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SMALL ICBM AREA NARROWING REPORT

VOLUME II
HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES BASING MODE

JANUARY 1986

SENSITIVE

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SMALL ICBM

AREA NARROWING REPORT

VOLUME II:

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES BASING MODE

JANUARY 1986

PREFACE

In accordance with Congressional and Presidential direction, the United States Air Force proposes to enter full scale development and select deployment areas in late 1986 for the Small ICBM weapon system. The deployment area selection will be supported by a Legislative Environmental Impact Statement (LEIS).

This Area Narrowing Report identifies the alternative deployment areas to be analyzed in the LEIS. It also documents the comprehensive siting analysis process through which potential locations were eliminated from consideration.

This Area Narrowing Report comprises an Executive Summary and three volumes. Volumes I, II, and III discuss Hard Mobile Launcher in Random Movement, Hard Mobile Launcher at Minuteman Facilities, and Hard Silo in Patterned Array, respectively.

Each of these volumes is structured the same. Section 1 provides the background and policies of the Small ICBM program. Section 2 contains system and operations descriptions. Section 3 provides an overview of the Comprehensive Siting Analyses Process. Sections 4 and 5 describe the application and results of the Exclusionary

and Evaluative Criteria, respectively. Section 6 identifies the geographic areas not eliminated by the siting process.

Appendices are included with each volume to provide more detailed information, such as the identification of United States military installations considered not suitable for the Small ICBM mission, descriptions of the Exclusionary and Evaluative Criteria, and how each potential main operating base and deployment installation fulfills the criteria.

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1.0 INTRODUCTION

1.1 PURPOSE OF DOCUMENT

The purpose of this report is to identify those areas that could potentially support deployment of the Small Intercontinental Ballistic Missile (ICBM) utilizing basing modes presently considered viable: the Hard Mobile Launcher in Random Movement, the Hard Mobile Launcher at Minuteman Facilities, and the Hard Silo in Patterned Array. Specifically, this report describes the process and the rationale supporting the application of Exclusionary and Evaluative Criteria and lists those locations that were eliminated through the application of these criteria. The remaining locations will be the subject of further investigations.

The report is divided into an Executive Summary and three separate volumes, one for each basing mode. Each volume presents an overview of system description; technical, operational, legal, and policy siting criteria; and potential locations remaining as a result of this analytical process. Volume I discusses Hard Mobile Launcher in Random Movement, Volume II discusses Hard Mobile Launcher at Minuteman Facilities, and Volume III discusses Hard Silo in Patterned Array. Each of the three volumes also includes appendices, which contain the goals, objectives, and rationale for each criterion, and an evaluation of the candidate locations for that basing mode.

This particular volume describes the application of the Exclusionary and Evaluative Criteria for the Hard Mobile Launcher at Minuteman Facilities basing mode. The appendices for this volume present the definition and rationale for each of the Exclusionary and Evaluative Criteria, and an evaluation of each of the candidate locations for the Hard Mobile Launcher at Minuteman Facilities basing mode.

1.2 BACKGROUND

1.2.1 Policy/Direction

The President established the bipartisan Commission on Strategic Forces (Scowcroft Commission) in January 1983 to study the nation's strategic needs. The Commission concluded that the land-based portion of the TRIAD should be upgraded. Specifically, the Commission recommended the development of a Small ICBM. The President accepted this and other recommendations in the Commission's report.

The Glenn Amendment to the 1984 Department of Defense (DoD) Authorization Act directed an Initial Operational Capability for the Small ICBM of 1992 or earlier. The amendment also directed that "...the design, development, and testing of a small, mobile, single warhead intercontinental ballistic missile be pursued as a matter of the highest national priority."

Acting on the Presidential decision and Congressional direction, the Air Force initiated engineering, siting, and environmental planning in support of a small, single warhead missile.

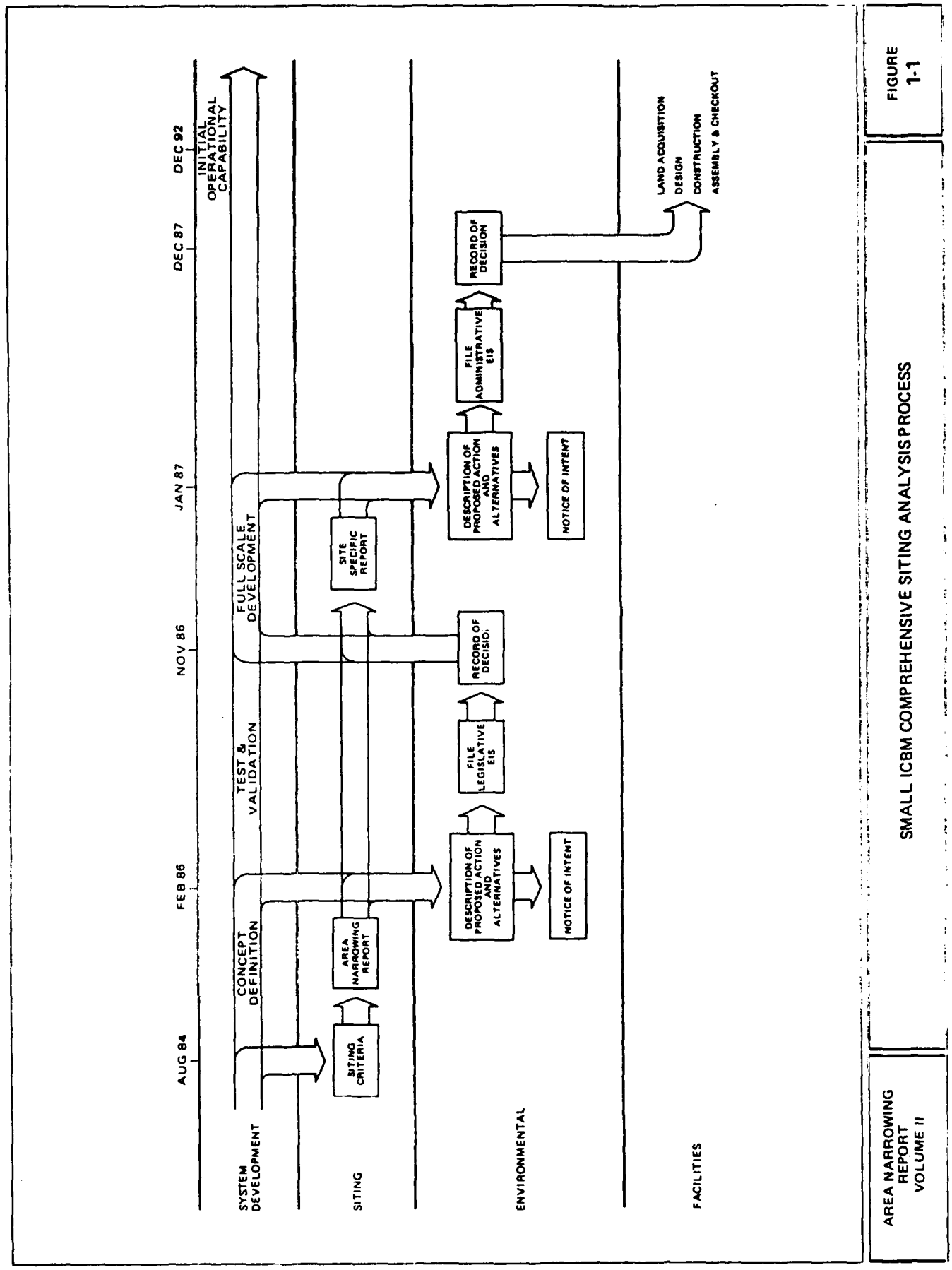
1.2.2 Schedule

A schedule for system siting and environmental analysis is presented in Figure 1-1. Key milestones are: Full Scale Development decision (which includes basing mode selection) and Deployment Area selection, late 1986; Site Specific decisions, early 1988; and Initial Operational Capability, late 1992.

1.3 ENVIRONMENTAL IMPACT AND SITING ANALYSIS PROCESS

The National Environmental Policy Act requires environmental documentation to aid deployment area and site-specific facility decisions. To correlate the detail of decisions with system development progress and for efficiencies in cost and scheduling, a tiered approach to these decisions will be used. The Comprehensive Siting Analysis Process supports tiered decision making by providing progressively more specific location alternatives at each key decision point.

The first tier involves the deployment area selection and basing mode decision. The FY 86 DoD Authorization Act directed that the environmental documentation to aid these decisions be prepared in accordance with the procedures


AUG 84
FEB 86
NOV 86
JAN 87
DEC 87
DEC 92
INITIAL OPERATIONAL CAPABILITY
CONCEPT DEFINITION
TEST & VALIDATION
FULL SCALE DEVELOPMENT
SYSTEM DEVELOPMENT
SITING
ENVIRONMENTAL
FACILITIES
SITING CRITERIA
AREA NARROWING REPORT
SITE SPECIFIC REPORT
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES
NOTICE OF INTENT
FILE LEGISLATIVE EIS
RECORD OF DECISION
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES
NOTICE OF INTENT
FILE ADMINISTRATIVE EIS
RECORD OF DECISION
LAND ACQUISITION
DESIGN
CONSTRUCTION
ASSEMBLY & CHECKOUT
SMALL ICBM COMPREHENSIVE SITING ANALYSIS PROCESS
AREA NARROWING REPORT VOLUME II
FIGURE 1-1

established in the Council on Environmental Quality Regulations for a Legislative Environmental Impact Statement (LEIS).

The second tier of decisions requiring environmental documentation involves facility site decisions. The Congress has directed that Administrative Environmental Impact Statements (EIS) be prepared to aid these decisions. Environmental documentation will be prepared in time to allow necessary land acquisition, design, construction, and assembly and check-out actions to meet the Initial Operational Capability date of late 1992.

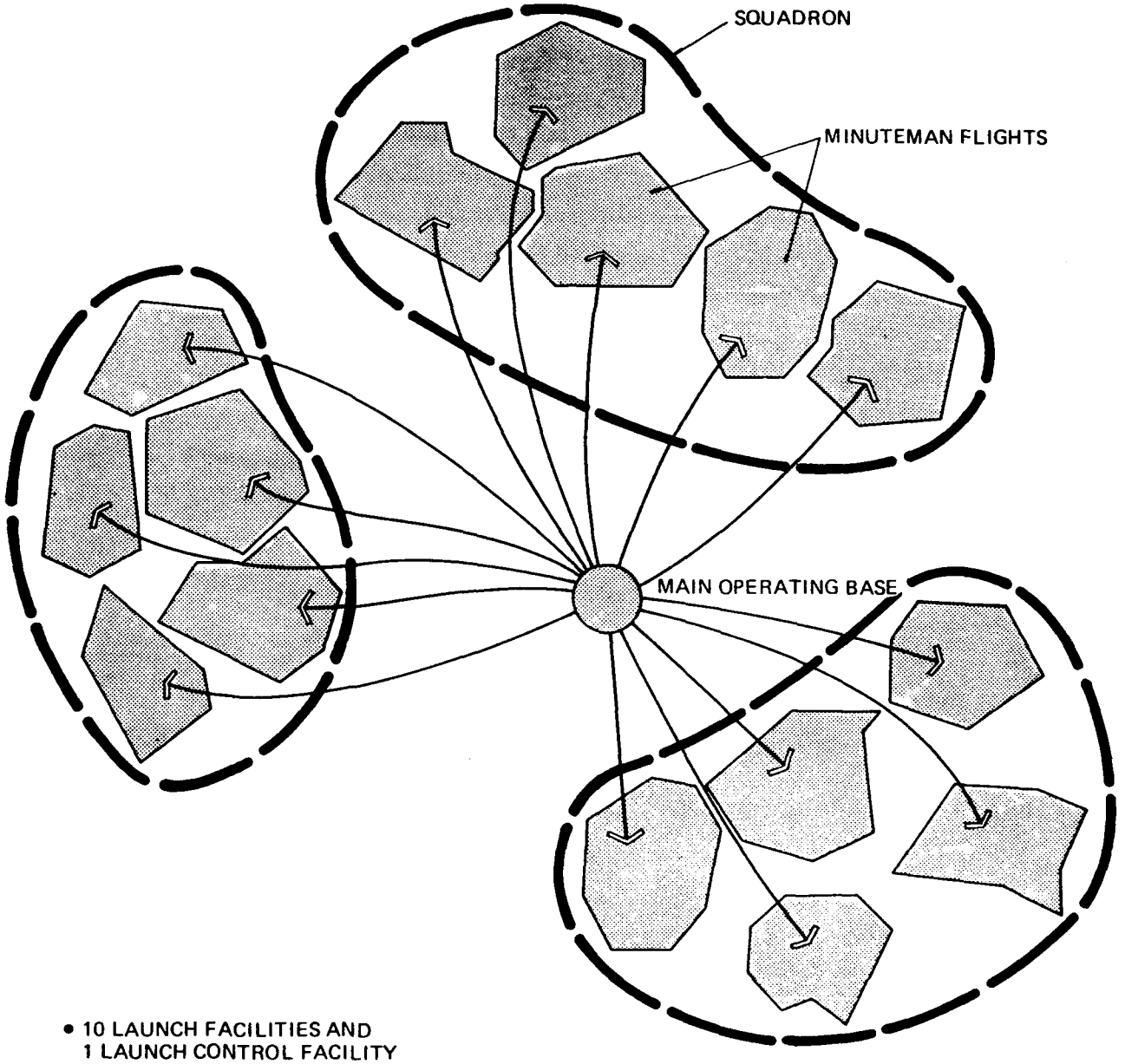
2.0 HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES SYSTEM CONCEPT

2.1 SYSTEM DESCRIPTION

A variant of the Hard Mobile Launcher in Random Movement deployment concept deploys Hard Mobile Launchers at Minuteman Facilities. These launchers are the same as those used in the Random Movement concept. The survivability of the Hard Mobile Launcher system is a function of launcher hardness and mobility. Each launcher is "hardened" to withstand high levels of blast pressure and radiation. The mobility of the launchers, positioned at dispersed Minuteman facilities, allows them to rapidly access a large area, providing launcher location uncertainty. Each of the six Minuteman wings comprises an Air Force Base and the three or four squadrons it supports. Each squadron consists of five flights, with ten Launch Facilities and one Launch Control Facility for each flight (Figure 2-1).

2.2 OPERATIONAL CONCEPT

The Hard Mobile Launcher is operated by a crew that drives the launcher and provides point security and limited maintenance. During peacetime, all launchers are parked "on alert" in austere shelters at Minuteman facilities, except for periodic training and maintenance. These shelters provide limited crew comfort and environmental protection

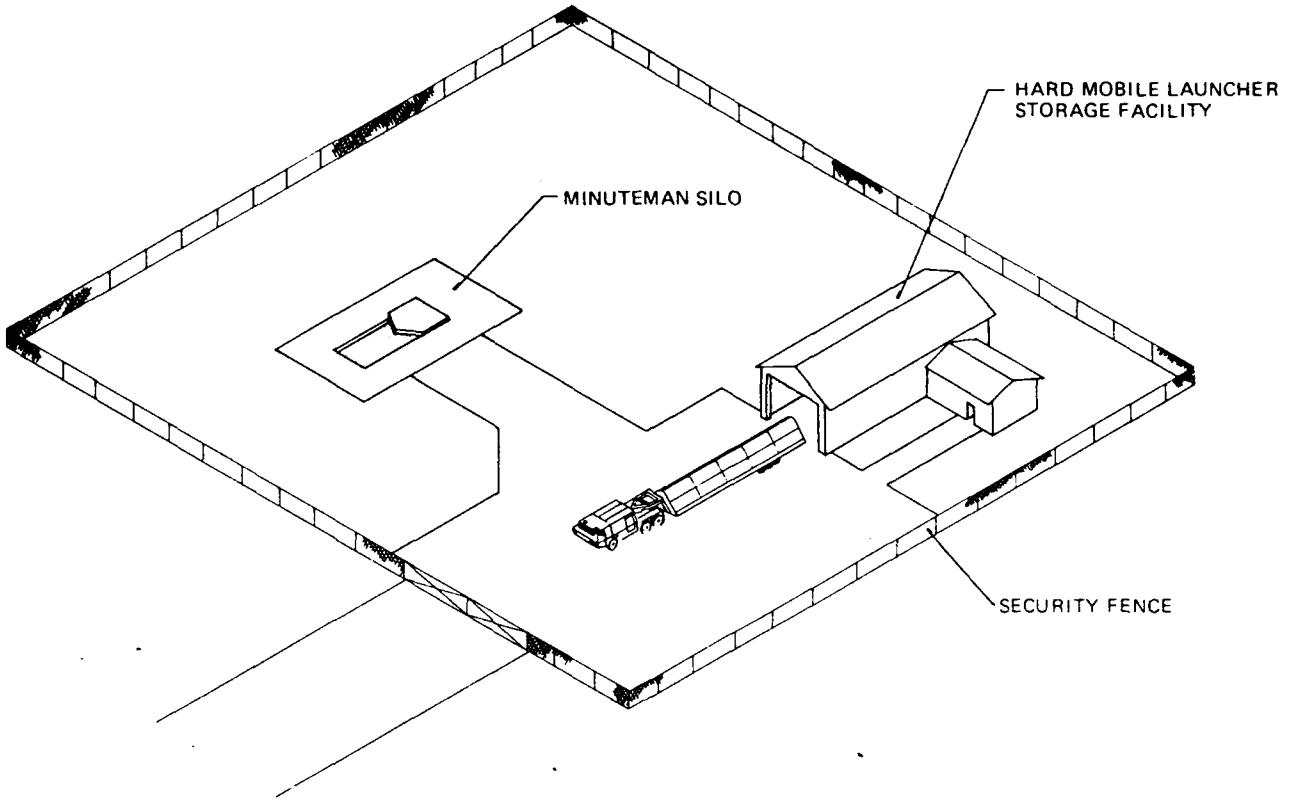


- 10 LAUNCH FACILITIES AND 1 LAUNCH CONTROL FACILITY AT EACH FLIGHT
- 5 FLIGHTS/SQUADRON
- 3-4 SQUADRONS/WING

AREA NARROWING REPORT VOLUME II	SCHEMATIC MINUTEMAN WING CONFIGURATION	FIGURE 2-1

for the launcher (Figure 2-2). Additional launchers could be placed in garrison at the Main Operating Base. Only under "attack dispersal" would the launcher be deployed off site. Because each launcher can dash within a large area, the system provides stability and contributes to deterrence by complicating the enemy's targeting task.

Main Operating Base facilities are located at the existing Minuteman support base. Each Minuteman base currently provides maintenance, logistics, and other support services for Minuteman Missile operations. The base would provide similar services for the Small ICBM operations.



AREA NARROWING REPORT VOLUME II	CONCEPTUAL LAYOUT FOR HARD MOBILE LAUNCHER AT MINUTEMAN LAUNCH FACILITY	FIGURE 2-2

3.0 COMPREHENSIVE SITING ANALYSIS PROCESS

The Comprehensive Siting Analysis Process for Small ICBM area narrowing is a sequential application of Exclusionary and Evaluative Criteria to eliminate unsuitable locations. Each location was evaluated for attainment of key system goals, subgoals, and objectives. Five system goals were defined: maximize system effectiveness, optimize system operability, optimize system practicability, minimize public impact, and minimize environmental impacts.

System effectiveness considers the ability of the weapon system to project a credible deterrent. System operability considers the characteristics, capacity, and ability of an installation's facilities and infrastructure to support a new mission. System practicability considers the relative costs and technical risks associated with construction and operation in the respective deployment areas. Public impact considers the relationship between deployment and land use, safety, security, and economic issues. Environmental impacts considers some of the natural and physical characteristics of an area that could be influenced by Small ICBM system deployment.

Within each of these goals, a hierarchical structure of subgoals and objectives was defined. Criteria were developed to reflect the goals, requirements, capabilities,

and constraints of the system and of each basing mode. Application of the criteria demonstrated the ability of a location to support the program goals and objectives. While the approach to each level of criteria application was consistent among basing modes, the criteria were not always identical. As a consequence, a given location may have performed well or poorly, depending upon the basing mode considered for that location.

3.1 EXCLUSIONARY CRITERIA

The first phase in the siting process for area narrowing is to eliminate locations that clearly do not meet the minimum requirements of the system. This is accomplished through the application of Exclusionary Criteria, which eliminate from further consideration locations unsuitable for system deployment (see Section 4.0).

Data necessary to support Exclusionary Criteria application were collected and evaluated to identify locations that did not meet system requirements. Locations remained for further study when the level of data and subsequent analysis did not clearly support their elimination. For this reason, at each subsequent phase in the siting process, a more detailed level of data was collected to evaluate the suitability of those locations that remained.

3.2 EVALUATIVE CRITERIA

All locations that meet the requirements of the Exclusionary Criteria are, by definition, suitable locations for deployment. The degree of suitability of each location was determined during the second phase of the siting process by the application of Evaluative Criteria (see Section 5.0). The purpose of this phase of the siting process was to eliminate locations determined to be unreasonable.

Evaluative Criteria were applied to those locations under consideration for the Hard Mobile Launcher at Minuteman Facilities basing mode that remained after application of Exclusionary Criteria. Each area was evaluated according to its performance against these criteria. Those locations that were determined to be of lower overall suitability were eliminated from further investigation. Those locations that performed better remain for further analysis.

3.3 SCOPE OF STUDY

Data to support Exclusionary Criteria application were compiled from published documents of federal and state agencies, interpretations of satellite imagery and/or analysis of topographic maps. The data were compiled onto overlays registered to topographic base maps to delineate the areal extent of excluded area within the Candidate Deployment Areas.

Application of Evaluative Criteria focused on evaluation of existing conditions and activities at both Main Operating

Bases and the Candidate Deployment Areas. Previously compiled data were refined and supplemented with the collection and analysis of additional published documents from federal, state, and local agencies, and satellite imagery interpretation. Data collection visits to the Main Operating Bases and aerial and ground reconnaissance surveys of the Candidate Deployment Areas were also performed. The ability of each Main Operating Base and Candidate Deployment Area to achieve system goals was used to compare and formulate recommendations for candidate bases that require further study.

4.0 APPLICATION OF EXCLUSIONARY CRITERIA

Exclusionary Criteria define the limits of suitability of a location. These criteria were applied to existing Strategic Air Command (SAC) Minuteman bases, pursuant to congressional direction that these bases be considered for possible basing of the Hard Mobile Launcher.

4.1 EXCLUSIONARY CRITERIA

Of the five system goals originally defined, two were considered to be of critical importance in discriminating among locations at this phase of the siting process. These two goals reflect constraints dictated by system operational and technical requirements and policy considerations. Specifically, these goals are: maximize system effectiveness (Goal 1) and optimize system operability (Goal 2). The hierarchy of Exclusionary Criteria for these goals is provided in Table 4-1. Specific definitions and rationale for each criterion are in Appendix A.

4.2 APPLICATION

Policy direction that only SAC Minuteman bases be considered eliminated all other installations (Criterion 1.1.1.A.4). Each of the six Minuteman bases has sufficient facilities to deploy more than 40 Hard Mobile Launchers (Criterion 2.3.1.A.1) and none is located in a region where the average normal daily sol-air temperature for any month falls at or

below 0°F (Criterion 1.3.1.A.1) (see Figure 4-1). Finally, none of the Minuteman bases is located within urbanized areas such that urban encroachment would limit potential base expansion (Criterion 2.3.1.A.3).

4.3 RESULTS

None of the Minuteman bases was found to be below the standards established by the Exclusionary Criteria shown on Table 4-1. Accordingly, all six Minuteman bases remain for further evaluation by application of Evaluative Criteria. The six bases are shown in Figure 4-2 and Table 4-2.

TABLE 4-1 HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES EXCLUSIONARY CRITERIA

GOAL	SUBGOAL	OBJECTIVE	CRITERION	MEASURE
1 MAXIMIZE SYSTEM EFFECTIVENESS	1.1 MAXIMIZE SYSTEM SURVIVABILITY	1.1.1 OPTIMIZE PRESERVATION OF HARD MOBILE LAUNCHER LOCATION UNCERTAINTY	1.1.1.A.4 DEPLOY ON MINUTEMAN FACILITIES	MINUTEMAN BASES
	1.3 MAXIMIZE RESPONSE CAPABILITY	1.3.1 OPTIMIZE PAYLOAD EFFECTIVENESS/ TARGET COVERAGE	1.3.1.A.1 TEMPERATURE REQUIREMENTS FOR OPERATION OF HARD MOBILE LAUNCHER	NORMAL DAILY SOL-AIR TEMPERATURE GREATER THAN OR EQUAL TO 0°F
2 OPTIMIZE SYSTEM OPERABILITY	2.3 MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.1 CONSIDER FUNCTIONAL SUPPORT CAPABILITY	2.3.1.A.2 MINIMUM OF 40 HARD MOBILE LAUCHERS REQUIRED FOR MAINTENANCE EFFICIENCY	NUMBER OF ICBM FACILITIES
			2.3.1.A.3 EXCLUDE MAIN OPERATING BASES WITHIN URBANIZED AREAS	URBANIZED AREA SURROUNDING MAIN OPERATING BASE

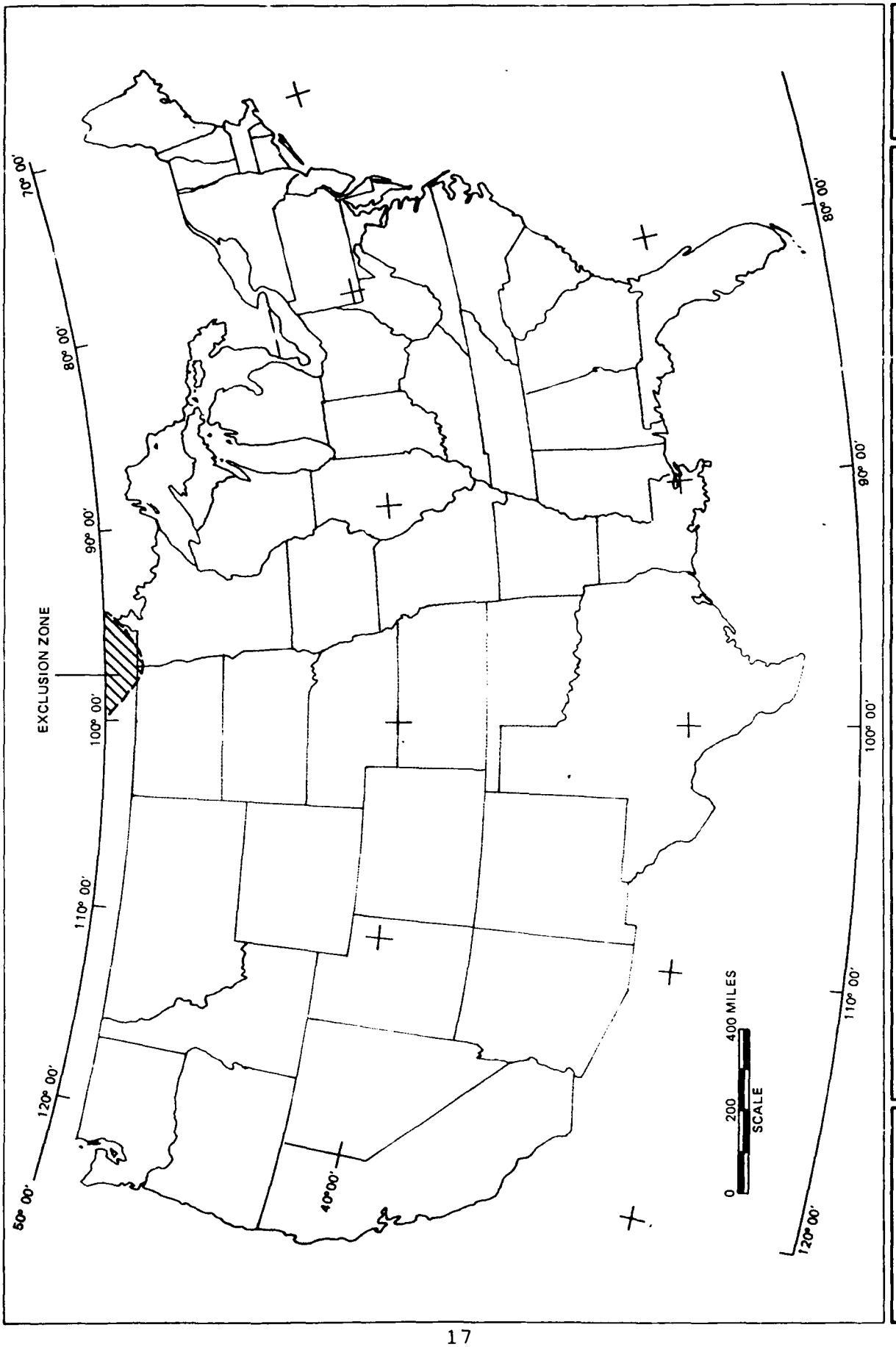
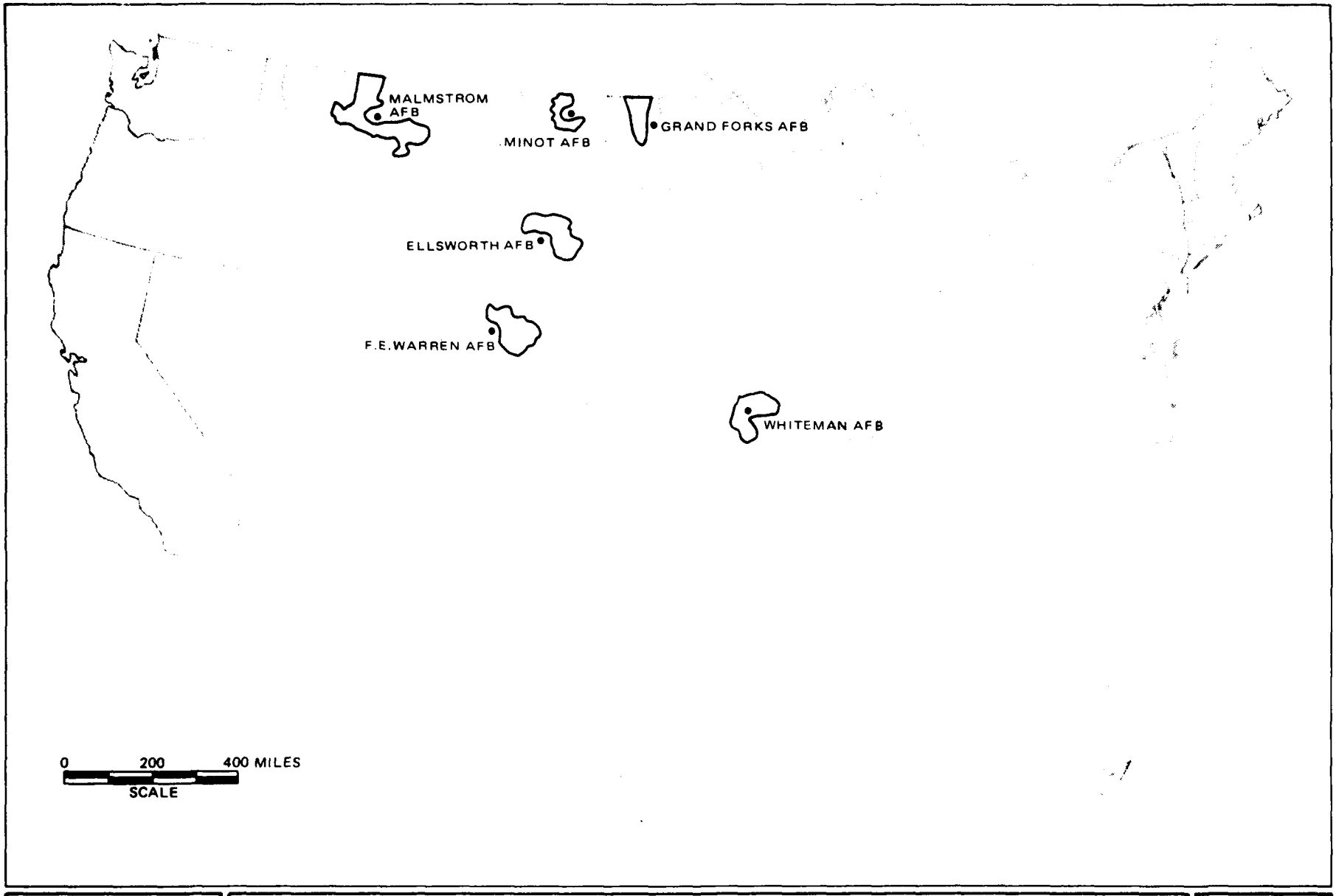


FIGURE 4-1

CONTERMINOUS UNITED STATES EXCLUSION ZONE
FOR 0° F SOL-AIR AVERAGE JANUARY ISOPLETH

AREA NARROWING REPORT VOLUME II



AREA NARROWING REPORT VOLUME II	MAIN OPERATING BASES AND ASSOCIATED CANDIDATE DEPLOYMENT AREAS AFTER APPLICATION OF EXCLUSIONARY CRITERIA	FIGURE 4-2

TABLE 4-2

MINUTEMAN FACILITIES AFTER APPLICATION
OF EXCLUSIONARY CRITERIA

Ellsworth Air Force Base, South Dakota

F.E. Warren Air Force Base, Wyoming

Grand Forks Air Force Base, North Dakota

Malmstrom Air Force Base, Montana

Minot Air Force Base, North Dakota

Whiteman Air Force Base, Missouri

5.0 APPLICATION OF EVALUATIVE CRITERIA

Evaluative Criteria do not eliminate an alternative when applied individually, but may in combination. All six Minuteman support bases were evaluated for attainment of system goals through the Evaluative Criteria.

5.1 EVALUATIVE CRITERIA

Of the five system goals, two were considered to be more important in discriminating among Main Operating Bases for this concept: optimize system operability (Goal 2), and minimize public impact (Goal 4). The hierarchy of evaluative goals, subgoals, objectives, and criteria for Main Operating Bases is depicted in Table 5-1. Specific definitions and rationale for each criterion are in Appendix B.

5.1.1 OPTIMIZE SYSTEM OPERABILITY

System operability considered the effectiveness of the Main Operating Base, the compatibility of the existing missions with the Small ICBM, and the quality of life in the area.

The effectiveness of a Main Operating Base was evaluated by its functional support capability, land availability, infrastructure support capability, and availability of existing transportation systems. Preference was given to Main Operating Bases with larger base populations, which could reduce the number of indirect or base support personnel required for system operation. Preference was

TABLE 5-1 MAIN OPERATING BASE EVALUATIVE CRITERIA

GOAL	SUBGOAL	OBJECTIVE	CRITERION	MEASURE
2 OPTIMIZE SYSTEM OPERABILITY	2.3 MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.1 CONSIDER FUNCTIONAL SUPPORT CAPABILITY	2.3.1.B.2 PREFER LARGER MILITARY POPULATION	NUMBER OF PERMANENT MILITARY PERSONNEL
			2.3.1.B.6 PREFER MAIN OPERATING BASES THAT ARE EASILY ACCESSIBLE FROM THE SUPPORT COMMUNITY	ROAD MILES FROM MAIN OPERATING BASE TO SUPPORT COMMUNITY
		2.3.2 CONSIDER LAND AVAILABILITY	2.3.2.B.1 PREFER MAIN OPERATING BASES WITH ADEQUATE LAND TO ACCOMMODATE THE SMALL ICBM MISSION	ACRES OF AVAILABLE LAND, FUNCTIONAL COMPATIBILITY
			2.3.2.B.2 PREFER MAIN OPERATING BASES REQUIRING MINIMUM LAND USE CHANGE TIME	AMOUNT OF FAVORABLE LAND OWNERSHIP
		2.3.3 CONSIDER INFRASTRUCTURE SUPPORT CAPABILITY	2.3.3.B.1 PREFER MAIN OPERATING BASES WHERE WATER CAN BE EASILY OBTAINED	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY AND REGULATORY PROCESS AFFECTING WATER RESOURCES

TABLE 5-1 MAIN OPERATING BASE EVALUATIVE CRITERIA

GOAL	SUBGOAL	OBJECTIVE	CRITERION	MEASURE
2 (cont'd) OPTIMIZE SYSTEM OPERABILITY	2.3 (cont'd) MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.3 (cont'd) CONSIDER INFRASTRUCTURE SUPPORT CAPABILITY	2.3.3.B.2 PREFER MAIN OPERATING BASES WHERE ELECTRICAL POWER TO MEET PROJECT REQUIREMENTS CAN EASILY BE OBTAINED	CAPACITY, SOURCE, AND EXPANDABILITY OF POWER SYSTEM
			2.3.3.B.3 PREFER MAIN OPERATING BASES WHERE ENERGY (HEATING) TO MEET PROJECT REQUIREMENTS CAN EASILY BE OBTAINED	CAPACITY, SOURCE, AND EXPANDABILITY OF HEATING SYSTEM
			2.3.3.B.4 PREFER MAIN OPERATING BASES WHERE WASTE-WATER TREATMENT CAPACITY IS MORE THAN ADEQUATE	CAPACITY AND EXPANDABILITY OF WASTE-WATER TREATMENT SYSTEM
			2.3.3.B.5 PREFER MAIN OPERATING BASES WHERE SOLID WASTE DISPOSAL SYSTEM IS MORE THAN ADEQUATE	CAPACITY, EXPANDABILITY, AND PROJECTED LIFE OF SOLID WASTE DISPOSAL SYSTEM
			2.3.3.B.6 PREFER MAIN OPERATING BASES WHERE STORM DRAINAGE SYSTEM IS MORE THAN ADEQUATE	CAPACITY OF STORM DRAINAGE SYSTEM

TABLE 5-1 MAIN OPERATING BASE EVALUATIVE CRITERIA

GOAL	SUBGOAL	OBJECTIVE	CRITERION	MEASURE
2 (cont'd) OPTIMIZE SYSTEM OPERABILITY	2.3 (cont'd) MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.4 CONSIDER TRANSPORTATION AVAILABILITY	2.3.4.B.1 PREFER MAIN OPERATING BASES WITH CAPABLE AIRFIELD ACCESSIBILITY	RUNWAY LENGTH, INSTRUMENTATION, AND PROXIMITY TO BASE
			2.3.4.B.2 PREFER MAIN OPERATING BASES WITH ADEQUATE HIGHWAY ACCESS	ROAD TYPE AND DISTANCE TO MAJOR HIGHWAY, TRAFFIC CONGESTION CONSIDERATIONS
			2.3.4.B.3 PREFER MAIN OPERATING BASES WITH RAILROAD FREIGHT SERVICE	DISTANCE OF RAIL SERVICE FROM MAIN OPERATING BASE
	2.5 MAXIMIZE QUALITY OF LIFE	2.5.1 PROVIDE ADEQUATE SUPPORT SERVICES	2.5.1.B.1 PREFER A LARGER DEVELOPED AREA WITHIN 25 MILES OF THE MAIN OPERATING BASES	LARGEST NEARBY POPULATION CENTER
			2.5.1.B.2 PREFER MAIN OPERATING BASES WITH AVAILABLE HOUSING	NUMBER AND TYPE OF AVAILABLE HOUSES ON AND OFF BASE

TABLE 5-1 MAIN OPERATING BASE EVALUATIVE CRITERIA

GOAL	SUBGOAL	OBJECTIVE	CRITERION	MEASURE
4 MINIMIZE PUBLIC IMPACT	4.1 MINIMIZE ECONOMIC IMPACTS	4.1.5 MINIMIZE IMPACTS ON RESOURCE AVAILABILITY	4.1.5.B.1 PREFER AREAS WHERE SUFFICIENT WATER CAN BE APPROPRIATED OR PURCHASED/ TRANSFERRED FOR THE MAIN OPERATING BASE AND SUPPORT COMMUNITY	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY, AND REGULATORY PROCESS AFFECTING WATER RESOURCES
	4.2 MAXIMIZE PUBLIC SAFETY/SECURITY	4.2.3 MINIMIZE PUBLIC EXPOSURE TO RISK	4.2.3.B.1 PREFER MAIN OPERATING BASES WITH MINIMUM OFF-BASE TRANSIT THROUGH URBAN AREAS	ROAD MILES THROUGH URBAN AREAS
	4.3 MINIMIZE SOCIAL IMPACTS	4.3.1 MINIMIZE SOCIAL DISRUPTION	4.3.1.B.1 PREFER MAIN OPERATING BASES IN AREAS WITH LARGE NON-RURAL POPULATIONS	CITY POPULATIONS IN ALL COUNTIES EITHER WHOLLY OR PARTIALLY WITHIN 50 MILES OF THE MAIN OPERATING BASE
			4.3.1.B.2 PREFER MAIN OPERATING BASES IN AREAS WITH AVAILABLE LABOR	NONAGRICULTURAL EMPLOYMENT FICURES
			4.3.1.B.3 PREFER MAIN OPERATING BASES IN AREAS WITH A DIVERSE ECONOMIC BASE	NUMBER OF FIRM TYPES PRODUCING FOR EXPORT CONSUMPTION

TABLE 5-1 MAIN OPERATING BASE EVALUATIVE CRITERIA

GOAL	SUBGOAL	OBJECTIVE	CRITERION	MEASURE
4 (cont'd) MINIMIZE PUBLIC IMPACT	4.3 (cont'd) MINIMIZE SOCIAL IMPACTS	4.3.1 (cont'd) MINIMIZE SOCIAL DISRUPTION	4.3.1.B.4 PREFER MAIN OPERATING BASES IN AREAS WITH SUBGROUP POPULATIONS SIMILAR TO THOSE INDUCED BY PROJECT CONSTRUCTION AND OPERATION	MILITARY AND CONSTRUCTION EMPLOYMENT
		4.3.2 MINIMIZE ADVERSE IMPACTS ON PUBLIC FINANCE	4.3.2.B.3 PREFER MAIN OPERATING BASES IN AREAS THAT EXHIBIT AN ADEQUATE TAXING EFFORT	TOTAL OWN-SOURCE REVENUES VERSUS TOTAL INCOME
		4.3.3 MINIMIZE IMPACTS ON COMMUNITY SUPPORT CAPABILITY	4.3.3.B.1 PREFER MAIN OPERATING BASES IN AREAS WITH LARGER SUPPLIES OF AVAILABLE HOUSING	TOTAL OFF-INSTALLATION VACANT HOUSING UNITS

given to Main Operating Bases closest to support communities, which reduces the travel time required for transport of services and personnel to the base. Preference was given to Main Operating Bases that have surplus or otherwise available land for locating operational and support facilities for the Hard Mobile Launcher system. Available land with ownership that would minimize the time of official land use change for support of the Hard Mobile Launcher system is more desirable. Preference was given to Main Operating Bases with suitable infrastructure, including favorable conditions for water obtainability and quality, electrical power and heating supply, waste water treatment, solid waste disposal, and storm drainage capacity. The effectiveness of the Main Operating Base is improved if there are available transportation facilities. Preference was given to Main Operating Bases with available airfields, adequate highway access, and railroad service.

The quality of life of project-related personnel was evaluated by the ability of the area to provide adequate support services. Preference was given to Main Operating Bases with larger support communities and with housing available both on and off the base.

5.1.2 Minimize Public Impact

The goal of minimizing public impact was evaluated for minimizing economic impacts and social disruption and

maximizing security and public safety. Economic considerations focused on evaluating water availability in the support communities. Preference was given to those Main Operating Bases where water resources and the water system can be developed to accommodate the needs of project personnel and operations without compromising supply to the surrounding communities.

Social impacts were considered by evaluating the characteristics and diversity of nearby population centers. Factors considered included community size and proximity; size, diversity, and composition of the labor pool; and diversity of a community's economy and tax base. Preference was given to Main Operating Bases where nearby communities are large, anticipate future growth, and have a diverse socioeconomic base that could more easily absorb population influx that may arise as a result of system deployment.

Public safety was considered by evaluating the road networks and associated populated areas in the vicinity of the Main Operating Bases. Preference was given to Main Operating Bases that minimize the potential for travel of Hard Mobile Launchers through urbanized areas.

5.1.3 Application

The measures for all Evaluative Criteria were combined for each Main Operating Base. The ability of each Main Operating Base to achieve system goals was used to compare

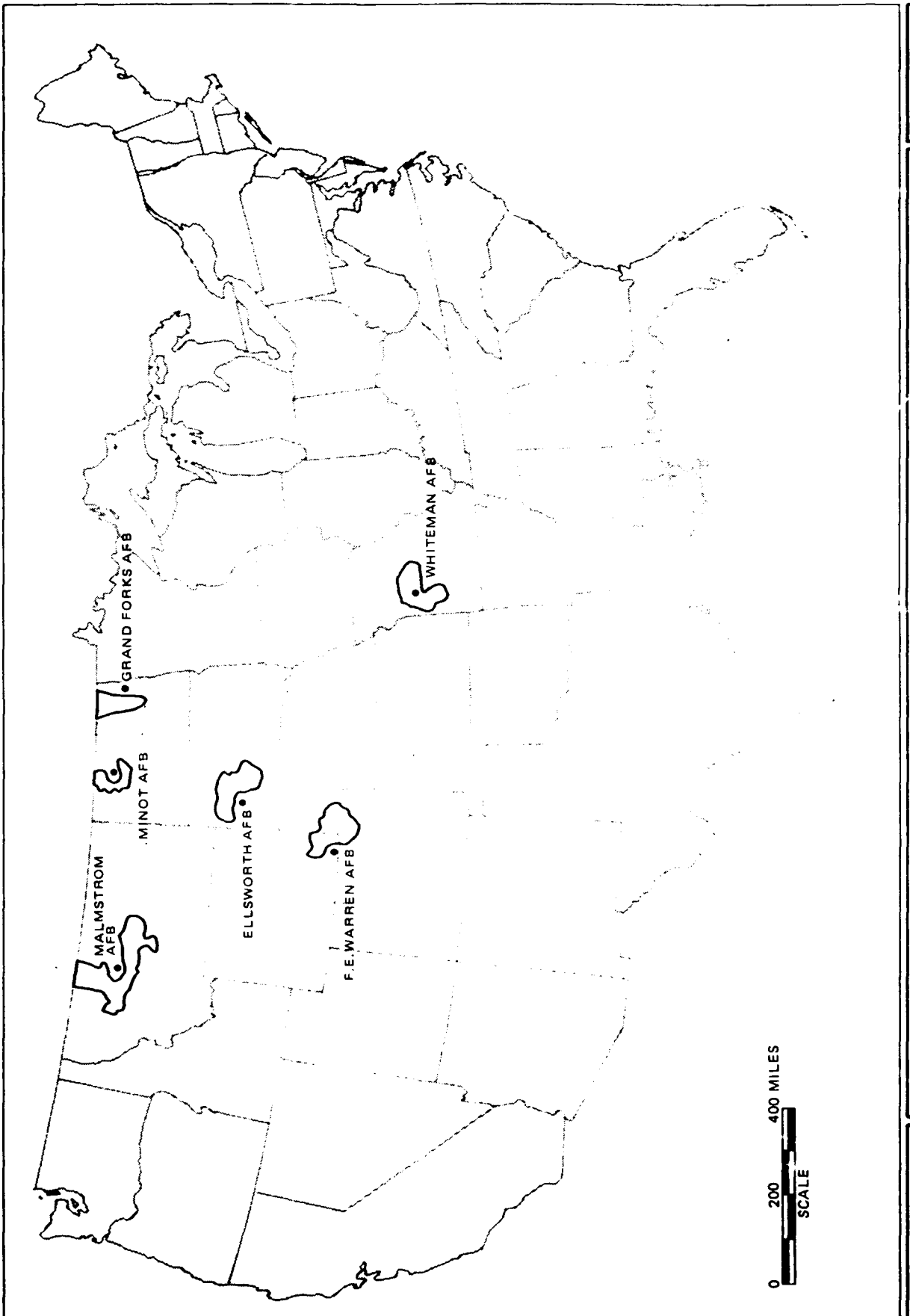
and formulate recommendations for candidate bases that should be eliminated from, or that remain for, further study. A summary of pertinent results from the application of the Evaluative Criteria is provided for each Candidate Main Operating Base in Appendix C. The summary focuses on the base performance against each unit of measure as well as achievement of critical goals.

5.1.4 Results

As a result of the application of Evaluative Criteria, none of the Candidate Main Operating Bases was determined to fulfill system goals significantly better than others. All six Main Operating Bases remain for future siting investigation and environmental analysis.

6.0 RECOMMENDATIONS

All six bases are recommended for evaluation in the Environmental Impact Analysis Process for the Hard Mobile Launcher at Minuteman Facilities basing mode. The locations of the Minuteman Candidate Main Operating Bases and associated Candidate Deployment Areas are depicted in Figure 6-1 and listed in Table 6-1.



AREA NARROWING REPORT VOLUME II

MAIN OPERATING BASES AND ASSOCIATED CANDIDATE DEPLOYMENT AREAS AFTER AREA NARROWING

FIGURE 6-1

TABLE 6-1

MINUTEMAN FACILITIES AFTER AREA NARROWING

Ellsworth Air Force Base, South Dakota

F.E. Warren Air Force Base, Wyoming

Grand Forks Air Force Base, North Dakota

Malmstrom Air Force Base, Montana

Minot Air Force Base, North Dakota

Whiteman Air Force Base, Missouri

APPENDIX A

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES

BASING MODE

EXCLUSIONARY CRITERIA

APPENDIX A

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES EXCLUSIONARY CRITERIA

Criteria statements below are organized by goals and level of application. Full criteria descriptions, including definitions and rationale, follow and can be referenced using their alphanumeric designator.

The alphanumeric system is illustrated by the following example:

1	1	1	X	1

GOAL

SUBGOAL

OBJECTIVE

LEVEL OF APPLICATION

CRITERION

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES
EXCLUSIONARY CRITERIA FOR AREA NARROWING

GOAL 1: Maximize System Effectiveness
- 1.1 Maximize System Survivability
  - 1.1.1 Optimize Preservation of Hard Mobile Launcher Location Uncertainty
    - Minuteman Facilities (1.1.1.A.4)
- 1.3 Maximize Response Capability
  - 1.3.1 Optimize Payload Effectiveness/Target Coverage
    - Temperature (1.3.1.A.1)

GOAL 2: Optimize System Operability
- 2.3 Maximize Main Operating Base Effectiveness
  - 2.3.1 Consider Functional Support Capability
    - Deployment Facilities (2.3.1.A.1)
    - Encroachment (2.3.1.A.3)

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.1: Optimize Preservation of Hard Mobile Launcher Location Uncertainty

LEVEL OF APPLICATION: A - Deployment Area Exclusionary

CRITERION STATEMENT 1.1.1.A.4: Employ existing Strategic Air Command Minuteman facilities sites for deployment of the Hard Mobile Launcher system.

CRITERION DEFINITION: Strategic Air Command Minuteman facilities sites are the launch facilities, launch control facilities, and Main Operating Bases for the six Minuteman wings.

CRITERION RATIONALE: Congress directed the Air Force (Senate Armed Services Committee Report, FY 86 DoD Authorization Act) to "take advantage of the existing infrastructure of our Minuteman missile basing complex" for the Small ICBM Hard Mobile Launcher concept.

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.3: Maximize Response Capability

OBJECTIVE 1.3.1: Optimize Payload Effectiveness/Target Coverage

LEVEL OF APPLICATION: A - Regional Exclusionary

CRITERION STATEMENT 1.3.1.A.1: Exclude areas of the United States from consideration for Hard Mobile Launcher system deployment that have an average normal daily sol-air temperature for any month at or below 0°F.

CRITERION DEFINITION: Sol-air temperature reflects the combined effect of ambient temperature and solar radiation upon the missiles, launcher, and subsystems.

CRITERION RATIONALE: The coldest acceptable temperature below which propellant performance is unacceptably degraded is 0°F. During periods when the missile and launcher must be in an essentially dormant mode (known as the soak period) the missile will tend to stabilize at an average sol-air temperature. Assuming that the Hard Mobile Launcher will be insulated to at least R-20, the propellants will cool to about 10 percent of a change in average ambient sol-air temperature over a seven day period. Consequently, those areas with average daily temperatures measured over an entire month of 0°F or less would likely result in the degradation of the propellant performance.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.1: Exclude from consideration all potential Main Operating Bases that are not capable of deploying at least 40 Hard Mobile Launchers.

CRITERION DEFINITION: A Hard Mobile Launcher may be deployed at each launch facility and launch control facility, and on the Main Operating Base. A suitable Main Operating Base satisfies the criterion if it currently supports a minimum of 40 Launch Facilities.

CRITERION RATIONALE: A minimum maintenance team size of 30 people with various skills is necessary to maintain a deployed missile, but a minimum number of deployed missiles is required to keep the team fully employed. A minimum of 40 Hard Mobile Launchers would be required to be supported by a Main Operating Base to ensure efficient use of a maintenance team.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.3: Exclude from consideration all potential Main Operating Bases that are completely surrounded by urbanized areas.

CRITERION DEFINITION: An urbanized area was defined for this criterion by the Census Bureau as a central city or cities and surrounding closely settled territory comprising a minimum total population of 50,000. The closely settled surrounding territory may comprise incorporated areas with populations of 2,500 or more or other places with a density of at least 1,000 persons per square mile.

CRITERION RATIONALE: Installations that are completely surrounded by urbanized area have little or no flexibility for expansion or for adjustments in land use that may be required by the addition of a new mission.

APPENDIX B

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES

BASING MODE

EVALUATIVE CRITERIA

APPENDIX B

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES EVALUATIVE CRITERIA

Criteria statements below are organized by goals and level of application. Full criteria descriptions, including definitions and rationale, follow and can be referenced using their alphanumeric designator.

The alphanumeric system is illustrated by the following example:

1	1	1	X	1
GOAL	SUBGOAL	OBJECTIVE	LEVEL OF APPLICATION	CRITERION

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES
EVALUATIVE CRITERIA FOR AREA NARROWING

Goal 2: Optimize System Operability
- 2.3 Maximize Main Operating Base Effectiveness
  - 2.3.1 Consider Functional Support Capability
    - Base Population (2.3.1.B.2)
    - Distance to Support Community (2.3.1.B.6)
  - 2.3.2 Consider Land Availability
    - Adequate Land (2.3.2.B.1)
    - Ownership (2.3.2.B.2)
  - 2.3.3 Consider Infrastructure Support Capability
    - Water Obtainability (2.3.3.B.1)
    - Power (2.3.3.B.2)
    - Heating (2.3.3.B.3)
    - Waste Water (2.3.3.B.4)
    - Solid Waste (2.3.3.B.5)
    - Storm Drains (2.3.3.B.6)
  - 2.3.4 Consider Transportation Availability
    - Air (2.3.4.B.1)
    - Highway Access (2.3.4.B.2)
    - Railroad (2.3.4.B.3)
- 2.5 Maximize Quality of Life
  - 2.5.1 Provide Adequate Support Services
    - Support Community (2.5.1.B.1)
    - Housing Availability (2.5.1.B.2)

Goal 4: Minimize Public Impact
- 4.1 Minimize Economic Impacts
  - 4.1.5 Minimize Impact on Resource Availability
    - Water Availability (4.1.5.B.1)
- 4.2 Maximize Public Safety/Security
  - 4.2.3 Minimize Public Exposure to Risk
    - Public Safety (4.2.3.B.1)
- 4.3 Minimize Social Impacts
  - 4.3.1 Minimize Social Disruption
    - Urban Populations (4.3.1.B.1)
    - Labor Availability (4.3.1.B.2)
    - Economic Diversity (4.3.1.B.3)
    - Population Similarity (4.3.1.B.4)
  - 4.3.2 Minimize Adverse Impacts on Public Finance
    - Taxing Effort (4.3.2.B.3)
  - 4.3.3 Minimize Impacts on Community Support Capability
    - Housing (4.3.3.B.1)

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.2: Preference was given to suitable Main Operating Bases with larger populations.

CRITERION DEFINITION: Base population is the number of assigned military personnel at a potential existing Main Operating Base.

CRITERION RATIONALE: Base population is used as an indicator of the capability of the base to accommodate the Hard Mobile Launcher system mission. The larger the base population, the greater the probability that a lower number of indirect or base support people would be required. Also, a larger base population would be an indicator of a full complement of housing, morale, welfare, recreation, health, and education services, as well as a full range of administrative and base support facilities.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.6: Preference was given to Main Operating Bases that are easily accessible from the support community.

CRITERION DEFINITION: Accessibility to the support community is the distance in road miles from the Main Operating Base to the border of the nearest support community. A support community is one that is of sufficient size to provide typical services (greater than 25,000 population).

CRITERION RATIONALE: Close proximity of a support community enhances the likelihood that public and private sectors can respond to induced demands for goods, services, and facilities. Close proximity also minimizes the time required for transport of services and personnel that normally report to the Main Operating Base before going to the deployment area.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.2: Consider Land Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.2.B.1: Preference was given to Main Operating Bases with adequate land for locating the Hard Mobile Launcher system facilities and other components without functional land use concerns.

CRITERION DEFINITION: Available land on base is the quantity of land with characteristics to accommodate the Hard Mobile Launcher mission.

CRITERION RATIONALE: Available land on an existing Main Operating Base is required to efficiently support the mission and to provide the capability for timely construction of critical facilities to meet the Initial Operational Capability need date. Available land must be suitable to support standard construction methods and minimize impacts to existing uses.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.2: Consider Land Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.2.B.2: Preference was given to Main Operating Bases that contain available land with ownership that would minimize the time of official land use change for support of the Small ICBM system.

CRITERION DEFINITION: Land ownership refers to th owner/manager of land on the Main Operating Base that is potentially available for the Hard Mobile Launcher mission.

CRITERION RATIONALE: The order of preference for ownership of available land on base is DoD fee-owned, DoD leased land, and DoD withdrawn land. The rationale for ordering the land ownership categories arises from consideration of different time durations required to change the official land use of land with these ownership types. DoD fee-owned poses the least time constraint while DoD withdrawn land may entail the longest and most complicated change of land use and presents the greatest schedule risk.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.1: Preference was given to Main Operating Bases where sufficient water can be developed or obtained by appropriation or purchase/transfer for operations and limited construction.

CRITERION DEFINITION: A Main Operating Base will be deemed to have sufficient water for operations and construction of the Hard Mobile Launcher system when the water can be obtained without exercising condemnation.

CRITERION RATIONALE: Availability of water affects both system constructibility and operability. It is preferable to develop unused water or purchase/transfer water from existing uses.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.2: Preference was given to Main Operating Bases with power systems that can meet project requirements.

CRITERION DEFINITION: Project requirement for power is the amount of power needed from public/private utilities plus any co/self generation systems to meet the Small ICBM system construction and operational requirements.

CRITERION RATIONALE: Deployment costs are reduced when existing power systems are adequate or can be easily expanded to accommodate project demands.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.3: Preference was given to Main Operating Bases with heating systems that can meet project requirements.

CRITERION DEFINITION: The project will require an on-base heating system with adequate excess capacity to accommodate the Small ICBM mission or a system that could easily be expanded to meet project requirements.

CRITERION RATIONALE: Deployment costs are reduced when no modifications to the existing heating system are required. If modifications are required, costs would be minimized if the existing system could easily be expanded.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.4: Preference was given to Main Operating Bases with waste-water treatment and collections systems that can meet project requirements.

CRITERION DEFINITION: The project will require a waste-water treatment and collection system that can accommodate the Small ICBM mission.

CRITERION RATIONALE: Cost of new facilities is reduced to the degree that existing waste-water treatment and collection systems are capable of accommodating growth.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.5: Preference was given to Main Operating Bases with solid waste disposal systems that can meet project requirements.

CRITERION DEFINITION: The project will require a solid waste disposal system that is capable of accommodating the Small ICBM mission.

CRITERION RATIONALE: Siting and development of new landfills is a lengthy and complex process. Cost and land requirements are lessened if existing landfill or disposal systems are large enough to accommodate growth.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.6: Preference was given to Main Operating Bases with storm drainage systems that can meet project requirements.

CRITERION DEFINITION: The project requires a storm drainage system capable of accommodating increased runoff.

CRITERION RATIONALE: Additional runoff from Small ICBM related construction and facilities may cause flooding and affect water quality if existing capacities are exceeded. The presence of existing storm drainage systems capable of accommodating growth will reduce the cost of new facilities.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availabilty

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.1: Preference was given to Main Operating Bases close to capable airfields.

CRITERION DEFINITION: Airfield capability is a function of length, instrument capability, and location of a runway relative to the base.

CRITERION RATIONALE: The presence of an airfield provides flexibility in logistics support and travel.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availabilty

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.2: Preference was given to Main Operating Bases with adequate highway access.

CRITERION DEFINITION: Highway access is determined by type, capacity, and location of access roads, quality of interface with base roads, and congestion.

CRITERION RATIONALE: Adequate highway access facilitates movement of missile components, maintenance equipment, and personnel on and off base.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availabilty

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.3: Preference shall be given to Main Operating Bases with railroad freight service.

CRITERION DEFINITION: Railroad freight service is the existence of a railroad line, or spur, within the vicinity of the Main Operating Base that could support the Small ICBM mission.

CRITERION RATIONALE: Railroad freight service allows missile components and general supplies to be transported directly to the base. Existing on-base capacity and/or rights-of-way from the existing railroad freight service to the Main Operating Base reduces costs of land acquisition and construction for rail extension.

GOAL 2: Optimize System Operability

SUBGOAL 2.5: Maximize Quality of Life

OBJECTIVE 2.5.1: Provide Adequate Support Services

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.5.1.B.1: Preference was given to Main Operating Bases within 25 radial miles of a larger developed area (city, Census Designated Place, Urbanized Area).

CRITERION DEFINITION: A developed area is a support community that is of sufficient size and proximity to the Main Operating Base to provide typical services.

CRITERION RATIONAL: Basing within 25 miles of a support community enhances the likelihood that public and private sectors can respond to induced demands for goods, services, and facilities. Size of a support community is a surrogate measure of the community's ability to provide a full range of public services, merchandise, entertainment, and recreational activities for government employees.

GOAL 2: Optimize System Operability

SUBGOAL 2.5: Maximize Quality of Life

OBJECTIVE 2.5.1: Provide Adequate Support Services

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.5.1.B.2: Preference was given to Main Operating Bases with greater housing availability.

CRITERION DEFINITION: Housing is unaccompanied personnel quarters, military family housing, and off-base housing.

CRITERION RATIONALE: It is desirable to ensure that adequate and affordable housing is available on or near a Main Operating Base, thereby minimizing the need to construct new housing.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.5: Minimize Impacts on Resource Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.5.B.1: Preference was given to Main Operating Bases where water is available to meet the needs of the existing population and the additional project requirements.

CRITERION DEFINITION: An area will be deemed to have sufficient water when water resources and water systems can be developed to meet the project needs of both the support community and Main Operating Base.

CRITERION RATIONALE: Availability of water affects both system constructibility and operability. It is preferable to develop unused water or purchase/transfer water from existing uses. It is desirable to avoid areas where present use is depleting local water supplies and where additional demands on the Main Operating Base and the support communities' water-supply systems will seriously stress the systems.

GOAL 4: Minimize Public Impact

SUBGOAL 4.2: Maximize Public Safety/Security

OBJECTIVE 4.2.3: Minimize Public Exposure to Risk

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.2.3.B.1: Preference was given to Main Operating Bases that minimize the necessity for travel of Hard Mobile Launchers through urban areas.

CRITERION DEFINITION: For purposes of this evaluation urban areas are defined as areas designated by the Census Bureau as urbanized areas, census designated places, and incorporated areas.

CRITERION RATIONALE: The potential for safety and security incidents is assumed to increase with increased traffic flows as found in urban areas.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.1: Preference was given to Main Operating Bases in areas with large urban populations.

CRITERION DEFINITION: Population is the urban population as defined by the U.S. Census in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Large population centers reduce the need to provide new public services and facilities.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.2: Preference was given to Main Operating Bases in areas that have available labor.

CRITERION DEFINITION: Available labor is measured as the amount of nonagricultural employment within all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: A constrained labor supply may limit opportunities for satisfying direct and indirect labor demand locally and thereby increase the likelihood of induced inmigration. This is especially true of the critical induced demand for construction labor, which can lead to rapid fluctuations in population. Low rates might create sector-specific labor shortages and drive up the cost of labor.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.3: Preference was given to Main Operating Bases in areas that have a diverse economic base.

CRITERION DEFINITION: Economic diversity is measured by the relative concentrations of export-producing industries at the two-digit Standard Industrial Classification level in all counties either wholly or partially within 50 miles of the Main Operating Base.

CRITERION RATIONALE: Induced inmigration may be minimized if many export-producing industry types are strongly represented locally and have the capacity to respond to project-related purchases.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.4: Preference was given to Main Operating Bases in areas with subgroup populations similar to those induced by project construction and operation.

CRITERION DEFINITION: Population similarity was measured in terms of the relative military and construction employment in all counties either partially or wholly within 50 miles of a Main Operating Base.

CRITERION RATIONALE: The extent to which the resident population matches the induced inmigrating population, in terms of the demographic characteristics defined above, will determine, in large part, the degree to which residents will notice change. It is assumed that assimilation of induced population could best occur in a host area containing larger populations with similar characteristics.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.2: Minimize Adverse Impacts on Public Finance

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.2.B.3: Preference was given to Main Operating Bases where areas of potential socioeconomic influence contain jurisdictions that exhibit an adequate taxing effort.

CRITERION DEFINITION: Taxing effort is an indicator of the ability of the local tax structure to respond to an increased need for public services. It is measured by the quotient of total own-source revenues over total local income in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Rapid growth often generates the need for increased capital and operating expenditures. Public entities that are constrained in their ability to raise tax revenues in the short term due to political or legal limitations may face fiscal adjustment problems. Areas with a relatively broad-based tax effort are able to capture more benefits (revenues) from the project.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.3: Minimize Impacts on Community Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.3.B.1: Preference was given to Main Operating Bases in areas with larger supplies of available housing.

CRITERION DEFINITION: Available housing supply is defined as the number of vacant dwelling units in all counties either wholly or partially withn 50 miles of a Main Operating Base.

CRITERION RATIONALE: An adequate housing supply can accommodate inmigration more readily by reducing the need for additional housing and related public services.

APPENDIX C

HARD MOBILE LAUNCHER AT MINUTEMAN FACILITIES

BASING MODE

MAIN OPERATING BASE EVALUATION

APPENDIX C

TABLE OF CONTENTS

APPENDIX C

LIST OF FIGURES

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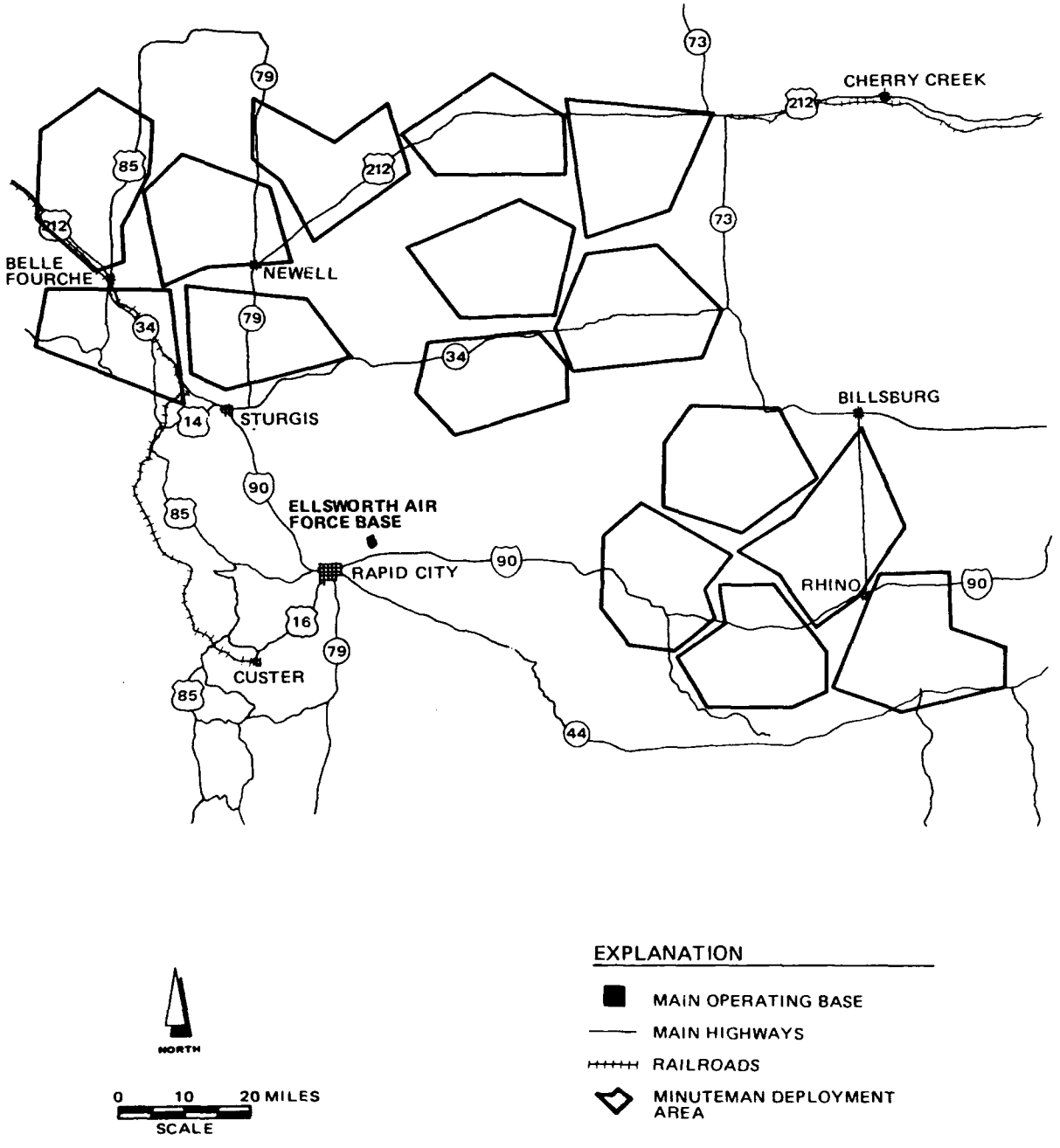


AREA NARROWING REPORT VOLUME II	ELLSWORTH AIR FORCE BASE, SOUTH DAKOTA	FIGURE C-1

C-1 Ellsworth Air Force Base, South Dakota

After evaluating the alternatives in relation to each other, Ellsworth Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. On-base land is available for construction of new facilities to support the Hard Mobile Launcher mission; however, existing housing has been infilled to the base boundary, and on-base housing expansion is restricted. The support community has a wide range of goods and services available. In addition, the base is served by a good transportation system.

Ellsworth AFB is located in southwestern South Dakota, 50 miles east of the Wyoming border and 9 miles northeast of Rapid City (Figure C-1). The base is presently home to the 44th Strategic Missile Wing and supports 150 Minuteman II missiles located within an approximately 4,790-square-mile area. The base also supports the 28th Bomb Wing, the B-52's being augmented with B-1 bombers, and 14 tenant units, including the U.S. Air Force Hospital and the 2148th Communications Squadron.

System Operability: The efficiency of Main Operating Base activities at Ellsworth AFB is expected to be enhanced by the installation's proximity to the community of Rapid City . The base military population

(approximately 6,000) indicates that the installation has a good on-base support system. Ellsworth AFB has available land for new support facilities, including land to expand its present Weapons Storage Areas/Stage Storage Area facilities. All land on the base is DoD fee owned.

The utility infrastructure at Ellsworth AFB is adequate for current base operations and could readily be expanded to accommodate the Hard Mobile Launcher system. Electrical power is supplied by the Western Area Power Administration. Present peak demand is 8,000 kW, with a total of 10,000 kW permitted by allotment. An additional 3,000 kW is available to the Main Operating Base from the Black Hills Power and Light Company. Heating is provided to some areas by natural gas (supplied by Montana-Dakota Utilities) and to other areas by small heating plants (oil-fired furnaces or steam boilers). The natural gas supply is adequate for current demand; additional capacity appears available to satisfy the needs of the Hard Mobile Launcher mission. The capacity of the base waste-water treatment plant was recently expanded to 3 million gallons-per-day, providing an excess capacity of 2 million gallons-per-day. Presently, collection and disposal of solid waste is provided by private contractor at a site 2 miles south of Rapid City. The

current site has a remaining lifespan of 15 years at the current rate of use. The present storm drainage system has four distinct drainage areas. The drainage system eventually drains into one of these areas and is then carried by natural drainage into Box Elder Creek, a tributary of the Cheyenne River. The system is adequate for the present base facilities. There is sufficient surface water available from present supply sources to meet increased demands on base. Water quality is good and water requires only conventional treatment for domestic use. Ground water is potentially available for appropriation, but the quality in some areas is poor and the water would require more than conventional treatment for domestic use.

Ellsworth AFB is served by a spur from the Chicago Northwestern Railroad, which is routed into the base's industrial areas for transporting stages of the Minuteman II missile system. The 13,497-foot, fully instrumented runway has the capacity to handle all aircraft types. Access to the base is provided by Interstate 90, which runs due south of the base. Five other U.S./State Highways access the missile fields.

Ellsworth AFB has good support services as indicated by the size and proximity of the support community and the

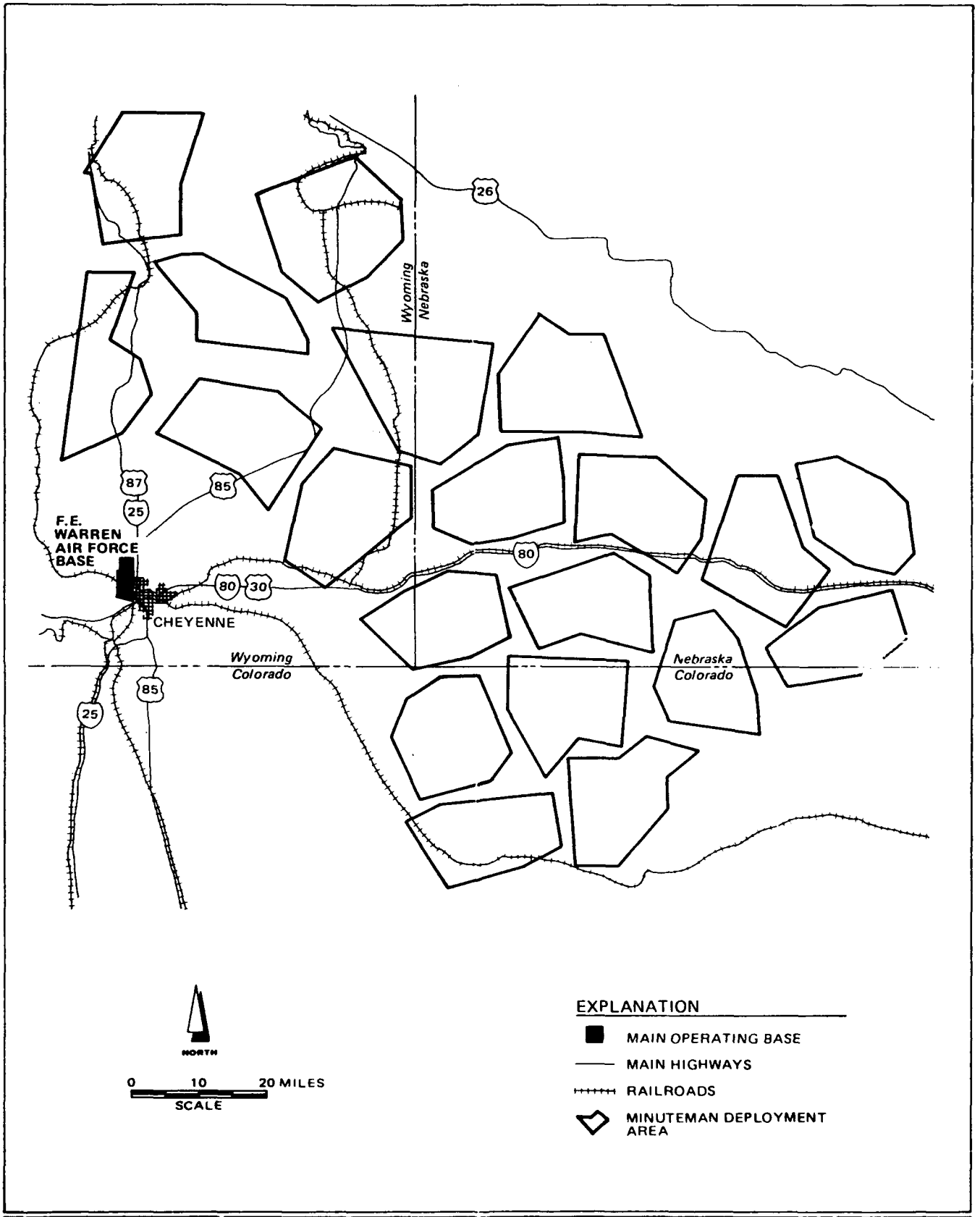
availability of housing units in the immediate vicinity of the base. Rapid City, the largest support community within 25 miles of Ellsworth AFB, has a population of approximately 46,500. Although some housing is available both on and off base, additional housing would be required to accommodate the Hard Mobile Launcher system personnel and their dependents. Existing housing on base has infilled to the installation boundary, and on-base expansion of the housing area is restricted.

Public Impacts: The present defense access routes between Ellsworth AFB and the deployment area have a total of 11.5 miles of highways that traverse urban areas. This public interface may increase concerns regarding security and public safety.

Sufficient surface and ground water is available in the support community of Rapid City to meet the increased demand of a project-related work force. Ground water quality may be poor in some locations and the water would require more than conventional treatment for domestic use.

The region of influence surrounding the Main Operating Base has a small urban population, most of which is concentrated in the Rapid City area. Although the urban population of the region is very low, which

implies limited goods and services, Rapid City can provide a variety of goods and services. Nonagricultural employment in the region indicates the potential for inmigration of project-related workers. Low regional employment in the construction and military sectors indicates that large numbers of inmigrant project workers would have backgrounds dissimilar to those of the resident population. The number of export-producing industries in the region indicates good economic diversity. Local governments in the region should be able to capture tax revenues to address potential expenditure demands. Available housing in the region is limited, but a reasonable supply is concentrated in the Rapid City area.



AREA NARROWING REPORT VOLUME II	F.E. WARREN AIR FORCE BASE, WYOMING	FIGURE C-2

C-2 F.E. Warren Air Force Base, Wyoming

After evaluating the alternatives in relation to each other, F.E. Warren Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. On-base land is available for construction of new facilities to support the Hard Mobile Launcher mission and the city of Cheyenne has a wide range of goods and services available. In addition, the base is served by a good transportation system.

F.E. Warren AFB is located in southeastern Wyoming, adjacent to and west of Cheyenne, the state capitol (Figure C-2). The Denver metropolitan area is approximately 90 miles to the south. The base is home to the 90th Strategic Missile Wing and currently supports 200 Minuteman III missiles within a 6,400-square-mile area. Replacement of 50 Minuteman III missiles with 50 Peacekeeper missiles has begun, and is scheduled to be completed in 1988.

System Operability: The community of Cheyenne is adjacent to F.E. Warren AFB and would enhance the efficiency of operations on the installation. The base military population (approximately 3,700) indicates that the installation has a good on-base support system. F.E. Warren AFB has available land for new support facilities, including land to expand it

present Weapons Storage Area/Stage Storage Area facilities. All land on base is DoD fee owned.

The utility infrastructure at F.E. Warren AFB is adequate for current base operations and could readily be expanded to accommodate the Hard Mobile Launcher system. Electrical power is presently supplied by the U.S. Department of the Interior, Bureau of Reclamation, and by the Cheyenne Light, Fuel, and Power Company. The system is operating at capacity but expansion has been planned to provide excess capacity. Heating is provided by natural gas (supplied by the Cheyenne Light, Fuel, and Power Company) and a relatively new coal-fired central plant. The systems have adequate capacity to satisfy the Hard Mobile Launcher mission demands. Waste-water treatment is provided by the city of Cheyenne and is adequate to meet present and projected future needs. The city's system capacity is 11 million gallons-per-day, while the average usage is 7.5 million gallons-per-day. Base usage averages 0.5 to 0.7 million gallons-per-day. Solid waste is collected and disposed of by private contractors in the Cheyenne landfill; the existing landfill capacity is adequate to meet future demands. The base storm drainage system is a network of piping, which is adequate to handle the runoff that occurs on base. Sufficient water would potentially be available from

the city of Cheyenne to meet the increased demands on base; however, increased use of community supply sources may cause local opposition. The quality of supply sources is good and only conventional treatment is required for domestic purposes.

The F.E. Warren AFB transportation system is good, but it lacks airfield facilities on base. The municipal airport, which is located 2 miles from the base, has a 9,200-foot, fully instrumented runway and is jointly used by the city of Cheyenne and F.E. Warren AFB. Highway access is provided by Interstate Highways 25 and 80, which bound the base to the east and south, respectively. Rail service is provided by three different lines, with a Colorado Southern Railroad line crossing the base.

F.E. Warren AFB has good support services as indicated by the size and proximity of the support community and the availability of housing on and in the immediate vicinity of the Main Operating Base. The base is adjacent to the city of Cheyenne, which has a population of approximately 47,000. On-base housing is limited and off-base housing availability may be affected by the highly competitive housing market.

Public Impacts: The present defense access routes between F.E. Warren AFB and the deployment area have 21

miles of highways that traverse urban areas. This public interface may increase public safety and security concerns.

Significant expansion of the present water supply system in the support community of Cheyenne would be required to meet the demand of the project-induced work force. Sufficient water may not be available from existing sources for use in the support community due to present commitments of water supply sources. Water quality is good, and only conventional treatment is required for domestic purposes.

Although the city of Cheyenne can provide a full range of goods and services, elsewhere in the region the availability of goods and services is limited. Nonagricultural employment in the region indicates the potential for inmigration of project-related workers. Low regional employment in the construction and military sectors indicates that large numbers of inmigrant project workers would have backgrounds dissimilar to those of the resident population. The number of export industries in the region indicates good economic diversity. Local governments in the region could not readily capture tax revenues to address potential expenditure demands. Available housing in the region is limited, but a reasonable amount is concentrated in the Cheyenne area.

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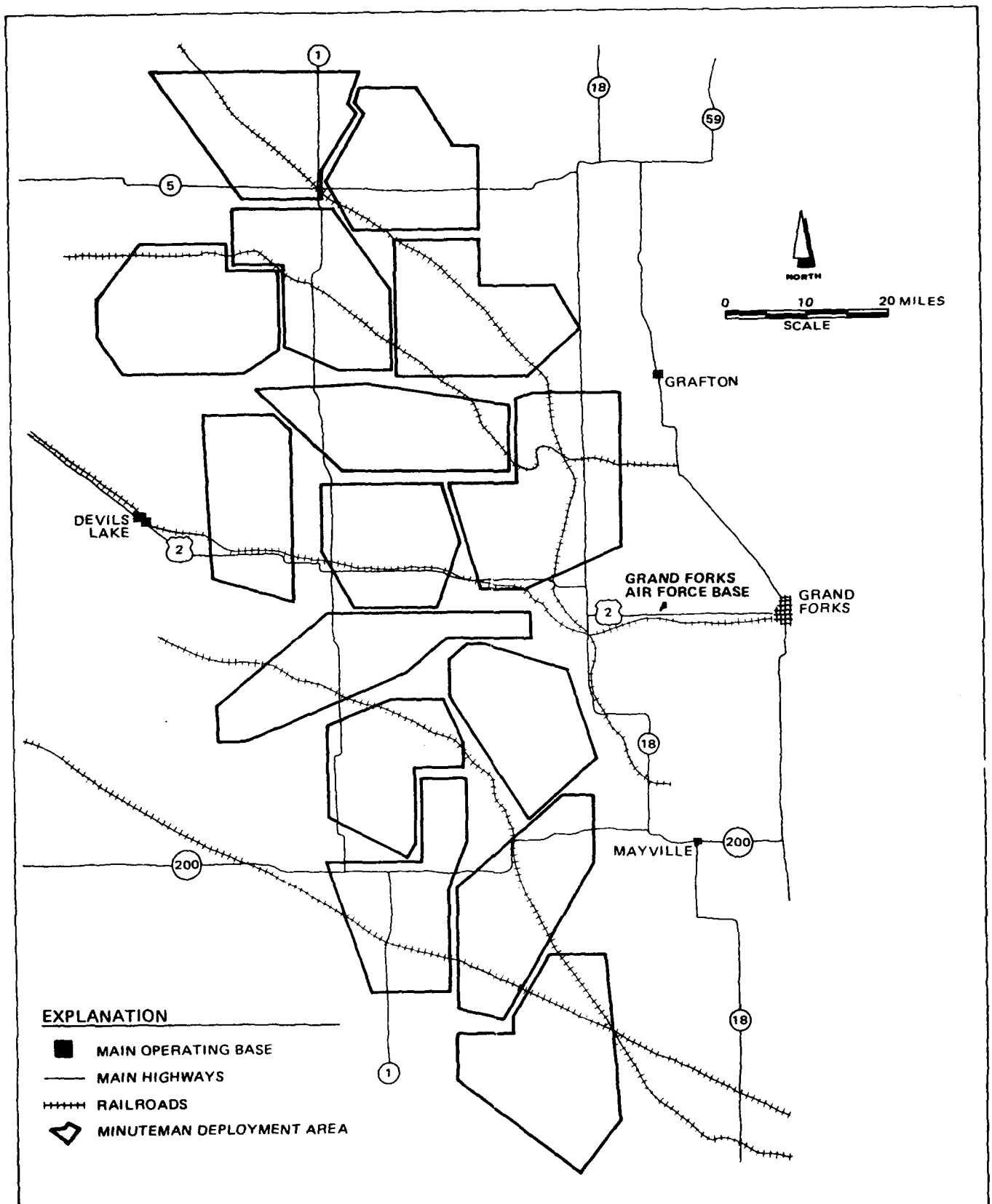

AREA NARROWING REPORT VOLUME II	GRAND FORKS AIR FORCE BASE, NORTH DAKOTA	FIGURE C-3

C-3 Grand Forks Air Force Base, North Dakota

After evaluating the alternatives in relation to each other, Grand Forks Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. The base has excellent existing air, rail, and highway transportation systems and adequate utility infrastructure capabilities. The base provides a large number of support services and facilities.

Grand Forks AFB is located in northeastern North Dakota, approximately 15 miles west of Grand Forks (Figure C-3). The base currently supports the 321st Strategic Missile Wing, made up of 150 Minuteman III ICBMs within an area of approximately 4,300 square miles. In addition, the base supports the 319th Bombardment Wing, which operates B-52G strategic bombers, new B-1 bombers, and KC-135A strategic refueling tankers.

System Operability: The efficiency of Main Operating Base activities is enhanced by the distance (15 road miles) to Grand Forks, the nearest community that can provide adequate goods and services. The base military population (approximately 5,500) indicates that there are a large number of existing on-base support facilities and services. Within the base limits, there is very little land available for expansion of

additional support facilities, including Weapons Storage Area/Stage Storage Area facilities; however, sparsely populated farmland is available adjacent to the base for such facilities. The base is entirely DoD fee-owned land.

The utility infrastructure at Grand Forks AFB is adequate for current base operations and could readily be expanded to accommodate the Hard Mobile Launcher system. Electrical power is supplied by the NODAK Rural Electrical Corporation through two substations on base (10,000 kVA each). The demand load is near 15,000 kVA. Heating is provided by a 40-megawatt electric boiler plant using a separate electrical supply from Minnetonka Cooperative. A standby, government-owned, No. 4 fuel, oil-fired boiler plant is available should the main boilers go off-line. The present heating plant capacity is 176 million BTUH. A new natural gas system, provided by Northern States Power, will deliver natural gas to 750 housing units when it is completed in 1986. The remainder of the cantonment area will continue to use the boiler plant. The on-base waste-water treatment facility is a two-stage, 177-acre lagoon system that discharges effluent into the Red River. Average flow is 770,000 gallons-per-day. Solid waste collection and disposal are performed by contract. The off-base landfill has a life expectancy

of 20 years. The base storm drainage system can handle major flows and spring thaw conditions adequately. There are no major flooding problems on base. Sufficient surface water is potentially available from the present supply source to meet increased demands on base. Water quality is good and water requires only conventional treatment. Ground water is potentially available for appropriation but the quality is poor in many areas and water may require more than conventional treatment for domestic use.

The Grand Forks AFB transportation network is excellent. The base has a fully instrumented, 12,350-foot runway. Highway access to the base is provided by Interstate 2, which runs east to Grand Forks. Access roads to the Minuteman Launch Facilities are maintained in operable condition year-round. A railroad spur enters the southeast area of the base and serves the existing Weapons Storage Area/Stage Storage Area facilities.

Grand Forks AFB is 15 miles from Grand Forks, which has a population of approximately 43,000. The city is the closest community that can provide adequate goods and services. Although on-base housing is inadequate to meet present requirements, a reasonable amount of housing is available in Grand Forks.

Public Impacts: Defense access routes between Grand Forks AFB and the deployment area have a total of 11.9 miles of highways that traverse urban areas. This interface may increase public safety and security concerns.

Sufficient surface water is potentially available in the support community of Grand Forks to meet increased demands of the project-induced work force. Water quality may be a limiting factor in some areas and water may require more than conventional treatment for domestic purposes.

Although the low urban population of the region implies limited goods and services, Grand Forks can provide a variety of goods and services. Nonagricultural employment in the region indicates the potential for inmigration of project-related workers. Low regional employment in the construction and military sectors indicates that large numbers of inmigrant project workers would have backgrounds dissimilar to those of the resident population. The number of export-producing industries in the region indicates good economic diversity. Local governments in the region should be able to capture tax revenues to address potential expenditure demands. Available housing in the region is limited, but a reasonable supply is concentrated in the Grand Forks area.

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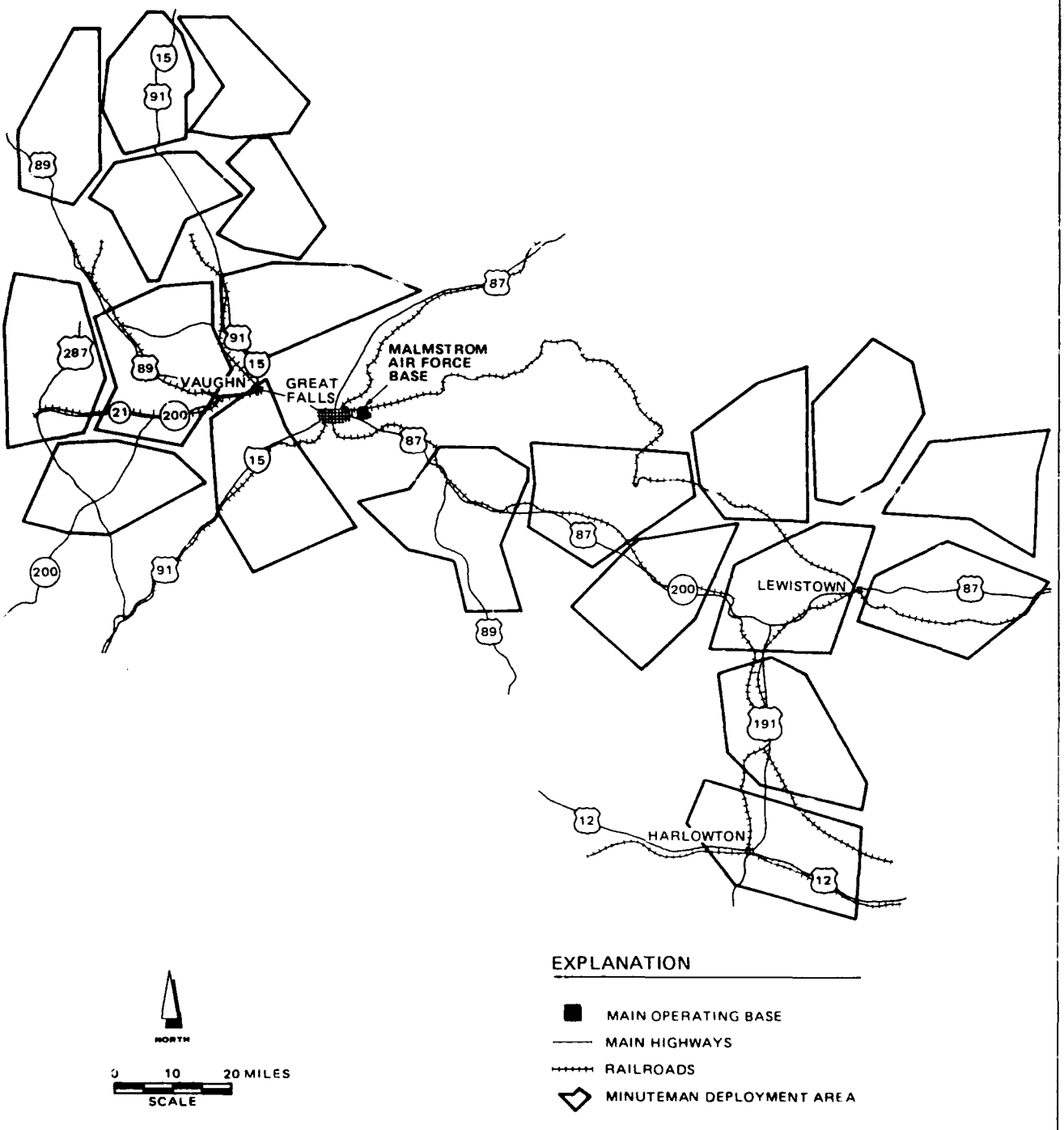


AREA NARROWING REPORT VOLUME II	MALMSTROM AIR FORCE BASE, MONTANA	FIGURE C-4

C-4 Malmstrom Air Force Base, Montana

After evaluating the alternatives in relation to each other, Malmstrom Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. On-base land is available for construction of new facilities to support the Hard Mobile Launcher mission and the base is served by good utility and transportation systems. A full range of goods and services is available in the adjacent city of Great Falls.

Malmstrom AFB is located in north-central Montana, about 2 miles east of the city of Great Falls (Figure C-4). The base supports 150 Minuteman II and 50 Minuteman III ICBM missiles within approximately 7,700 square miles. The host command is the 341st Strategic Missile Wing.

System Operability: The efficiency of Main Operating Base activities is enhanced by the proximity of Great Falls, the support community. The base military population (approximately 4,000) indicates that the installation has a good on-base support system. In addition, the availability of facilities has been increased as a result of a previous reduction in the base mission. Malmstrom AFB has available land for new support facilities, including land to expand its

present Weapons Storage Area/Stage Storage Area Facilities. Eighty-six percent of the land on the base is DoD fee owned.

The utility infrastructure at Malmstrom AFB is adequate for current base operations and could readily be expanded to accommodate the Hard Mobile Launcher system. Electrical power is supplied by the Montana Power Company. At present, the annual base and deployment area consumption is approximately 90 to 95 percent of the system capacity. The distribution system would need some expansion to support the new mission. Heating is provided by natural gas (supplied by the Great Falls Gas Company) and an on-base, coal-fired plant. The gas supply is adequate for present requirements and could be expanded to accommodate the Hard Mobile Launcher mission. Waste-water treatment has been provided by the city of Great Falls waste-water system since 1983, and the base treatment plant has been abandoned. The city's system is more than adequate for present and projected future demands; its capacity is 15.75 million gallons-per-day, while the average combined city and base usage is 9 to 10 million gallons-per-day. Solid waste is collected and disposed of by private contractor in the city landfill, located 3 miles north of the base; the existing landfill capacity is adequate to meet future

demands. The base storm drainage system consists of underground piping in the airfield and industrial areas and open ditches adjacent to the roads elsewhere. Drainage capacity is believed to be adequate. Sufficient surface water withdrawn from the Missouri River is potentially available to the base. Water quality is good and water requires only conventional treatment. Ground water is available by appropriation, but quality may be a limiting factor in some areas and the water may require more than conventional treatment for domestic purposes.

Malmstrom AFB is served by a good transportation system. The base airfield has an 11,500-foot, fully instrumented runway. Good highway access to the Main Operating Base is provided by U.S. Highway 89/87, which is south of the base. A railroad spur connects the base to a now-defunct railroad main line. At present, rail facilities are in good condition, but some maintenance would be required before use.

Malmstrom AFB has good support services as indicated by the size and proximity of the support community and the availability of housing on and in the immediate vicinity of the Main Operating Base. The base is adjacent to the city of Great Falls, which has a population of approximately 56,000 and provides

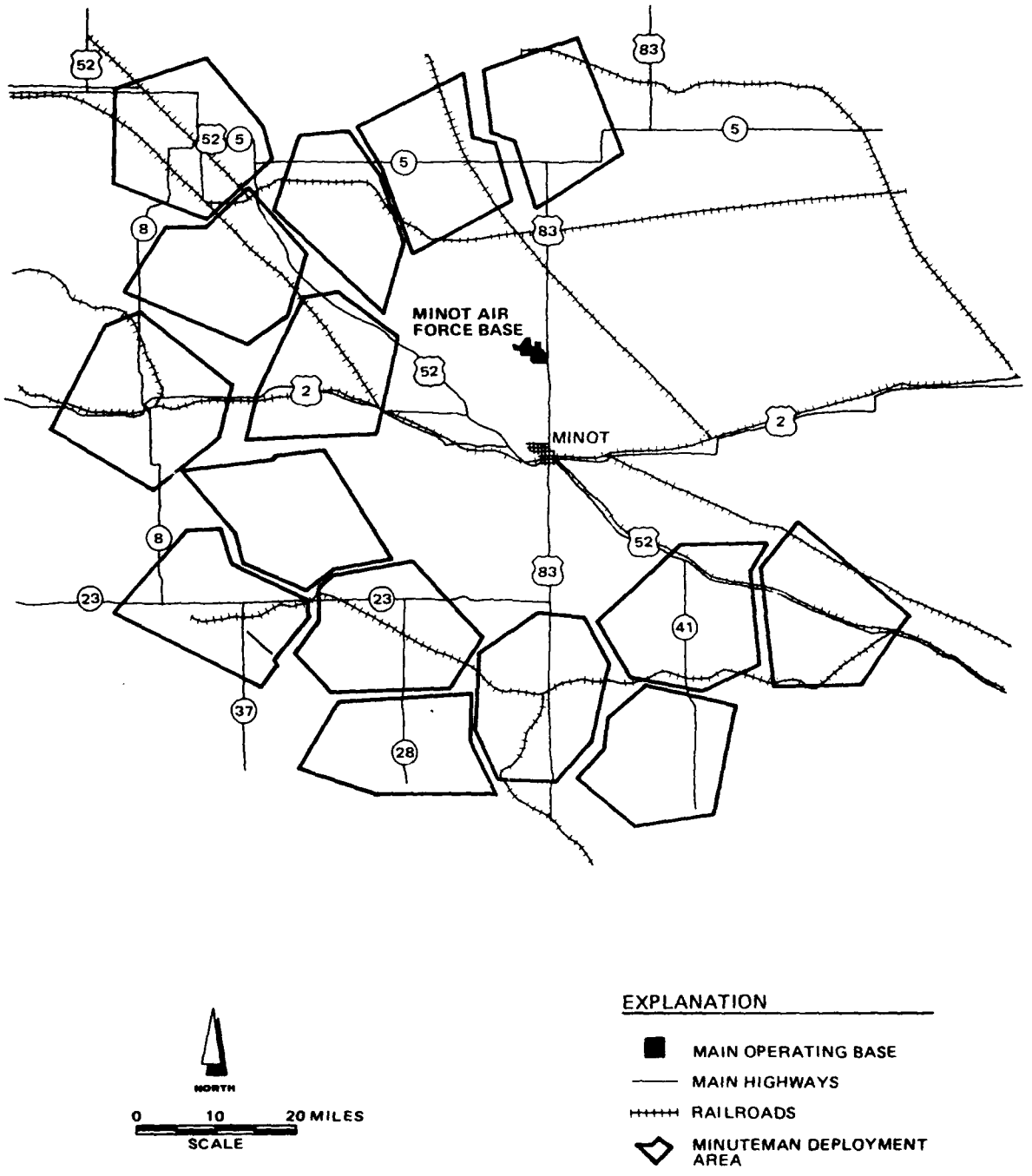
a reasonable amount of support services. Permanent base housing is almost totally occupied. Land on base is available for housing expansion. Off base, the adjacent community of Great Falls has a reasonable supply of housing.

Public Impacts: The present defense access routes between Malmstrom AFB and the proposed deployment area have 20 miles of highways that traverse urban areas. This public interface may increase safety and security concerns in these areas.

Sufficient surface water is potentially available to the support community of Great Falls from the Missouri River to meet the increased demands of the project-induced work force. Water is of good quality, requiring only conventional treatment. Ground water is also available, but quality may be a limiting factor in some areas and the water may require more than conventional treatment for domestic purposes.

Although the low urban population in the region implies limited goods and services, the city of Great Falls can provide a variety of goods and services. Nonagricultural employment in the region is low, indicating the potential for inmigration of project-related workers. Low regional employment in the construction and military sectors indicates that

large numbers of inmigrant project workers would have backgrounds dissimilar to those of the resident population. The number of export-producing industries in the region indicates good economic diversity. Local governments in the region may not be able to capture tax revenues to address potential expenditure demands. Available housing in the region is very limited, but a reasonable supply is concentrated in the Great Falls area.



AREA NARROWING REPORT VOLUME II	MINOT AIR FORCE BASE, NORTH DAKOTA	FIGURE C-5

C-5 Minot Air Force Base, North Dakota

After evaluating the alternatives in relation to each other, Minot Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. The base is served by good transportation and utility systems. A wide range of goods and services is available in the city of Minot.

Minot AFB is located in north-central North Dakota, approximately 13 miles north of the city of Minot (Figure C-5). Bismark, the state capital, is 130 miles to the south, and the Canadian border is approximately 45 miles to the north. The primary mission of the base is to support the 91st Strategic Missile Wing, which includes 150 Minuteman III missiles within approximately 3,800 square miles. The base also supports a bomber wing.

System Operability: The efficiency of Main Operating Base activities at Minot AFB is expected to be enhanced by the installation's proximity to the city of Minot, the nearest community with a wide range of goods and services. The base military population (approximately 6,100) indicates that the installation has a good on-base support system. Minot AFB has available land for new facilities, including land to expand its present Weapons Storage Area/Stage Storage Area

facilities; however, expansion of on-base housing is restricted. Land is available for expansion of mission support facilities on base with opportunity for future housing development off base. The majority of land on the base is DoD fee owned.

The utility infrastructure at Minot AFB is adequate for current base operations and could readily be expanded to accommodate the Hard Mobile Launcher system. Electrical power is supplied to the base by the Verendrye Electric Cooperative through two substations, which together provide 25,000 kVA. Present peak demand is only 60 percent of the system capacity. Natural gas is supplied by the Montana-Dakota Utilities Company, which supplies the base with interruptible gas. The base heating plant has a one-million-gallon fuel reserve in case of interruption of natural gas supplies to the base during periods of extremely cold weather. The base heating plant has a total annual capacity of 1,462,920 MBTU, which is more than three times the present annual usage. Waste-water treatment facilities on base are adequate to meet present demands, with an average estimated flow of approximately one million gallons-per-day. Improvements to the sewage collection system and expansion of the capacity of the lagoons are planned but have not yet been implemented. Solid wastes are hauled to an off-site landfill by a private

contractor. Due to the large amount of open land in the region, potential landfill expansion does not appear to be a problem. Storm runoff is carried in a system of concrete pipes and open ditches into three major ditches, which discharge off base into natural drainages. The storm drainage system is adequate for existing conditions but will require modification to accommodate an additional mission. There is sufficient ground and surface water potentially available to meet the increased demand on base. Ground water quality may be poor in some areas and the water may require more than conventional treatment for domestic purposes.

Minot AFB is served by a good transportation system. The base airfield consists of a fully instrumented, 13,200-foot runway. The base is adjacent to U.S. Highway 83, which has four lanes and provides good, generally uncongested, access to the base. The base is served by a rail spur maintained by the Burlington Northern Railroad.

Minot AFB has good support services as indicated by the size of the support community and the availability of housing in the vicinity of the Main Operating Base. The city of Minot (population about 33,000) is the nearest community to the base that is capable of providing a reasonable level of goods and services.

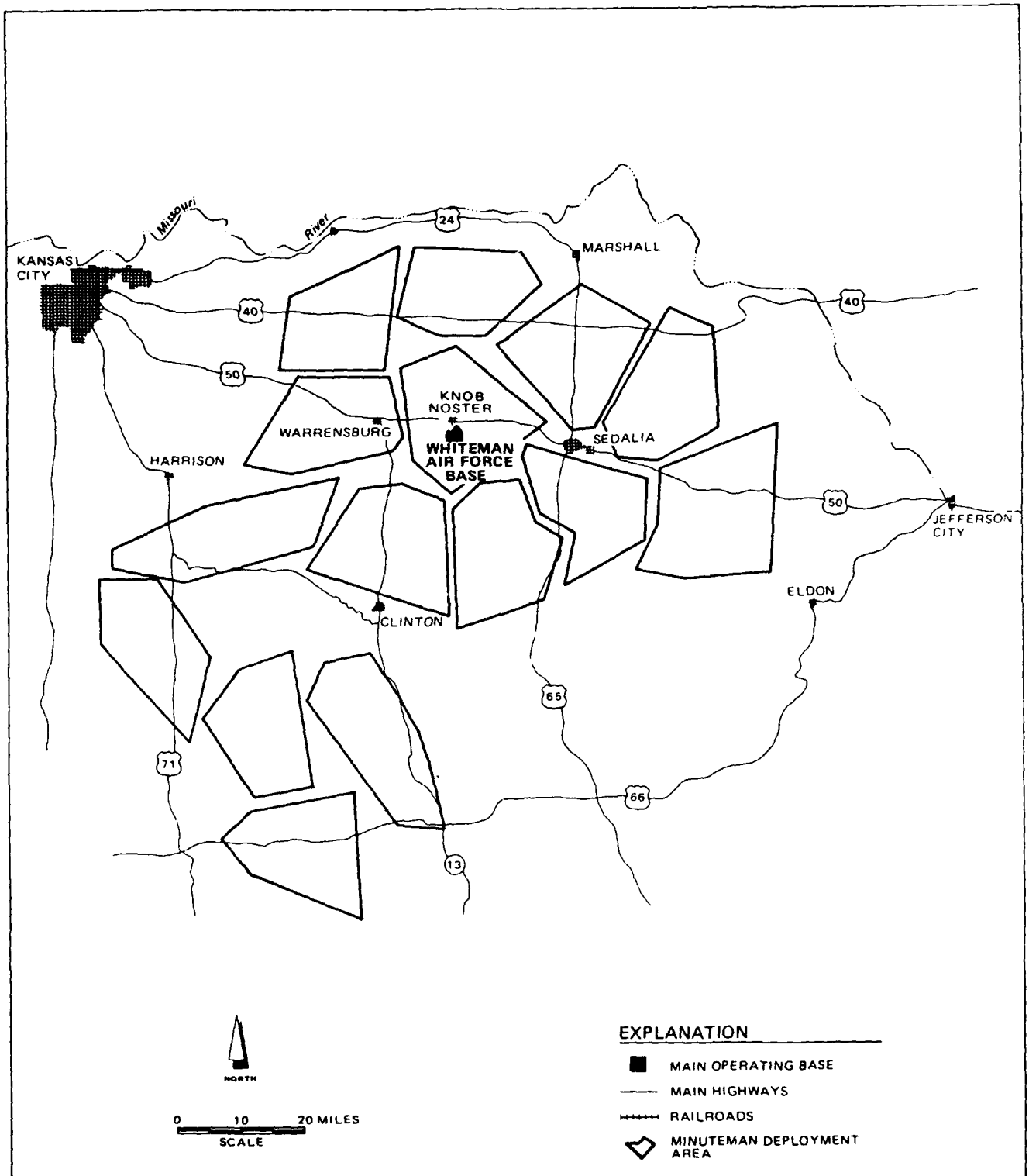
The approximately 2,500 housing units on base are in good condition, but the occupancy is usually 100 percent, with a variable waiting period.

Public Impacts: Defense access routes between Minot AFB and the deployment area have a total of 11.5 miles of highways that traverse urban areas. This public interface may increase public safety and security concerns.

Significant water level decreases have occurred in the support community area of Minot and the stream flow in the Souris River is normally inadequate to meet regional needs. Water shortages in the area may occur even without the addition of the Hard Mobile Launcher system. The quality of surface and ground water sources may be poor in some areas and water may require more than conventional treatment for domestic use.

Although the low regional urban population implies limited goods and services, the city of Minot can provide a variety of goods and services. Nonagricultural employment in the region is low, indicating the potential for inmigration of project-related workers. Low regional employment in the construction and military sectors indicates that large numbers of inmigrant project workers would have backgrounds dissimilar to those of the resident

population. The number of export-producing industries in the region indicates good economic diversity. Local governments in the region may not be able to capture tax revenues to address potential expenditure demands. Available housing in the region is very limited, but a reasonable supply is concentrated in the city of Minot.



AREA NARROWING REPORT VOLUME II	WHITEMAN AIR FORCE BASE, MISSOURI	FIGURE C-6

C-6 Whiteman Air Force Base, Missouri

After evaluating the alternatives in relation to each other, Whiteman Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. On-base land is available for construction of new facilities to support the Hard Mobile Launcher mission and the base is served by good utility and transportation systems. Many goods and services are available in the nearby community of Warrensburg and a wide range of services is available in Kansas City.

Whiteman AFB is located in west-central Missouri, 25 miles west of Sedalia and about 65 miles southeast of Kansas City, Missouri (Figure C-6). It is approximately 10 miles east of Warrensburg, the county seat, and 2 miles south of Knob Noster, the closest community to the base. The base is presently home to the 351st Strategic Missile Wing, and supports 150 Minuteman II missiles within an approximately 4,900-square-mile area.

System Operability: The efficiency of the Main Operating Base activities at Whiteman AFB is expected to be reduced by the installation's distance from Kansas City (approximately 65 miles), the nearest community with a wide range of goods and services. The base military population (approximately 3,000)

indicates that the installation has a good on-base support system. Whiteman AFB has some land available for new support facilities, including land to expand its present Weapons Storage Area/Stage Storage Area facilities. Approximately 90 percent of the land at the base is DoD fee owned.

The utility infrastructure at Whiteman AFB is adequate for current base operations and could readily be expanded to accommodate the Hard Mobile Launcher system. Electrical power is supplied by the Missouri Public Service Company. Transmission lines will allow an additional supply to the base of approximately 15 kV, but the existing base substation and distribution facilities require upgrading. This is scheduled under the FY 87 Military Construction Program. All base heating is provided by natural gas (supplied by the KPL Gas Service Company). The supply is adequate for present demands and could accommodate the Hard Mobile Launcher mission. Although rarely used, heating oil is provided for back-up heating. Waste water is treated on base in a plant with a capacity of 1.1 million gallons-per-day. Average usage is 600,000 gallons-per-day. This plant is only marginally adequate for present peak demands and would need to be expanded to accommodate the Hard Mobile Launcher mission. Solid waste is collected and disposed of by

private contractor in an off-base landfill site of limited capacity, but additional off-base sites are also available. The storm drainage system can accommodate additional flow and no flooding has occurred at the base. No portion of the base is within a 100-year floodplain. Sufficient ground water is available to meet increased demand on base. Water quality is good in the vicinity of the base and water requires only conventional treatment for domestic use.

Whiteman AFB is served by a good transportation system. The base airfield has a 12,400-foot, fully instrumented runway. The roadway system is adequate; U.S. Highway 50 lies approximately 2 miles to the north and connects to the base via State Highway 132. Both highways have light traffic. The base is served by a 2-mile long rail spur that connects directly to the Missouri Pacific Railroad main line at Knob Noster.

Whiteman AFB has limited support services, as indicated by the size of the local communities and the availability of housing on and in the immediate vicinity of the Main Operating Base. Warrensburg, the county seat, with a population of 13,000, and Sedalia, the largest city within 25 miles of the base, with a population of about 22,000, could provide some goods and services to base personnel. Little on-base housing

is available and additional housing expansion in agricultural lands off base will be required to accommodate an additional mission. Off base, there is an adequate supply of housing of most types at reasonable cost.

Public Impacts: The present defense access routes between Whiteman AFB and the deployment area have 28 miles of highways that traverse urban areas. This interface may increase public safety and security concerns.

Sufficient surface water is potentially available in the support community to meet the demands of a project-related work force. Surface water quality is good, requiring only conventional treatment. Sufficient ground water is available, but the quality is poor in some areas and the water may require more than conventional treatment.

The region of influence surrounding the Main Operating Base offers a reasonable range of goods and services. Nonagricultural employment in the region indicates the potential for inmigration of project-related workers. Low regional employment in the construction and military sectors indicates that large numbers of inmigrant project workers would have backgrounds dissimilar to those of the resident population. The

number of export-producing industries in the region indicates good economic diversity. Local governments in the region could capture some tax revenues to address potential expenditure demands. The surrounding region can provide only limited housing.