	7.48	7.4	6.9	7.5	7.4	7.48	7.78
Hardness, Total CaCO ₃	96.3	69.4	52.8	72.0	77.6	109.0	165.0
Specific Conductance	184.0	157.0	115.0	152.0	164.0	221.0	326.0
Calcium	19.5	15.4	11.3	16.8	17.3	23.5	37.7
Potassium	0.9	0.8	1.5	1.3	1.3	0.8	0.6
Silica	12.7	15.5	10.5	10.5	10.1	16.2	22.1
Solids, Total Dissolved	114.0	91.0	77.0	80.0	93.0	128.0	194.0
Color	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Boron	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Copper	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Iron	0.13	0.06	0.39	0.17	0.06	0.06	0.083
Magnesium	9.2	7.5	5.2	7.9	8.5	11.6	18.7
Manganese	0.02	0.02	0.036	0.02	0.02	0.02	0.02
Zinc	0.02	0.02	0.02	0.02	0.02	0.02	0.037
Chlorides	0.5	1.1	1.3	0.8	0.5	0.8	0.8
Sulfates	14.7	5.3	8.1	10.0	10.3	7.0	8.0
Arsenic	0.01	0.01	0.01	0.04	0.01	0.01	0.01
Barium	0.3	not analyzed	0.3	0.3	0.3	0.3	0.3
Cadmium	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Chromium	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Fluorides	0.1	0.01	0.1	0.1	0.1	0.1	0.15
Lead	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mercury	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Nitrates, as Nitrogen	0.04	0.17	1.76	0.04	0.04	0.53	0.04
Silver	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium	0.8	1.1	1.0	.7	.7	1.4	3.1

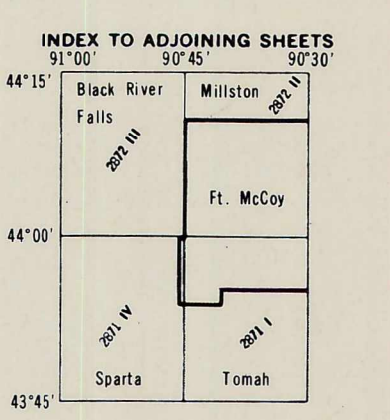
Analyses provided by Sanitation Branch of Utilities Division, Directorate of Facilities Engineering, Fort McCoy, Wisconsin.



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000
 1 1/2 0 1 2 3 Statute Miles
 1000 500 0 1000 2000 3000 4000 Meters

Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060



WATER RESOURCES

SURFACE WATER

FRESH WATER PERENNIALY PLENTIFUL

- Enormous quantities available from LaCrosse River.
- Very Large quantities available from Tarr Creek, Sparta Creek, the upper reaches of LaCrosse River, the lower reaches of Silver Creek, Stillwell Creek, Squaw Creek, Clear Creek and Ranch Creek.
- Large quantities available from Swamp Creek, Showen Creek, and upper reaches of most streams on the post.
- Moderate quantities available from extreme upper reaches of most streams on the post.

NOTE: Definitions of underlined terms are as follows:

Volume	Gallon	Liters
Enormous	Greater than 15,000,000 GPD	More than 40,000 LPM
Very Large	1,500,000 to 15,000,000 GPD	4,000 to 40,000 LPM
Large	150,000 to 1,500,000 GPD	400 to 4,000 LPM
Moderate	15,000 to 150,000 GPD	40 to 400 LPM

GROUND WATER

FRESH WATER GENERALLY PLENTIFUL

- VERY LARGE* QUANTITIES AT DEPTHS OF 34.1 to 59.13 METERS (11 to 194 FEET) FROM ALLUVIUM
- LARGE QUANTITIES AT DEPTHS OF 7.62 to 347.82 METERS (25 to 1100 FEET) FROM SANDSTONE

USER NOTE: For permissible concentration of impurities in military water supplies, see Field Water Supply, TM 5-700; JULY 1967, paragraph 19; or other applicable manuals or regulation.

— 900' — APPROXIMATE WATER TABLE CONTOURS (ABOVE SEA LEVEL)

5 • WELL SITES

— LAKES — SWAMPS

D. ENGINEERING SOILS

SOIL CHARACTERISTICS AND SELECTED EVALUATIONS

Engineering soils data presented on the map and in this table have been adapted, and to some extent generalized, from a soil survey made of Fort McCoy by the Soil Conservation Service, U.S. Department of Agriculture. Information is necessarily generalized in order to be compatible with the scale of the map and scope of study. The data should be helpful in planning for land use and for construction activities covering large areas. For information on a specific site or otherwise small area, on-site inspection and testing is required.

Soil series (kinds of soils) have been grouped into six groups or map units. Each group is based, more or less, on common soil characteristics pertinent to engineering use. Only the major soil series have been listed in the table. There are, of course, many other minor soils in each grouping. The soil profile diagrams depict the representative composition, sequence of major horizons and total depth of the dominant soils. It is not possible to portray graphically, the many variations in composition, thickness and sequence of layering that occurs naturally, even within very short distance of one site to another.

Fort McCoy lies within the unglaciated area of southwest Wisconsin. Soils are dominantly very sandy, having been locally derived from the underlying sandstone formations. However, much of the soil material has been reworked by water. Wind-blown silt (loess) and soils de-

rived from dolomite occur locally, mainly along the eastern boundary of the reservation. The loess deposits range from less than one foot to more than ten feet. Very poorly drained organic soils, chiefly muck, occur along many of the drainageways and in old lake basins. The muck is mostly quite thin and generally overlies stratified sandy soils.

Most of the upland sandy soils are well-drained or even, excessively drained. Those in somewhat lowerlying topographic positions tend to be less well-drained and have a seasonal high water table of varying duration.

In general, many soils have severe limitations for engineering or construction uses. The major limitations are wetness due to a high water table, shallow depths to bedrock, and excessive slopes. Fortunately, the extensive well-drained sandy soils comprising map unit two, have few limitations for many engineering practices and military field activities. The fine sand is suitable for many purposes, including road fill. Gravel suitable for construction use is scarce and only occurs locally in small subsurface pockets.

More detailed information concerning the distribution, characteristics, and behavior of different kinds of soil can be obtained from the Soil Conservation Service, U.S. Department of Agriculture, Sparta, Wisconsin.

MAP UNIT	RESERVATION (acres)	LANDFORM & SLOPE	TYPICAL SOIL PROFILE ^{1/} layers, thickness and color of layers depth to rock and unified engineering classification ^{2/} (Profile diagram not to scale).	HIGH-WATER TABLE depth (meters) and duration (months)	PERMEABILITY ^{3/} centimeters/hour or (inches/hour)	RATING AND MAJOR LIMITING SOIL CHARACTERISTICS FOR:							REMARKS & MAJOR SOIL SERIES ^{4/}
						SHRINK-SWELL POTENTIAL	SEWAGE LAGOONS	SANITARY LANDFILLS	FOUNDATIONS FOR SMALL BUILDINGS	ROAD LOCATION	SHALLOW EXCAVATIONS	TRAFFIC-ABILITY	
1	8.7 (2032.5)	Well to excessively drained low ridges and knolls. Most slopes between 6 and 12 percent; a few up to 20 percent.		None	5.0-15.0 (2.0-6.0)	Low	Severe (r,p)	Severe (s,b)	Slight	Moderate (h)	Moderate to Severe (b,r)	Slight	Erosion hazard high, particularly in places denuded of vegetation. Soil droughty. Boone-Urne.
2	155.2 (38,377.9)	Predominantly well-drained soils on nearly level to sloping colluvium and outwash plains. Most slopes between 1 and 6 percent; a few up to about 12 percent.		None	15.0-50.0 (6.0-20.0)	Low	Severe (p)	Severe (s)	Slight	Slight	Moderate (b)	Slight	Erosion hazard high, particularly in places denuded of vegetation. Some blowout spots (wind erosion) located in these areas. Soils droughty. Vegetation cover difficult to maintain in areas of heavy use. Tarr-Sparta-Impact.
3	1.7 (597.8)	Chiefly uplands with slopes between 4 and 12 percent. Areas are mostly well-drained. Unit is very limited in extent.		None	1.5-5.0 (0.6-2.0)	Low to Moderate	Slight to Moderate (h,p)	Slight	Slight to Moderate (h,a)	Moderate (h)	Slight	Slight to Moderate (t)	Silty material is dominantly loess, a wind-blown deposit. In places the loess is considerably deeper than shown in the profile diagram. The underlying dolomite occurs mainly in the east-central part of the Fort, near the Greenfield Fire Tower. LaFarge-Council-Wilton.
4	35.3 (8727.7)	Moderately steep to very steep sandstone hills and ridges. Most slopes between 15 and 45 percent. Areas are mostly excessively drained.		None	5.0-15.0 (2.0-6.0)	Low	Severe (h,p,r)	Severe (h,r)	Severe (h)	Severe (h)	Severe (r)	Slight to Severe (h)	Soil commonly contains many small rock fragments. Sandstone outcroppings locally common. Thin loess covers some ridgetops and hillside slopes. Steep phases of various soil series.
5	33.1 (8070.1)	Nearly level bottomlands of streams including some outwash plains. Areas poorly to somewhat poorly drained. Slopes range from 0 to 2 percent.		0.0-0.6 Mar.-May	15.0-50.0 (6.0-20.0)	Low	Severe (w,f)	Severe (w,f)	Severe (w,f)	Moderate to Severe (w,f)	Severe (w,f)	Slight to Severe (w,f)	Potential for flooding is high, particularly during spring months. Newton-Morocco.
6	7.9 (1972.7)	Nearly level soils in old lake basins and some drainageways. Areas are very poorly drained and wet for a considerable part of year. Slopes are less than 2 percent.		0.0-0.3 Near or at the surface most of the year	5.0-15.0 (2.0-6.0) in muck layer 15.0-50.0 (6.0-20.0) in sand layer	Low	Severe (o,w,f)	Severe (o,w,f)	Severe (o,w,f)	Severe (o,w,f)	Severe (o,w,f)	Severe (o,w,f)	In addition to a very high water table, soils are frequently flooded. Adrian.

^{1/} The soil profile diagrams depict "average" typical profiles (cross-section). Actual conditions may vary to some extent, especially the thickness of the layers.

^{2/} The Unified Soil Classification System. Technical Memorandum No. 3-357, U.S. Army Corps of Engineers, March 1953.

^{3/} Permeability rates do not apply to frozen soil. Maximum depths of frozen soil during the winter may exceed 0.8m.

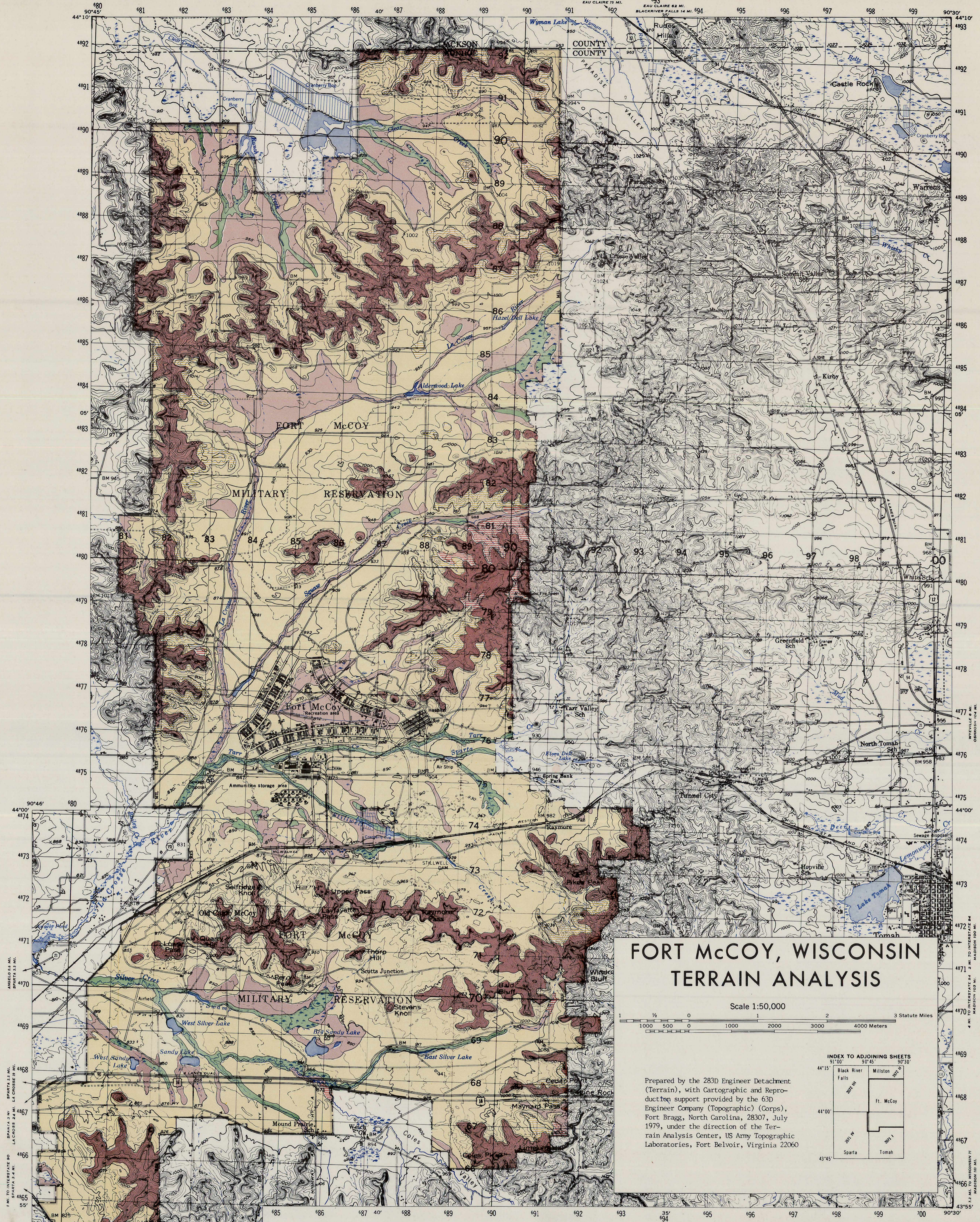
^{4/} The series is the common name of the soil. Each series is named for a town or other geographic feature near the place where a soil of that series was first observed and described. The soil series listed for each map unit are only the major ones, other soils of lesser areal extent than those indicated may occur within each map unit.

DEFINITION OF RATING TERMS

SLIGHT - relatively free of limitations or limitations easily overcome
 MODERATE - limitations can be overcome with good planning and/or careful design
 SEVERE - limitations are serious and are difficult to overcome

SOIL - RELATED CHARACTERISTICS AND FEATURES AFFECTING RATINGS

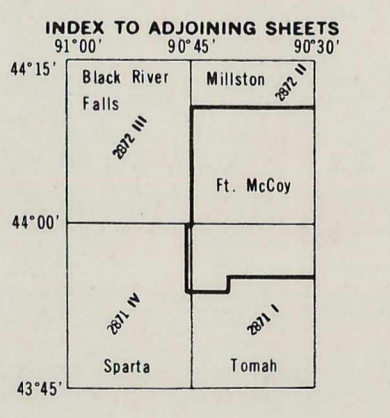
a - high shrink-swell p - rapid permeability
 b - cutbanks cave r - stony or shallow soils
 f - floods s - seepage
 h - slope t - low strength
 o - high in organic matter w - wetness or high water table



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000
 1 1/2 0 1 2 3 Statute Miles
 1000 500 0 1000 2000 3000 4000 Meters

Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060



ENGINEERING SOILS

*Definition of Depth Terms

Very deep	6m
Deep	2-6m
Moderately deep	0.6-2m
Shallow	0.6m

COARSE-GRAINED SOILS

1. Fine sands on low ridges and knolls; moderately deep.*
2. Fine sands on nearly level to sloping plains; deep to very deep.*

FINE-GRAINED SOILS

3. Silt loams, partly from loess, on gently to strongly sloping uplands; moderately deep.*

COARSE AND FINE - GRAINED SOILS

4. Sandy to loamy soils on steeply sloping hills and ridges; shallow.*
5. Poorly to somewhat poorly drained sands and silts on stream bottomlands and outwash plains; very deep.*

ORGANIC SOILS

6. Very poorly drained muck soils over sands and silts along drainageways and old lake basins; very deep.*

AREA:

1 =	8,661,791	m ²
2 =	155,218,000	m ²
3 =	1,732,245	m ²
4 =	35,281,633	m ²
5 =	33,104,000	m ²
6 =	7,934,694	m ²

E. ENGINEERING GEOLOGY

The tables below and the accompanying Engineering Geology map indicate the engineering characteristic and distribution of the five major geologic units on the reservation. These units are evaluated with regard to their engineering suitability for construction sites and route alignment; their foundation stability for road and bridge construction; and their potential as sources of natural materials for construction and maintenance. Key physical properties of the individual units are also evaluated to determine additional impacts or constraints on engineering development. The units are placed into three major suitability categories: those having numerous, those having some, and those having few engineering uses.

Fort McCoy is in Monroe County in southwest Wisconsin, and an area not covered by the glacial deposits which are characteristic of the rest of the state. Rocks exposed on the reservation range in age from Cambrian sandstone to an Ordovician dolomite. These formations are especially flat-lying, with a regional dip to the southwest of (5 to 10 meters per kilometer). Alluvial fill in the stream valleys consists of poorly sorted sand, clay, gravel, and rubble.

Alluvium (map unit 1) ranges from 0 to 32 meters (105 feet) in depth. Slope stability is generally poor, in low-lying areas, where bogs are common.

Three of the map units are composed primarily of sandstone; these are: The Dresbach Sandstone (map unit 2), the Trempealeau Formation (map unit 4) and the Franconia Sandstone (map unit 5).

The Dresbach is a Cambrian sandstone, white to yellowish in color, and 114.3 to 182.9 meters (375 to 600 ft) thick that forms the base of the hills on the reservation. The unit may be identified by the presence of vertical tubes resembling worm casts. Castellated cliffs, steep slopes, conical hills and ledges at the edges of low rock benches are forms characteristic of this sandstone. The Dresbach is well drained. It is friable, but stands well in vertical faces, tending to harden on exposure to air. While the sandstone is suitable for concrete aggregate, it disintegrates too rapidly for practical use as road or airfield material. The Franconia Formation (map unit 5) is a fine sandstone, 36.6 to 48.8 meters (120 to 160 ft) thick and gray to green in color. A basal shale layer separates this unit from the Dresbach Sandstone beneath it.

The upper parts of most ridges on the reservation are composed of the Franconia Formation. Erosion of the unit has produced a rolling terrain of rock benches and discontinuous rock terraces. Excavations in the Franconia will drain poorly.

Trenches will stand in the more sandy beds, but the shaly beds must be reworked to prevent mud-flows and cave-ins. The lower sandstone beds are a good source of building stone, and the shaly and greensand beds provide good road aggregate.

The Trempealeau Formation (map unit 4) includes the upper Jordan Sandstone Member and the lower St. Lawrence Member with a basal shale or consolidated clay layer. The unit is of limited areal extent, forming the tops of ridges in the southeast and occurring on upper slopes in the east-central parts of the reservation. The Jordan Sandstone includes sandy dolomite, sandstone and sandy shale. It is separated from the member below by an erosion surface. The St. Lawrence Member, about 25.9 meters (85 ft) thick, is composed of a fine gray sandstone with limey shale of clay at its base. It resists weathering well, forming occasional flat-topped benches. Drainage and excavation problems encountered in the Franconia Formation.

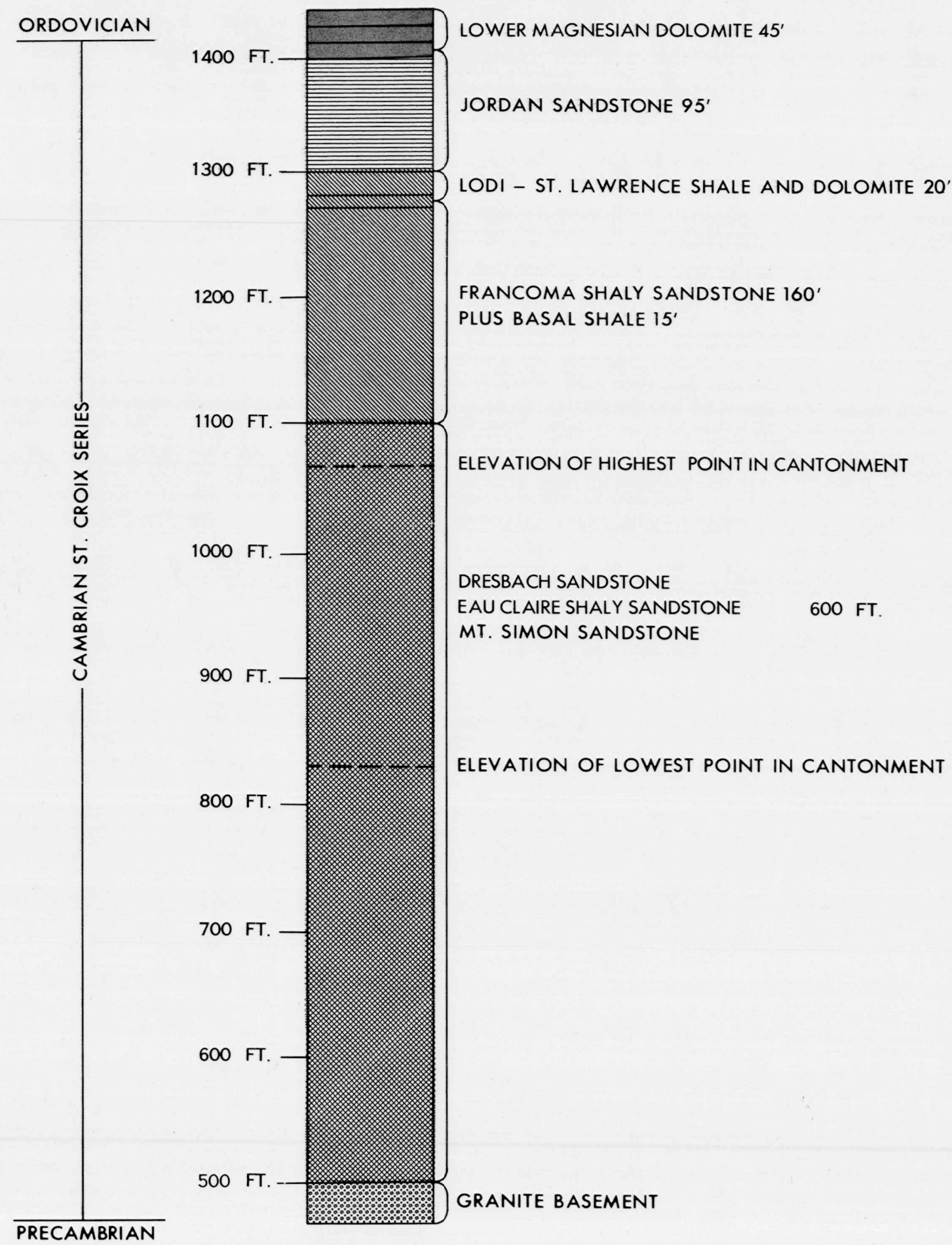
The upper layers provide good building stone, and the lower beds may be used for road aggregate. The coarse gray Jordan Sandstone has engineering properties similar to the Dresbach Sandstone. The Prairie du Chien Formation (map unit 3) of Ordovician age, is a gray dolomite that caps the hills around the Greenfield fire tower. It weathers to a brownish-red color.

The formation is used extensively for construction material, making good railroad ballast and road wearing surface material. Due to local variations in bearing strength of soils, foundation investigation is essential at all potential construction sites to determine the maximum permissible loading.

MAP UNIT	TOPOGRAPHY	ROCK DESCRIPTION	PHYSICAL CONSTANTS (SELECTED SAMPLES)	ENGINEERING EVALUATION	EXCAVATION FACTORS	PITS AND QUARRIES
1. Alluvial deposits consisting of a mixture of windblown silt deposits (loess) and sand dunes. Also includes gravel, sand, silt and clay.	Forms floodplains, low terraces and acts as a fill in valleys. The sand, rubble and gravel form higher terraces. There are sand and gravel bars deposited along many of the streams and along the inside bends of old meander scars. Sand dunes have been formed by eolian action north of the South Impact Area (old impact area).	The Alluvium is an unconsolidated mixture containing silt, sand, and gravel, all derived locally by erosion of the Cambrian sandstone. A thin blanket of wind blown silt (loess) covers the area, ranging in thickness from 0 to 4.8 meters (16 ft). This serves as the parent material for most topsoil in the area. Sand dunes in the south area average 2.5 meters (8 ft) in height with a leeward slope of 4° and a windward slope of 8°. Movement of the dunes has been stabilized by berms on the range.	No physical constants available.	Sand is suitable for use in concrete structures; windblown silt (loess) deposits are unsuitable for engineering purposes. Foundation investigation is essential to all potential construction sites to determine maximum permissible loading.	Overburden soil generally of varying thickness; underlain by Dresbach Sandstone throughout the area. Easily excavated by hand tools or power equipment. High water table could necessitate special equipment. Easily and rapidly eroded; adequate protective cover or stabilization needed. Above water table percolation is rapid.	Few pits are located on the lowlands or floodplains. There are numerous potential sites with good access throughout the area.
2. Dresbach Sandstone	Forms the lower part of ridges on the reservation. Slopes are generally steep, with rock ledges outcropping below shallow rock benches. Castellated cliffs and conical hills are common features.	The Dresbach is a Cambrian age, coarse to medium-grained sandstone. It is generally white to yellowish in color, but may be red or brown. The sandstone is massive, highly porous and extremely friable. The average thickness on Ft. McCoy is 38 meters (120 feet).	Shrink-swell ratio 0%. No other constants available	Construction sites are available on the lower, gentler slopes of this formation. The unit is well drained and, though friable, provides a hard surface for construction. Road cuts will stand well as vertical faces. Material from this unit is suitable for concrete aggregate, but disintegrates too rapidly for practical use as road or aircraft material.	Overburden varies in thickness. The rock is soft, but excavation may require power tools. High water table may cause flooding. Erosion moderate, depending on cementing agent.	There are no quarries evident in this unit within the reservation boundaries. Access to most of the unit is provided by the current road network. Pits and quarries should be located on hillslopes where overburden is thinnest.
3. Prairie du Chien	Forms a cap rock on the hills around the Greenfield fire tower.	The Prairie du Chien Formation is an Ordovician age, gray dolomite consisting primarily of a mixture of dolomite grains with a sparry cement. The formation weathers to a brownish-red color. It is massive, well drained formation that is resistant to erosion.	Shrink-and-swell ratio 5% swell. Specific gravity 2.50 to 2.60 Wear (Hardness - 1% loss) commonly in the 40-45% range. Soundness (Sodium Sulfate, 5 cycles, % loss)- Varied but clusters in 4 to 7% and 14 to 17%.	Most of the Prairie du Chien formation has been quarried. That which is still in place forms thin caps on outcrops. Experience indicates that the lower 15-20 feet of Prairie du Chien formation, referred to by some as the Sunset Point member, is a sandy dolomite that performs poorly in bituminous pavements. Physical constants listed are for the portion above this sandy transition zone. Material from this formation is used as base course and aggregates for bituminous mixes and Portland Cement concrete when approved by testing. Provides excellent railroad ballast.	Overburden varies in thickness. Excavation is easy with power tools. Cut slopes will generally stand without sliding or slumping, but field verification is necessary.	Working pits on ridgetops in the Greenfield Fire Tower area. Limited potential sites in the area because of small formation area.
4. Trempealeau Formation	Forms upper slopes of hills on east side of the reservation. Slopes are generally rounded with occasional flat-topped benches.	The Trempealeau Formation which outcrops on the reservation is composed of two members, the coarse, gray Jordan Sandstone and the fine, gray sandstone of the St. Lawrence Member. At the base of the St. Lawrence Member is a consolidated clay or limey shale. An erosion surface separates the upper beds of the St. Lawrence Member from the Jordan Sandstone above. The Jordan sandstone is coarse, grey sandstone composed of beds of sandy dolomite, sandstone and shaley dolomite. The whole formation is generally less than 25.9 meters (85 feet) thick where it outcrops on the eastern side of the reservation.	Shrink-and-swell ratio 0%. No other physical constants are available.	This unit is of too limited an extent and is too dissected for siting of any structures on it. Road alignments would require extensive cut and fill. Material from the Jordan Sandstone is used as fill and sub-base for highways. The St. Lawrence is a good building stone.	Overburden varies in thickness. Excavation is easy with power tools. Cut slopes will experience moderate erosions.	Working pits on ridges of Greenfield Fire Tower. Limited potential sites in the area because of small formation area.
5. Franconia Formation	The upper slopes and crests of most of the ridges on Ft. McCoy are composed of this unit. In general, it forms rolling bench tops and discontinuous rock terraces. Develops into steep, well drained slopes, with gentler slopes near the base of ridges.	The Franconia is a Cambrian age, fine texture gray or green sandstone with shale at its base. The clayey, shaly beds include mica flakes and glauconite and merit the name "greensand". The formation is massive, forming beds 36.6 meters (120 ft) to 48.8 meters (160 ft) thick. It drains poorly due to the clayey shale at its base.	Only generalized physical constants are available for this formation. Triaxial strength (AASHTO-99 method) 900 psf 15.4 (green glauconitic unit remolded to 90% of maximum density)	Material is used as fill and in surfacing local and town roads. Forms a hard surface when dry but soft and slick when wet. Lower portion can be broken into slabs suitable for building stone. Foundation investigation is essential at all potential construction sites to determine the maximum loading.	Overburden thickness variable; Underlain by the Trempealeau Group. In excavations sliding and slumping present no problems, but field investigation is required for verification. Moderate rate of erosion. Streamflow rapid on steep hillsides.	A few working pits were noted on the steep hillsides and ridgetops east, south, and west of the contonment area. There is a relative abundance of potential sites with good access.

E. ENGINEERING GEOLOGY (CONTINUED)

GEOLOGICAL COLUMN SHOWING UNITS ON FT. McCOY



ENGINEERING USE OF CONSOLIDATED AND UNCONSOLIDATED MATERIALS SUITABILITY

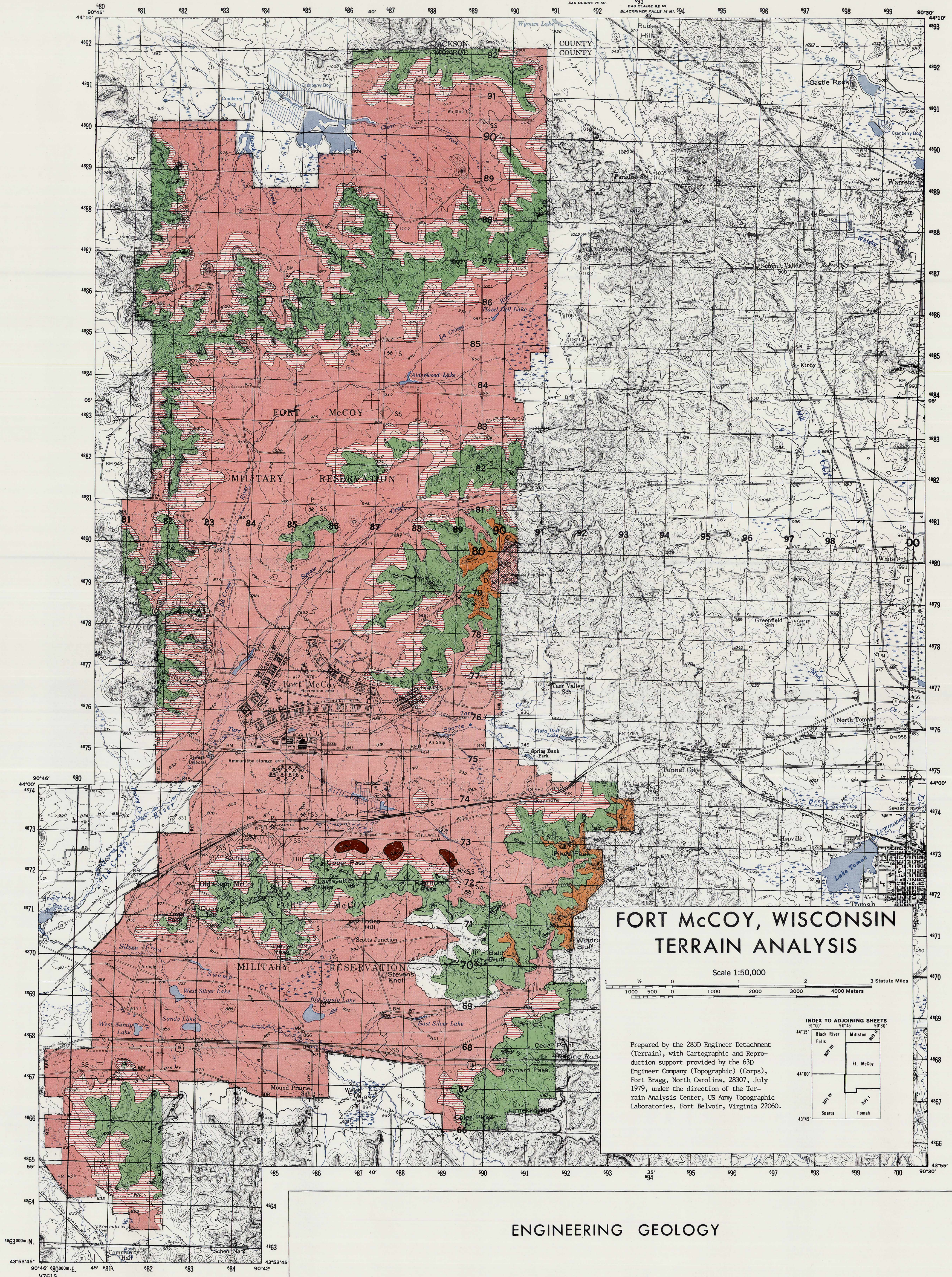
MAP UNIT	COARSE AGGREG FOR PCC	FINE AGGREG FOR PCC	BASE COURSE	SUR- FACING	SUB- GRADE	EMBANK- MENT AND FILL	RIPRAP SAND	MORTAR SAND	ASPHALT SAND	LIGHT RIP & RUB MASONRY	CUT-STONE MASONRY
1. Alluvium	VG ¹	G-F ¹	G ²	G ¹	G-P ²	G-P ²	F ¹	F ¹	G ¹	-	-
2. Sandstone	G ^{1,2}	G ^{1,2}	G-F ^{1,2}	G-P ^{1,2}	G-P ^{1,2}	G-P ²	G ¹	G ¹	G ¹	G-P ^{1,2}	-
3. Dolomite	G ^{1,2}	G ^{1,2}	G-F ^{1,2}	VG-F ^{1,2}	VG-F ^{1,2}	G-P ¹				G-F ³	G-F ³
4. Sandstone Shale Dolomite	G-G ¹	G-F ¹	G-F ^{1,2}	G-P ^{1,2}	G-P ^{1,2}	G-P ^{1,2}	G ¹	G ¹	G ¹	G-P ^{1,2,3}	F-P ^{1,2,3}
5. Shale Sandstone	p ^{1,2}	p ^{1,2}	p ^{1,2}	P-UNSAT ^{1,2}	p ^{1,2}	p ^{1,2}	p ¹	p ¹	p ¹	-	-

Values are for guidance and apply only to the dominant material in the unit: VG (very good), G (good), F (fair), P (poor), and UNSAT (unstatistical).

Classification footnotes: 1. Material may require washing, screening, or other processing.
2. May require binder for maximum stability.
3. Applicable only to limited amount of dolomite in the unit.

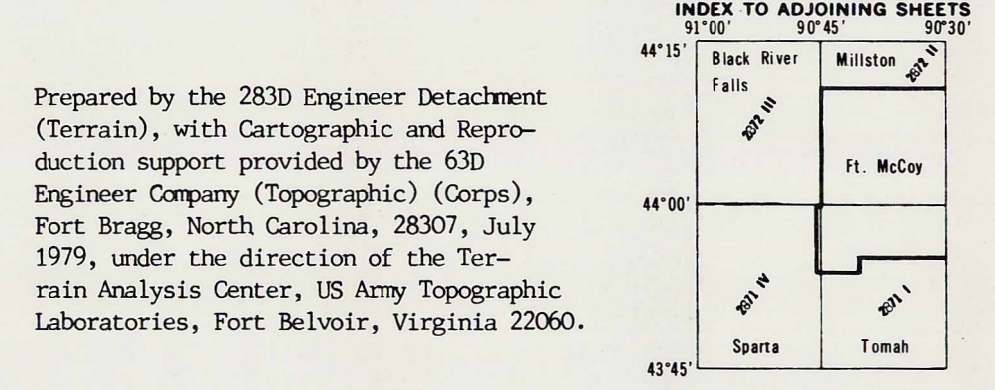
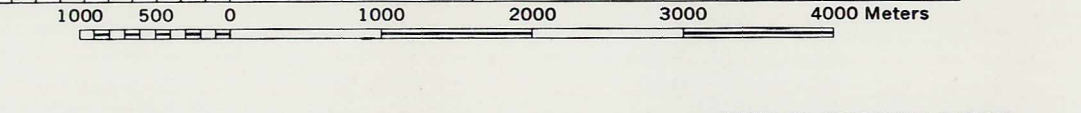
F. SPECIAL PHYSICAL PHENOMENA

There are no important special physical phenomena in the Fort McCoy area, although earthquakes do occur occasionally. Local earthquakes may cause minor damage, while more distant earthquakes may cause damage to structures. Fort McCoy is in seismic risk zone 1. Earthquakes in this zone are generally of intensities V and VI on the Modified Mercalli Intensity Scale.



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000



Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060.

ENGINEERING GEOLOGY

CONSTRUCTION MATERIALS

- ⊗ BORROW PIT: STATUS AND MATERIAL UNDETERMINED; PROBABLE MATERIAL INDICATED
- ⊙ POSSIBLE PIT OR QUARRY DEVELOPMENT SITE
- OUTCROP
- ◇ ROAD CUT EXPOSURE: PROBABLE MATERIAL INDICATED

TYPE OF MATERIAL

S-SANDSTONE SS-SILTY SAND D-DOLOMITE

NUMEROUS ENGINEERING USES

- 1. ALLUVIUM
- 2. SANDSTONE-DRESBACH
- 3. DOLOMITE-PRAIRIE DU CHIEN FORMATION

SOME ENGINEERING USES

- 4. SANDSTONE/SHALE/DOLOMITE TREMPLEAU FORMATION

FEW ENGINEERING USES

- 5. SHALY SANDSTONE FRANCONIA FORMATION

NUMBERS REFER TO ENTRIES IN TABLE 1.

G. VEGETATION

There are four major types of vegetation on Fort McCoy: forest, scrub, grassland and wetlands.

Forest occupies roughly 65% of the reservation, of which about 75% is deciduous and the rest evergreen. The most common evergreen species are jack pine, red (Norway) pine, and white pine; the main deciduous types are red maple, quaking aspen, and oak.

Forest management consists of fire protection, including maintenance of 100 kilometers (62 miles) of firebreaks and continuous supervision of potential fire hazards; reforestation on 20 to 40 hectares (50 to 100 acres) per year, as well as encouragement of natural regeneration; timber stand improvement by way of weeding, thinning and/or pruning, on 120 hectares (300 acres) per year; and harvesting of timber on 200 hectares (500 acres) per year. Timber sales are primarily undertaken in the winter and early summer.

Approximately 10% of the reservation can be classified as scrubs, of which over 80% is deciduous. The evergreen scrub actually consists of stands of young jack pine and red pine trees, classified as scrub on the basis of height. The majority of the deciduous scrub is scrub oak; pin cherry and boxelder are also common.

Grasses over 15% of Fort McCoy, the greatest part lying within the north impact area. There are many different types of native prairie grasses and weeds, no one or two of which is predominant. Generally, all of these grasses are less than 1 meter (3 feet) high.

Less than 2% of the reservation is wetlands, which remain saturated year-round and are thus not usefull in military operations. Most of these wetlands are swamps containing deciduous trees and scrub; there are some scattered areas of marsh grass.

The remaining reservation areas contain no vegetation of significance or are open water areas.

The deciduous and needleleaf forests afford numerous opportunities for cover and concealment for foot troops and vehicles. The evergreen stands provide good cover and concealment year-round, which the deciduous stands provide good year-round cover and excellent concealment between April and October when trees are in leaf.

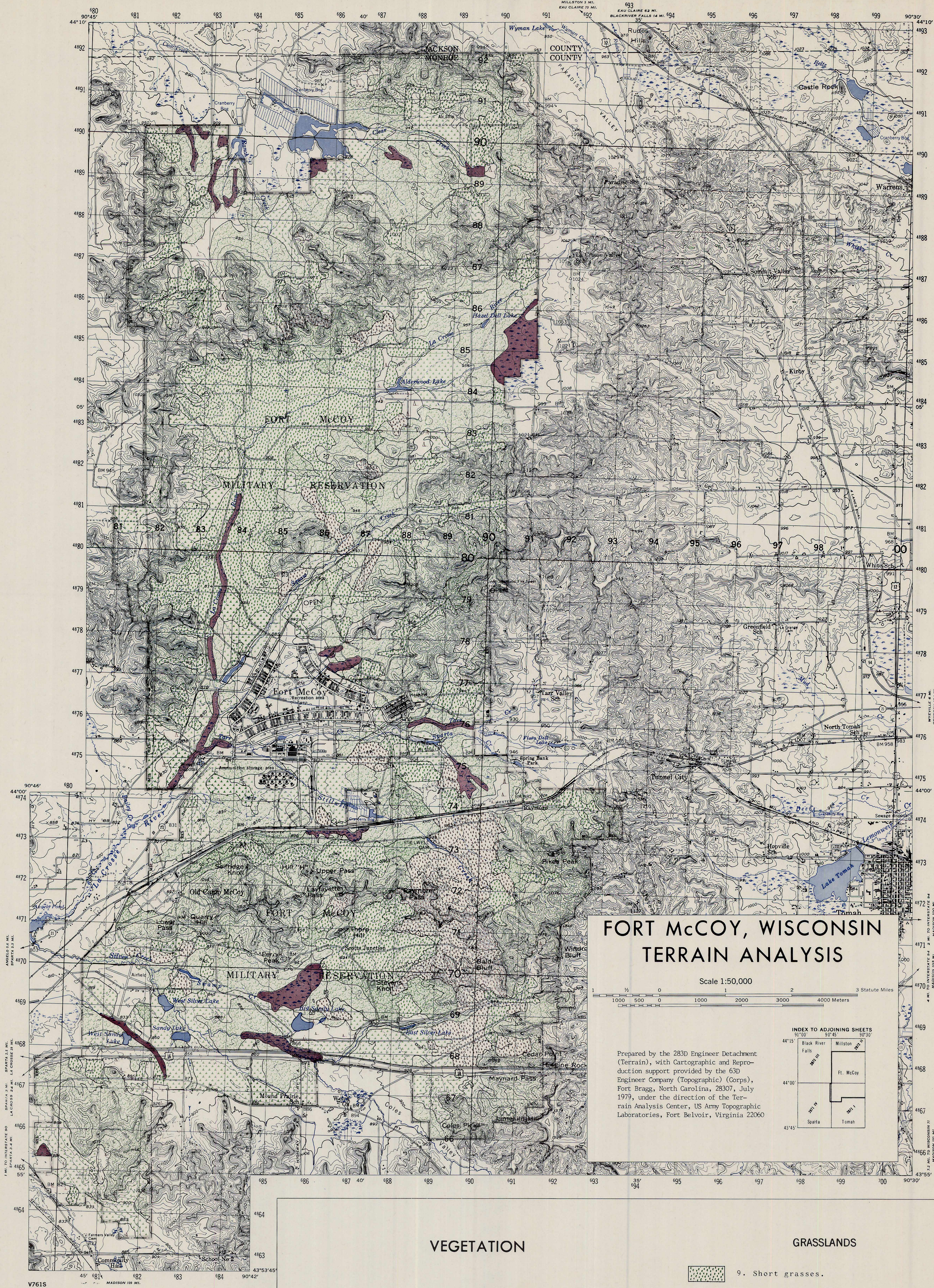
COVER: Will remain good throughout - Trees size for protection remains the same.

The location and extent of vegetation patterns by types and subtypes are shown on the accompanying Vegetation map. While a number of the areas shown actually contain a mixture of two or three vegetation types, it is the predominant type that is represented graphically in such cases. Descriptive details of each map unit are in the table below.

MAP UNIT	DESCRIPTION	DISTRIBUTION	REMARKS	COVER	CONCEALMENT
1. Evergreen needleleaf trees; medium to dense spacing.	Evergreen needleleaf trees, 70 to 90% crown cover density; 75% or more of each stand composed of one or more evergreen needleleaf species; predominant species are jack pine, red pine, and white pine; stem heights range from 20 to 35 m (50 to 100 ft); stem diameters range from 20 to 90 cm (8 to 36 in.), majority greater than 30 cm (12 in.); tree spacings 3 to 7 m (10 to 23 ft). Undergrowth density is sparse to medium, predominantly hazelbrush and scrub oak.	Scattered throughout the reservation; particularly concentrated just south of the cantonment area and among the lakes and streams in the southern part of post.	Jack pine harvested for timber; red pine reforested annually; jack pine and red pine stands improved by weeding, white pine and red pine by pruning.	Fair to good.	Concealment from aerial and ground observation is good year-round for foot troops and fair to good for vehicles.
2. Evergreen needleleaf trees; nearly open to medium spacing.	Evergreen needleleaf trees, 15 to 45% crown cover density; 75% or more of each stand composed of one or more evergreen needleleaf species; predominant species are jack pine, red pine, and white pine; stem heights range from 15 to 30 m (35 to 85 ft); stem diameters range from 20 to 90 cm (8 to 36 ft), majority greater than 30 cm (12 in.); tree spacings 7 to 15 m (23 to 50 ft). Undergrowth density is sparse to medium; predominantly hazelbrush and scrub oak.	Located mostly along the western boundary of the impact area on north post.	Jack pine harvested for timber; red pine reforested annually; jack pine and red pine stands improved by weeding, white pine and red pine by pruning.	Poor to fair.	Concealment from aerial and ground observation is fair year-round for foot troops and poor to fair for vehicles.
3. Deciduous broadleaf trees; medium to dense spacing.	Deciduous broadleaf trees, 60 to 90% crown cover density; 75% or more of each stand composed of one or more deciduous broadleaf species; dominant species are red maple, quaking aspen, and black, red, and white oak; stem heights range from 10 to 35 m (33 to 115 ft); stem diameters range from 25 to 120 cm (10 to 48 in.), majority greater than 55 cm (22 in.); tree spacings 5 to 7 m (16 to 23 ft). Undergrowth medium to dense; predominantly staghorn sumac, choke cherry, hazelbrush and various wild berries.	Widely distributed throughout the reservation.	White oak, red oak, and black oak harvested for timber; red oak stands improved by thinning.	Fair to good.	Concealment from aerial and ground observation is good to excellent for foot troops and good for vehicles in summer, and fair to good for foot troops and poor to fair for vehicles in the winter.
4. Deciduous broadleaf trees; nearly open to medium spacing.	Deciduous broadleaf trees, 20 to 50% crown cover density; 75% or more of each stand composed of one or more deciduous broadleaf species; predominant species are red maple, quaking aspen, and black, red and white oak; stem heights range from 10 to 35 m (33 to 115 ft); stem diameters range from 25 to 120 cm (10 to 48 in.), majority greater than 55 cm (22 in.); tree spacings 7 to 12 m (23 to 40 ft). Undergrowth density is open to medium spacing, predominantly staghorn sumac, choke cherry, hazelbrush and various wild berries.	Located near the old cantonment area, south of the drop zone, and in a few small stands around the reservation.	White oak, red oak, and black oak harvested for timber; red oak stands improved by thinning.	Poor to fair.	Concealment from aerial and ground observation is fair to good for foot troops and poor to good for vehicles in the summer, and good to fair for foot troops and poor for vehicles in the winter.
5. Evergreen needleleaf scrub; medium to dense spacing.	Evergreen needleleaf scrub, 60 to 80% crown cover density; 75% or more of each stand composed of one or more evergreen needleleaf species; dominant species are jack pine and red pine; stem heights range from 5 to 20 m (16 to 66 ft), majority greater than 10 m (33 ft); stem spacings 1 to 7 m (3 to 23 ft). Undergrowth density sparse to medium, predominantly hazelbrush and scrub oak.	Located mostly in the northwest and southwest corners of the reservation.	Red pine reforested annually; jack pine and red pine stands improved by weeding.	Poor to fair.	Concealment from aerial observation is fair to good year-round for foot troops and poor to fair for vehicles; concealment from ground observation is good year-round for foot troops and fair to good for vehicles.
6. Evergreen needleleaf scrub; nearly open to medium spacing.	Evergreen needleleaf scrub, 10 to 35% crown cover density; 75% or more of each stand composed of one or more evergreen needleleaf species; dominant species are jack pine and red pine; stem heights range from 3 to 6 m (10 to 20 ft); stem diameters range from 5 to 20 cm (2 to 8 in.), majority greater than 10 cm (4 in.); stem spacings 1 to 7 m (3 to 23 ft). Undergrowth density sparse to medium spacing, predominantly hazelbrush and scrub oak.	Sparsely scattered throughout the reservation.	Red pine reforested annually; jack pine and red pine stands improved by weeding.	Nonexistent to poor.	Concealment from aerial observation is poor to fair year-round for foot troops and nonexistent to poor for vehicles; concealment from ground observation is fair year-round for foot troops and poor to fair for vehicles.
7. Deciduous broadleaf scrub; medium to dense spacing.	Deciduous broadleaf scrub, 65 to 90% crown cover density; 75% or more of each stand composed of one or more deciduous broadleaf species; dominant species are scrub oak, associated species are pin cherry, and boxelder; stem heights range from 1 to 3 m (3 to 10 ft); stem diameters range from 5 to 25 cm (2 to 10 in.), majority greater than 15 cm (6 in.); stem spacings 3 to 7 m (10 to 23 ft). Undergrowth density is medium to dense, predominantly staghorn sumac, choke cherry, hazelbrush and various wild berries.	Found along the hills east of the drop zone.		Poor to fair.	Concealment from aerial observation is good for foot troops and fair for vehicles in the summer, and fair for foot troops and poor for vehicles in the winter; concealment from ground observation is good to excellent for foot troops and good for vehicles in the summer, and fair to good for foot troops and poor to fair for vehicles in the winter.
8. Deciduous broadleaf scrub; nearly open to medium spacing.	Deciduous broadleaf scrub, 10 to 30% crown cover density; 75% or more of each stand composed of one or more deciduous broadleaf species; dominant species is scrub oak, associated species are pin cherry and boxelder; stem diameters range from 5 to 25 cm (2 to 10 in.), majority greater than 15 cm (6 in.); stem spacings 7 to 15 m (23 to 50 ft). Undergrowth density is medium to dense; predominantly staghorn sumac, choke cherry, hazelbrush and various wild berries.	Located mostly in the flatlands in the south-east part of the reservation.		Nonexistent to poor.	Concealment from aerial observation is poor to fair for foot troops and poor for vehicles in the summer, and poor for foot troops and nonexistent for vehicles in the winter; concealment from ground observation is fair to good for foot troops and poor to good for vehicles in the summer, and poor to fair for foot troops and poor for vehicles in the winter.
9. Short grasses.	Short grasses; various types of native prairie grasses and weeds; heights generally less than 1 m (3 ft); includes scattered trees and scrub vegetation, not exceeding 10% crown cover density.	Covering the north impact area and the drop zone, as well as numerous smaller areas throughout the reservation.	Approximately 50% of the grasslands are located within the impact area.	Nonexistent.	Concealment from aerial and ground observation is nonexistent for both foot troops and vehicles.
10. Swamps; wet areas with over 50% trees.	Swamps; wet areas with over 50% in trees; deciduous broadleaf trees, 30 to 90% crown cover density; bottomland hardwoods predominate; species include maple, birch, elm, black cherry, tågelder, and ash; stem heights average 10 m (33 ft); stem diameters average 25 cm (10 in.); tree spacings average 7 m (23 ft); includes some areas of marsh grass.	Located along the La - Crosse River and other smaller streams, and in several pockets around the reservation.		Fair to good in swamps; nonexistent in open marsh areas.	Concealment from aerial and ground observation in swamps is fair to good in the summer and poor to good in the winter for foot troops and vehicles; concealment from aerial and ground observation in marshy areas is nonexistent for both foot troops and vehicles.

* Evaluation of cover possibilities for foot troops from flat-trajectory fire of small arms.

** Evaluation of concealment possibilities for foot troops and vehicles. "Summer" is defined as the season during which deciduous trees are in leaf, which on Fort McCoy is from late April to October. "Winter" is the remainder of the year.



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000

1 0 1000 2000 3000 4000 Meters 3 Statute Miles

Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060

INDEX TO ADJOINING SHEETS	
44°15'	44°00'
Black River Falls	Ft. McCoy
Millsboro	Millsboro
44°15'	44°00'
Spartan	Tomah

FOREST

- 1. Evergreen needleleaf trees; medium to dense spacing.
- 2. Evergreen needleleaf trees; nearly open to medium spacing.
- 3. Deciduous broadleaf trees; medium to dense spacing.
- 4. Deciduous broadleaf trees; nearly open to medium spacing.

SCRUB

- 5. Evergreen needleleaf scrub; medium to dense spacing.
- 6. Evergreen needleleaf scrub; nearly open to medium spacing.
- 7. Deciduous broadleaf scrub; medium to dense spacing.
- 8. Deciduous broadleaf scrub; medium to dense medium spacing.

GRASSLANDS

- 9. Short grasses.

WETLANDS

- 10. Swamps; wet areas with over 50% trees.

OPEN

- 11. Built up and/or heavily used areas. Vegetation is not a significant factor.

Note: Number refers to entry in table.

V761S
Edition 4-TPC

H. CLIMATE

Fort McCoy has a continental climate where winters are relatively long, cold and snowy and summers are warm and at times hot and humid. Fall and spring are generally short with many rapid temperature changes. A variety of weather can be expected in all seasons as frequent pressure systems pass over the area.

The number of days in a year with temperatures 90° F (32.2° C) or higher has varied from 35° F in 1939 to 0° F in 1950 and 1951. The number of days with 0° F (17.8° C) or lower has varied from 48° F in 1950 to 14° F in 1954. The mean daily temperature in the two coldest months, January and February, are 7° F (-13.9° C) and 12° F (-11.1° C) respectively. The mean daily maximum temperature in the two hottest months, July and August, are 82° F (27.8° C) and 81° F (27.2° C) respectively. The highest temperatures recorded at Fort McCoy has been 108° F (42.2° C) in July 1936 and the lowest has been -43.0° F (-41.7° C) in January 1873.

The average annual precipitation is 749.3 mm (29.5 in.) the maximum occurring in July (106.4 mm or 4.9 in.) and the minimum in January (19.8 mm or 0.78 in.). Precipitation during the 5 month period, May through September, has averaged about 65% of the annual normal. The probability of 1 inch or more rainfall in a 7-day period during the summer is greatest in June when the chance is 4 in 10 years. The probability of a dry 7-day period, with a trace or less, during the summer is greatest the last part of August, when the chance is 2 in 10 years. Intensities of about 1.35 inches in 1 hour, 2.20 inches in 6 hours, and 3.00 inches in 24 hours can be expected about once in two years. The number of days in a year with 0.01 or more precipitation has been between 100 and 124 in 2 or three years with an average of 112 days. A maximum 24-hour rainfall of 183.6 mm (7.23 in.) was recorded in October 1900.

Measurable amounts of snow occur from October to April, with traces in September and May. The mean annual snowfall is 998.2 mm (39.3 in.), the majority of which falls from December through March. The windchill temperature (a cold air temperature combined with a high wind

speed) is especially hazardous during the months of December, January and February, and therefore frostbite from cold exposure offers a substantial hazard to personnel not wearing adequate winter clothing. The average date of the first 1 inch or greater of snowfall is November 27. The chance of this fall by October 30 is 1 in 10 years and by December 24 is 9 in 10 years.

Prevailing winds are from the northwest in winter and from the southerly directions the remainder of the year. April is the windiest month with an average 10.4 knots (19.3 kmph) and August is the least windy month with an average of 6.1 knots (11.3 kmph). The wind speed has averaged less than 3.5 knots (6.4 kmph) about 10%, 3.5 - 10.4 knots (6.4 - 19.3 kmph) about 65%, 11.3 - 26.9 knots (20.9 - 49.9 kmph) about 25% and greater than 26.9 knots (49.9 kmph) less than 1% of the time. The highest speeds are usually ones' of the westerly directions.

Thunderstorms have occurred 43 days a year on the average with extreme years of 61 and 24 days. Hail has fallen on an average of 3 days a year with individual years ranging from 6 to 0 days. Since 1916, 4 tornadoes have been confirmed in Monroe County (west of central Wisconsin).

It should be noted that the following climatic summary is principally derived not from the weather stations at Sparta/Ft. McCoy AAF (at Lat. 43° 52' N, Long. 91° 15' W) located about 15 miles WSW. Where as detailed climatological data have been published for the LaCrosse station, only average temperature and mean precipitation normals are available for Sparta/Ft. McCoy AAF. However, a comparison of these two parameters at two stations (see table) shows that the two locations have almost identical precipitation values, while in the case of temperature, La Crosse averages 0.7° F warmer than the summer months. Thus a La Crosse the average date of the last freeze (temperatures of 0° C or 32° F) in the spring is April 25, and the date of the first freeze in the fall is October 16, making for an average growing season of 174 days. However, at Fort McCoy the freeze dates are May 11 and September 27, giving a growing season of 139 days.

CLIMATIC SUMMARY

LA CROSSE, WISCONSIN		LATITUDE: 43° 52' N		LONGITUDE: 91° 15' W		ELEVATION: 198.44 m (651 ft)														YEAR
PARAMETER DESCRIPTION		UNIT OF TIME OF MEASURE		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	RECORD			
ABSOLUTE MAXIMUM TEMPERATURE	°C	13.9	18.3	18.3	33.9	41.7	38.9	42.2	39.4	38.2	33.9	26.7	16.1	42.2	105					
	°F	57.0	65.0	65.0	93.0	107.7	102.0	108.0	103.0	101.0	93.0	80.0	61.0	108.0	105					
MEAN DAILY MAXIMUM TEMPERATURE	°C	-3.9	-1.3	4.4	14.3	20.7	25.8	27.6	22.1	16.6	6.1	-1.3	13.3	30						
	°F	25.0	29.7	40.0	57.8	69.3	78.4	83.0	81.7	71.8	43.0	29.6	55.9	30						
MEAN DAILY MINIMUM TEMPERATURE	°C	-13.8	-12.1	-5.5	3.0	9.3	14.7	16.9	16.1	11.0	5.4	-2.3	-10.0	2.7	30					
	°F	7.1	10.3	22.1	37.4	48.7	58.5	62.5	61.0	51.8	41.7	27.8	14.0	36.9	30					
ABSOLUTE MINIMUM TEMPERATURE	°C	-41.7	-32.2	-33.3	-13.9	-3.3	0.6	6.7	1.7	4.4	-14.4	-29.4	-38.3	-41.7	105					
	°F	-43.0	-36.0	-28.0	7.0	26.0	33.0	44.0	35.0	24.0	6.0	-21.0	-37.0	-43.0	105					
AVERAGE MONTHLY TEMPERATURE	°C	-8.8	-6.7	-0.5	8.6	15.0	20.3	22.7	21.9	16.6	11.0	1.9	-5.7	8.0	30					
	°F	16.1	20.0	31.1	47.6	59.0	68.5	72.8	71.4	61.8	51.8	35.4	21.8	46.4	30					
AVERAGE MONTHLY TEMPERATURE (SPARTA-FT. McCOY AAF)	°C	-8.9	-6.8	-0.7	8.3	14.6	19.6	21.9	21.1	16.0	10.5	1.7	-5.8	7.6	30					
	°F	15.9	19.8	30.8	46.9	58.3	67.3	71.4	70.0	60.8	50.9	35.0	21.6	45.7	30					
MEAN NUMBER DAYS WITH MAXIMUM TEMPERATURE GREATER THAN 90° F (32.2° C)		0	0	0	0	1	3	6	4	1	#	0	0	16	26					
MEAN NUMBER DAYS WITH MINIMUM TEMPERATURE LESS THAN 32° F (0.0° C)		31	28	27	10	1	0	0	0	#	6	21	29	152	26					
NORMAL HEATING DEGREE DAYS (BASE 65° F/18.3° C)		1516	1260	1051	522	224	39	10	17	130	421	888	1339	7417	20					
NORMAL COOLING DEGREE DAYS (BASE 65° F/18.3° C)		0	0	0	0	38	144	252	215	34	12	0	0	695	20					
MEAN DEW POINT TEMPERATURE	°C	-12.8	-9.4	-6.7	0.0	7.2	13.3	16.1	16.1	11.1	4.4	-3.9	-8.9	2.2	12					
	°F	9.0	15.0	20.0	32.0	45.0	56.0	61.0	61.0	52.0	40.0	25.0	16.0	36.0	12					
MEAN PERCENT RELATIVE HUMIDITY	0600 LST	77	78	81	79	80	84	87	90	90	84	82	81	83	26					
	1200 LST	66	64	62	53	53	56	57	58	60	58	66	71	60	26					
MEAN MONTHLY PRECIPITATION	mm	24.4	22.1	51.3	66.8	94.0	112.8	89.4	76.7	85.9	52.1	36.8	26.4	738.6	30					
	in.	0.96	0.87	2.02	2.63	3.70	4.44	3.52	3.02	3.38	2.05	1.45	1.04	29.08	30					
MEAN MONTHLY PRECIPITATION (SPARTA-FT. McCOY AAF)	mm	22.8	20.8	44.2	68.1	92.2	117.6	88.4	73.7	99.3	52.1	36.8	26.4	745.7	30					
	in.	0.09	0.82	1.74	2.68	3.63	4.64	3.48	2.90	3.91	2.07	1.51	1.07	29.08	30					
MEAN NUMBER DAYS WITH PRECIPITATION GREATER THAN 0.01 in. (0.25 mm)		8	7	10	10	12	11	10	9	9	8	7	9	109	26					
ABSOLUTE MAXIMUM MONTHLY PRECIPITATION	mm	87.4	102.6	107.4	185.7	224.3	293.6	280.2	235.0	276.1	307.1	178.1	87.1	1120.4	105					
	in.	3.44	4.04	4.23	7.31	8.83	11.56	11.03	9.25	10.87	12.10	7.01	3.43	44.11	105					
ABSOLUTE MINIMUM MONTHLY PRECIPITATION	mm	3.6	1.3	0.8	10.7	12.7	9.4	3.8	8.9	7.4	0.5	1.0	0.3	426.0	105					
	in.	0.14	0.05	0.03	0.42	0.50	0.37	0.15	0.35	0.29	0.02	0.04	0.01	16.17	105					
ABSOLUTE MAXIMUM 24-HOUR PRECIPITATION	mm	42.4	39.9	52.6	97.5	79.0	124.7	119.4	124.2	144.5	183.6	60.5	53.6	183.6	105					
	in.	1.67	1.57	2.07	3.84	3.11	4.91	4.70	4.89	5.69	7.23	2.38	2.11	7.23	105					
MEAN NUMBER DAYS WITH THUNDERSTORMS		#	#	1	3	6	8	7	7	4	2	1	#	40	26					
MEAN MONTHLY SNOWFALL	mm	274.3	228.6	198.1	43.2	5.1	0.0	0.0	0.0	T	7.6	104.4	226.1	1087.1	65					
	in.	10.8	9.0	7.8	1.7	0.2	0.0	0.0	0.0	T	0.3	4.1	8.9	42.8	65					
ABSOLUTE MAXIMUM MONTHLY SNOWFALL	mm	1005.8	787.4	850.9	431.8	167.6	0.0	0.0	0.0	5.1	177.8	382.3	675.6	1999.0	92					
	in.	39.6	31.0	33.5	17.0	6.6	0.0	0.0	0.0	0.2	4.7	12.5	10.5	15.7	92					
ABSOLUTE MAXIMUM 24-HOUR SNOWFALL	mm	292.1	297.2	298.8	185.4	152.4	0.0	0.0	0.0	5.1	119.4	317.5	266.7	398.8	92					
	in.	11.5	11.7	25.7	7.3	6.0	0.0	0.0	0.0	0.2	4.7	12.5	10.5	15.7	92					
MEAN SNOW DEPTH	mm	182.9	195.6	315.0	43.2	2.5	0.0	0.0	0.0	0.0	2.5	142.2	203.2	1087.1	23					
	in.	7.2	7.7	12.4	1.7	0.1	0.0	0.0	0.0	0.0	0.1	5.6	8.0	42.8	23					
MEAN NUMBER DAYS WITH SNOWFALL GREATER THAN 1.0 in. (25.4 mm)		3	2	3	#	0	0	0	0	0	#	1	3	12	26					
MEAN PRESSURE ALTITUDE (SPARTA-FT. McCOY AAF)	m	201.2	202.7	224.9	234.1	242.9	245.1	238.4	235.6	221.6	213.7	212.8	203.9	223.1	0					
	ft.	660.0	665.0	738.0	768.0	797.9	804.0	782.0	773.0	727.0	701.0	698.0	669.0	732.0	0					
PERCENT FREQUENCY OF SURFACE WIND SPEED -28 KNOTS (32.26 mph or 51.9 kmph)		0.1	0.1	0.1	0.3	0.4	0.1	0.0	0.0	0.0	0.2	0.2	0.1	0.1	12					

H. CLIMATE (CONTINUED)

CLIMATIC SUMMARY (Continued)

PARAMETER DESCRIPTION	UNIT OR TIME OF MEASURE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	YEAR RECORD
PERCENT FREQUENCY OF SURFACE WIND SPEED ≥ 17 knots (19.58 mph or 31.5 kmph)		6.1	5.0	8.8	15.2	10.6	4.0	1.8	1.5	4.0	7.3	12.7	6.4	7.0	12
MEAN NUMBER DAYS WITH SURFACE WIND ≥ 17 knots (19.58 mph or 31.5 kmph) AND NO PRECIPITATION	AT 1800 LST	1.4	1.5	2.2	4.4	3.6	0.8	0.4	0.3	0.8	2.0	3.0	1.8	22.2	12
	0000 LST	1.7	0.7	1.7	2.5	1.2	0.5	0.1	0.1	0.3	1.1	2.7	1.4	14.0	12
	0600 LST	1.7	0.7	2.4	3.0	1.5	0.3	0.2	0.2	0.6	1.1	2.6	1.8	16.1	12
	1200 LST	2.6	2.0	3.3	7.1	7.0	2.4	1.1	0.9	2.9	3.8	4.7	3.6	41.4	12
MEAN NUMBER DAYS WITH SURFACE WIND 4 - 10 knots (41.61 - 11.5 mph or 7.4 - 18.5 kmph) AND TEMPERATURE 33 - 89°F (0.6 - 31.7°C) AND NO PRECIPITATION	AT 1800 LST	2.6	5.4	11.4	13.5	15.9	22.4	21.4	21.0	17.9	10.5	4.2	166.5	12	
	0000 LST	1.2	2.6	4.7	14.6	20.0	20.3	21.5	19.6	19.8	20.1	8.3	3.8	156.5	12
	0600 LST	1.0	1.8	3.5	12.8	18.3	21.2	22.1	21.9	20.6	18.5	7.4	2.9	152.0	12
	1200 LST	2.4	4.2	9.5	10.5	12.8	16.1	19.7	19.7	15.4	16.0	9.4	4.3	140.0	12
MEAN WIND SPEED	kmph	14.0	14.0	15.0	17.1	15.8	13.4	12.2	11.9	13.2	15.0	15.8	14.0	14.3	26
	knots	10.0	10.0	10.7	12.2	11.3	9.6	8.7	8.5	9.4	10.7	11.3	10.0	10.2	26
	mph	8.7	8.7	9.3	10.6	9.8	8.3	7.6	7.4	8.2	9.3	9.8	8.7	8.9	26
PREVAILING WIND DIRECTION		S	NW	NW	NW	S	S	S	S	S	S	S	S	S	13
FASTEST ONE-MINUTE WIND SPEED	kmph	72.4	59.5	64.4	85.3	93.3	101.4	83.7	101.4	64.4	62.8	74.0	69.2	101.4	18
	knots	39.1	32.1	34.7	46.0	50.5	54.7	45.1	54.7	34.7	33.9	39.9	37.3	54.7	18
	mph	45.0	37.0	40.0	53.0	58.0	63.0	52.0	63.0	40.0	39.0	46.0	43.0	63.0	18
MEAN NUMBER DAYS WITH AN OCCURENCE OF VISIBILITY ≥ 0.5 mi. (0.8 km)		2.1	2.7	2.4	1.1	0.9	1.1	2.0	3.8	3.6	2.6	1.4	1.3	25.0	12
PERCENT FREQUENCY CEILING ≥ 5000 ft. (1524 m) OR VISIBILITY ≥ 5 mi. (8.047 km)		41.9	39.3	37.1	34.8	26.6	21.5	17.1	23.2	26.1	28.5	42.3	45.9	32.0	12
PERCENT FREQUENCY CEILING ≥ 5000 ft. (1524 m) OR VISIBILITY ≥ 5 mi. (8.047 km)	FOR 00-02 LST	21.8	18.7	14.5	12.3	8.2	6.1	4.9	9.6	9.6	8.8	12.6	22.1	12.4	12
	03-05 LST	24.3	23.3	16.0	16.7	11.7	11.4	12.1	19.6	18.0	12.5	13.5	22.5	16.8	12
	06-08 LST	26.7	26.8	19.7	18.9	15.0	13.0	16.0	23.5	25.6	18.3	17.4	27.8	20.7	12
	09-11 LST	24.4	22.7	17.8	15.2	10.9	7.8	6.7	11.4	13.5	13.1	16.8	25.8	15.5	12
	12-14 LST	18.1	13.6	13.8	11.9	8.1	4.4	3.4	5.8	7.3	8.3	14.8	20.3	10.8	12
	15-17 LST	14.5	10.9	10.7	10.6	6.7	3.0	2.3	4.1	6.4	8.3	12.2	17.7	9.0	12
	18-20 LST	14.3	11.3	12.3	10.1	6.6	2.6	1.7	3.2	6.5	7.6	12.9	19.2	9.0	12
	21-23 LST	16.4	14.9	12.6	8.8	7.5	3.1	1.7	4.4	7.4	7.0	13.1	20.4	9.8	12
PERCENT FREQUENCY CEILING ≥ 300 ft. (91.4 m) OR VISIBILITY ≥ 1 mi. (1609 km)	FOR 00-02 LST	2.0	3.6	4.4	1.0	0.8	0.2	1.2	2.4	1.2	1.5	1.7	1.3	1.8	12
	03-05 LST	2.5	6.1	3.2	2.1	1.7	1.9	4.0	8.3	7.4	2.8	1.9	2.0	3.7	12
	06-08 LST	2.9	7.3	4.9	2.9	1.2	1.8	3.9	8.6	8.9	5.3	3.2	3.4	4.5	12
	09-11 LST	3.1	3.5	3.8	0.7	0.0	0.0	0.0	0.5	0.3	1.8	1.8	3.9	1.6	12
	12-14 LST	2.2	2.2	3.5	1.3	0.1	0.1	0.0	0.0	0.3	0.0	1.3	2.6	1.1	12
	15-17 LST	2.4	2.1	2.6	1.0	0.0	0.1	0.0	0.0	0.0	0.4	2.4	2.4	1.1	12
	18-20 LST	2.1	1.6	2.5	0.3	0.3	0.2	0.1	0.1	0.0	0.4	1.9	1.3	0.9	12
	21-23 LST	1.7	2.2	3.1	0.5	0.4	0.1	0.1	0.1	0.6	0.4	1.3	1.3	1.0	12
MEAN NUMBER DAYS WITH SKY COVER $\leq 30\%$ AND VISIBILITY ≥ 3 mi. (4.828 km)	AT 1800 LST	9.6	9.9	7.0	7.1	7.3	8.6	11.2	11.9	10.7	12.8	8.6	9.6	114.3	12
	0000 LST	9.1	9.3	9.7	9.1	11.7	13.8	16.6	14.9	16.1	17.0	11.5	6.8	145.6	10
	0600 LST	9.9	9.3	8.9	8.6	9.1	7.9	8.9	7.5	7.9	10.7	9.2	10.1	108.0	12
	1200 LST	9.1	8.6	8.3	8.6	7.5	6.6	7.8	9.6	9.8	10.9	6.8	6.6	100.2	12
MEAN NUMBER DAYS WITH CEILING ≥ 1000 ft. (304.8 m) AND VISIBILITY ≥ 3 mi. (4.828 km)	AT 1800 LST	28.1	25.7	28.3	28.2	29.6	29.6	30.3	30.4	28.7	29.9	27.5	27.2	343.5	12
	0000 LST	26.7	24.6	27.9	28.0	29.7	29.2	30.3	29.5	28.4	29.3	27.1	26.5	337.2	12
	0600 LST	25.4	22.4	26.2	26.6	28.1	27.1	26.2	24.1	24.2	26.7	27.0	25.7	309.7	12
	1200 LST	27.2	25.3	27.9	28.3	29.7	29.3	30.2	30.2	28.7	29.8	27.2	26.9	340.7	12
MEAN NUMBER DAYS WITH CEILING ≥ 2000 ft. (609.6 m) AND VISIBILITY ≥ 3 mi. (4.828 km) AND SURFACE WINDS ≥ 10 knots (11.5 mph or 18.53 kmph)	AT 1800 LST	17.5	15.8	15.4	11.2	13.3	18.4	22.3	24.1	21.9	19.9	14.1	14.2	208.1	12
	0000 LST	15.6	17.1	18.7	15.9	19.9	22.5	27.3	25.5	22.6	20.0	14.3	15.3	234.7	12
	0600 LST	15.6	14.2	16.6	15.2	16.3	19.1	20.9	19.7	17.3	17.0	13.2	14.4	199.5	12
	1200 LST	13.2	12.0	11.0	6.8	9.3	12.4	16.2	17.7	11.3	11.7	9.5	11.7	142.8	12
MEAN NUMBER DAYS WITH CEILING ≥ 2500 ft. (762.0 m) AND VISIBILITY ≥ 3 mi. (4.828 km)	AT 1800 LST	23.0	21.1	24.6	24.8	27.4	28.5	30.0	29.3	26.9	27.5	22.9	21.4	307.4	12
	0000 LST	21.2	20.6	24.3	24.7	27.3	27.5	29.4	27.7	26.6	26.9	22.5	20.9	299.6	12
	0600 LST	19.7	18.4	22.3	22.8	24.8	24.5	24.3	21.2	20.9	22.8	21.1	19.0	261.8	12
	1200 LST	22.5	20.8	23.7	23.4	25.0	26.3	28.1	26.9	24.6	25.8	21.5	19.5	288.1	12
MEAN NUMBER DAYS WITH CEILING 6000 ft. (1828.9 m) AND VISIBILITY ≥ 3 mi. (4.828 km)	AT 1800 LST	19.5	18.9	19.6	19.7	23.6	24.9	27.0	26.6	24.1	23.6	18.3	17.5	263.3	12
	0000 LST	18.7	17.4	19.8	19.7	21.9	24.2	27.3	25.5	23.3	23.2	17.5	17.1	255.6	12
	0600 LST	16.6	16.5	18.7	18.7	22.2	21.8	22.7	18.5	18.8	19.8	16.4	15.7	226.4	12
	1200 LST	20.1	18.4	19.8	19.1	20.2	21.8	24.6	23.9	21.3	21.5	17.4	17.1	245.2	12
MEAN NUMBER DAYS WITH CEILING $\geq 10,000$ ft. (3048.0 m) AND VISIBILITY ≥ 3 mi. (4.828 km)	AT 1800 LST	18.2	17.1	16.4	16.7	19.6	22.1	24.9	24.2	21.4	21.6	16.9	16.5	235.6	12
	0000 LST	17.4	16.2	18.4	17.3	19.7	21.9	24.9	23.3	20.9	21.6	16.1	15.6	233.3	12
	0600 LST	15.4	15.3	16.8	16.0	18.7	19.5	20.5	16.6	16.2	18.1	15.2	14.4	202.7	12
	1200 LST	18.7	17.3	17.3	17.2	18.5	19.6	22.7	22.3	20.2	19.7	16.0	15.9	225.4	12

NOTE: a) LST = LOCAL STANDARD TIME
 b) T = TRACE
 c) # = 0.5 DAYS

EPIHEMERIS FOR FT. McCOY, WISCONSIN (CENTRAL STANDARD TIME)

NAUTICAL TWILIGHT					NAUTICAL TWILIGHT					NAUTICAL TWILIGHT				
DATE	BEGINNING	END	SUNRISE	SUNSET	DATE	BEGINNING	END	SUNRISE	SUNSET	DATE	BEGINNING	END	SUNRISE	SUNSET
JANUARY 1	0628	1745	0738	1636	MAY 1	0345	2017	0455	1906	SEPTEMBER 1	0420	1945	0526	1839
JANUARY 11	0628	1754	0736	1646	MAY 11	0328	2032	0442	1917	SEPTEMBER 11	0433	1925	0537	1821
JANUARY 21	0624	1805	0731	1658	MAY 21	0314	2046	0431	1928	SEPTEMBER 21	0446	1905	0548	1803
FEBRUARY 1	0615	1818	0721	1713	JUNE 1	0302	2100	0423	1938	OCTOBER 1	0458	1847	0600	1744
FEBRUARY 11	0604	1831	0708	1727	JUNE 11	0257	2109	0420	1945	OCTOBER 11	0510	1829	0612	1727
FEBRUARY 21	0551	1843	0653	1740	JUNE 21	0256	2113	0420	1949	OCTOBER 21	0522	1813	0625	1710
MARCH 1	0538	1853	0640	1751	JULY 1	0300	2113	0424	1949	NOVEMBER 1	0535	1758	0639	1654
MARCH 11	0521	1906	0623	1804	JULY 11	0309	2107	0430	1946	NOVEMBER 11	0547	1747	0652	1641
MARCH 21	0502	1919	0605	1816	JULY 21	0321	2057	0439	1939	NOVEMBER 21	0558	1739	0705	1632
APRIL 1	0441	1933	0545	1830	AUGUST 1	0336	2041	0451	1927	DECEMBER 1	0609	1735	0717	1626
APRIL 11	0422	1947	0527	1842	AUGUST 11	0351	2024	0502	1914	DECEMBER 11	0618	1734	0727	1625
APRIL 21	0403	2002	0510	1854	AUGUST 21	0405	2006	0513	1858	DECEMBER 21	0625	1737	0734	1628

WINDCHILL CHART

I. CROSS COUNTRY MOVEMENT

Cross-country movement (CCM) refers to movement by military vehicles and foot troops away from roads and trails. It differs from the somewhat nebulous term "trafficability", which refers to the soil component as it affects movement, or the capacity of roads to support traffic.

At Fort McCoy, the major direct factors affecting movement are surface configuration and vegetation. Vegetation varies from dense forest to open grassland; the surface configuration consists of nearly level lowlands and moderately to steeply sloping hills. Soils are of somewhat less significance to movement since most are sandy and well drained. With respect to some streams that are not readily fordable. Generally, the best areas for vehicular cross-country movement are found in the impact area (off-limits) and the drop zone (depicted on the Lines of Communication topic), as well as smaller tracts of land throughout the reservation. Otherwise, most of the land is poor to unsuited for vehicular movement, due largely to the combined effects of closely spaced trees and steep slopes.

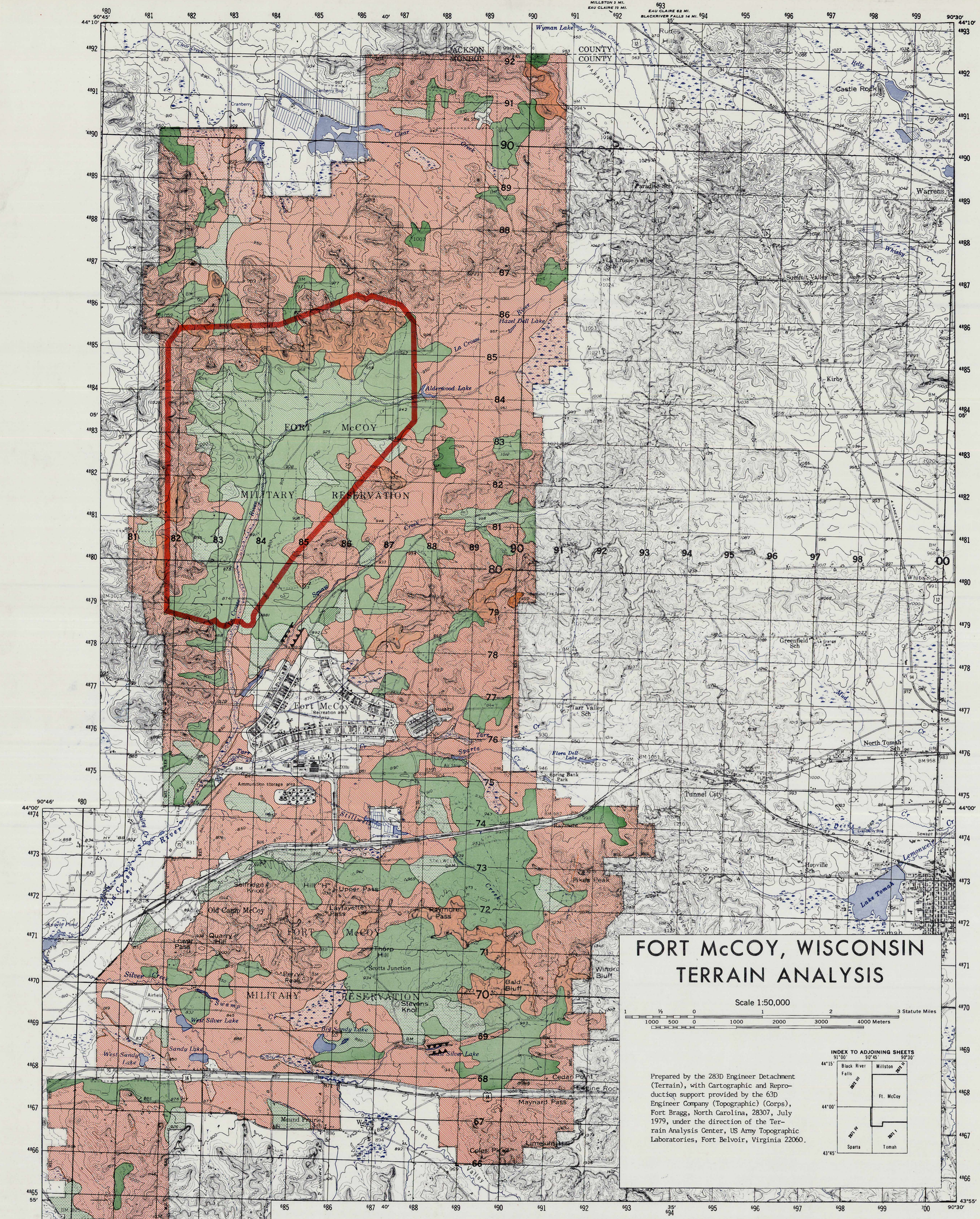
From about December through mid-April, snow has a crucial impact on CCM. Depth of snow during the winter months slows vehicular and troop movement considerably. In addition, some of the soils that are high in silt and/or clay can become slippery and miry during early spring thaws and therefore, difficult to traverse.

The map and movement evaluations should be used only as a guide in planning military training activities. For exact movement routes, ground reconnaissance is required.

MAP UNIT	GENERAL TERRAIN CONDITION	MOVEMENT OF TRACKED VEHICLES *	MOVEMENT OF WHEELED VEHICLES **	MOVEMENT OF FOOT TROOPS
1.	Nearly level grasslands with some areas of scattered scrub. Extensive areas are located in the north-central portion of reservation. Slopes seldom exceed 3 percent. Soils are generally well-drained and course-grained. Dominant vegetation is mainly grass; some thinly harvested stands of jack pine and red pine and areas of scrub oak occur in local areas.	Easy in any direction for tracked vehicles; movement limited only by natural boundaries of the open areas. Snow cover slows movement during the winter months.	Fairly easy most of the year. Movement precluded during the winter months because of snow cover.	Generally unhindered except during winter months when snow greatly inhibits movement.
2.	Nearly level grasslands with some areas of scattered scrub. Virtually all this unit located within impact area. Slopes seldom exceed 3 percent. Soils can become slippery and miry during the spring thaw.	Generally easy when soils are dry; after soaking rains or during the spring thaw, movement can be difficult. The APC is somewhat more mobile than the tank, and stands less risk of immobilization in snow or soft, miry soil. Some streams not fordable due to steepness and height of banks.	Fairly easy when soils firm. Movement precluded with snow cover or during spring thaw. Some streams not fordable due to steepness and height of banks.	Generally unhindered except during winter months by snow, and during spring thaw by sticky or slippery soils.
3.	Nearly level wooded areas consisting of medium to closely spaced stands of young pine and scrub oak, and more thinly populated stands of evergreen and deciduous trees. Slopes seldom exceed 3 percent. Soils are generally well-drained. Trunk spacing is usually greater than 5 m (16 ft) and stem diameters are commonly less than 25 cm (10 in.).	Moderately slowed by either scrub or randomly spaced trees; maneuvering limited in some places. Most of the scrub can be easily pushed over. During winter months, movement is precluded for tank and severely limited for APC because of snow conditions. Streams are readily fordable.	Scrub and randomly spaced trees restrict wheeled vehicles more severely than they do tracked vehicles; movement precluded entirely during winter and early spring. Streams fordable during dry periods.	Somewhat hindered by undergrowth and medium to dense scrub; more severely restricted in deep snow.
4.	Moderately to steeply sloping hills concentrated mainly in the two ranges that lie within the reservation. Slopes generally range from 8 percent to 30 percent; some as high as 45 percent along the lower valley slopes. The configuration is irregular and hummocky. Soils are generally well-drained. Vegetation includes scrub of varying type and density, and thinly populated stands of evergreen and deciduous trees. Undergrowth sparse to medium. Trunk spacings are usually greater than 5 m (16 ft) and stem diameters are commonly less than 25 cm (10 in.).	Feasible but difficult in most areas because of steep slopes and irregular terrain. maneuvering restricted by scrub and scattered trees. Movement precluded in deep snow.	Unsuited for all but local movement due mainly to thickness and close spacing of trees.	Somewhat hindered by undergrowth and closely spaced trees; navigation may be difficult. Considerably slowed in deep snow and may be impossible in areas with steep slopes.
5.	Wooded, nearly level plains and moderately to steeply sloping hills. In the nearly level wooded areas, slopes seldom exceed 3 percent. Elsewhere, slopes generally range from 8 to 30 percent, and as high as 45 percent along the lower valley slopes. The configuration is irregular and hummocky. Soils are generally well-drained. Vegetation consists of medium to closely spaced stands of evergreen and deciduous trees, with some small areas of scrub. Trunks of trees commonly greater than 25 cm (10 in.). thick; spacings usually less than 5m (16 ft). Undergrowth normally sparse.	Unsuited for all but local movement due mainly to thickness and close spacing of trees.	Unsuited for movement because of steep slopes, irregular terrain, and thickness and close spacing of trees.	Somewhat hindered by undergrowth or scrub; more severely restricted in deep snow. Steepness of slopes may restrict choices of movement in some areas.
6.	Swamps and other areas which are saturated year round; along streams and other low areas where the water table is high. Vegetation mostly deciduous trees and scrub, as well as marsh grasses.	Completely unsuited for movement because of saturated condition of soil, even during winter months when ground may be partly frozen.	Completely unsuited for movement because of saturated soil.	Movement feasible but impractical; potentially very dangerous in winter when snow may obscure wet areas.

* Comments apply to the M-60 tank and M-113 armored personnel carrier.

** Comments apply to the m-35, 2½ ton truck and the M-151, ½ ton truck.



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000

1 0 1000 2000 3000 4000 Meters
0 1 2 3 Statute Miles

INDEX TO ADJOINING SHEETS

91°00'	90°45'	90°30'
44°15'	Black River Falls	Millston
44°00'	Fort McCoy	
43°45'	Sparta	Tomah

Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060.

CROSS COUNTRY MOVEMENT

This map deals with cross-country movement, or movement away from roads, and is primarily intended for use in planning operations. For determining exact routes, reconnaissance on the ground is required. Many areas are too small to be shown, such as small tracts of forest, cleared areas, and swamps. The predicted movement ratings are those believed to be prevailing most of the time. Variations in these evaluations may occur from year to year and even within a season due to abnormal weather conditions. Since winter and early spring conditions are markedly different from those prevailing in summer and fall, the ratings have been provided for two periods of the year. Areas with no color represent built-up areas and are not evaluated.

EVALUATION OF TERRAIN FOR CROSS-COUNTRY MOVEMENT

Predicted Movement Ratings for:

Tank (M-60)		APC (M-113)		2 1/2-T Truck (M-35)		1-T Truck (M-151)		Foot Troops	
S/F	W/S	S/F	W/S	S/F	W/S	S/F	W/S	S/F	W/S
Good	Fair	Good	Fair	Good	Unsuited	Good	Unsuited	Good	Poor
Good	Poor	Good	Fair	Good	Unsuited	Good	Unsuited	Good	Poor
Fair	Unsuited	Fair	Poor	Poor	Unsuited	Good	Unsuited	Fair	Poor
Poor	Unsuited	Poor	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Fair	Poor
Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Fair	Poor
Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Poor	Unsuited

Note: Numbers refer to entries in tables.

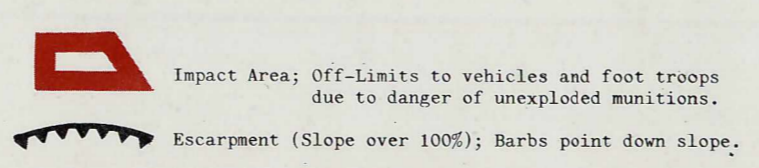
EXPLANATION OF RATING TERMS

Good - Conditions permit free movement in any direction. Terrain will permit 12 or more passes in trace of an M-60 tank or permit at least one maneuver (starts, stops, sharp turns, or crossing of tracks) at one location.

Fair - Conditions moderately hinder progress or moderately restrict choices of direction for movement. Terrain will permit 3 to 12 passes in trace of an M-60 but maneuvering will be difficult.

Poor - Conditions severely hinder progress or greatly restrict choice of movement routes. Terrain will probably permit up to 3 passes in trace of an M-60. Very cautions driving required. Movement in trace should be avoided.

Unsuited - Conditions preclude all but local movement. Engineer work required for vehicular movement.



DEFINITIONS OF SEASONS

* S/F Summer/fall: Period from about May through November.

* W/S Winter/spring: Period from about December through April.

J. LINES OF COMMUNICATION

ROADS

The existing road network on Fort McCoy consists of hard surface, improved and unimproved dirt roads, and tank trails. Together this network provides the reservation with about 475 kilometers (295 miles) of roads. The roads shown on the map do not represent the complete network since many minor roads have been omitted. There are 98 kilometers (62 miles) of hard surface roads on Fort McCoy, most of which are in and around the cantonment area, except for three highways (Interstate 90, U.S. Route 16, and Wisconsin Route 21) traversing the southern portion of the reservation. The shoulders along the major highways are asphalt or sand and gravel, while the shoulders of most other roads are generally dirt. The hard surface roads are usable throughout the year and are suitable for all vehicles. Roads are generally snow bound from December through mid-April; snow is removed from the paved roads, and range roads as needed.

Shale-base, improved dirt roads account for approximately 214 kilometers (133 miles) of roads providing access to ranges and training areas. During adverse weather conditions, it is advisable to use four-wheel drive or tracked vehicles.

Unimproved dirt roads and jeep trails provide about 109 kilometers (68 miles) of fair weather routes. On such routes, the use of four-wheel drive or tracked vehicles is advisable at all times.

There are 73 kilometers (45 miles) of tank trails, paralleling some of the shale-based roads and encircling the north range area and the drop zone area. The tank trails are generally one-lane, dirt and in excellent condition.

There are 60 road bridges, most of which are timber trestle construction. All the bridges in use are in fair to excellent condition, and no new construction is planned.

ROUTE NUMBER /NAME	ROUTE LOCATION (GRID REFERENCE)		LENGTH OF SEGMENT		MILITARY LOAD CLASSIFI- CATION	ROUTE TYPE	CONSTRUCTION MATERIALS	SURFACE WIDTH		CONDITION	CONSTRUCTION MATERIALS	SHOULDERS WIDTH		CONDITION	REMARKS
	FROM	TO	KM	MI				M	FT			M	FT		
Interstate 90 segment a	794675	917678	11.6	7.2	No Data	All Weather	Asphalt	7.3	24	Excellent	Asphalt	3.0	10	Excellent	2 lanes each way, heavy duty
	794675	797677	0.4	0.2	No Data	All Weather	Asphalt	7.3	24	Excellent	Asphalt	3.0	10	Excellent	2 lanes each way, heavy duty
U.S. Route 16 segment a	794676	917676	10.0	6.2	No Data	All Weather	Asphalt	6.7	22	Good	Sand and Gravel	2.4	8	Excellent	2 lanes, heavy duty
	794676	802677	0.8	0.5	40 40	All Weather	Asphalt	6.7	22	Good	Sand and Gravel	2.4	8	Excellent	2 lanes, heavy duty
	805677	862678	5.7	3.5	No Data	All Weather	Asphalt	6.7	22	Good	Sand and Gravel	2.4	8	Excellent	2 lanes, heavy duty
	866677	870677	0.4	0.2	No Data	All Weather	Asphalt	6.7	22	Good	Sand and Gravel	2.4	8	Excellent	2 lanes, heavy duty
Wisconsin Route 21 segment a	820729	906753	8.2	5.1	No Data	All Weather	Asphalt	7.3	24	Excellent	Sand and Gravel	2.4	8	Good	2 lanes, heavy duty
	820729	821730	0.2	0.1	No Data	All Weather	Asphalt	7.3	24	Excellent	Sand and Gravel	2.4	8	Good	2 lanes, heavy duty
County Highway A	858678	859667	1.1	0.7	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Fair	
County Highway BB	819742	829743	1.0	0.6	No Data	All Weather	Asphalt	6.7	22	Good	Dirt	Variable		Fair	
County Highway H	826754	850755	1.2	0.7	No Data	All Weather	Asphalt	6.7	22	Good	Dirt	Variable		Good	
Eighth Place	849754	850755	0.1	0.1	No Data	All Weather	Concrete	11.0	36	Excellent	Dirt	Variable		Good	
Foresman Road segment a	824721	825694	1.9	1.2	No Data	All Weather	Bituminous	5.5	18	Good	Dirt	Variable		Good	
	824721	828699	1.3	0.8	No Data	All Weather	Asphalt	6.1	20	Good	Dirt	Variable		Good	
South Headquarters Avenue	854769	856762	0.7	0.4	50 45	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
East Headquarters Road	853769	858771	0.5	0.3	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
West Headquarters Road	848772	854769	0.7	0.4	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
Quartermaster Avenue	819717	824721	0.7	0.4	No Data	All Weather	Bituminous	5.5	18	Good	Dirt	Variable		Good	
Sparta Street	817717	827711	1.3	0.8	No Data	All Weather	Bituminous	7.3	24	Fair	Dirt	Variable		Good	
Township Road	825694	822678	2.0	1.2	30 --	All Weather	Asphalt	7.3	24	Fair	Dirt	Variable		Good	
West A Street	839761	840756	0.5	0.3	No Data	All Weather	Asphalt	11.0	36	Excellent	Dirt	Variable		Good	
South A Street	840756	840751	0.5	0.3	30 20	All Weather	Asphalt	11.0	36	Excellent	Dirt	Variable		Good	
South E Street	849753	849751	0.3	0.2	No Data	All Weather	Concrete	7.3	24	Excellent	Dirt	Variable		Good	2 lanes; gate closed
West F Road	831767	843767	1.3	0.8	35 25	All Weather	Asphalt	6.7	22	Good	Dirt	Variable		Good	
South F Street segment a	845766	850755	1.2	0.7	50 30	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
	845766	850756	1.1	0.7	30 20	All Weather	Asphalt	7.3	24	Excellent	Dirt	Variable		Good	
West F Street	843767	845766	0.2	0.1	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
East G Street	852778	858778	0.7	0.4	No Data	All Weather	Asphalt	11.0	36	Good	Dirt	Variable		Good	
South J Street segment a	856735	855762	2.7	1.7	No Data	All Weather	Asphalt	6.7	22	Good	Dirt	Variable		Good	
	856735	855751	1.6	1.0	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
	855751	856758	0.7	0.4	30 20	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
West J Street	848772	832782	1.9	1.2	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
East K Street segment a	858771	865779	1.1	0.7	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
	858771	860774	0.4	0.2	No Data	All Weather	Asphalt	6.1	20	Good	Dirt	Variable		Good	
West N Street	849779	852778	0.2	0.1	No Data	All Weather	Asphalt	11.0	36	Good	Dirt	Variable		Good	
South O Street segment a	864751	864767	1.5	0.9	45 30	All Weather	Asphalt	7.3	24	Excellent	Dirt	Variable		Good	2 lanes; gate closed
	864751	864763	1.1	0.7	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
East S Street	872768	871764	0.4	0.2	No Data	All Weather	Asphalt	11.0	36	Excellent	Dirt	Variable		Good	
South S Street	871764	871760	0.4	0.2	No Data	All Weather	Asphalt	11.0	36	Excellent	Dirt	Variable		Good	
South X Road	882763	882752	1.1	0.7	50 30	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	2 lanes; gate closed
South 8th Avenue	875759	882760	0.7	0.4	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
South 9th Avenue	843755	871760	3.0	1.9	No Data	All Weather	Asphalt	7.3	24	Excellent	Dirt	Variable		Good	
South 10th Avenue	840754	879732	6.4	4.0	35 25	All Weather	Asphalt	11.0	36	Excellent	Dirt	Variable		Good	
South 11th Avenue	840756	871762	3.2	2.0	No Data	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
East 12th Avenue	854778	871764	2.3	1.4	60 40	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
West 12th Avenue	839758	851778	2.4	1.5	50 30	All Weather	Asphalt	6.7	22	Excellent	Dirt	Variable		Good	
East 13th Avenue	857778	872766	2.0	1.2	25 15	All Weather	Asphalt	7.3	24	Excellent	Dirt	Variable		Good	
West 13th Avenue	839761	849779	2.1	1.3	50 30	All Weather	Asphalt	11.0	36	Excellent	Dirt	Variable		Good	
East 14th Avenue	858778	876771	2.4	1.5	35 25	All Weather	Asphalt	7.3	24	Excellent	Dirt	Variable		Good	
Improved Dirt Roads			214	133		All Weather; Limited Traffic	Sand and Gravel	Variable		Good					Generally 2 lanes
Unimproved Dirt Roads			109	68		Fair Weather	Dirt	Variable		Fair to Poor					Generally 1 lane
Tank Trails			73	45		Fair Weather	Dirt	Variable		Good					

J. LINES OF COMMUNICATION (CONTINUED)

ROAD BRIDGES

BRIDGE NUMBER	ROUTE DESIGNATION	GRID REFERENCE	FEATURE CROSSED	MILITARY LOAD CLASSIFICATION		DIMENSIONS				CLEARANCE		TYPE	CONSTRUCTION MATERIAL	SURFACE MATERIAL	CONDITION	REMARKS			
				1-way	2-way	LENGTH		ROADWAY WIDTH		VERTICAL	HORIZONTAL								
						M	FT	M	FT		M						FT		
1	South O Street	864757	Tarr Creek	45	30	23.4	76.8	12.6	41.3	8.5	28.0	∞	12.2	39.7	Beam	Timber	Asphalt	Good	
2	South J Street	856756	Tarr Creek	30	20	23.3	76.6	16.3	53.5	12.3	40.2	∞	15.8	51.8	Beam	Timber	Asphalt	Good	
3	South F Street	850755	Tarr Creek	30	20	23.2	76.0	16.2	53.3	12.3	40.2	∞	15.7	51.7	Beam	Timber	Asphalt	Good	
4	South 10th Avenue	876757	Tarr Creek	35	25	23.3	76.5	12.7	41.7	8.6	28.1	∞	12.2	40.0	Beam	Timber	Asphalt	Good	
5	South Street	847754	Tarr Creek	35	20	23.2	76.0	12.7	41.7	8.6	28.2	∞	12.2	40.0	Beam	Timber	Asphalt	Good	
6	South A Street	840753	Tarr Creek	30	20	23.4	76.8	16.2	53.2	12.2	40.0	∞	15.7	51.5	Beam	Timber	Asphalt	Good	
7	County Highway H	831751	LaCrosse River	35	25	28.0	91.7	12.6	41.3	8.6	28.1	∞	12.1	39.6	Beam	Timber	Asphalt	Good	
8	South X Road	882759	Tarr Creek	50	30	14.0	46.0	9.5	31.2	8.6	28.1	∞	9.0	29.5	Beam	Timber	Asphalt	Good	
9	West F Road	836767	LaCrosse River	35	25	27.7	90.8	12.0	39.4	7.8	25.7	∞	11.5	37.8	Beam	Timber	Asphalt	Good	
10	County Highway B	846673	Stream	15	--	5.5	18.0	4.9	16.0	4.6	15.0	∞	4.6	15.0	Slab	Reinforced-Concrete	Gravel	Excellent	One lane
11	West J Street	842775	Squaw Creek	35	25	23.5	77.0	12.0	39.4	7.9	26.0	∞	11.5	37.6	Beam	Timber	Asphalt	Good	
12	Unnamed	846781	Squaw Creek	35	30	23.5	77.0	12.2	40.1	8.5	28.0	∞	11.7	38.4	Beam	Timber	Asphalt	Good	
13	West J Street	833781	LaCrosse River	35	25	23.5	77.0	11.9	39.2	7.9	26.0	∞	11.4	37.5	Beam	Timber	Asphalt	Good	
14	Unnamed	836792	LaCrosse River	No Data	--	27.4	90.0	10.6	34.7	10.1	33.0	∞	10.1	33.0	Beam	Timber	Dirt	Good	Located in impact area
15	East 13th Avenue	860772	Stream	25	15	5.8	19.0	19.4	63.7	11.0	36.0	∞	18.9	62.0	Beam	Timber	Asphalt	Good	
16	East 12th Avenue	859770	Stream	60	40	6.7	22.0	14.4	47.4	10.4	34.0	∞	14.0	45.8	Beam	Timber	Asphalt	Good	
17	South Headquarters Ave.	854768	Stream	50	45	6.7	22.0	14.4	47.4	10.4	34.0	∞	13.9	45.7	Beam	Timber	Asphalt	Good	
18	South F Street	847765	Ash Run	50	30	6.8	22.2	15.2	49.8	11.3	37.2	∞	14.7	48.2	Beam	Timber	Asphalt	Good	
19	West 12th Avenue	845765	Ash Run	50	30	7.3	24.0	14.6	47.8	11.0	36.0	∞	14.1	46.2	Beam	Timber	Asphalt	Good	
20	West 13th Avenue	843766	Ash Run	50	30	7.3	24.0	21.5	70.7	16.0	52.6	∞	21.0	69.0	Beam	Timber	Asphalt	Good	
21	Tank Trail	874757	Tarr Creek	50	--	8.2	27.0	5.1	16.7	4.3	14.0	∞	4.6	15.0	Beam	Timber	Dirt	Good	One lane
22	Unnamed	890811	Squaw Creek	40	--	5.1	16.7	4.7	15.3	3.8	12.5	∞	4.2	13.7	Beam	Timber	Gravel	Good	One lane
23	Not Applicable	853764	Stream	30	--	4.9	16.0	5.0	17.8	4.4	14.3	∞	4.9	16.1	Beam	Timber	Wood	Good	Provides vehicle access to drill field
24	Unnamed	832779	Stream	90	30	12.9	42.2	7.3	23.9	6.4	21.0	∞	6.8	22.3	Beam	Timber	Gravel	Good	
25	Tank Trail	893854	LaCrosse River	150	--	4.6	15.0	5.4	17.7	4.6	15.0	∞	4.9	16.0	Beam	Timber	Dirt	Good	Adjacent to bridge no. 26
26	Unnamed	894855	LaCrosse River	20	--	4.9	16.0	7.7	25.2	7.2	23.5	∞	7.2	23.5	Beam	Timber	Dirt	Good	
27	Unnamed	894846	Alderwood Creek	55	40	4.8	15.7	7.8	25.7	6.9	22.5	∞	7.3	24.0	Beam	Timber	Dirt	Good	
28	Side Street	843753	Tarr Creek	60	--	8.2	27.0	4.4	14.3	3.8	12.6	∞	3.8	12.6	Beam	Timber	Asphalt	Fair	Provides access to storage area
29	Unnamed	834769	LaCrosse River	100	--	8.5	28.0	5.3	17.3	4.6	15.0	∞	4.8	15.7	Beam	Timber	Gravel	Good	One lane
30	Unnamed	841773	Squaw Lake	50	--	13.0	42.8	5.5	18.2	3.7	12.0	∞	5.0	16.5	Beam	Timber	Dirt	Good	Not used; both approaches blocked
31	Unnamed	868773	Stream	50	--	5.3	17.5	5.4	17.8	4.3	14.2	∞	4.9	16.2	Beam	Timber	Sand and-Gravel	Excellent	One lane
32	Unnamed	860757	Tarr Creek	40	--	11.1	36.5	4.6	15.2	4.1	13.5	∞	4.1	13.5	Beam	Timber	Dirt	Good	One lane
33	Side Street	843753	Tarr Creek	80	--	18.3	60.2	5.2	17.0	4.2	13.9	∞	4.7	15.3	Beam	Timber	Dirt	Good	Adjacent to bridge no. 28
34	Unnamed	898847	Alderwood Creek	45	35	4.6	15.0	7.7	25.2	6.7	22.0	∞	7.2	23.5	Beam	Timber	Dirt	Good	
35	Unnamed	915706	Silver Creek	55	--	4.8	15.7	7.7	25.2	6.9	22.6	∞	7.2	23.5	Beam	Timber	Dirt	Good	
36	Unnamed	875839	Alderwood Creek	45	--	11.3	37.1	7.8	25.7	6.8	22.2	∞	7.3	24.0	Beam	Timber	Wood	Excellent	Dam
37	County Highway BB	825742	LaCrosse River	No Data	--	12.4	40.7	8.9	29.2	6.5	21.3	∞	8.6	28.2	Beam	Concrete	Asphalt	Excellent	County maintenance; new bridge
38	Unnamed	872683	Silver Creek	90	--	8.6	28.3	4.1	13.5	3.1	10.2	∞	3.6	11.8	Beam	Timber	Wood	Good	One lane
39	County Highway A	856667	Stream	75	--	6.7	22.0	5.9	19.2	5.3	17.5	∞	5.3	17.5	Slab	Reinforced-Concrete	Asphalt	Good	County maintenance
40	U.S. Route 16	861678	Coles Creek	40	40	8.1	26.5	13.5	44.2	6.1	20.0	∞	13.0	42.5	Beam	Steel	Concrete	Good	State Maintenance
41	Township Road	823694	Silver Creek	30	30	13.1	43.0	10.0	32.7	7.6	25.0	∞	9.4	31.0	Beam	Steel	Asphalt	Good	
42	Unnamed	817701	Silver Creek	45	--	11.3	37.0	4.8	15.9	3.7	12.0	∞	4.4	14.3	Beam	Timber	Dirt	Good	Provides access to north end of airfield
43	Not Applicable	858764	Stream	50	--	4.9	16.0	4.9	16.0	4.0	13.0	∞	4.4	14.3	Beam	Timber	Wood	Good	Provides vehicle access to parade field
44	Not Applicable	859764	Stream	50	--	4.9	16.0	4.8	15.9	4.0	13.0	∞	4.4	14.3	Beam	Timber	Wood	Good	Provides vehicle access to parade field
45	Not Applicable	861764	Stream	50	--	5.1	16.7	5.0	16.4	3.9	12.7	∞	4.5	14.8	Beam	Timber	Wood	Good	Provides vehicle access to parade field
46	Foreman Road	828699	Swamp Creek	80	--	9.8	32.3	7.8	25.7	7.0	23.0	∞	7.3	24.0	Beam	Timber	Asphalt	Good	Dam
47	Not Applicable	841765	Ash Run	45	--	5.0	16.3	4.8	15.9	3.9	12.7	∞	4.3	14.1	Beam	Timber	Gravel	Good	Connects two parking areas
48	Not Applicable	867764	Stream	50	--	4.8	15.7	4.7	15.4	3.8	12.5	∞	4.2	13.8	Beam	Timber	Wood	Good	Provides access to parade field
49	Tank Trail	903813	Squaw Creek	45	--	5.2	16.9	7.7	25.3	7.0	23.0	∞	7.2	23.7	Beam	Timber	Dirt	Good	Closed
50	Not Applicable	856768	Stream	15	--	5.5	18.0	6.6	21.7	6.1	20.0	∞	6.1	20.0	Beam	Timber	Wood	Good	Provides access to parade field.
51	Not Applicable	850765	Stream	65	--	4.9	16.0	4.7	15.4	3.8	12.5	∞	4.2	13.8	Beam	Timber	Wood	Good	Provides access to parade field.
52	Not Applicable	857769	Stream	85	--	5.1	16.5	7.1	23.3	6.6	21.7	∞	6.6	21.7	Beam	Timber	Wood	Good	Provides access to parade field.
53	Unnamed	906865	LaCrosse River	45	--	4.9	16.0	7.8	25.7	6.8	22.4	∞	7.3	24.0	Beam	Timber	Dirt	Good	
54	Unnamed	893895	Clear Creek	45	--	3.4	11.0	7.7	25.2	6.6	21.8	∞	7.2	23.5	Beam	Timber	Dirt	Good	
55	Not Applicable	850765	Stream	30	--	4.9	16.0	5.3	17.4	4.3	14.2	∞	4.8	15.8	Beam	Timber	Wood	Good	Provides vehicle access to drill field
56	East 14th Avenue	861773	Stream	35	25	4.9	16.0	16.4	53.7	7.8	25.7	∞	15.8	52.0	Beam	Timber	Asphalt	Good	
57	Unnamed	880810	Squaw Creek	50	--	5.5	18.0	5.0	16.3	4.4	14.3	∞	4.7	15.3	Beam	Steel	Dirt	Good	One lane
58	Unnamed	889767	Stream	20	--	9.8	32.0	5.0	16.3	4.2	13.8	∞	4.5	14.6	Beam	Timber	Dirt	Good	One lane
59	Tank Trail	834783	LaCrosse River	80	--	21.9	72.0	5.4	17.7	4.9	16.0	∞	4.9	16.0	Beam	Timber	Dirt	Good	One lane
60	Unnamed	858796	Squaw Creek	100	--	4.3	14.0	6.6	21.7	5.5	18.0	∞	6.1	20.0	Beam	Timber	Dirt	Good	

J. LINES OF COMMUNICATION (CONTINUED)

RAILROADS

The main line of the Chicago, Milwaukee, St. Paul and Pacific connects Fort McCoy to Minneapolis - St. Paul, Milwaukee and other points. This line carries freight traffic for both the Milwaukee Road railroad and the Chicago and North Western; it also is part of the AMTRAK passenger train network, the nearest station being located at Tomah for travel between Chicago and Seattle.

Rail freight service to the main post is furnished by means of a government-owned spur track and sections formerly used by the North Western; (see Remarks column in table).

Branches of the spur feed warehouses in the southern portion of the cantonment area. This spur could readily be used to load and ship troops in the event of deployment, but presently it is used exclusively for supply purposes.

There are two railroad bridges within the boundaries of Fort McCoy, both crossing the southern most leg of 10th Avenue near Stilwell Dam; one, however, while in serviceable condition, is part of the abandoned rail line and therefore is not included in the Lines of Communication section of this study (see Non-Urban Culture Features).

IDENTIFICATION NUMBER	SEGMENT OF TRACK (GRID REFERENCE)		LENGTH OF SEGMENT		OWNERSHIP OF LINE AND CONDITION OF TRACK	CHARACTERISTICS OF TRACKS	CROSSOVER LOCATIONS	SIDING	BALLAST MATERIAL	VOLUME OF TRAFFIC	FACILITIES	REMARKS
	FROM	TO	KM	MI								
1	859737	880761	4.5	2.8	Government-Owned (good condition)	Standard gage, 1.44 m (4 ft 8.5 in.); single track; 44.7 kg/m (90 lb/yard) rails; minimum radius of curvature unknown; maximum grade less than 3 percent	None	From 859747 to 859737; 1000 m (3280 ft) long From 851750 to 859748; 800 m (2620 ft) long From 850750 to 859749; 900 m (2950 ft) long From 853752 to 859750; 650 m (2130 ft) long From 850753 to 859751; 900 m (2620 ft) long From 853754 to 859752; 650 m (2130 ft) long From 859752 to 862753; 350 m (1150 ft) long	Crushed slag	25 cars/month	Engine shop and warehouses	This spur to the cantonment area joins the abandoned North Western line (most of which is still intact) at a wye. The west leg of the wye (859737 to 857734), a short segment of the abandoned line (855734 to 849733) connect this spur to the Milwaukee main line. The east leg of the wye is considered abandoned.
2	820719	920743	10.4	6.5	Chicago, Milwaukee, St. Paul and Pacific (excellent condition)	Standard gage; 1.44 m (4 ft 8.5 in.); double track from 820719 to 906741, single track from 906741 to 920743; 65.6 kg/m (132 lb/yard) rails; minimum radius of curvature unknown; maximum grade less than 3 percent; track spacing approximately 3 m (9.8 ft)	None	None	Crushed slag	28 trains/day (freight) 4 trains/day (passenger)	None	

RAILROAD BRIDGES

IDENTIFICATION NUMBER	GRID REFERENCE	FEATURE CROSSED	NUMBER OF TRACKS	ROADWAY WIDTH		CLEARANCE		DECK MATERIAL	OVERALL LENGTH		TYPE OF STRUCTURE
				M	FT	HORIZONTAL	VERTICAL		M	FT	
1	878736	South 10th Avenue	Multiple standard gage	12.2	40.0	∞	∞	Concrete	6.1	20.0	Closed Arch

AIRFIELDS

Fort McCoy Army Airfield is capable of accepting aircraft with single-wheel and twin-wheel type landing gear, such as the C-47 and the C-9A. Medium and Heavy tactical aircraft use Volk Field, 40 kilometers (25 miles) to the southwest at Camp Douglas. The communications facility at Chicago Center controls approach and departures at McCoy AAF. The airfield is currently closed until further notice because of construction to

upgrade the runways to C-130 capabilities.

There are both temporary and permanent buildings at the airfield. Facilities include two hangars, a new operations building, two quanset huts, and the control tower; most of the structures were built since World War II, and are in satisfactory condition.

NAME, LOCATION, TYPE AND CLASSIFICATION	ELEVATION AND STATUS	RUNWAY DESCRIPTION	TAXIWAY, PARKING APRON AND HARDSTAND AREA	BUILDING DESCRIPTION	POL FACILITIES	NAVIGATIONAL AIDS	REMARKS
Fort McCoy Army Airfield; 815695; non-precision instrumented airfield	256.2 m (839 ft); temporarily closed	Primary runway: 1281.0 x 30.5 m (4200 x 100 ft); azimuth 110°/290°; maximum weight bearing capacity S20, T40; asphalt surface Crosswind runway: 861.6 x 30.5 m (2825 x 100 ft); azimuth 015°/195°; bearing capacity and surface same as primary runway	Taxiway: 15.2 m (50 ft) wide; maximum weight bearing capacity and surface same as primary runway Parking apron, hardstand: None	Two hangars: Two permanent buildings, numbers P06036 and P06050, concrete; 26.6 m long x 15.8 m wide x 2.9 m high (87.3 x 52.0 x 9.6 ft) and 38.6 m long x 23.5 m wide x 9.1 m high (126.7 x 77.0 x 30.0 ft) Administration and terminal buildings: Control tower, building number P06044; corrugated steel, 131.4 m ² (431 ft ²) Operations building, number T06038; wood frame, 427.0 m ² (1400 ft ²) Two quanset huts, numbers T06043 and T06041; corrugated steel with concrete floors, 1219.2 m ² (400 ft ²) each Other buildings: Pumping station, number P06052; concrete block, 365.8 m ² (1200 ft ²) Water well building, number P06053; concrete, 36.6 m ² (120 ft ²) Lighting equipment vault, number P06047; concrete block, 151.8 m ² (498 ft ²)	No permanent facilities; portable bladders used to supply U.S. aviation fuel (MIL-SPECS)115/145, JP-4	Control tower: 256.2 m (840 ft) mean sea level, 19.8 m (65 ft) high; non-directional radio beacon (no voice); radar control Chicago Center Lights; Rotating beacon; runway lights.	Low rugged hills approximately 2 km (1.2 mi) northeast of airfield.

Note: Runway weight bearing capacity in pounds (gross weight of aircraft) is determined by adding 000 to figure following S or T. Bearing capacity given is for unlimited operations. Aircraft weight higher than given requires prior permission from aerodrome controlling authority. The S-prefix is for aircraft with single-wheel type landing gear (C-47, F100), and the T-prefix is for aircraft with twin-wheel type landing gear (C-9A).

PIPELINES

The Northern Natural Gas Company's main pipeline traverses the installation approximately 12 m (40 ft) to the north of Wisconsin Highway 21, from 829743 to 898753. Natural gas is not supplied to Fort McCoy from this pipeline. This regulated utility is strictly limited in its ability to accept new customers on a large scale, and there are no future plans to tie Fort McCoy into this pipeline. There are no tank crossings along the pipeline.

MAP NUMBER	GRID REFERENCE FROM	GRID REFERENCE TO	STATUS	OWNERSHIP	PIPELINE CHARACTERISTICS	TANK CROSSING SITES	REMARKS
1	829743	898753	Operative	Northern Natural Gas Company	15.2 cm (6 in) diameter pipe; 7.4 km (4.6 mi) across the reservation design capacity maximum flow under 56.3 kg/cm ² (800 lb/in ²) pressure	No crossings	No connections are made on the reservation. No data on burial depth.

J. LINES OF COMMUNICATION (CONTINUED)

HELICOPTER LANDING ZONES

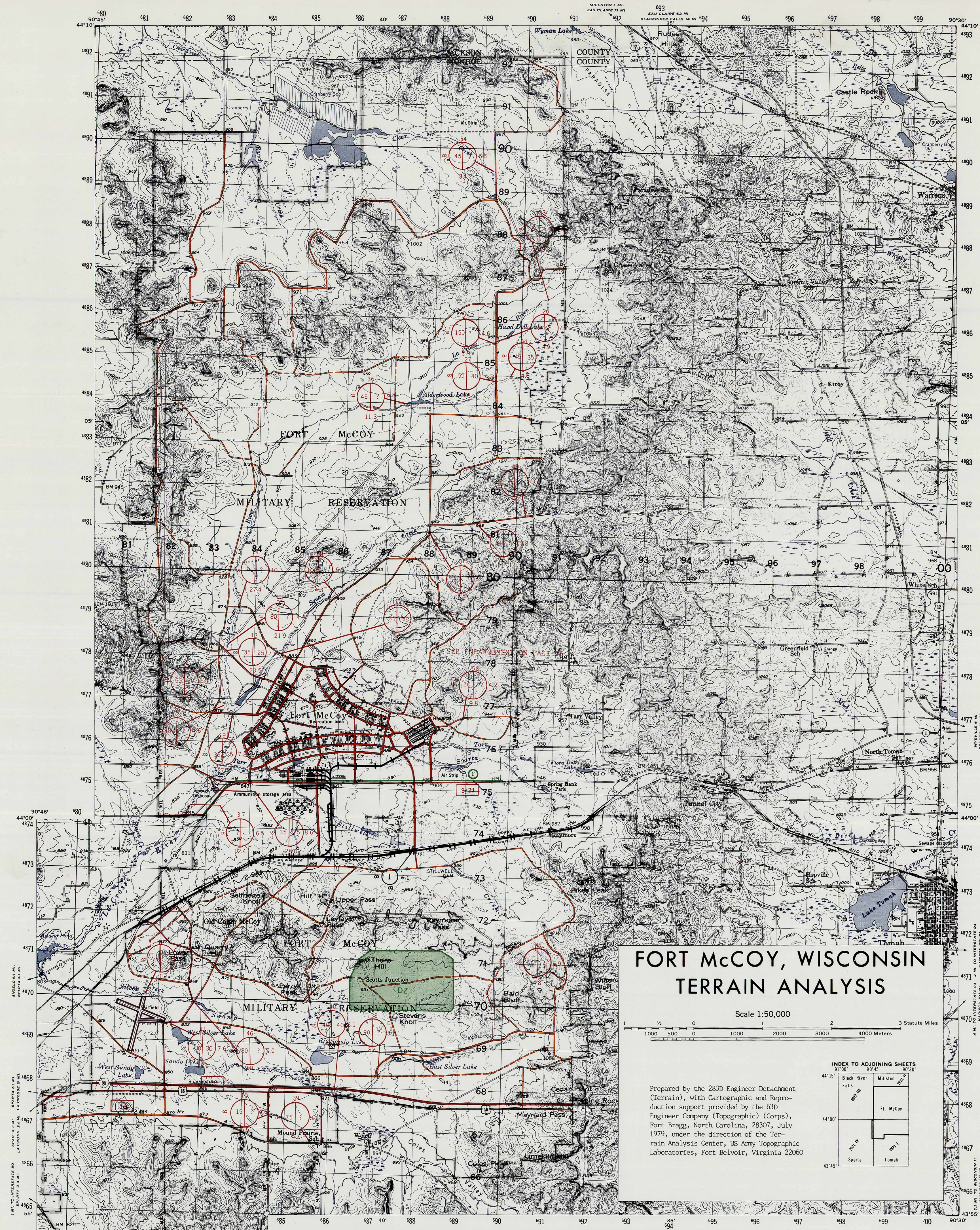
Six helicopter landing zones are designated in the cantonment area, three of which are hard-surface helipads; the others are open areas. The hospital helipad is the only one that is lighted.

MAP NUMBER AND NAME	GRID REFERENCE	DIMENSIONS		AZIMUTH	ELEVATION		SURFACE MATERIAL	RESTRAINTS	REMARKS
		M	FT		M	FT			
1 Fieldhouse	871760	40 x 40	25 x 25	170°/350°	271	888	Asphalt	Nearby buildings lighted; hallfield north; trees east and south	
2 Drill Field #2	853777	No Data	No Data	No Data	271	890	Grass	Trees and buildings east	Painted tires used as markers.
3 Range Control	852772	32 x 32	20 x 20	No Data	267	875	Aluminum	Trees north and south; buildings east	Pad made from aluminum matting.
4 Drill Field #4	862764	No Data	No Data	No Data	268	880	Grass	Trees north, east, and west; buildings south	
5 Parade Field	858768	No Data	No Data	No Data	267	877	Grass	Trees north and east	Painted tires used as markers.
6 Hospital	884765	48 x 48	30 x 30	000°/180°	280	918	Asphalt	Trees north, east, and south; buildings west	Lighted.

DROP ZONES

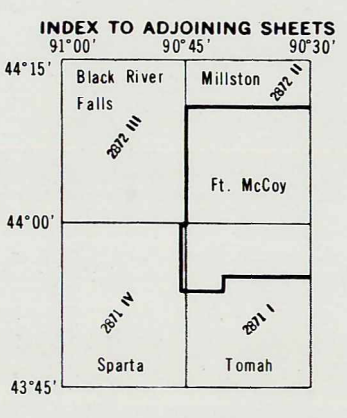
There is one designated drop zone on Fort McCoy, located in the southern part of the reservation in a former range area. It occupies a total area of approximately 2.7 km² (1.7 mi²), and is covered almost entirely by grassland. Low rugged hills lie to the north, east, and west, with swampland to the immediate southwest. An unimproved dirt road runs through the area, providing access for four-wheel-drive and tracked vehicles.

MAP NUMBER AND NAME	LOCATION (GRID REFERENCE)	DIMENSIONS		AZIMUTH	ELEVATION		SURFACE DESCRIPTION	AIRCRAFT OBSTRUCTIONS	REMARKS
		LENGTH M FT	WIDTH M FT		M	FT			
1. Drop Zones	877705	2330 7644	1170 3839	090° to 270°	285	934	Grass	Hills to the north, east and west.	Unimproved dirt road run-lengthwise through the drop zone.



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000
 1 0 1000 2000 3000 4000 Meters
 0 1 2 3 Statute Miles



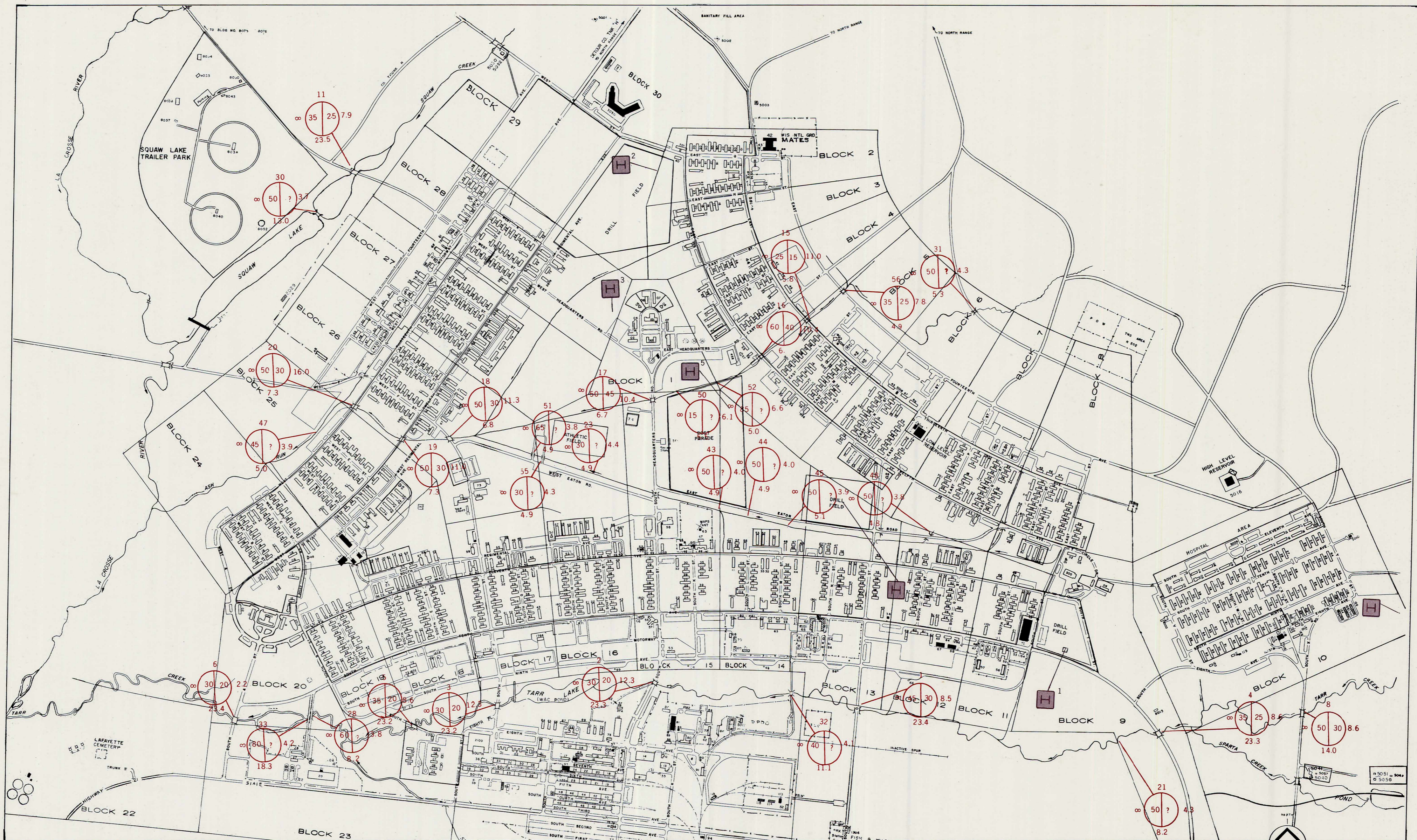
Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060

- ROADS**
- Hard surface divided, 4 or more lanes
 - Hard surface, 2 or 3 lanes
 - Improved dirt
 - Unimproved dirt
 - Tank trail
- Interstate route number
- National route number
- State route number

- ROAD BRIDGE DATA** (measurements in meters)
- A - Bridge number
 - B - One-way military load classification
 - C - Two-way military load classification
 - D - Roadway width
 - E - Length
 - F - Overhead clearance
 - ∞ - Unlimited clearance
 - ? - Data not available
- RAILROADS**
- Multiple track, standard gage
 - Single track, standard gage
- RAILROAD BRIDGE DATA** (measurement in meters)
- A - Bridge number
 - B - Vertical clearance
 - C - Horizontal clearance
 - D - Length
 - ∞ - Unlimited clearance

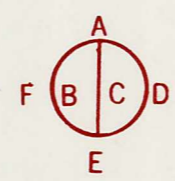
- AIRFIELDS**
- Airfield
- PIPELINES**
- Pipeline
- HELICOPTER LANDING ZONES**
- Helicopter landing zone
- DROP ZONES**
- Drop zone

Note: Numbers refer to entries in tables



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

LINES OF COMMUNICATION ENLARGEMENT (measurements in feet)



- A - Bridge number
- B - One-way military load classification
- C - Two-way military load classification
- D - Roadway width
- E - Length
- F - Overhead clearance
- ∞ - Unlimited clearance
- ?

HELICOPTER LANDING ZONES



- Helicopter landing zone
- Note: Numbers refer to entries in landing zones

K. URBAN AREAS (CANTONMENT AREAS)

TROOP BILLETS					
TYPE	NUMBER OF BUILDINGS	CAPACITY	CURRENT LOAD	CONDITION	REMARKS
Temporary	485	23,045 Men	No Data	Fair to Poor	Temporary barracks consisting of type 74-M structures, constructed in 1942, with an area of 493 m ² (5310 ft ²) on two floors, with open squad bays, small cadre rooms, a latrine/shower and a furnace room. These troop billets are substandard for year-round training or permanent party use, but adequate for summer training. Most barracks are not winterized, however, in 1966-68 virtually all buildings in 1100-1400 areas were winterized. Troop billets are occupied by training personnel only. An average 40,000 troops occupy these billets from May-September for Annual Reserve Training (AT), and for Weekend Reserve Training (WT), an average of 33,000 troops per year. Permanent party troops are housed in BOQ type facilities.

QUARTERS					
TYPE	NUMBER OF BUILDINGS	CAPACITY	YEAR CONSTRUCTED	CONDITION	REMARKS
BOQ (Temporary)	3	22	1942	Fair	VIP and BOQ quarters are used for temporary duty assignments (TDY). Quarters are adequate for annual training but substandard for permanent party use. There are plans to build a permanent party 35-person BOQ in FY 1980
BOQ (Temporary)	52	1459	1942	Fair	
Permanent Party (Temp.)	1	20	1942	Fair to Poor	Two officers and nine enlisted men presently occupy building T-1675.
BEQ (Temporary)	8	235	1942	Fair	Bachelor Enlisted Quarters are used for TDY and are substandard for permanent party use.
GUEST HOUSE (Temporary)	1	N/A	1942	Fair to Poor	Guest House, building T-1450 was converted from a BOQ. There are no current plans to expand this facility.

FAMILY HOUSING					
TYPE	NUMBER OF BUILDINGS	NUMBER OF FAMILY UNITS	CURRENT LOAD	CONDITION	REMARKS
Quarters (Temporary)	3	3	3	Good to Fair	Family housing accommodations are very limited at Fort McCoy. Housing is issued according to family need. There are currently 15 family units available, which are maintained in good to fair condition, but are either deficient in size or have poor space distribution. There are currently no plans to expand family housing. The remaining demand is currently being met on the civilian market, and by partial use of the 37 mobile home sites available on the South Fort.
Converted Quarters (Temporary)	4	4	3	Good to Fair	
Summer Cottages (Temporary)	2	2	2	Good	
Farmhouse (Temporary)	1	1	1	Good	
Mobile Homes	5	5	5	Good to Fair	

HEATING FUELS			
TYPE	STORAGE CAPACITY	CURRENT LOAD	REMARKS
LPG	1010 kL (270,000 gal)	2022.7 kL/year (534,400 gal/year) Yearly draw	Fort McCoy heating systems presently consist of Liquefied Petroleum Gas (LPG), #2 Fuel Oil, Bituminous Coal units
OIL	2,850 kL (750,000 gal)	679.8 kL/year (179,600 gal/year) Yearly draw	LPG- Currently there are 35 LP gas-fired heating units used during the cold season. The fieldhouse is using 10 gas units which are currently under consideration for conversion to a stoker-fired heating system. There are currently 234 LP gas-fired units that are only being used during Annual Training period, approximately two weeks.
COAL	Unlimited	2,909.1 k/year (3,200 tons/year) Yearly draw	OIL- Currently 30 oil-fired heating systems are used throughout the installation. During the heating season, two larger furnaces are used in the Consolidated Maintenance building (T-7320) which are currently being converted to stoker-fired units for the next heating season. COAL- Currently 22 stoker-fired coal units are used during the heating season, there are 340 hand-fired coal units that are only being used during AT period, approximately two weeks yearly. A nine-inch natural gas main crosses the installation along the north side of State Highway #21, however, Ft. McCoy is not allowed to tap this line.

WATER SUPPLY			
TYPE	CAPACITY	CURRENT LOAD	REMARKS
Supply	21,300 kL/day (5,600,000 gal/day)	2013 kL/day (530,000 gal/day) average daily consumption	Fort McCoy has three separate domestic water systems, one supplying water for the cantonment area, one for the South Fort, and one for the airfield.
		3900 kL/day (1,000,000 gal/day) peak daily consumption	The cantonment area uses the principal water supply system, installed in 1942. The supply components include thirteen 25.4 cm (10") bedrock wells with 1135 Lpm (300 Gpm), a 3,785,000 liter (1,000,000 gal) low-level reservoir, and a water treatment plant. The treated water system includes 5450 Lpm (1440 Gpm) and 10,900 Lpm (2880 Gpm) booster pumps and a 3,785,000 liter (1,000,000 gal) high-level reservoir.
Storage Reservoir	Two 3,800 kL (1,000,000 Gal) One 1140 kL (300,000 Gal)	75% to 100% capacity	
Tanks	Two 460 kL (120,000 Gal)	75% to 100% capacity	The South Fort system, constructed in 1929, has four wells with 530 Lpm (140 Gpm) pumps and a rated capacity of 3,565,000 Lpd (942,000 Gpd) and 2 elevated storage tanks with a storage capacity of 485,000 liters (121,000 Gal). The airfield has a separate fire protection system consisting of a well, pump, and a 1,140,000 liter (300,000 gal) reservoir, completed in 1975.

SCHOOLS AND MEDICAL FACILITIES		
TYPE	CAPACITY	REMARKS
Schools	None	Fort McCoy, having a limited number of permanent party personnel, does not warrant a permanent school. Neighboring communities provide education for military dependents. Five public school districts serve Monroe County. In addition to the public school districts, six parochial schools are in the county. Presently the school facilities are adequate to meet the needs of the county and Fort McCoy.

MEDICAL FACILITIES		
TYPE	CAPACITY	REMARKS
Hospital (Semi-Active)	1328 beds	The U.S. Army Hospital, Fort McCoy, has not been fully active since the Korean Conflict and is currently used for annual training, during May-August. The Mobilization-type hospital has 68 buildings, with a total area of 30,000 m ² (320,000 ft ²), which includes 58 hospital buildings, five hospital clinics, dispensary, laboratory, dental clinic, morgue, and X-ray. Construction of the hospital consists of single-story wood-framed ward buildings separated for fire safety, but connected by enclosed exterior corridors. The following are separate facilities distributed throughout the cantonment area, but not regularly active or currently equipped: 12 dispensaries, two dental clinics, and two medical processing centers. The only active facility on Fort McCoy is the Health Clinic in building 1404 and 1405, 1,000 m ² (11,000 ft ²), available to permanent party and employees. Also St. Mary's Hospital in Sparta and Tomah Memorial in Tomah help meet the medical needs of Fort McCoy.
Dispensary (Semi-Active)	12 bldgs	
Dental Clinics (Semi-Active)	2 bldgs	
Medical Processing (Semi-Active)	2 bldgs	
Health Clinic (Active)	2 bldgs	

RECREATIONAL FACILITIES		
TYPE	NUMBER OF FACILITIES	REMARKS
Outdoor Facilities		
Tennis Courts	3	Lighted courts
Basketball Courts	2	
Sofball Fields	8	Lights on two fields.
Running Track	1	Located on PT field.
Golf Driving Range	1	Located on parade field.
Outdoor Swimming Pool	1	Located on South Fort. Attached bathhouse and picnic area.
Camping Area	1	Squaw Lake Recreation Area has 38 trailer campsites and 42 tentsites.
Winter Recreational Area	1	Include ski slope, skilift, and recreational lodge.

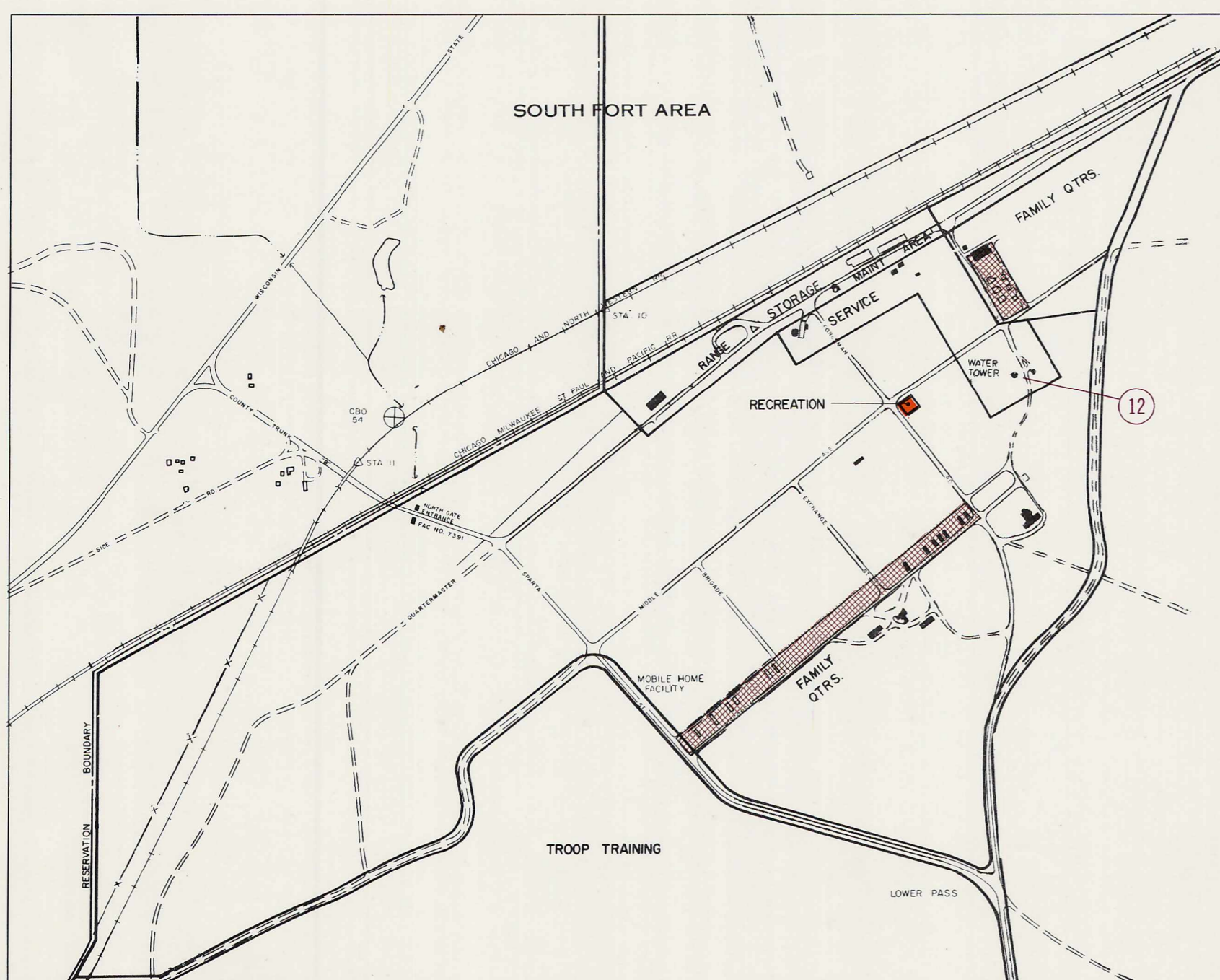
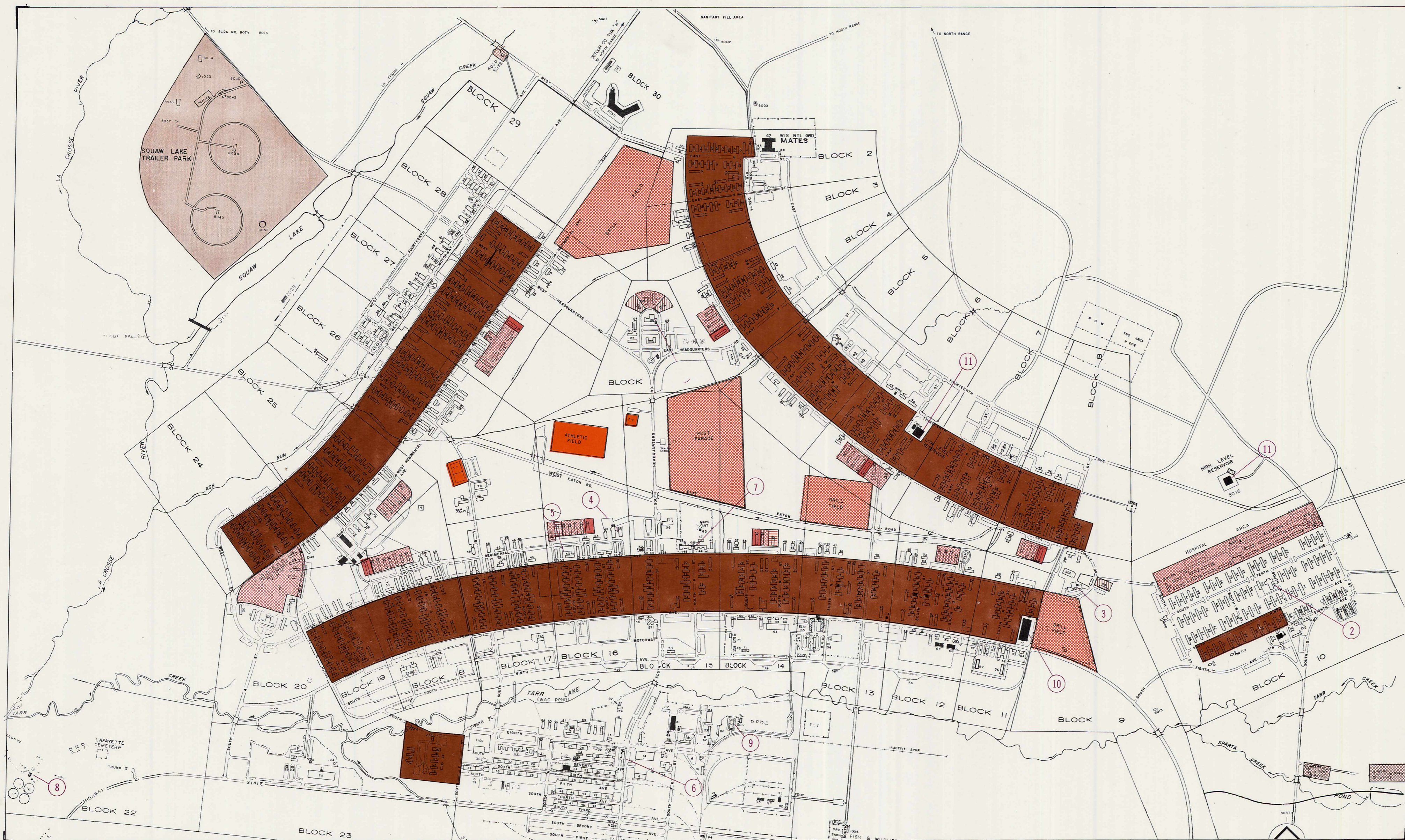
INDOOR FACILITIES		
TYPE	NUMBER OF FACILITIES	REMARKS
Fieldhouse	1	Built in 1967, 3000 m ² (36,000 ft ²) includes gymnasium, handball court 25 m (82 ft) swimming pool, exercise/wrestling room, male and female shower/locker rooms, laundry and office space.
Auto Hobby Shop	1	288 m ² (3108 ft ²)
Handball Court	1	Under construction
Bowling Center	1	Inactive
Woodcraft/Ceramic Shop	1	

TELECOMMUNICATIONS		
TYPE	CAPACITY AND CURRENT LOAD	REMARKS
Official Telephones	2,400 lines 16 Autovon circuits 17 Watts circuits 1 Foreign Exchange 1 Autodin DCT 9000 SAT-5 6 Operator position Current Load 80%	Fort McCoy telephone service is provided by a subordinate element of the U.S. Army Communication Command. The telephone system is completely owned, operated, and maintained by DOD personnel. The installation has primary lead covered cables consisting of 4,472 circuit miles underground, 1,500 circuit miles overhead cables, and 975 circuit miles open wire.

ELECTRICITY				
SUBSTATION	TRANSFORMER	CAPACITY	LOAD	REMARKS
Three Phase	6,900 V	3.5 MVA	Peak Demand 46 kW	Fort McCoy is provided with electrical service by Northern States Power Company via a 69,000 volt transmission line from a substation in Sparta.

SEWERAGE				
CAPACITY	AVERAGE DAILY FLOW	PEAK RECORDED FLOW	REMARKS	
9500 kL/day 2,500,000 gal/day	154 kL/day (41,000 gal/day)	265 kL/day (70,000 gal/day)	The sanitary sewer system at Fort McCoy, located south of County Highway H, serves the family housing area on the South Fort by means of gravity flow collection system and a sewage lift station. The airfield and separate family housing units at other locations have individual septic systems.	

WATER POLLUTION CONTROL				
CAPACITY	AVERAGE DAILY FLOW	PEAK RECORDED FLOW	REMARKS	
9500 kL/day 2,500,000 gal/day	154 kL/day (41,000 gal/day)	265 kL/day (70,000 gal/day)	The water pollution control plant consists of a grit chamber and machine, 4 primary settling tanks, 2 sludge digesters, 4 trickling filters, a pump house, 2 final clarifiers, a chlorine contact tank, and 14 drying beds, installed in 1942.	



FORT MCCOY, WISCONSIN TERRAIN ANALYSIS

URBAN AREAS (CANTONMENT AREAS)

AREA FEATURES

<ul style="list-style-type: none"> Family Housing Troop Bilets VIP Quarters Bachelor Officer Quarters Permanent Party Bachelor Quarters 	<ul style="list-style-type: none"> Bachelor Enlisted Quarters Guest House Parade Field Recreation Facilities (Outdoors) Trailer Park
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POINT FEATURES

<ul style="list-style-type: none"> Post Headquarters Post Hospital Officer's Open Mess Post Exchange Post Office Directorate of Facilities Engineering 	<ul style="list-style-type: none"> Telephone Exchange Sewerage Treatment Plant Electric Power Substation Indoor Recreation Facilities Water Shortage Reservoir Water Tanks
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L. NON-URBAN CULTURE FEATURES

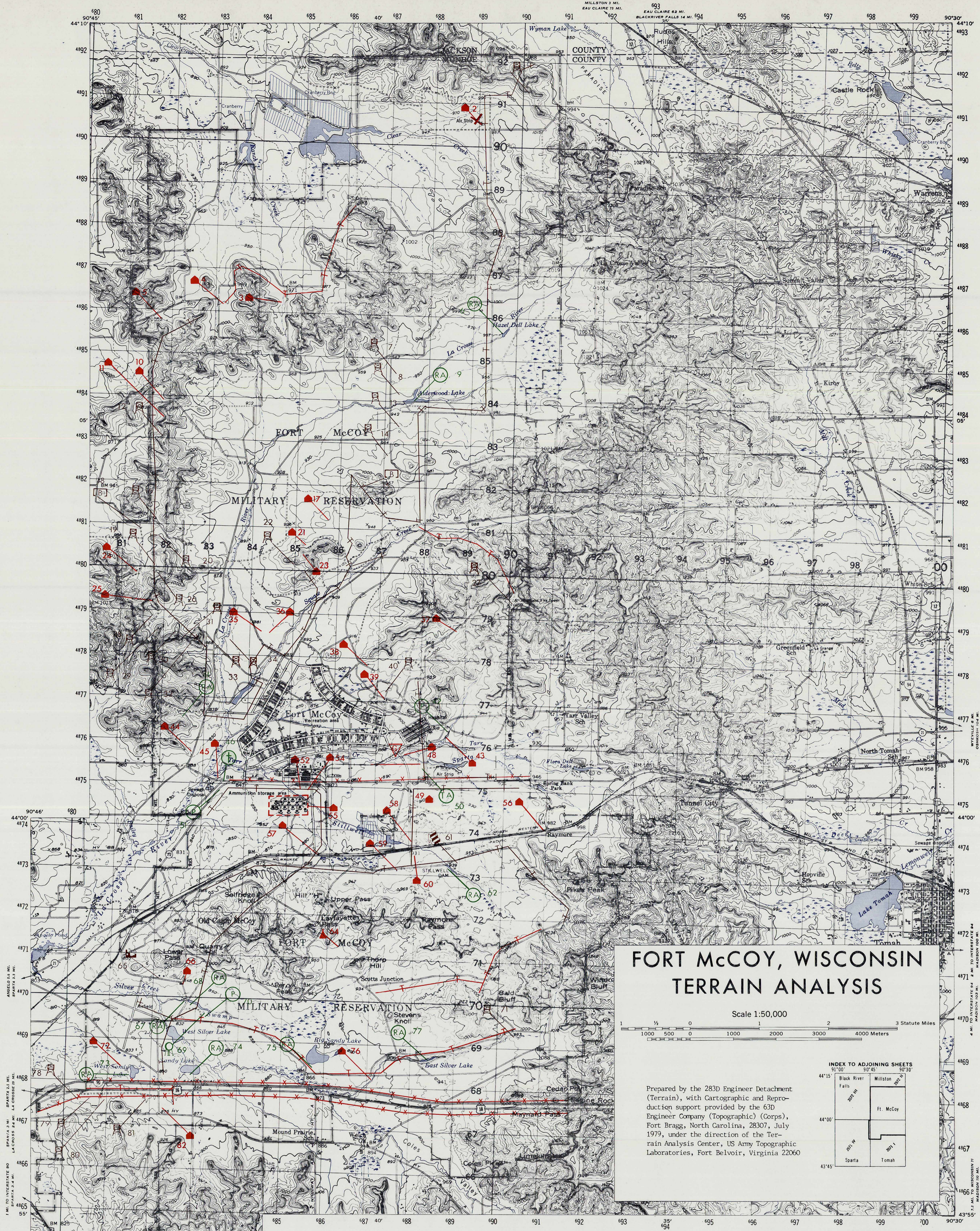
MAP NUMBER	GRID REFERENCE	DESCRIPTION	MAP NUMBER	GRID REFERENCE	DESCRIPTION
1	902913	At Range 44 (Combined Tank Gunnery Range, Table VI & VII) Latrine (1); Control tower, height 1.8 m (6 ft), base 3.7 m ² (40 ft ²), wood, temporary.	41	825766	Recreation Area (Ski Slope), Ski-pull, length 400 m (1312 ft); Building, 7.4 m ² (80 ft ²), wood, frame, temporary; Trailer, 66.9 m ² (720 ft ²), temporary; Building, 19.0 m ² (204 ft ²), wood, frame, temporary; Building, 9.3 m ² (100 ft ²), wood, frame, temporary; Building, 37.9 m ² (408 ft ²), wood, frame, temporary.
2	889906	Airfield (Abandon): Two runways each, length 289.6m (950 ft) width 13.7 m (45 ft), asphalt surface.	42	887763	Water Pumphouse: 18.1 m ² (95 ft ²), brick, permanent.
3	845863	At Range 6A (Scout Range and .30 cal): Latrine, 4.5 m ² (48 ft ²), wood.	43	886762	Building: 5.9 m ² (64 ft ²), wood, frame, temporary.
4	832862	At Range 18 (Moving Tank [Moving Target/Stationary Target] Sub-cal, .50 cal M113, & 106mm RR Sub-cal): Range storage shed (2), Latrine, 4.5 m ² (48 ft ²), wood frame, temporary.	44	828757	Building: (MP Post): 19.0 m ² (204 ft ²), wood, frame, temporary.
5	818858	At Range 23 (Tank Sub-caliber, Tables I-VI) Range storage shed (2); Latrine, 4.5 m ² (48 ft ²), wood frame, temporary.	45	834751	Can Washing Plant: Three Buildings each 126.3 m ² (1360 ft ²), metal; Chimney on each building, height 10.7 m (35 ft ²), brick.
6	897856	Recreation Area (Hazel Dell Lake): 9.7 hectares (24 acres); Fishing Dock, 11.1 m ² (120 ft ²), wood.	46	835751	Cemetery 16.3 m ² (175 ft ²), Split-rail fence.
7	873847	At Range 34 (Machine Gun): Range storage shed, 3.0 m ² (32 ft ²), wood, frame, temporary, Latrine, 3.0 m ² (32 ft ²), wood, frame, temporary, Control tower, height 1.8 m (6 ft), base 5.2 m ² (56 ft ²), wood, temporary.	47	876758	Building (Gas Chamber #2): 55.7 m ² (600 ft ²), wood, frame, temporary.
8	874842	At Range 33 (Known Distance, Trainfire): Range storage shed, 26.8 m ² (288 ft ²), wood, frame, temporary, Latrine, 3.0 m ² (32 ft ²), wood, frame, temporary, Control tower, height 2.4 m (8 ft), base 5.9 m ² (64 ft ²), wood, temporary.	48	877758	Latrine: 3.3 m ² (36 ft ²), wood, frame, temporary.
9	877840	Recreation Area (Alderwood Lake): 99.6 hectares (246 acres), Sheltered picnic area, 18.6 m ² (200 ft ²), wood.	49	880756	Latrine (1).
10	819839	At Range 17 (.30 cal Machine Gun, 500): Range storage shed (2), Latrine (1); Control tower, height 1.8 m (6 ft), base 3.3 m ² (36 ft ²), wood, temporary.	50	881755	Training Area: Horizontal Ladder, 31.6 m ² (340 ft ²), four runs, wood.
11	819835	At Range 16 (.30 cal Machine Gun, 500): Range storage shed (2), Latrine (1), Control tower, height 1.8 m (6 ft), base 2.8 m ² (30 ft ²), wood, temporary.	51	834749	Water Pumphouse: 20.9 m ² (225 ft ²), brick, permanent.
12	819831	At Range 15 (Sub-Machine Gun) Range storage shed, 9.3 m ² (100 ft ²), wood, frame, temporary; Latrine, 5.6 m ² (60 ft ²), wood, frame, temporary, Control tower, height 1.2 m (4 ft), base 3.7 m ² (40 ft ²), wood, temporary.	52	853749	Building (Vehicle Shed): 348.4 m ² (3750 ft ²), wood, frame, temporary.
13	874835	At Range 32 (Field Fire, Trainfire): Range storage shed, 34.8 m ² (375 ft ²), wood, frame, temporary, Latrine, 13.9 m ² (150 ft ²), wood, frame, temporary, Tower, height 2.4 m (8 ft), base 5.9 m ² (64 ft ²), wood, temporary; Bleacher, covered, 30.7 m ² (330 ft ²), wood.	53	850745	Ammunition Dump: Operation building, 55.7 m ² (600 ft ²), wood, frame, temporary, Storage shed (2), Chain-link fence.
14	872827	At Range 31 (Qualification, Trainfire): Range storage shed, 34.8 m ² (375 ft ²), wood, frame, temporary, Latrine, 13.9 m ² (150 ft ²), wood, frame, temporary; Tower, height 2.4 m (8 ft), base 5.9 m ² (64 ft ²), wood, frame, temporary, Bleacher, covered 16.7 m ² (180 ft ²), wood.	54	855749	Building (2).
15	866820	At Range 30 (Heavy Demolition Range) Two bunkers each 11.6 m ² (125 ft ²), wood.	55	855745	Warehouse: Building, 278.7 m ² (3000 ft ²), wood, frame, temporary, Latrine (1), Storage shed (2), Chain-link fence.
16	818812	At Range 12 (40 mm Projectile Range). Latrine (1), Tower (3).	56	909741	Building: 7.4 m ² (80 ft ²), wood, frame, temporary.
17	858812	At Range 29 (Artillery Defense Course). Range storage shed (2), Latrine (1).	57	858733	Building (shack): 5.6 m ² (60 ft ²), wood, frame, temporary.
18	815809	At Range 11 (Demolition Range). Latrine, 10.2 m ² (110 ft ²), wood, frame, temporary, Two bunkers each 7.4 m ² (80 ft ²).	58	879738	Building 18.9 m ² (200 ft ²), wood, frame, temporary.
19	818801	At Range 10 (Pistol and Revolver - .32, .38, and .45 cal) Range storage shed (2), Latrine, 7.4 m ² (80 ft ²), wood, frame, temporary, Control tower, height 1.8 m (6 ft), base 3.3 m ² (35 ft ²), wood, temporary.	59	876731	Range storage shed (2) (Abandon).
20	819807	At Range 10A (Inactive): Latrine (1), Control tower (3).	60	889735	At Range 109 (14.5 Artillery Training Range) Two Range storage sheds (2), Latrine (1).
21	853806	At Range 19 (106 mm Recoilless Rifle Sub-Cal [7.62 mm]) Range storage shed and latrine are shared with Range 20 listed below in #23.	61	889733	Bleachers: Two each, wood.
22	850802	At Range 22 (Infantry Squad Course) Latrine (1), Control tower, height 2.4 m (8 ft), base 5.9 m ² (64 ft ²), wood, temporary.	62	887732	Recreation Area (Stillwell Dam) Fishing dock, 27.7 m ² (266 ft ²), wood, Picnic shelter, 26.8 m ² (263 ft ²), wood.
23	852804	At Range 20 (106 mm Recoilless Rifle Sub-Cal [7.62 mm]) Range storage shed, 12.3 m ² (132 ft ²), wood, frame, temporary, Latrine (1).	63	236718	Radio Tower (Abandon) height 10.7 m (35 ft).
24	814799	Farmhouse (Abandon): 55.7 m ² (600 ft ²), wood, frame, Barn, 250.1 m ² (2700 ft ²), wood, frame.	64	853713	Bivouac Area. 30 Latrines (1).
25	818792	At Range 8 (14.5 Artillery Range): Latrine (1).	65	822704	Ruins: Two concrete slab; 13.9 m ² (150 ft ²).
26	819799	At Range 9 (Pistol and Revolver - .32, .38, and .45 cal) Range storage shed (2), Latrine, 9.3 m ² (100 ft ²), wood, frame, temporary, Control tower, height 1.4 m (4 ft), base 1.9 m ² (20 ft ²), wood, temporary.	66	826703	Building (Warehouse): 238.3 m ² (2565 ft ²), concrete, permanent.
27	901794	Fire Tower: height 35.1 m (115 ft), top base 30.5 m ² (100 ft ²), steel construction, windows, permanent.	67	827699	Recreation Area: Swimming pool, 250.8 m ² (2790 ft ²), Bath house, 139.4 m ² (1500 ft ²), wood, frame, temporary, Latrine 24.5 m ² (264 ft ²), wood, frame, temporary, Water pumphouse, 22.3 m ² (240 ft ²), wood, Two picnic shelters.
28	818789	At Range 7 (Live 40 mm M79 Launcher Site). Latrine (1), Control tower (3).	68	828698	Recreation Area Fishing dock, 11.1 m ² (120 ft ²), wood.
29	819786	At Range 6 (Machine Gun, .50 cal). Latrine (1), Control tower (3).	69	832696	Water Tower: Height 12.2 m (40 ft), diameter 6.1 m (20 ft).
30	823785	At Range 5 (106 mm Recoilless Rifle Range) Latrine (1), Control tower (3).	70	832695	Water Pumphouse: 15.8 m ² (170 ft ²), wood, frame, temporary.
31	825784	At Range 4 (Direct Fire Artillery Range, 106 mm RR) Control tower (3).	71	904693	At POW Compound #2. Eight towers each, height 1.8 m (6 ft), base 5.0 m ² (54 ft ²), wood; Two latrines (1).
32	828784	At Range 3 (Machine Gun - .50 cal & M60) Range storage shed, 83.6 m ² (900 ft ²), concrete block, permanent, Control tower, height 1.2 m (4 ft), base 3.3 m ² (35 ft ²), wood, temporary.	72	813683	Latrine (1).
33	831784	At Range 2 (90 mm and 106 mm RR [scryive]). Range storage shed and Latrine Combination, 81.3 m ² (875 ft ²), concrete block, permanent, Control tower, height 1.2 m (4 ft), base 5.6 m ² (60 ft ²), wood, temporary.	73	815682	Recreation Area: Fishing dock, 24.7 m ² (266 ft ²), wood.
34	836784	At Range 1 (Machine Gun and Pistol Range) Range storage sheds (3); Control tower, height 1.2 m (4 ft), base 5.6 m ² (60 ft ²), wood, temporary.	74	829682	Recreation Area: Fishing dock, 24.7 m ² (266 ft ²), wood.
35	843786	At Range 25 (Anti-Armor Course) Latrine (1).	75	857685	Recreation Area Fishing dock, 24.7 m ² (266 ft ²), wood.
36	844785	At Range 21 (Infantry Squad Course) Range storage shed (2), Latrine (1).	76	871682	Building: 3.3 m ² (35 ft ²), metal; Surrounded by concrete wall, height, 2.7 m (9 ft), thickness .3 m (1 ft).
37	888787	Latrine (1).	77	884687	Recreation Area: East Silver Lake.
38	868778	At Range 24 (Pistol/Revolver Range - Wisconsin State Patrol) Range storage shed, 58.1 m ² (625 ft ²), wood, frame, temporary, Range storage shed (2).	78	803676	At Range 108 (KD [Rifle and Carbine] 100, 200, 300 yds, 25 meters): Two range storage sheds, (2); Latrine (1); Control tower (3).
39	872770	Two Latrines (1).	79	806676	At Range 107 (KD [Rifle and Carbine] 100, 200, 300 yds, 25 meters) Two range storage sheds, (2), Latrine (1), Control tower (3).
40	872773	At POW Compound #1 Eleven Observation towers, height 1.8 m (6 ft), base 5.9 m ² (64 ft ²), wood, temporary.	80	810676	At Range 106 (KD [Rifle and Carbine] 100, 200, 300 yds, 25 meters) Four range storage sheds, (2), Latrine (1); Control tower (3).
			81	819676	At Range 100 (Pistol Range) Three range storage sheds (2), Latrine (1), Tower, height 1.5 m (5 ft), base 3.7 m ² (40 ft ²), wood, temporary.
			82	823674	At Range 105 (KD [Rifle and Carbine] 100, 200, 300 yds, 25 meters) Two range storage sheds (2); Latrine (1).
			83	837751/898752	FROM/TO Fence: Chain-link, length 6.1 km (3.8 mi).
			84	805680/917678	Fence: Chain-link, length 11.3 km (7.0 mi).
			85	794673/917675	Fence: Chain-link, length 12.4 km (7.6 mi).
			86	902913/850780	Range communication line. underground, length 17.1 km (10.6 mi).
			87	879811/901796	Range communication line. aboveground, length 2.9 km (1.8 mi).
			88	876807/866820	Range communication line. underground, length 1.7 km (1.1 mi).
			89	867802/859812	Range communication line. underground, length 1.3 km (0.8 mi).
			90	864800/861804	Range communication line underground, length .6 km (.4 mi).
			91	858794/854807	Range communication line underground, length 1.6 km (1.0 mi).
			92	850780/841789	Range communication line underground, length 1.3 km (0.8 mi).

L. NON-URBAN CULTURE FEATURES (CONTINUED)

MAP NUMBER	GRID REFERENCE	DESCRIPTION	MAP NUMBER	GRID REFERENCE	DESCRIPTION
	FROM/TO			FROM/TO	
93	863886/833862	Range communication line: aboveground, length 5.4 km (3.4 mi).	101	825695/903695	Range communication line: aboveground, length 8.4 km (5.2 mi).
94	833862/844773	Range communication line: underground, length 11.4 km (7.1 mi).	102	805678/826675	Range communication line: underground, length 2.5 km (1.6 mi).
95	825766/840766	Range communication line: underground, length 1.5 km (0.9 mi).	103	878756/880732	Range communication line: underground, length 2.5 km (1.6 mi).
96	880777/880766	Range communication line: underground, length 1.2 km (0.8 mi).	104	879252/906753	Range communication line: underground, length 2.7 km (1.7 mi).
97	856750/823679	Range communication line: underground, length 8.7 km (5.4 mi).	105	879750/906752	Range communication line: underground, length 2.7 km (1.7 mi).
98	856750/828737	Range communication line: underground, length 3.5 km (2.2 mi).	106	880735/892738	Range communication line: underground, length 1.3 km (.8 mi).
99	853731/830724	Range communication line: underground, length 2.5 km (1.6 mi).	107	860732/910718	Range communication line: underground, length 6.9 km (4.3 mi).
100	829702/817693	Range communication line: underground, length 2.7 km (1.7 mi).	108	910718/896704	Range communication line: aboveground, length 2.2 km (1.3 mi).
			109	896705/871702	Range communication line: aboveground, length 2.5 km (1.6 mi).

FOOT NOTES:

- (1) Latrine, 5.9 m² (64 ft²), wood, frame, temporary.
- (2) Range storage shed, or building; 19.0 m² (204 ft²), wood, frame, temporary.
- (3) Control tower, height 1.2 m (4 ft), base 2.2 m² (24 ft²), wood, temporary.



FORT McCOY, WISCONSIN TERRAIN ANALYSIS

Scale 1:50,000

1 1/2 0 1000 2000 3000 4000 Meters 3 Statute Miles

INDEX TO ADJOINING SHEETS

44°15'	Black River	Millston
44°00'	Fort McCoy	
43°45'	Sparta	Tomah

Prepared by the 283D Engineer Detachment (Terrain), with Cartographic and Reproduction support provided by the 63D Engineer Company (Topographic) (Corps), Fort Bragg, North Carolina, 28307, July 1979, under the direction of the Terrain Analysis Center, US Army Topographic Laboratories, Fort Belvoir, Virginia 22060

NON-URBAN CULTURE FEATURES

- Telephone Cable (Underground)
- Telephone Line
- Fence
- ⊠ Tower (Observation, Guard, Range)
- ⊡ Water Tower
- Building
- ⊙ Pumping Station
- ⊠ Bunkers
- ⊙ Recreation Areas
- ⊠ Bleachers
- ⊠ Gas Chamber
- ⊙ Cemetary (Small)
- ⊠ Abandoned Airfield
- ⊠ Ammunition Dump
- ⊠ Ruins
- ⊙ Training Area
- ⊠ Bivouac

Note: Symbol numbers on map refer to entries in table.

III OFF - POST FEATURES

A. AIRFIELDS

Two airfields within a 50 mile radius of Fort McCoy will support aircraft as large as C-130's. The La Crosse Municipal Airport is approximately 48 kilometers (30 miles) southwest of Fort McCoy. Volk Field is approximately 35 kilometers (22 miles) southeast of the cantonment area.

La Crosse Municipal Airport primarily accommodates private and commercial flight operations.

Volk Airfield is an Air National Guard airfield, supporting training from May to August each year.

NAME LOCATION, TYPE, AND CLASSIFICATION	ELEVATION AND STATUS	RUNWAY DESCRIPTION	TAXIWAY, PARKING APRON, AND HARDSTAND AREA DESCRIPTION	BUILDING DESCRIPTION	POL FACILITIES	NAVIGATIONAL AIDS	REMARKS
La Crosse Municipal Airport, 43°53'N, 91°15'W, Air- field, Civil airport.	199 m (653 ft), Operational.	North - South Runway 2591 X 46 m (8500 X 150 ft), azimuth, 355° - 175°, maxi- mum weight bearing capa- city S95, T160, ST175, TT289; asphalt/concrete surface. Northwest - Southeast 1615 X 46 m (5300 X 150 ft), azimuth 318° - 138°, maximum weight bearing capacity: S100, T170, ST175, TT310, asphalt/concrete surface. Northeast - Southwest 1615 X 46 m (5300 X 150 ft), azimuth 220° - 040°, maxi- mum weight bearing capa- city: S100, T170, ST175, TT310; asphalt/concrete surface.	Taxiway 5, 15.2 m (50 ft) wide, maximum weight bearing capacity, TT125, Sur- faces to be paved spring of 1979 to TT300, ST175, asphalt/concrete surface. Parking Apron, and Hardstand Area Area Unknown, maximum weight bearing capacity 136,079 kg, (300,000 lbs), asphalt and/or concrete materials, 6 in. thick.		Jet fuel type A; underground storage capacity 264,959 liters (70,000 gal), 5 refuelers.	Control Tower 20.1 m (66 ft) high including antenna, VOR unusable 100°- 150° beyond 37 km (23 mi), below 1006 m (3300 ft), and 230° - 060° beyond 37 km (23 mi), below 1006 m (3300ft). Lights White and green rotating beacon, has approach lights, high intensity runway lights, sequenced flashing lights, runway and identifier lights.	
Volk Field (Camp Douglas); 43° 56'N, 90° 16'W, military airfield.	279 m (915 ft), Operational.	East - West Runway 2743.23 X 45.27 m (9000 X 150 ft), azimuth 090° - 270°; maximum weight bearing capacity: S60, T155, ST175, TT275, asphalt surface. North-South Runway Closed. Northeast-Southwest Runway Closed.	Taxiway 8, 22.9 m (75 ft) wide, maximum weight bearing capacity same as run- way, asphalt surface. Parking Apron, and Hardstand Area East parking apron 266,700 m ² (875,000 ft ²) total area, maximum weight bearing capacity same as runways. West parking apron 121,192 m ² (400,000 ft ²). South-East Apron 18,288 m ² (60,000 ft ²). Center Hangar Apron 4572 m ² (15,000 ft ²).	Military Facilities 11 hangars, 8 HC Alert, 371.6 m ² (4000 ft ²) each building, 3 maintenance hangars, one 1263 m ² (13,600 ft ²), one 929 m ² (10,000 ft ²), one 587.5 m ² (6324 ft ²). Administration and Ter- minal Building 5 buildings, base oper- ations building No. 508A, 547.4 m ² (5892 ft ²), 2 SQ operations, 185.8 m ² (2000 ft ²) each, photo lab, 223 m ² (2400 ft ²), air traf- fic, 175.6 m ² (1890 ft ²). Maintenance Buildings Total 9 facilities, 2 in hangars, total area 1085.2 m ² (11,681.4 ft ²). Other Buildings One fire station, 295.8 m ² (3184 ft ²). One readiness crew, 44.6 m ² (480 ft ²). Building Description 2 storage buildings, one for paint, 27.9 m ² (300 ft ²), one for liquid oxygen, 230 m ² (2475 ft ²).	Jet fuel type JP-4 storage capacity 1.5x10 ⁶ liter (4x 10 ⁵ gal). Av Gas 94,625 liters (25,000 gal). Mo Gas (for motor pool) one under ground tank, 56,775 liters (15,000 gal). There are 8 JP-4 refuelers and one Av Gas refueler, 18,925 liters (5000 gal) each. Low Pressure oxy- gen and liquid oxygen servicing are available.	Navigational Aids Control Tower 14 m (46 ft) high including antenna, VOR unusable 355° - 040° beyond 37 km (20 nm) unreliable 180° through 230°; DME unusable 178° - 230° beyond 55.6 km (30 nm) below 914.4 m (3000 ft) TACAN unusable 132° - 260° beyond 37 km (20 nm) below 1219.2 m (4000 ft). Lights Rotating beacon, high in- tensity runway lights, high runway end identifier, threshold strobe lights.	Intensive jet training base May through August each year; deer in vicinity of runway, bluff south, nonfrangible ap- proach light runway 27, ramp lighting from poles 15' from south edge of ramp, due to tactical aircraft requirements, during tower hours, BAK-12 (Pick up cable and a mechanical energy absorber) cable may be in position for runway 9-27 simultaneously. Contact tower for current barrier status. Normal barrier status will pro- vide BAK-9 web barrier between adjustable stanchions combined with a hook at both ends of 9-27. MA-1A web barrier be- tween stanchions attached to chain energy absorber up when runway 27 used during tower hours, down other times. BAK- 12 in position on deep end of active runway depending on prevailing wind. Transient fac- ility extremely limited, available 1400-2200Z (DT 1300- 2100Z) Monday-Friday. Limited transient maintenance and limited drag chute and repack service available when Air Force National Guard flying units training. Not available other times. Fire/Crash pro- tection available when Air Force National Guard units are in training, extremely limited other times. MA-1A intercon- nected with BAK-9 runway 9 man- ually operated at barrier. Prior notice required to raise, lower and/or remove net and cable prior to approach end engagement runway 9. Copter traffic pattern 457.2 m (1500 ft), conventional 609.6 m (2000 ft), and jet overhead 914.4 m (3000 ft).
*NOTE		Runway weight bearing capacity in pounds (gross weight of aircraft) is determined by adding 000 to figure following S, T, ST, TT. Runway weight bearing capacity given is for unlimited operations. Aircraft weight higher than given requires prior permission from aerodrome controlling authority. S-Runway weight bearing capacity for aircraft with single-wheel type landing gear (C-47, F100). T-Runway weight bearing capacity for aircraft with twin-wheel type landing gear (C-9A). ST-Runway weight bearing capacity for aircraft with single-tandem landing gear (C-130). TT-Runway weight bearing capacity for aircraft with twin-tandem type (includes quadricycle) landing gear (B-52, C-135).					
		For further information, see DOD Flight Information Publication (enroute IFR-Supplement United States).					

B. URBAN AREAS

There are 15 urban areas within 50 miles of the reservation that had 1970 census populations greater than 2500. These areas are scattered evenly throughout the whole area.

The smallest population includes Caledonia City (2675), Nekoosa City (2584), Neillsville City (2950), and West Salem (3000).

Winona (27,700), in Winona County southwest of the reservation, is the second largest population center, and the second largest urban area within 50 miles of Fort McCoy. Winona, one of the oldest cities in Minnesota, is the most industrialized of the states smaller cities, but has no single specialty.

La Crosse (51,153), third largest population center in La Crosse County, is located west of the cantonment area on the Mississippi River at the confluence of Black River and La Crosse Creek. Leading industries are the manufacturing of air-conditioning equipment, farm equipment, auto-mobile parts and plastics.

The most recent available data was used to compile the table on page 33.

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATIONAL FACILITIES	MEDICAL FACILITIES	RECREATION FACILITIES	UTILITIES AND SERVICES
Black River Falls, WI 90° 51' W 44° 17' N	1970 3273 1978 3357 1980 Projected 3400	Single and Multi-Family Dwellings Total Units 1500 Rental Units 300 Vacant Year Around 0 Average Sale Price \$40000 Average Rent Per Month \$140.	Public Schools 4 Elementary Schools Enrollment Capacity 1145 1978 Enrollment 1040 1980 Projected Enrollment 1035 1 Junior High School Enrollment Capacity 550 1978 Enrollment 480 1980 Projected Enrollment 475 1 High School Enrollment 550 1978 Enrollment 480 1980 Projected Enrollment 430	1 Hospital Black River Memorial Hospital 70 Beds 4 Beds ICU* 2 Beds CCU* Doctors Total 8 Doctor/Population Ratio, 1/409 Dentist Total 2 Ratio 1/1637	8 Parks 3 Athletic Fields 10 Tennis Courts 1 Nine-Hole Golf Course 1 Swimming Pool 1 Bowling Alley	Electric Northern States power Company Black River Falls Municipal Electric Utility, Hydroelectric Diesel, Located on Black River, adequate electricity supply No plans to expand. <u>Heating Fuels</u> Gas, oil, Propane, Wisconsin Gas Company, Federation Co-op, Falls Oil Company, Northern (Standard Oil Company), Home Oil Company, Adequate supply No plans to expand. <u>Water Supply</u> 2 Municipal Wells, Adequate supply, Peak Daily Consumption (3 x 10 ⁶ LPD) (8 x 10 ⁶ GPD), Present storage capacity above ground (2.4 x 10 ⁶ L) (6.5 x 10 ⁴ G), Under ground (2.2 x 10 ⁵ L) (6 x 10 ⁴ G), There is adequate water supply, There are no plans to expand <u>Sewage Disposal</u> Municipal primary and secondary treatment, Flow capacity (2.5 x 10 ⁶ LPD) (6.7 x 10 ⁵ GPD), Actual flow (2.1 x 10 ⁶ LPD) (5.8 x 10 ⁵ GPD), 100% of community served.
Caledonia, MN 91° 30' W 43° 37' N	1970 2619 1978 2675 1980 Projected 2830	Single and Multi-Family Dwellings Total Units 840 Rental Units 172 Vacant Year Around 30 Average Sale Price \$25000 Average Rent Per Month \$155	Public Schools 1 Elementary School 1978 Enrollment 507 1980 Projected Enrollment 438 1 Junior High School 1978 Enrollment 315 1980 Projected Enrollment 296 1 High School 1978 Enrollment 315 1980 Projected Enrollment 385	1 Hospital 24 Beds 1 Nursing Home 70 Beds Doctors Total 3 Doctor/Population Ratio 1/890 Dentist Total 4 Ratio 1/675	2 Parks 2 Ball Fields 3 Tennis Courts 1 Nine-Hole Golf Course 1 Swimming Pool	Electric Power purchased from Co-op, Adequate supply, No plans to expand. <u>Heating Fuels</u> Natural Gas Static supply (dependent on national), Fuel oil, Adequate supply (depend- ent on national), Propane Gas, Adequate supply, Wood, Adequate supply. <u>Water Supply</u> 2 Municipal wells, Daily con- sumption (2.5 x 10 ⁶ LPD) (6.5 x 10 ⁵ GPD), Storage Capacity (1 x 10 ⁶ L) (3 x 10 ⁵ G), No plans to expand. <u>Sewage Disposal</u> Municipal sewage, Flow capacity (2 x 10 ⁶ LPD) (6 x 10 ⁵ GPD), Actual flow (1.7 x 10 ⁶ LPD) (4.5 x 10 ⁵ GPD), No plans to expand.
La Crosse, WI 91° 15' W 43° 50' N	1970 50286 1978 51153 1980 Projected 52054	Single and Multi-Family Dwellings Total Units 16808 Rental Units 5883 Vacant Year Around 397 Average Sale Price \$16775 Average Rent Per Month \$220.	Public Schools 14 Elementary Schools (1-6) Enrollment Capacity 5147 1978 Enrollment 2842 3 Junior High Schools (7-9) Enrollment Capacity 2022 1978 Enrollment 1806 2 High Schools (10-12) Enrollment Capacity 2220 1978 Enrollment 2246 Private Schools 10 Elementary Schools 1978 Enrollment 2389 1 High School 1978 Enrollment 1112 1 K-12 School Enrollment 100 <u>Colleges and Universities</u> University of Wisconsin La Crosse 1978 Enrollment 8400 1980 Projected Enrollment 8500 Viterbo College (Catholic) Enrollment Capacity 1400 1978 Enrollment 941 1980 Projected Enrollment 1000 Western Wisconsin Technical Institute 1978 Enrollment 3844	2 Hospitals Cobalt Therapy, Open Heart Surgery and Kidney Transplants, New- Born Center. 799 Beds 12 ICU/CCU 30 Beds Psychiatric Unit 1 Nursing Home Doctors Total 239 Doctor/Population Ratio 1/214 Dentist Total 93 Ratio 1/550	26 Parks 25 Athletic Fields 10 Tennis Courts 7 Golf Courses 1 Swimming Pool 11 Skating Rinks 5 Movie Theaters 1 Fine Arts Center 2 Community Theaters	Electric Dairyland Power Co-op, (2 Steam Generating Plants, 1 Nuclear Generating Plant, 2 Coal-Fired Plants), Northern States Power Company, (1 La Crosse Oil-Fired), Adequate supply, No plans to expand. <u>Heating Fuels</u> Natural Gas, Northern States Power, Coal, Oil, and Propane, (from local suppliers), Adequate supply, No plans to expand. <u>Water Supply</u> La Crosse Water Utility, 15 wells, (162.7 x 10 ⁶ LPD) (43 x 10 ⁶ GPD), Capacity, Adequate supply, average daily consumption (51.9 x 10 ⁶ LPD) (13.7 x 10 ⁶ GPD), Present storage capacity (22.7 x 10 ⁶ L) (6 x 10 ⁶ G), No plans to expand. <u>Sewage Disposal</u> Secondary treatment, flow cap- acity is (181.5 x 10 ⁶ LPD) (48 x 10 ⁶ GPD), Actual flow (83.3 x 10 ⁶ LPD) (22 x 10 ⁶ GPD), Serves 100% of community and city of Onalaska, No plans to expand.
Marshfield, WI 90° 10' W 44° 40' N	1970 No Data 1978 17056 1980 Projected 18000	Single and Multi-Family Dwellings Total Units 4792 Rental Units 1563 Vacant Year Around 118 Average Sale Price \$19,400 Average Rent Per Month \$81.	Public Schools 7 Elementary Schools 1978 Enrollment 2210 1 Junior High School 1978 Enrollment 1037 1 High School 1978 Enrollment 1114 Private Schools 3 Parochial Elementary Schools 1978 Enrollment 1010 1 Parochial High School 1978 Enrollment 410 1 Lutheran Elementary School 1978 Enrollment 157 <u>Universities and Colleges</u> University of Wisconsin at Marshfield, 1978 Enrollment 502 St Joseph School of Nursing 1978 Enrollment 216 Vocational Mid-State VJAE 1978 Enrollment 117	1 Hospital St Josephs Hospital 422 Beds Plans to expand to 509 Beds Doctors Total 141 Doctor/Population Ratio 1/345 Dentists Total 12 Ratio 1/4047 Norwood Health Center 109 Beds for Mental Related Problems Marshfield Convalescent Center Nursing Facility 180 Beds	4 City Parks 1 Public Golf Course 1 Private Golf Course 2 Bowling Alleys 3 Movie Theaters 1 Field House	Electric No Data. <u>Sewage</u> No Data. <u>Water Supply</u> 17 Municipal wells, 3 MG Storage capacity <u>Heating Fuels</u> No Data.

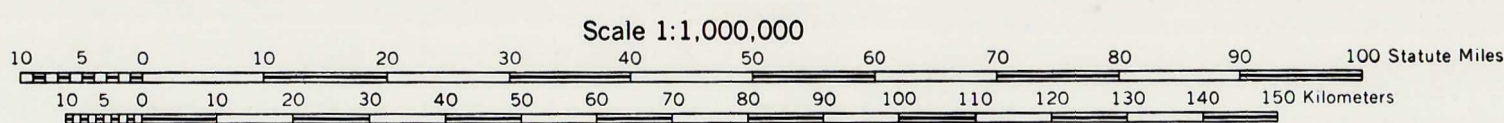
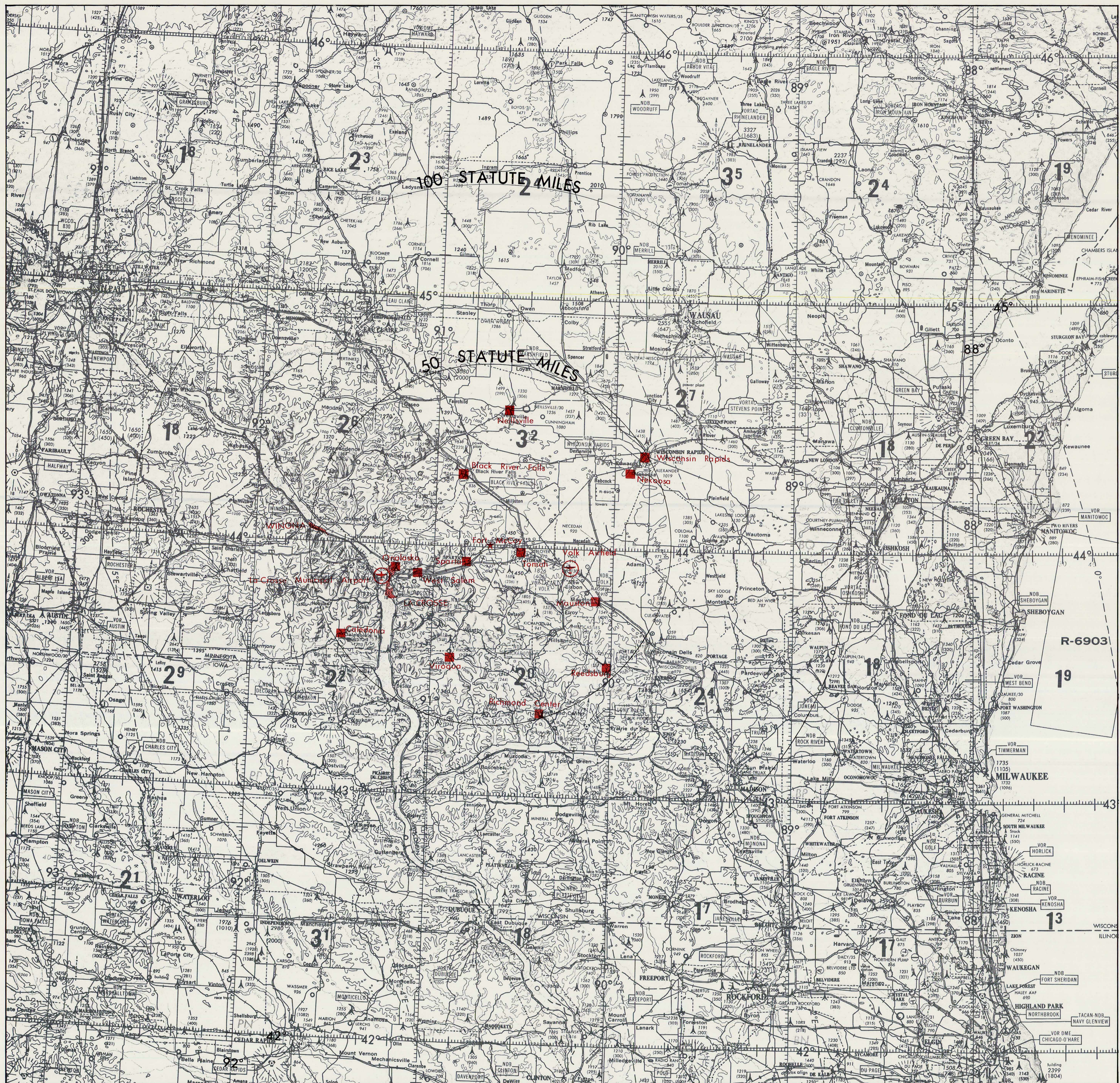
B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	Educational Facilities	Medical Facilities	Recreational Facilities	Utilities and Services
Mauston, WI 90° 05' W 43° 37' N	1970: 3471 1978: 3308 1980 Projected: 3818	Single and Multi-Family Dwellings Total Units: 1208 Rental Units: 345 Vacant Year Around: 10 Average Sale Price: \$30000 Average Rent Per Month: \$175.	Public Schools 2 Elementary Schools (K-4) Enrollment Capacity: 625 1978 Enrollment: 538 1980 Projected Enrollment: 500 1 Junior High School (5-8) Enrollment Capacity: 535 1978 Enrollment: 415 1980 Projected Enrollment: 409 1 High School (9-12) Enrollment Capacity: 650 1978 Enrollment: 632 1980 Projected Enrollment: 573 Private Schools 1 Catholic Elementary School 1978 Enrollment: 232 Western Wisconsin Technical Institute 1978 Enrollment: 300	1 Hospital Hess Memorial 45 Beds New Hospital Planned Doctors Total: 7 Doctor/Population Ratio: 1/473 Dentists Total: 4 Ratio: 1/827	5 Parks 5 Athletic Fields 1 Golf Course 1 Swimming Pool 1 Bowling Alley 8 Lanes 1 Movie Theater	Electric Wisconsin Power and Light; Hydrogenerating stations; Adequate supply, No plans to expand. Heating Fuels Natural Gas, Wisconsin Power and Light, also, Oil, Propane; natural gas to present customers only; Adequate oil, gas, No plans to expand. Water Supply 3 Municipal wells; Adequate supply; capacity (4 x 10 ⁶ LPD) 1 x 10 ⁶ GPD; Daily consumption (2 x 10 ⁶ LPD)(5.2 x 10 ⁶ GPD); present storage capacity (1.9 x 10 ⁶ L)(5 x 10 ⁶ G); No plans to expand. Sewage Disposal Secondary treatment; flow capacity (1.9 x 10 ⁶ LPD)(5 x 10 ⁶ GPD); actual flow (1.9 x 10 ⁶ LPD)(5 x 10 ⁶ GPD); Serves 100% of community; No plans to expand.
Nellsville, WI 90° 36' W 44° 34' N	1970: 2795 1978: 2950 1980 Projected: 3100	Single and Multi-Family Dwellings Total Units: 890 Rental Units: 100 Vacant Year Around: 2 Average Sale Price: \$25000 Average Rent Per Month: \$150.	Public Schools 1 Elementary School (1-5) 1978 Enrollment: 590 1980 Projected Enrollment: 610 1 Junior High School (6-8) 1978 Enrollment: 306 1980 Projected Enrollment: 320 High School (9-12) 1978 Enrollment: 538 1980 Projected Enrollment: 550	1 Hospital Memorial 38 Beds Doctors Total: 7 Doctor/Population Ratio: 1/399 Dentists Total: 3 Ratio: 1/932	2 Parks 3 Athletic Fields 1 Golf Course 1 Swimming Pool 3 Tennis Courts	Electric Northern State Power Company, No Further Data. Heating Fuels Natural Gas, Oil (local suppliers), Adequate oil, gas; No plans to expand. Water Supply 2 Municipal wells, Peak Daily Consumption (2.5 x 10 ⁶ LPD)(6.5 x 10 ⁶ GPD); Average Daily Consumption (1.6 x 10 ⁶ LPD) (4.1 x 10 ⁶ GPD); Present storage capacity (1.9 x 10 ⁶ L)(5 x 10 ⁶ G); Adequate supply, No plans to expand. Sewage Disposal Activated Sludge.
Nekoosa, WI 89° 51' W 44° 19' N	1970: 2409 1978: 2584 1980 Projected: 2650	Single and Multi-Family Dwellings Total Units: 789 Rental Units: 35 Vacant Year Around: 0 Average Sale Price: \$24000 Average Rent Per Month: \$150.	Public Schools 1 Elementary School (K-4) Enrollment Capacity: 700 1978 Enrollment: 585 1980 Projected Enrollment: 585 1 Junior High School (5-8) Enrollment Capacity: 600 1978 Enrollment: 494 1980 Projected Enrollment: 510 1 High School (9-12) Enrollment Capacity: 650 1978 Enrollment: 588 1980 Projected Enrollment: 625	Nekoosa Clinic Doctors Total: 3 Doctor/Population Ratio: 1/861 Dentists Total: 2 Ratio: 1/1292	2 Parks 3 Athletic Fields 2 Tennis Courts 1 Swimming Pool	Electric Wisconsin Power and Light Company, Adequate supply; No plans to expand. Heating Fuels Natural gas, oil; Adequate supply; No plans to expand. Water Supply 3 Municipal wells, Adequate supply; Peak Daily Consumption (4.5 x 10 ⁶ LPD)(1 x 10 ⁶ GPD), Daily Consumption (1.3 x 10 ⁶ LPD)(3.4 x 10 ⁶ GPD); Storage capacity below ground (2.3 x 10 ⁶ L)(6 x 10 ⁶ G); elevated storage capacity (1.9 x 10 ⁶ L)(5 x 10 ⁶ G); No plans to expand. Sewage Disposal Secondary high rate filters; flow capacity (1.9 x 10 ⁶ LPD)(5 x 10 ⁶ GPD), actual flow (1.6 x 10 ⁶ LPD)(4.1 x 10 ⁶ GPD) 97% of community served; No plans to expand.
Onalaska, WI 91° 15' W 43° 53' N	1970: 7306 1978: 8123 1980 Projected: 10000	Single and Multi-Family Dwellings Total Units: 2476 Rental Units: 120 Vacant Year Around: 88 Average Sale Price: \$45900 Average Rent Per Month: \$190.	Public Schools 4 Elementary Schools Enrollment Capacity: 1444 1978 Enrollment: 1194 1980 Projected Enrollment: 1294 1 Junior High School Enrollment Capacity: 720 1978 Enrollment: 646 1980 Projected Enrollment: 712 2 High Schools Enrollment Capacity: 1200 1978 Enrollment: 1021 1980 Projected Enrollment: 1100	Gundersen Clinic Doctors Total: 4 Doctor/Population Ratio: 1/2030 Dentists Total: 4 Ratio: 1/2030	6 Parks 3 Athletic Fields 3 Tennis Courts 1 Swimming Pool	Electric Northern State Power; Adequate supply; No plans to expand. Heating Fuels Natural gas, oil; can no longer hook up new customers; Adequate supply; No plans to expand. Water Supply 3 Municipal wells; Daily consumption (3.1 x 10 ⁶ LPD)(8.2 x 10 ⁶ GPD), Peak consumption (8.2 x 10 ⁶ LPD)(2.1 x 10 ⁶ GPD); Planned expansion of one more well in 1979 with storage capacity of (2.6 x 10 ⁶ L)(7 x 10 ⁶ G). Sewage Disposal See La Crosse
Reedsburg, WI 90° 00' W 43° 42' N	1970: 4585 1978: 4750 1980 Projected: 4750	Single and Multi-Family Dwellings Total Units: 1750 Rental Units: 150 Vacant Year Around: 0 Average Sale Price: \$39000 Average Rent Per Month: \$175.	Public Schools 5 Elementary Schools (K-3) Enrollment Capacity: 600 1978 Enrollment: 568 1980 Projected Enrollment: 771 1 Junior High School (4-8) Enrollment Capacity: 800 1978 Enrollment: 777 1980 Projected Enrollment: 770 1 High School (9-12) Enrollment Capacity: 875 1978 Enrollment: 859 1980 Projected Enrollment: 850	1 Hospital Reedsburg Memorial 60 Beds 3 Beds ICC Doctors Total: 9 Doctor/Population Ratio: 1/522 Dentists Total: 5 Ratio: 1/940	7 Parks 2 Athletic Fields 2 Tennis Courts 1 Golf Course 1 Swimming Pool 1 Bowling Alley	Electric Wisconsin Power and Light; Adequate supply; No plans to expand. Heating Fuels Natural gas, oil; Suppliers, Wisconsin Power and Light, Adequate supply, gas not available to new customers; No plans to expand. Water Supply 4 Municipal wells; Daily consumption (7.1 x 10 ⁶ LPD)(1.9 x 10 ⁶ GPD), Peak consumption (8.1 x 10 ⁶ LPD)(2.1 x 10 ⁶ GPD), Adequate supply, present storage capacity (2.6 x 10 ⁶ L)(7 x 10 ⁶ G), No plans to expand. Sewage Disposal Primary and secondary treatment, flow capacity (5.7 x 10 ⁶ LPD)(1.5 x 10 ⁶ GPD); actual flow (3 x 10 ⁶ LPD)(8 x 10 ⁵ GPD), 100% of community served; No plans to expand.
Richland Center, WI 90° 23' W 43° 20' N	1970: 5086 1978: 4710 1980 Projected: 4750	Single and Multi-Family Dwellings Total Units: 1700 Rental Units: 157 Vacant Year Around: 15 Average Sale Price: \$40000 Average Rent Per Month: \$175.	Public Schools 6 Elementary Schools Enrollment Capacity: 950 1978 Enrollment: 974 1980 Projected Enrollment: 957 1 Junior High School Enrollment Capacity: 300 1978 Enrollment: 259 1980 Projected Enrollment: 270 1 High School Enrollment Capacity: 760 1978 Enrollment: 750 1980 Projected Enrollment: 764 Colleges and Universities 1 University of Wisconsin Richland Center Enrollment Capacity: 500 1978 Enrollment: 325 1980 Projected Enrollment: 325	1 Hospital Richland 75 Beds 5 ICU 2 CCU 2 Nursing Homes 204 Beds Doctors Total: 13 Doctor/Population Ratio: 1/362 Dentists Total: 6 Ratio: 1/785	3 Parks 2 Athletic Fields 6 Tennis Courts 1 Nine-Hole Golf Course 3 Swimming Pools 1 Bowling Alley 1 Ice Skating Rink 1 Out Door Theater	Electric Municipal Coal, steam generating station, in city, Inadequate supply, plans to buy from Cumberland. Heating Fuels Natural gas, oil; Wisconsin Power and Light Company; private suppliers also, Adequate supply, No plans to expand. Water Supply 2 Municipal wells, Daily consumption (2.7 x 10 ⁶ LPD)(7 x 10 ⁵ GPD), Peak consumption (3.8 x 10 ⁶ LPD)(1 x 10 ⁶ GPD); Adequate supply; present storage capacity (3 x 10 ⁶ L)(8 x 10 ⁵ G); Plans to add reservoir (1.9 x 10 ⁶ L)(5 x 10 ⁵ G). Sewage Disposal Secondary treatment; flow capacity (6.1 x 10 ⁶ LPD)(1.6 x 10 ⁶ GPD), actual flow (3.8 x 10 ⁶ LPD)(1 x 10 ⁶ GPD); 100% of community served, No plans to expand.

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATIONAL FACILITIES	MEDICAL FACILITIES	RECREATIONAL FACILITIES	UTILITIES AND SERVICES
Sparta, WI 98° 49' W 43° 56' N	1970: 6258 1978: 6750 1980 Projected: 8665	Single and Multi-Family Dwellings Total Units: 2000 Rental Units: 400 Vacant Year Around: 5 Average Sale Price: \$30000 Average Rent Per Month: \$175	Public Schools 6 Elementary Schools (K-6) Enrollment Capacity: 2700 1978 Enrollment: 1275 1980 Projected Enrollment: 1173 1 Junior High School (7-9) 1978 Enrollment: 623 1980 Projected Enrollment: 607 1 High School (10-12) 1978 Enrollment: 707 1980 Projected Enrollment: 653 Private Schools 3 Elementary Schools 1978 Enrollment: 430	1 Hospital: St. Mary's 70 Beds 1 Resident Care Home 30 Beds 1 Nursing Home 15 Beds Doctors: Total: 7 Doctor/Population Ratio: 1/964 Dentists: Total: 8 Ratio: 1/844	42 Acres of Parks 1 Athletic Field 8 Tennis Courts 1 Nine-Hole Golf Course 1 Swimming Pool 1 Bowling Alley 8 Lanes 1 Ice Skating Lake 2 Movie Theaters (1 indoor, 1 outdoor)	Electric Northern States Power Company, located at Perry Island Monticello; Adequate supply; No plans to expand. Heating Fuels Natural gas, oil propane, Wisconsin gas company, Propane gas company; Adequate supply, No plans to expand. Water Supply 7 Municipal wells; Daily consumption (6.4 x 10 ⁶ LPD) (1.7 x 10 ⁶ GPD), peak consumption (11.6 x 10 ⁶ LPD) (3.1 x 10 ⁶ GPD); Present storage capacity (3.9 x 10 ⁶ L) (1 x 10 ⁶ G); Adequate supply, No plans to expand. Sewage Disposal Flow capacity (4.9 x 10 ⁶ LPD) (1.3 x 10 ⁶ GPD), actual flow (3.8 x 10 ⁶ LPD) (1 x 10 ⁶ GPD); serves 100% of community; No plans to expand.
Tomah, WI 90° 31' W 43° 59' N	1970: 5600 1978: 7150 1980 Projected: 8665	Single and Multi-Family Dwellings Total Units: 1900 Rental Units: 760 Vacant Year Around: 57 Average Sale Price: \$32000 Average Rent Per Month: \$150-250	Public Schools 9 Elementary Schools Enrollment Capacity: 2100 1978 Enrollment: 1400 1980 Projected Enrollment: 1354 1 Junior High School Enrollment Capacity: 950 1978 Enrollment: 800 1980 Projected Enrollment: 720 1 High School Enrollment Capacity: 1100 1978 Enrollment: 870 1980 Projected Enrollment: 784 Private Schools 2 Elementary Schools No Data	2 Hospitals: Veterans Administration Hospital 900 Beds Internal Med. Psychiatric Care Alcohol Treatment Tomah Memorial Hospital 70 Beds Emergency Care Facilities Doctors: Total: 7 Doctor/Population Ratio: 1/1021 Dentists: Total: 8 Ratio: 1/894	7 Parks 3 Athletic Fields 10 Tennis Courts 2 Nine-Hole Golf Courses 1 Swimming Pool 1 Lake Tomah 260 Acres 1 Bowling Alley 1 Skating Rink	Electric Wisconsin Power and Light Company, Hydro and Coal type generating plant; location Perten well, Castle Rock Dam, (Kilberner Plant, Wisconsin Dells), Adequate supply, No plans to expand. Heating Fuels Natural gas, oil and propane; Wisconsin natural gas, and local supplier, Adequate supply, No plans to expand. Water Supply 4 Municipal well; Daily consumption (5.7 x 10 ⁶ LPD) (1.5 x 10 ⁶ GPD), peak consumption (9.5 x 10 ⁶ LPD) (2.5 x 10 ⁶ GPD); Adequate supply, Present storage capacity (4.5 x 10 ⁶ L) (1.2 x 10 ⁶ G), No plans to expand. Sewage Disposal Activated sludge, flow capacity (3.9 x 10 ⁶ LPD) (1 x 10 ⁶ GPD); Actual flow (3 x 10 ⁶ L) (8 x 10 ⁵ G), serves 100% of community, No plans to expand.
Viroqua, WI 90° 53' W 43° 33' N	1970: 3739 1978: 3636 1980 Projected: 3670	Single and Multi-Family Dwellings Total Units: 1800 Rental Units: 25 Vacant Year Around: 0 Average Sale Price: \$25000 Average Rent Per Month: \$125-175	Public Schools 2 Elementary Schools (K-5) Enrollment Capacity: 800 1978 Enrollment: 750 1980 Projected Enrollment: No Data 1 Junior High School (6-8) Enrollment Capacity: 450 1978 Enrollment: 365 1 High School (9-12) Enrollment Capacity: 700 1978 Enrollment: 600	1 Hospital: Veteran Memorial Hospital 80 Beds 1 Home Bethel 105 Beds Doctors: Total: 8 Doctor/Population Ratio: 1/455 Dentists: Total: 6 Ratio: 1/606	1 Park 3 Athletic Fields 1 Tennis Court 1 Nine-Hole Golf Course 1 Swimming Pool 1 Bowling Alley 1 Ice Skating Rink 1 Movie Theater (indoor)	Electric Northern States Power Company; Nuclear and Coal type generating stations; location Genoa; Adequate supply; No plans to expand. Heating Fuels Natural gas, Propane, wood, local suppliers, Inadequate supply, Plans to expand. Water Supply 3 Municipal wells; Daily consumption (1.9 x 10 ⁶ LPD) (5 x 10 ⁵ GPD), peak consumption (3 x 10 ⁶ LPD) (8 x 10 ⁵ GPD); Adequate supply; present storage capacity (1.6 x 10 ⁶ L) (4.1 x 10 ⁵ G); No plans to expand. Sewage Disposal Secondary Treatment; Inadequate, Flow capacity (1.9 x 10 ⁶ LPD) (5 x 10 ⁵ GPD), actual flow (1.5 x 10 ⁶ LPD) (4 x 10 ⁵ GPD), 100% of community served.
West Salem, WI 91° 05' W 43° 54' N	1970: 2180 1978: 2700 1980 Projected: 3300	Single and Multi-Family Dwellings Total Units: 800 Rental Units: 50 Vacant Year Around: 0 Average Sale Price: \$35000 Average Rent Per Month: \$175	Public Schools 1 Elementary/Junior High School Enrollment Capacity: 1000 1978 Enrollment: 1200 1980 Projected Enrollment: 800 1 Junior High School Planned Enrollment Capacity: 800 1980 Projected Enrollment: 575 1 High School Enrollment Capacity: 600 1978 Enrollment: 400 1980 Projected Enrollment: 450	0 Hospital: Doctors: Total: 2 Doctor/Population Ratio: 1/1500 Dentists: Total: 3 Ratio: 1/1000	3 Parks 2 Athletic Fields 5 Tennis Courts 1 Golf Course 1 Swimming Pool	Electric Northern States Power Company, Adequate supply, No plans to expand. Heating Fuels Natural gas, oil, Adequate supply, No new natural gas customers; No plans to expand. Water Supply Municipal water; Daily consumption (9.5 x 10 ⁵ LPD) (2.5 x 10 ⁵ GPD) Peak consumption (4.5 x 10 ⁶ LPD) (1.2 x 10 ⁶ GPD); Adequate supply, present storage capacity (2.8 x 10 ⁶ L) (7.5 x 10 ⁵ G), No plans to expand. Sewage Disposal Activated sludge, Flow capacity (2 x 10 ⁶ LPD) (5.2 x 10 ⁵ GPD), Actual flow (9.5 x 10 ⁵ LPD) (2.5 x 10 ⁵ GPD), serves 100% of community, No plans to expand. Secondary treatment, flow capacity (17 x 10 ⁶ LPD) (4.5 x 10 ⁶ GPD); actual flow (14.4 x 10 ⁶ LPD) (3.8 x 10 ⁶ GPD), serves 100% of community. No plans to expand.
Wingona, WI 89° 40' W 44° 03' N	1970: 26438 1978: 27700 1980 Projected: 28000	Single and Multi-Family Dwellings Total Units: 9202 Rental Units: Unknown Vacant Year Around: Unknown Average Sale Price: \$35,000/40,000 Average Rent Per Month: \$200-500	Public Schools 1 Elementary School (K-6) Enrollment Capacity: 3274 1978 Enrollment: 2922 1 Junior High School (7-9) Enrollment Capacity: 1200 1978 Enrollment: 1483 1980 Projected Enrollment: 1500 2 High Schools (10-12) 1978 Enrollment: 2050 1980 Projected Enrollment: 2100 Colleges and Universities 3 Colleges 1978 Enrollment: 6000 1980 Projected Enrollment: 6300 Private School 1 Technical Institute Enrollment Capacity: 400 1978 Enrollment: 558	1 Hospital: Community 134 Beds 8 Beds ICU 1 Convalescent and Rehabilitation Unit 104 Beds 1 Mental Health Center Doctors: Total: 32 Doctor/Population Ratio: 1/843 Dentists: Total: 20 Ratio: 1/1350	11 Parks 6 Athletic Fields 34 Tennis Courts 2 Golf Courses 7 Swimming Pools 2 Bowling Alleys 1 Roller Skating Rink 3 Movie Theaters 1 Ice Skating Rink	Electric Northern States Power Company; Nuclear type power plant; location Redwing; Adequate supply; No plans to expand. Heating Fuels Natural gas, oil; suppliers, Northern States Power Company; local suppliers for oil; Adequate supply, No plans to expand. Water Supply 11 Municipal wells; Daily consumption (13.3 x 10 ⁶ LPD) (3.5 x 10 ⁶ GPD), peak consumption (24.2 x 10 ⁶ LPD) (6.4 x 10 ⁶ GPD); Adequate supply, Present storage capacity (15.1 x 10 ⁶ L) (4 x 10 ⁶ G); No plans to expand.
Wisconsin Rapids, WI 89° 50' W 44° 23' N	1970: 18587 1978: 19150 1980 Projected: 22260	Single and Multi-Family Dwellings Total Units: 6333 Rental Units: 1336 Vacant Year Around: 210 Average Sale Price: \$31000 Average Rent Per Month: \$200	Public Schools 19 Elementary Schools 1978 Enrollment: 5495 1 Junior High School 1978 Enrollment: 1300 2 High Schools 1978 Enrollment: 2468 Private School 1 Technical Institute 1978 Enrollment: 900	1 Hospital: Riverview 144 Beds 6 Beds ICU Doctors: Total: 23 Doctor/Population Ratio: 1/833 Dentists: Total: 18 Ratio: 1/1064	14 Parks 12 Athletic Fields 18 Tennis Courts 4 Golf Courses 2 Swimming Pools	Electric Consolidated Power Company; location Castle Rock and Dubay; Adequate supply; No plans to expand. Heating Fuels Natural gas, oil; Wisconsin Gas Company and local suppliers, Adequate supply, No plans to expand. Water Supply 3 Municipal wells; Daily consumption (10.6 x 10 ⁶ LPD) (2.8 x 10 ⁶ GPD); peak consumption (19.7 x 10 ⁶ LPD) (5.2 x 10 ⁶ GPD); Adequate supply; present storage capacity, above ground (1.5 x 10 ⁶ L) (4 x 10 ⁵ G); below ground (2.8 x 10 ⁶ L) (7.5 x 10 ⁵ G), No plans to expand. Sewage Disposal Secondary treatment; flow capacity (15.1 x 10 ⁶ LPD) (4 x 10 ⁶ GPD) sometimes exceeded; (13.6 x 10 ⁶ LPD) (6 x 10 ⁶ GPD); serves 95% of community; No plans to expand.

FORT MCCOY, WISCONSIN TERRAIN ANALYSIS



OFF POST FEATURES

- URBAN AREA
- ⊕ AIRFIELD
- ★ CANTONMENT AREA

IV LIST OF SOURCES

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