SEPTEMBER 1991

FINAL
ENVIRONMENTAL ASSESSMENT

CONVERSION OF THE MINUTEMAN II MISSILE SYSTEM TO THE MINUTEMAN III SYSTEM AT MALMSTROM AIR FORCE BASE, MONTANA

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, STRATEGIC AIR COMMAND
OFFUTT AFB, NE

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS STRATEGIC AIR COMMAND
OFFUTT AIR FORCE BASE, NEBRASKA 68113-5001

LY TO N OF: DEVP

UECT: Malmstom AFB: Final Environmental Assessment for Conversion of the Minuteman II Missile System to the Minuteman III System

TO: ALL INTERESTED GOVERNMENT AGENCIES, LIBRARIES, PUBLIC GROUPS, AND INDIVIDUALS

1. Attached is the Final Environmental Assessment (EA) for the Conversion of Minuteman II to III Missiles at Malmstrom Air Force Base, Montana. This document is made available to you in compliance with the regulations of the President's Council on Environmental Quality.

2. Libraries in the region of Malmstrom are asked to maintain this Final EA in their reference collection for public review. If additional copies are needed, please contact HQ SAC/DEVP, Offutt AFB, Nebraska 68113-5001, telepone (402) 294-3684.

George Gauger

GEORGE GAUGER, Chief
Environmental Planning Division
DCS/Engineering and Services

1 Attachment
Final EA

COVER SHEET

a. Responsible Agency: U.S. Air Force

b. Action: The Department of Defense (DoD) is proposing the phaseout of the Minuteman (MM) II missile system, the oldest deployed system in the intercontinental ballistic missile (ICBM) force, in accordance with expectations regarding arms reduction agreements and to enable DoD to maintain credible strategic deterrence at the least cost. The U.S. Air Force proposes to remove 150 MM II missiles from the launch facilities (LFs) in the deployment area of Malmstrom Air Force Base (AFB) and replace them with 150 MM III missiles. A slight adjustment to the missile umbilical would be made and the suspension system would be checked, and adjusted if necessary, to handle the slightly heavier MM III missile. Modified software would be loaded into each LF and launch control facility (LCF). Some operations and maintenance crews would undergo further training. Conversion under the proposed action would proceed sequentially from one missile squadron to another over a 6-year period starting in October 1991. The no action alternative would be to continue maintenance of the existing system.

c. For further information, contact:

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(402) 294-3684

d. Designation: Draft Environmental Assessment

e. Abstract: This document assesses the potential environmental impacts from the phaseout of the MM II missile system and subsequent conversion to MM III missiles at Malmstrom AFB, located near Great Falls, Montana. Continued operation of the current system without conversion would have a negligible impact on the environment. The proposed action would have an overall insignificant impact on the biophysical and human environment in the vicinity of Malmstrom AFB and throughout the deployment area. The phaseout and conversion process could cause short-term, insignificant impacts to the air quality from increases in emissions from transporter, maintenance, and support vehicles, and increases in fugitive dust at the launch facilities from additional activity. Any impacts to the geological, water, biological, and cultural resources, and to noise receptors are expected to be negligible, and would be similar to those incurred under existing operation and maintenance conditions. The transportation network may experience slight, adverse impacts from the increased number of trips to and from the base and the deployment area. Any potential increase in the accident rate would be negligible. As long as proper handling procedures are followed, there would be no significant impacts from handling hazardous or radioactive materials. The risk of an accident causing a release of hazardous or radioactive materials is negligible. There would be a negligible increase in military or civilian personnel; therefore, the local social and economic environment would not experience any noticeable impacts from the proposed action.

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EXECUTIVE SUMMARY

This Environmental Assessment, prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality NEPA regulations at 40 CFR 1500-1508, and Air Force Regulation 19-2 defining the Environmental Impact Analysis Process for the Air Force, evaluates the proposed phaseout and subsequent conversion of Minuteman (MM) II missiles to MM III missiles at Malmstrom Air Force Base (AFB), Montana. The purpose of and need for the proposed action is to remove the oldest system from the intercontinental ballistic missile (ICBM) force, while retaining the most cost-effective strategic deterrence in the context of the budget and resources available to the Department of Defense. The MM III system has improved accuracy and is more reliable than the MM II system.

The 341st Missile Wing (MW) operates and maintains the MM II missile system at Malmstrom AFB. The system includes 150 launch facilities (LFs) with one missile per LF, and 15 launch control facilities (LCFs) located throughout an extensive deployment area outside of the missile support base (MSB). The U.S. Air Force proposes to deactivate 150 MM II missiles from the LFs in the deployment area of Malmstrom AFB and replace them with 150 MM III missiles. A slight adjustment to the missile umbilical would be made and the suspension system would be checked and adjusted, if necessary, to handle the slightly heavier MM III missile. Software for use with the MM III system would be substituted for the existing software and loaded into each LF and LCF. Conversion under the proposed action would proceed sequentially from one missile squadron to another over a 6-year period starting in October 1991. A possible alternative to the proposed action is to continue maintenance of the existing system without conversion, also known as the no action alternative.

Under the proposed action, the missiles would be removed from the LFs using the same procedures as under current maintenance operations. The removal and transport of the missiles from the LFs would not introduce any new procedures or techniques; the same methods applicable to current operations would be applied to the proposed action. The procedures are proven and would involve experienced personnel. An average of two MM II missiles would be removed each month and replaced with the MM III missiles; however, weather conditions, equipment breakdown, personnel schedules, and holidays would cause the missile removal and transport rate to vary.

Once removed, the missile components would be transported to Malmstrom AFB. The rocket motors would be shipped from the missile support base to Hill AFB, Utah, and the guidance system would be shipped to Hill AFB, Newark Air Station, Ohio or to Pueblo Army Depot, Colorado. The procedures for shipping missile components are routinely followed as Minuteman II missiles are continually being refurbished and modernized. The MM system safety programs extend from concept development and system design, through deployment, operation, and transportation. In nearly 30 years of operating the Minuteman ICBM system, the Air Force has never experienced a mishap leading to a fire or explosion. The Air Force Logistics Logistics Command (AFLC) has prepared an environmental assessment on the handling, transportation, and storage of rocket motors. Based on the results of the study, a finding of no significant impact has been made.

The RVs are transported to Department of Energy (DOE) locations using safe, secure transport assets. The risk of impacts resulting from handling, transporting, and decommissioning reentry vehicles is negligible. The potential for a serious transportation accident is remote. The probability of a release of radioactive material is even less than the probability of an accident occurring. In the unlikely event that a serious transportation would occur, the predicted environmental impacts would be significant within the immediate accident vicinity. The risk of an accident, which is influenced by both the probability and consequences, is negligible.

The transport, maintenance, and support vehicles and facilities of the MM II system would be used for the same purposes to implement the proposed action as they are currently used. Adequate storage and handling facilities exist to facilitate the conversion. During the conversion process, the usage of particular vehicles would increase from approximately 20 missile recycles (removing one missile and emplacing another) per year to approximately 26 missile recycles per year (an increase of roughly 25 percent). Other missions in support of the MW, such as communications and operations, would incur a negligible increase in vehicle usage. Activities at each LF involving missile removal and emplacement would occur within the fenced security area.

The same Missile Handling Teams handle both the MM II and MM III systems; therefore, no additional training for these teams would be required if the MM II system was converted to a MM III system. However, two other groups that work with either the MM II or the MM III systems would need to undergo further training to perform their missions: the MM II missile combat crews would have to undergo a training program to monitor and operate the MM III system; and the Missile Maintenance Teams would require some training for maintenance of the MM III system.

The following areas of concern were included in an initial evaluation of the affected environment: air quality; geological resources; water resources; biological resources; archeological and cultural resources; health and safety/hazardous materials; noise; transportation; and socioeconomics. For these areas of concern, potential environmental consequences associated with the proposed action are evaluated and where applicable, mitigation measures are suggested. The no action alternative, continued operation of the MM II system, would not result in any new significant impacts. Other alternatives considered but eliminated from further evaluation include: changing the MW selected for conversion and/or phaseout, shortening the conversion process, lengthening the conversion process, or only converting one or two MSs. These alternatives were considered unreasonable because of the existing infrastructure at Malmstrom AFB to support a MM III conversion, the age of the MM II missiles, ranging and targeting capabilities, system hardness, Congressional direction, and the need to maintain strategic deterrence within the constraints of the DoD budget.

The evaluation of implementing the proposed action resulted in overall insignificant, if not negligible, impacts to the biophysical and human environment of Malmstrom AFB and throughout the deployment area. Any potential impacts to the geological, water, biological, and cultural resources, and to noise receptors would be negligible. A small number of security police (less than a one percent increase in personnel each year for two consecutive years) would be added to aid in the conversion process. Adequate housing and service capacity exist for the projected personnel increase. Thus, the local social and economic environment would not experience any significant impacts.

The local air quality along 10th Avenue South in Great Falls, MT would be insignificantly affected from a slight increase in the number of trips by the transporter-erector, maintenance, and support vehicles. Fugitive dust at the LFs may potentially increase from additional activity at the sites, but this would be an insignificant impact to the air quality.

Exposure to hazardous materials, particularly sodium chromate solution, during the proposed action could affect worker health and safety. However, the likelihood of this impact is negligible because of the low quantities of hazardous materials handled, the mechanics of the handling process, and the requirement to wear safety gear.

Adverse, yet insignificant impacts are anticipated to the transportation network, particularly along 10th Avenue South. The average number of trips by the transport, maintenance, and support vehicles would increase from approximately 20 missile recycles per year to approximately 26 missile recycles per year. However, other missions in support of the MW, such as communications and operations, would incur a negligible increase in vehicle usage. Although the number of trips would increase, the accident rate is expected to remain relatively constant with a negligible increase in accidents occurring. To minimize the potential of any impacts to local traffic, the majority of vehicle trips associated with the proposed action would occur during non-peak hours.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADT	Average Daily Traffic
AFB	Air Force Base
AFLC	Air Force Logistics Command
AFR	Air Force Regulation
AICUZ	Air Installation Compatible Use Zone
Al_2O_3	aluminum oxide
AREFW	Air Refueling Wing
ARS	Air Rescue Squadron
BMT	ballistic missile trailer
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES	Civil Engineering Squadron
CFR	Code of Federal Regulations
CO_2	carbon dioxide
CO	carbon monoxide
dBA	decibels by A-weighted scale
DE	Base Civil Engineer
DEU	diesel electric unit
DEV	Directorate of Environmental Management
DoD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
ECP	environmental compliance plan
EIAP	environmental impact analysis process
EIS	environmental impact statement
EO	Executive Order
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
FMMS	Field Missile Maintenance Squadron
FY	fiscal year

G&C	guidance and control system
GLEAMS	Groundwater Loading Effects Agricultural Management Systems
g/m	grams per meter
H_2O	dihydrogen oxide (water)
H_2S	hydrogen sulfide
HCl	hydrochloric acid
HICS	hardened intersite cable system
HMTA	Hazardous Materials Transportation Act
HQ SAC	Headquarters, Strategic Air Command
HUD	Housing and Urban Development
ICBM	Intercontinental Ballistic Missile
ID	Identification
IND	Inadvertent Nuclear Detonations
IRP	Installation Restoration Program
Kg	Kilogram
LCC	launch control center
LCF	launch control facility
L_{dn}	day-night average sound level
LF	launch facility
LFSB	launch facility support building
LITVC	liquid injector thrust vector control
LOS	level of service
MAC	Military Airlift Command
MCA	Montana Code Annotated
mg	milligrams
MGD	million gallons per day
MGS	missile guidance system
mg/L	milligrams per liter
µg/L	micrograms per liter
µg/M	micrograms per meter
µm	micrometers
MHT	missile handling team
MILE	Minuteman Integrated Life Extension Program
MIRV	multiple independently targetable reentry vehicle
M_L	PCB Marking Label
MM	Minuteman
MMH	monomethyl hydrazine
MMT	missile maintenance team
MPC	Montana Power Company

MS	Missile Squadron
MSB	Missile Support Base
MSDS	material safety data sheets
MT	missile transporter
MTAAQS	Montana Ambient Air Quality Standards
MW	Missile Wing
NAAQS	National Ambient Air Quality Standards
NCRPM	National Council on Radiation Protection Measures
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
N_2	nitrogen
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
OMMS	Operations Missile Maintenance Squadron
ORM	other regulated material
OSHA	Occupational Safety and Health Administration
PBCS	post boost control system
PCBs	polychlorinated biphenyls
ppm	parts per million
PSD	Prevention of Significant Deterioration
PSRE	propulsion system rocket engine
PT	payload-transporter
Pu	plutonium
RCRA	Resource Conservation and Recovery Act
RS	reentry system
RV	reentry vehicle
RVG&C	reentry vehicle guidance and control
SAC	Strategic Air Command
SFW	Strategic Fighter Wing
SGPB	bioenvironmental engineering
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SSCBM	shipping and storage container for ballistic missiles
SST	safe secure transport
SUPTG	Support Group

TCLP	toxicity characteristic leaching procedure
TE	transporter-erector
TSCA	Toxic Substance Control Act
TSP	total suspended particulates
U	uranium
USAF	United States Air Force
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNRC	United States Nuclear Regulatory Commission
UST	underground storage tank
UTTR	Utah Test and Training Range
WSA	weapons storage area
XRQ	Directorate of ICBM Requirements

DEFINITIONS

C-141—military transport plane used to transport rocket motors and other Minuteman missile components.

dBA—a measurement of sound levels according to the A-weighted scale which corresponds to human sensitivity to noise.

environmental impact statement (EIS)—document discussing potential environmental impacts of a proposed Federal action and alternatives to the action.

environmental assessment (EA)—an assessment of potential environmental impacts to determine whether or not an environmental impact statement must be prepared.

finding of no significant impact (FONSI)—a formal statement indicating that no significant impacts will occur as a result of proposed projects or actions.

launch control facility (LCF)—facility for monitoring and operating intercontinental ballistic missile systems. The facility has living quarters for missile crews and security police.

launch facility (LF)—an underground silo and support building for ballistic missiles.

L_{dn}—day-night average sound level corrected for the number of sound producing events and the time of day which they occur.

legal notice—publication of a government action in a newspaper or other media.

long-term impact—an impact occuring subsequent to or of longer duration than the proposed action.

Minuteman—three-stage, solid-propellant, rocket-powered ICBM.

missile guidance system (MGS)—provides computer guidance of reentry vehicle after launch of the missile.

mitigation—an action which could reduce the magnitude of a potential impact.

negligible impact—a barely noticeable, insignificant impact.

payload transporter—a vehicle used to transport the RV, MGS, and/or PSRE of a missile from the main operating base to the deployment area.

permit—license granting permission for an action.

post boost control system (PBCS)—a MM III unit containing the PSRE and missile guidance system.

propulsion system rocket engine (PSRE)—rocket engine used for vectoring reentry vehicles to its target(s).

recycle-the process of removing one missile and emplacing another missile.

reentry vehicle (RV)—unit which delivers warhead(s) to a target.

Rivet MILE—the Minuteman Integrated Life Extension program designed to extend the life of the Minuteman missile systems beyond their orignally conceived lifespan of 20 years.

reentry vehicle/guidance and control (RV/G&C) van—A vehicle used to transport the reentry vehicle and missile guidance set of a Minuteman II missile to or from the main operating base to the deployment area.

short-term impact— an impact occuring during a proposed action.

significant impact—an impact that would adversely effect the human environment to a noticeable extent.

state historic preservation officer (SHPO)—A designated person within the state historical preservation office that makes determinations regarding potential affects of activities on cultural and historical resources.

transporter erector (TE)—a vehicle used to emplace or remove ICBMs, and transport them to and from the main operating base and the deployment area.

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1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The Department of Defense (DoD) is contemplating phaseout of the Minuteman II (MM II) missile system, the oldest deployed missile system in the United States' intercontinental ballistic missile (ICBM) force. Older missiles such as the Titan I and II and MM I have been retired; phaseout of the MM II system would leave the newer MM III and more recently deployed Peacekeeper as the remaining elements of the ICBM force.

The first MM II missile system was activated in 1966, and the last was activated in 1972. The Air Force has been upgrading and modernizing the MM II system since its installation. The Air Force proposes to phaseout the MM II missile system in accordance with expectations regarding arms reductions agreements and to enable DoD to maintain credible strategic deterrence at the least cost. The DoD is planning to reduce the MM II expenditures beginning in November 1991. Minuteman II missiles would be retired over the next 6 years.

The MM II missile system, which includes launch facilities (LFs) and launch control facilities (LCFs), is operated and maintained by the 341st Missile Wing (MW) at Malmstrom Air Force Base (AFB) near Great Falls, Montana (50 MM III LFs are also included in the deployment area); the 351 MW at Whiteman AFB near Knob Noster, Missouri; and the 44 MW at Ellsworth AFB near Rapid City, South Dakota (figure 1.1-1). These three bases each maintain 150 MM II missiles in extensive deployment areas outside the missile support base (MSB).

This environmental assessment (EA) was prepared to evaluate the potential environmental impacts associated with the replacement of the MM II missiles with MM III missiles at Malmstrom AFB and some minor adjustments to the LFs. The potential environmental impacts of the proposed action and alternative(s) to the action must be evaluated according to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) implementing regulations [40 CFR 1500-1508], DoD Directive 6050.1, and Air Force Regulation (AFR) 19-2.

The Air Force plans to remove the MM II missiles at Malmstrom AFB starting in October 1991, at Ellsworth AFB starting in November 1991, and at Whiteman AFB starting in October 1994. The MWs at Ellsworth AFB and Whiteman AFB are planned to be phased out without conversion to the MM III system. The potential environmental impacts of these actions will be evaluated separately from the action at Malmstrom AFB. Although the actions will be evaluated separately, any potential cumulative impacts from these actions will be discussed in the separate analyses.

The Directorate of ICBM Requirements (XRQ) at Headquarters, Strategic Air Command (HQ SAC), Offutt AFB, Nebraska, has been designated the program manager with primary responsibility for the MM II system phaseout and conversion at the deployment

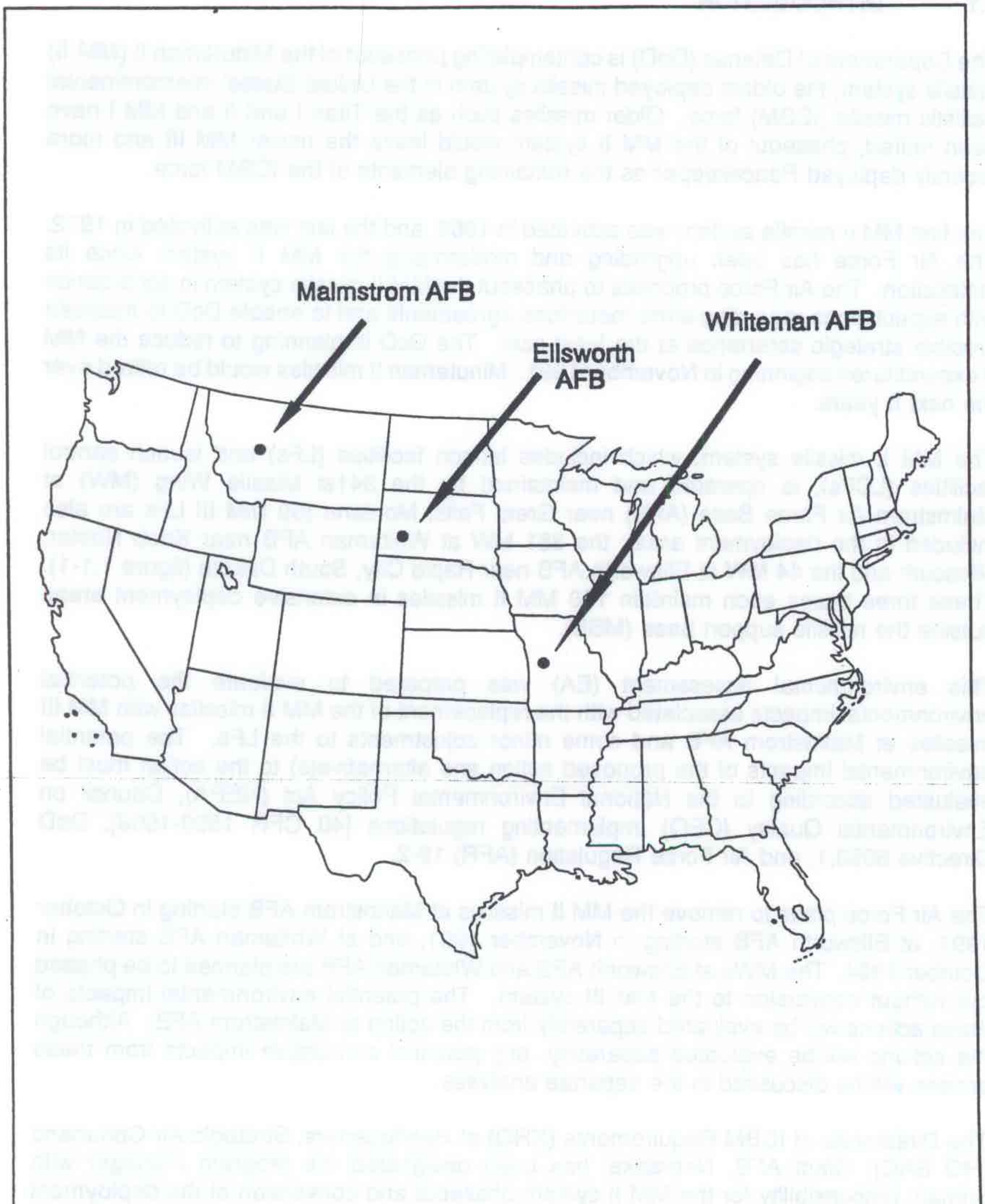


Figure 1.1-1 Location of Minuteman II Missile Systems

area and the MSB. HQ SAC/LGBX at Offutt AFB, and the 341 MW and 840th Support Group (SUPTG) at Malmstrom AFB are working with XRQ on the execution planning for the proposed action.

The missile system is operated and owned by two distinct entities. The Strategic Air Command is the custodian and operator of the MM II missile system whereas the single point weapons system manager is the Air Force Logistics Command (AFLC). For the phaseout and conversion process, SAC is responsible for removing the missile components from the LF, making minor adjustments at the LFs, and transporting the missile components to the MSB. The AFLC is responsible for transporting the MM II rocket motors and missile components, with the exception of reentry vehicles (RV), from the MSB to their final destination and transporting the MM III rocket motors and missile components (excluding the reentry systems (RSs)) from the logistic centers to the MSB. Transportation and disposition of missile components are governed by various regulations and specifications (see section 1.4). The AFLC has prepared an environmental assessment (EA) on the transport of the rocket motors from the MSB to Hill AFB, Utah and their storage at Hill AFB or the Utah Test and Training Range (USAF, 1991a). No new construction or land use changes would occur at Hill AFB and no new procedures would be implemented. The Air Force has been handling and transporting boosters for over 30 years and has an excellent safety record. The risk of an accident, which is influenced by both the probability and consequences, is negligible. The only change in the environment would be a slight increase in air, highway, and rail traffic during the duration of the deactivation/conversion programs. Over the long term, there would be an overall decrease in shipments between missile bases and Hill AFB. The AFLC EA concluded that there would be no significant impacts from the transportation and storage of rocket motors. Consequently, a finding of no significant impact has been signed. As recommended under regulations promulgated from NEPA, the AFLC EA is incorporated by reference (40 CFR 1502.21) into this EIS. Copies of the documents are available from Ogden Air Logistics Center at Hill AFB (phone number (801) 777-6918), HQ SAC/DEVP (phone number (402) 294-3684), and the 840th SUPTG/DEV at Malmstrom AFB (phone number (406) 731-6165). Chapter 5 of this EA discusses further details regarding the potential environmental impacts of rocket motor handling, movement, and storage, and the cumulative impacts of the Minuteman II activities at Malmstrom AFB, Ellsworth AFB, and Hill AFB. Appendix C of this EA further discusses safety concerns regarding the handling and transportation of rocket motors.

SAC owns the RVs and is responsible for them until they are retired. When RVs are scheduled for retirement, they are shipped to Department of Energy (DOE) facilities. If DOE transportation is backlogged, some of the RVs slated for retirement could be shipped by the Air Force to a DOE holding area; the identity and location of this area is classified. If they are shipped by DOE, they are DOE's responsibility when they leave the MSB. If they are shipped by the Air Force, they are the Air Force's responsibility until they arrive at DOE facilities. The impacts of RV retirement have previously been assessed in the <u>Final Environmental Impact Statement, Rocky Flats Plant Site, Golden, Colorado</u> (U.S. Department of Energy, 1977) and <u>Final Environmental Impact Statement,</u>

Pantex Plant Site, Amarillo, Texas (U.S. Department of Energy, 1983). These documents evaluated the impacts of nuclear weapon component production and the assembly, maintenance, and decommissioning of RVs. The Pantex document concluded direct measurable effects to the health and safety of the general public or adverse impacts to the environment are unlikely to occur from these activities. The plant will continue to operate according to DOE standards and no significant impacts to the health and safety of the general public are expected.

The transportation of radioactive materials in various environments has been evaluated in several studies: Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes (U.S. Nuclear Regulatory Commission (USNRC), 1977); Shipping Container Response to Severe Highway and Railway Accident Scenarios (U.S. Nuclear Regulatory Commission, 1987); Final Environmental Impact Statement, Rocky Flats Plant Site, Golden, Colorado (U.S. Department of Energy, 1977); and Final Environmental Impact Statement, Pantex Plant Site, Amarillo, Texas (U.S. Department of Energy, 1983). These studies concluded that the risks associated with such transportation are very low, although severe accidents in urban areas have the potential for large radiological and economic consequences. The analysis and findings of these studies are incorporated by reference (per 40 CFR 1502.21) into this EA. Copies of these documents are available from the National Technical Information Service (phone number (703) 487-4600), DOE (phone number (202) 586-8800), or NRC (phone number (202) 634-3273). Appendix C of this EA further discusses safety concerns regarding the handling and transportation of RVs.

1.2 LOCATION OF MALMSTROM AFB AND MISSILE DEPLOYMENT AREA

Malmstrom AFB is located in north central Montana, 1.5 miles east of Great Falls (figure 1.2-1). Interstate Highway 15 passes through Great Falls and access to Malmstrom AFB is along U.S. Highways 87/89. With a population of approximately 55,100 (Montana Department of Commerce, 1991), Great Falls is the only large population center near the base and it serves as the commercial and urban center for the region of influence for this analysis. The MSB encompasses about 3,659 acres of land in Cascade County. The MSB contains the flightline and related facilities, military family housing units, administrative offices, operational support facilities, strategic clinic, and other facilities. Malmstrom AFB has two primary missions, the 341 MW mission and the 301st Air Refueling Wing (AREFW) mission, both of which are supported by the 840 SUPTG and associated tenant functions (USAF, 1990a).

The deployment area of the 341 MW surrounds Great Falls, except to the northeast of the MSB (figure 1.2-1). The 50 MM III LFs and 5 LCFs of the 341 MW located in the northwest portion of the deployment area are not shown in figure 1.2-1, and are not included in further discussions of the deployment area because the area would not be affected by the proposed action or considered alternatives. The 150 MM II LFs and 15 LCFs are separated approximately 4 to 7 miles from each other and extend over approximately 6,000 square miles. Including the transportation and cable routes to and

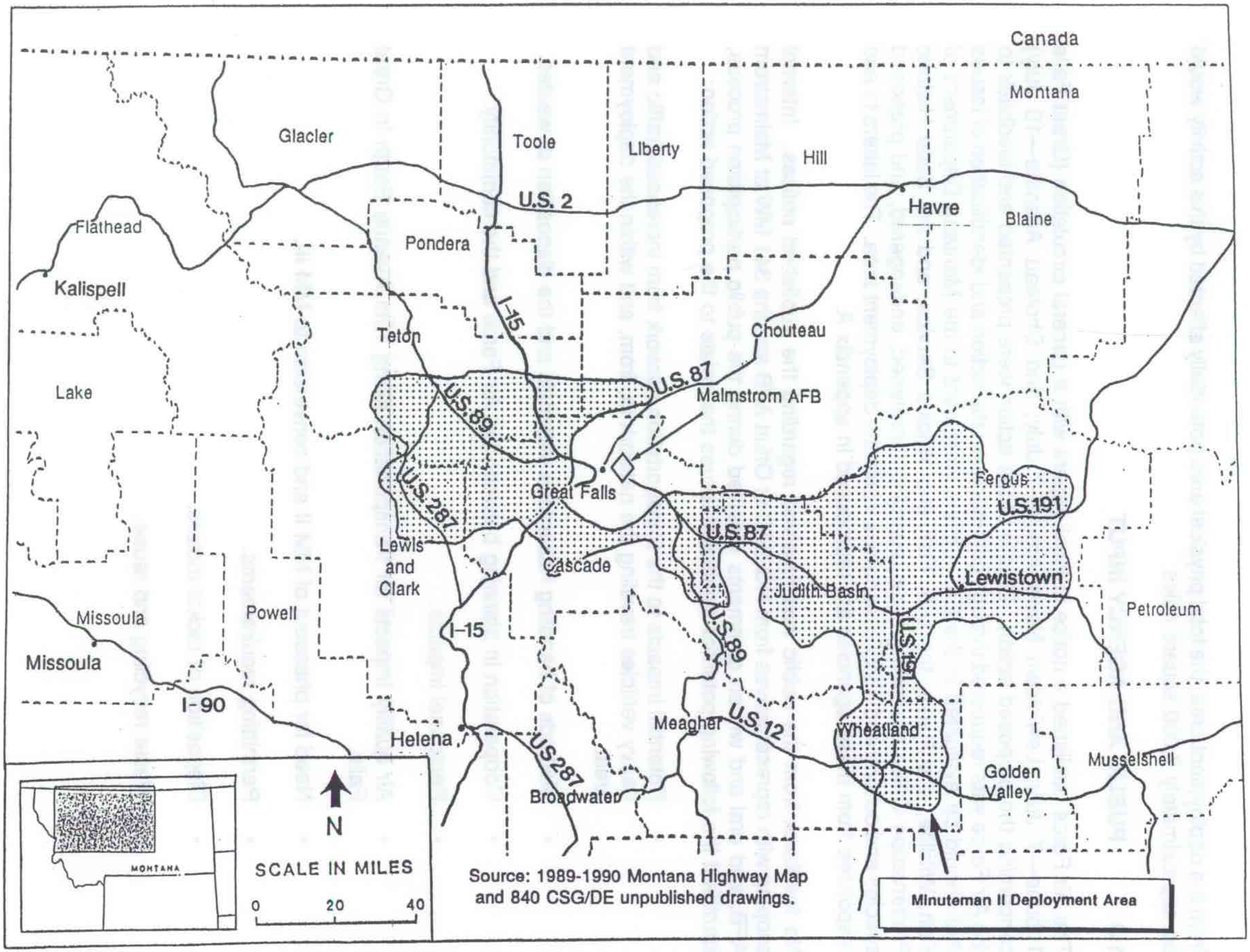


Figure 1.2-1 Malmstrom AFB and the Minuteman II Deployment Area

from the deployment area, the total physical area potentially affected by this activity would be approximately 7,000 square miles.

1.3 PUBLIC AND AGENCY INPUT

The Air Force published a notice in local papers with a general circulation (Great Falls Tribune—7 July; Lewistown News Argus—7 July; and Choteau Acantha—10 July) concerning the proposed action. Details of the action were presented and feedback to the Air Force was requested through comments on the action and identification of issues that should be evaluated in the EA. Letters were sent to the Montana Department of Fish, Wildlife, and Parks, the U.S. Fish and Wildlife Service, and the State Historic Preservation Office requesting input regarding threatened, endangered, and proposed species and cultural and historic resources within the deployment area. The letters to and responses from these agencies are reproduced in appendix A.

No feedback from the public was received regarding the published notices. Internal scoping with representatives from HQ SAC at Offutt AFB and the 341 MW at Malmstrom AFB, and oral and written comments received during the public participation process, identified the following potential significant issues that relate to the proposed action:

- Potential impacts to the transportation network from increased traffic and heavy vehicles traveling the network to, from, and within the deployment area.
- Methods of handling hazardous materials and the disposition of wastes.
- Cooperation in planning between the Air Force and the community.
- Personnel impacts.
- Air quality impacts for transportation along 10th Avenue South in Great Falls.
- Need for phaseout of MM II and conversion to MM III.
- Permitting requirements.
- Disposition of rocket motors.
- Waste recycling and reuse.

1.4 RELEVANT FEDERAL, STATE, AND LOCAL STATUTES AND GUIDELINES

A summary of the laws, regulations, executive orders (EO), and other types of requirements that may be applicable to the phaseout project is provided in the following paragraphs.

1.4.1 Environmental Policy

The National Environmental Policy Act of 1969 [42 United States Code (USC) 4321 et seq.] establishes national policy, sets goals, and provides the means to prevent or eliminate damage to the environment. NEPA procedures ensure that information about impacts to the human environment is available to public officials and citizens before decisions are made on major Federal actions that may significantly affect the environment. The *Council on Environmental Quality (CEQ) Regulations [40 Code of Federal Regulations (CFR) 1500-1508]* implement the procedural provisions of NEPA.

DoD Directive 6050.1 [32 CFR Part 214] establishes DoD policies and procedures to supplement the CEQ regulations promulgated from NEPA.

Air Force Regulation (AFR) 19-2 [32 CFR 989] establishes the Environmental Impact Analysis Process (EIAP) and the specific procedural requirements for Air Force implementation of NEPA.

EO 11514, Protection and Enhancement of Environmental Quality, as amended by EO 11991, sets policy for directing the Federal Government in providing leadership in protecting and enhancing the quality of the Nation's environment.

1.4.2 Air Quality

The *Clean Air Act (CAA) [42 USC 7401 et seq., as amended]* establishes Federal law to protect and enhance the quality of the Nation's air resources and to protect human health and the environment. The CAA requires, through a State-issued permit program, that adequate steps be taken to control the release of air contaminants and prevent significant deterioration of air quality. Under the CAA, most air pollutant-emitting modifications or new facilities require a permit. The CAA sets national primary and secondary ambient air quality standards as a framework for air pollution control. The CAA was recently significantly amended; the modifications are being evaluated by Federal, State, and local agencies. In addition to the requirements under the CAA, the *National Emission Standards for Hazardous Air Pollutants* establishes limits on new and existing sources that emit hazardous pollutants.

The *Montana Clean Air Act*, which essentially implements the Federal CAA, establishes ambient air quality standards to protect human health and the environment. The implementing regulations are contained in Montana Code Annotated (MCA) 16.801 through 16.8.822.

1.4.3 Water Quality

The *Clean Water Act of 1977* as amended by *The Water Quality Act of 1987 [33 USC 1251 et seq.]* establish Federal policy to restore and maintain the chemical, physical, and biological integrity of the Nation's waters and, where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

The act mandates that the Environmental Protection Agency (EPA) or federally authorized States to implement permit programs for regulating the discharge of pollutants to navigable waters (including wetlands) from any point source [the National Pollutant Discharge Elimination System (sec. 402)], and a permit system for the use of dredge and fill material (sec. 404).

The State of Montana has implemented the Federal Water Pollution Control Act (the Clean Water Act) in MCA 16.20.920 through 16.20.1347 (Montana pollution discharge elimination system—MPDES), 16.20.1001 through 16.20.1025 (groundwater pollution control), and 16.20.1401 through 16.20.1415 (pretreatment requirements).

The *Safe Drinking Water Act of 1974, as amended [42 USC 300f et seq.]* requires EPA to regulate public drinking water supplies by establishing drinking water regulations, delegating enforcement authority of drinking water standards to the States, and protecting drinking water supplies from the injection of wastes and other materials into wells. Drinking water standards were promulgated from the act by EPA. The *National Primary Drinking Water Regulations [40 CFR 141]* define maximum concentration limits of specified contaminants allowed in public water systems. The Federal Safe Drinking Water Act has been implemented by the State of Montana with MCA 16.20.101 through 16.20.260.

1.4.4 Biological Resources

The *Endangered Species Act [16 USC 1531-1543]* requires Federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of endangered or threatened species or destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on endangered or threatened species of fish, wildlife, and plants and their critical habitats and take steps to conserve and protect these species. All potentially adverse impacts to endangered and threatened species must be avoided or mitigated.

EO 11990, Protection of Wetlands, requires Federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect construction in wetlands if a feasible alternative is available. All Federal and federally supported activities and projects must comply with EO 11990.

1.4.5 Cultural, Paleontological, and Archaeological Resources

The primary goals of the *National Historic Preservation Act (NHPA) of 1966 [16 USC 470 et seq., as amended]; Historic Sites, Buildings, and Antiquities Act, as amended; and the Archaeological and Historic Preservation Act* are to ensure adequate consideration of the values of historic properties in carrying out Federal activities and to attempt to identify and mitigate impacts to significant historic properties. The NHPA is the principal authority used to protect historic properties; Federal agencies must determine the effect of their actions on cultural resources and take certain steps to ensure that these resources are located, identified, evaluated, and protected. *36 CFR 800* defines the responsibilities of the State, the Federal Government, and the Advisory Council on Historic Preservation (ACHP) in protecting historic properties identified in a project area. *36 CFR 60* establishes the National Register of Historic Places (NRHP) and defines the criteria for evaluating eligibility of cultural resources to the NRHP.

The *Archaeological Resources Protection Act of 1979 [16 USC 470a-47011, as amended]* protects archaeological resources on Federal lands. If archaeological resources are discovered that may be disturbed during site activities, the act requires permits for excavating and removing any archaeological resources.

The *American Indian Religious Freedom Act of 1978 [Public Law 95-341]* requires Federal agencies to consider Indian religious values when undertaking land use projects and is applicable to all site characterization activities that could directly or indirectly affect Native American sacred or religious sites.

1.4.6 Health and Safety/Hazardous Materials

EO 12088, Federal Compliance With Pollution Control Standards, directs Federal agencies to comply with State and local laws and regulations concerning air, water, and noise pollution, and hazardous materials and substances to the same extent as any private party.

The *Resource Conservation and Recovery Act of 1976 (RCRA) [42 USC 6901], as amended by the Hazardous and Solid Waste Amendments of 1984 [Public Law 98-616]*, is a comprehensive program for regulating and managing hazardous wastes (Subtitle C), nonhazardous solid wastes (Subtitle D), Federal procurement of reclaimed products (Subtitle F), and underground storage tanks (Subtitle I). RCRA requires Federal agencies to comply with all Federal, State, interstate, and local regulations respecting control and abatement of solid waste or hazardous waste disposal. EPA's most comprehensive regulations have been developed under the Subtitle C program that governs the generation, transportation, and treatment, storage, or disposal of hazardous wastes.

Montana's hazardous waste management program (contained in MCA 16.44.101 through 16.44.1017) is nearly identical to the Federal hazardous waste program under RCRA. However, Montana does have additional requirements including annual reporting and registration for hazardous waste transporters (in addition to obtaining an EPA identification number) that have principal offices or operations located in Montana.

The State of Montana has a comprehensive program that implements Subtitle I of RCRA. The requirements (contained in 16.45.101 through 16.45.1103) include proper design, construction, and maintenance of new underground storage tanks (USTs); upgrading of existing USTs to meet new tank standards; spill and overfill control; corrosion protection; reporting and recordkeeping; release detection; corrective action; public involvement; and closure. The owner or operator of any UST undergoing closure must notify the State in writing at least 30 days prior to such activity.

The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act [42 USC 9601 et seq.]* provides EPA with the authority to inventory, investigate, and clean up uncontrolled or abandoned hazardous waste sites. EPA has established a series of programs to clean up hazardous waste disposal and spill sites nationwide.

The State of Montana has enacted law (*Title 75, Chapter 10*) that institutes coordination with the Federal CERCLA program. The law primarily ensures that there will be adequate funds and activities for site remediation.

The *Toxic Substances Control Act of 1976 (TSCA)* requires EPA to regulate the use, storage, and disposal of polychlorinated biphenyls (PCBs), and prohibits production of these compounds after January 1979. Because TSCA is a preemptive federal law—the statute does not have a provision to authorize States to operate the program in lieu of the Federal government—PCBs are regulated only by EPA.

The *Occupational Safety and Health Act of 1971* created the Occupational Safety and Health Administration (OSHA) under the Department of Labor. The act grants the Secretary of Labor the authority to promulgate, modify, and revoke safety and health standards; to conduct inspections and investigations and issue citations, including penalties; to require employers to keep records of safety and health data; to petition the courts to restrain imminent danger situations; and to approve or reject State plans for programs under the act. The act also established the National Institute for Occupational Safety and Health (NIOSH), the principal Federal agency engaged in research to eliminate on-the-job hazards. NIOSH is primarily responsible for identifying occupational safety and health hazards and determining necessary changes to the encompassing regulations.

The *Installation Restoration Program* is a DoD program designed to identify, confirm, quantify, and remediate suspected problems associated with past hazardous material disposal sites on Air Force installations.

1.4.7 Noise

The *Noise Control Act of 1972 [Public Law 92-574], as amended by the Quiet Communities Act of 1978* establishes a Federal policy "to promote an environment free from noise harmful to health or welfare" and identifies desirable noise levels for residential areas. Federal agencies must also comply with State and local requirements for the control and abatement of environmental noise.

1.4.8 Land Use

EO 12372, Intergovernmental Review of Federal Programs, directs Federal agencies to consult with and solicit comments from State and local government officials whose jurisdictions would be affected by Federal actions.

EO 11988, Floodplain Management, requires each Federal agency to take action to reduce the risk of flood damage, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains. All Federal and federally supported activities and projects are required to comply with EO 11988. Specific compliance actions are required for activities planned within a defined 100-year floodplain.

The *Air Installation Compatible Use Zone (AICUZ) Program [AFR 19-9]* provides guidance to local communities for land use planning compatible with airfield operations. This Air Force program describes existing noise conditions and safety zones on and near the installation.

1.4.9 Transportation

The *Hazardous Materials Transportation Act (HMTA) of 1975 [49 USC 1761]* authorizes the Secretary of Transportation to protect public health from the risks of transporting hazardous materials. These materials include explosives, flammable liquids and solids, combustible and corrosive materials, and compressed gases. The transportation of all hazardous materials must meet requirements of the HMTA. Regulations promulgated by the U.S. Department of Transportation include requirements for packaging, handling, labeling, placarding, and shipping procedures for hazardous materials. RCRA contains additional requirements for generators and transporters of hazardous waste.

AFR 136-2, The Logistics Movement and Handling of Nuclear Cargo and the *Department of Energy/Defense Nuclear Agency Technical Publication 4551* govern the shipment of reentry vehicles from the MSB to their destination. Department of Defense Directive 4540.5, Movement of Nuclear Weapons by Noncombat vehicles, also governs transportation of reentry vehicles.

AFRs 76-1 and 122-4 govern the shipments of the missile guidance system (MGS). Shipments of classified MGS components, which must be escorted, are managed under

AFR 122-4. AFR 76-1 governs unescorted shipments of unclassified MGS components. Truck shipments of MGS components are regulated under *AFR 75-1.*

AFRs 75-1 and 75-2 govern the surface transport of rocket motor components. *AFR 71-4* regulates logistic air shipments of rocket motor components.

1.5 DECISIONS NEEDED

There are two main decisions to be made as a result of this document: whether to implement the proposed action or an alternative to the proposed action; or whether an environmental impact statement (EIS) is required to evaluate in detail the potential impacts of the proposed action and the no action alternative (40 CFR 1501.4) or whether a finding of no significant impact (FONSI) may be issued (40 CFR 1508.13). Necessary mitigation steps to prevent significant environmental impacts from occurring, as well as those that could be used to diminish the intensity of a non-significant impact, are defined by resource element within chapter 4.

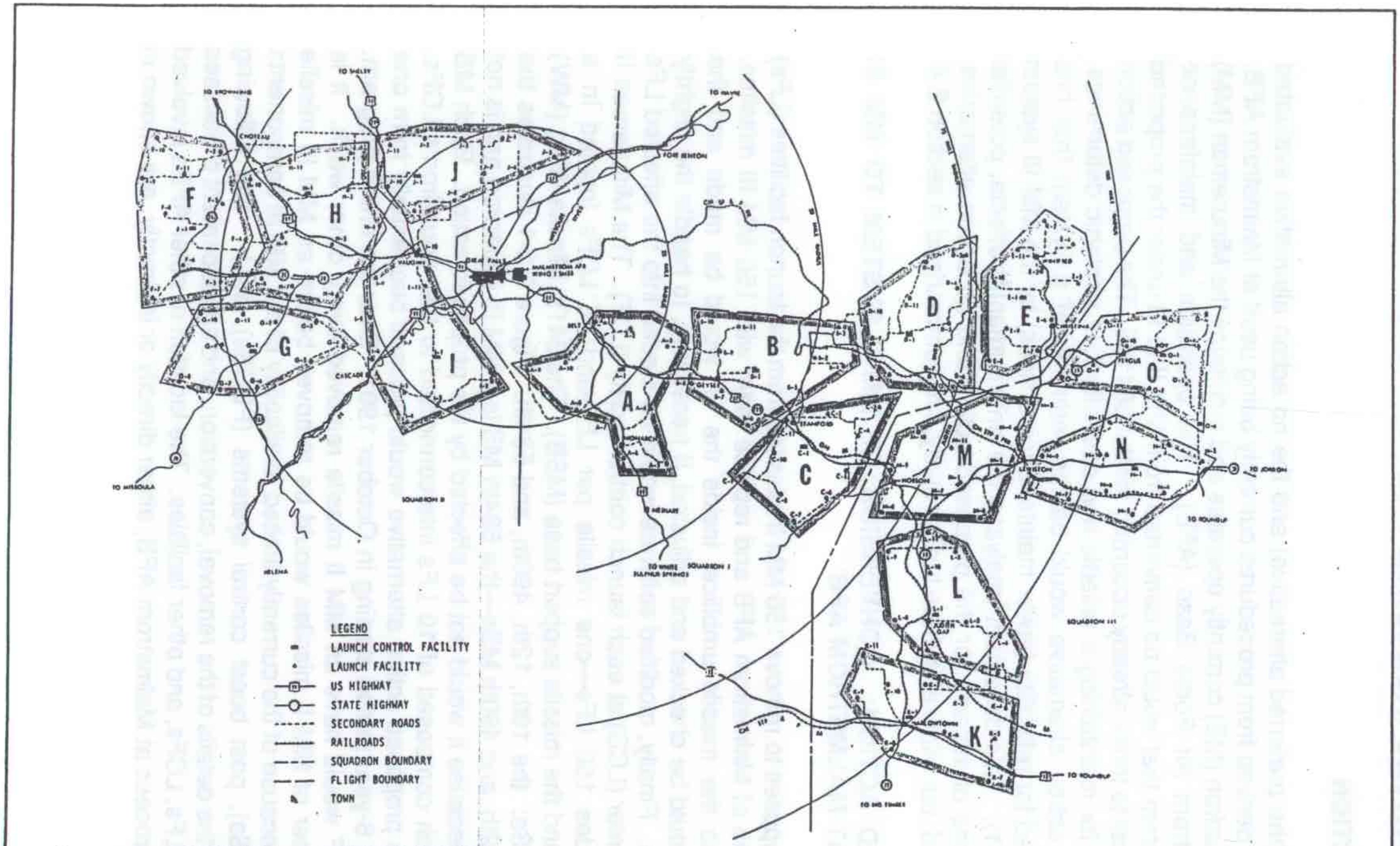
2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

The proposed action (the preferred alternative) and the no action alternative evaluated in this document were derived from procedures currently being used at Malmstrom AFB. The 564th Missile Squadron (MS) currently operates and maintains the Minuteman (MM) III missiles at Malmstrom Air Force Base (AFB). The operation and maintenance procedures for the system that would be converted from MM II to III under the proposed action would be identical to those already occurring for the 564 MS. The proposed action responds to the need for maintaining a reliable and cost-effective strategic deterrence. Implementing the no action alternative would be the retention of a system that has already been surpassed for reliability (fewer maintenance actions) by the MM III system (341 MW/MBMS, 1991). This document analyzes the environmental effects, potential impacts, and mitigations of impacts for the proposed action and no action alternative. Alternatives considered, but eliminated from further study, are summarized in section 2.4.

2.2 PROPOSED ACTION: CONVERSION OF MM II SYSTEM TO MM III SYSTEM AT MALMSTROM AFB

The U.S. Air Force proposes to remove 150 MM II missiles from the launch facilities (LFs) in the deployment area of Malmstrom AFB and replace them with 150 MM III missiles. A slight adjustment to the missile umbilical inside the LF would be made and the suspension system would be checked and adjusted, if necessary, to handle the slightly heavier MM III missile. Finally, modified software would be loaded into the affected LFs and launch control center (LCC) at each launch control facility (LCF). The Minuteman II missile system includes 150 LFs—one missile per LF—and 15 LCFs located in a deployment area around the missile support base (MSB). The 341st Missile Wing (MW) is made up of four MSs: the 10th, 12th, 490th, and 564th. Figure 2.2-1 illustrates the location of the 10th, 12th, and 490th MSs—the 564th MS is a MM III squadron and is not shown on the figure because it would not be affected by the proposed action. Each MS includes 5 flights, each composed of 10 LFs interconnected to that squadron's LCFs. Conversion under the proposed action alternative would proceed sequentially from one MS to another over a 6-year period starting in October 1991. Over the entire program, approximately one LF would have an MM II missile removed every other week. It is probable that a number of MM II missiles would be removed before an MM III missile would be emplaced because of the currently limited availability of the MM III components (reentry systems (RSs), post boost control systems (PBCSs), etc.). The following subsections describe the details of the removal, conversion, and emplacement processes at the MSB facilities, LFs, LCFs, and other facilities. The location of other AFBs involved with the conversion process at Malmstrom AFB, either directly or indirectly, are shown in figure 2.2-2.



Source: 840 CSG/DE unpublished drawings.

Figure 2.2-1 Location of the Minuteman II ICBM System and Missile Squadrons Overseen by Malmstrom AFB

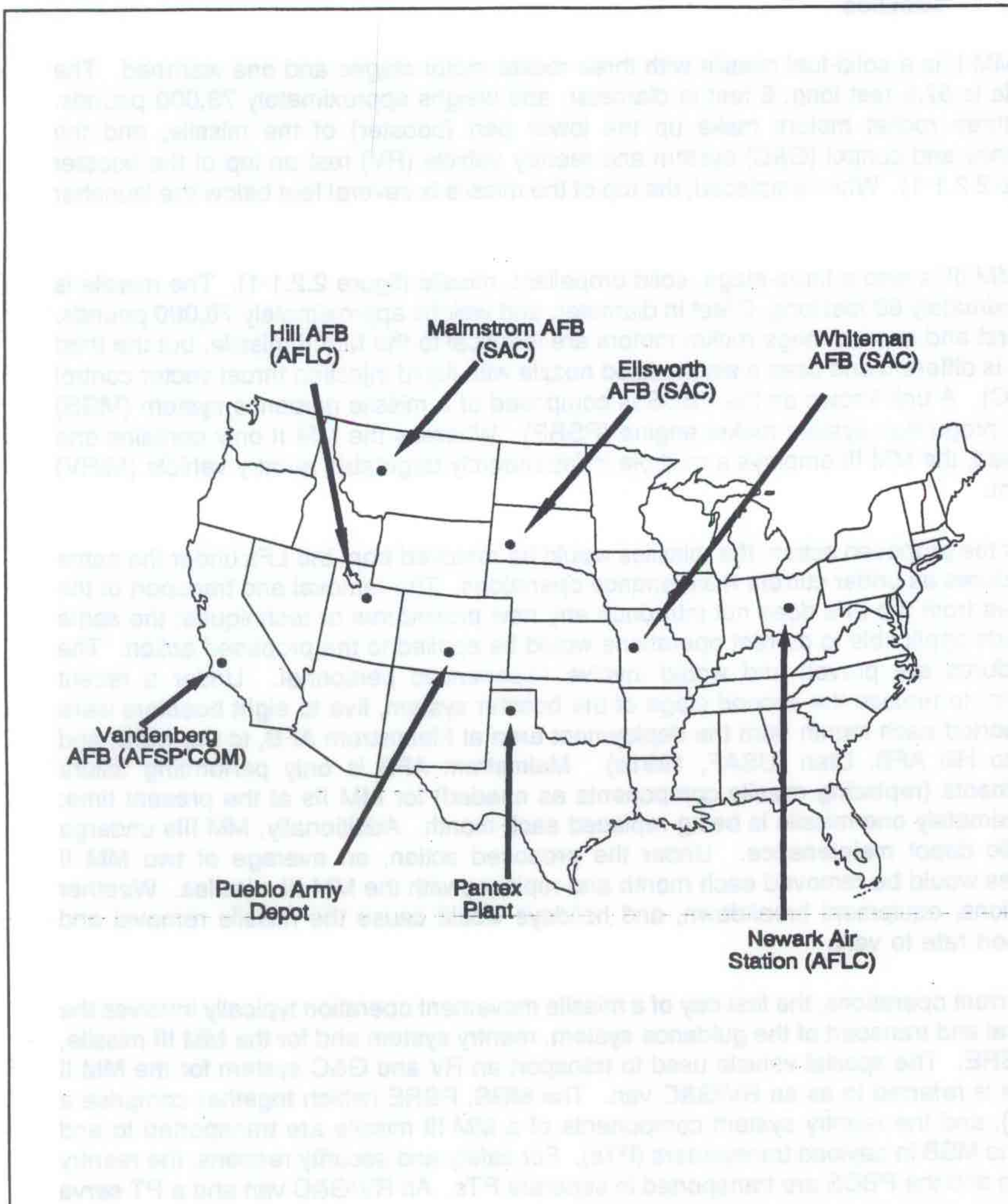


Figure 2.2-2 Location of Facilities Directly and Indirectly Involved in the Minuteman II System Phase-out/Conversion at Malmstrom AFB.

2.2.1 Missiles

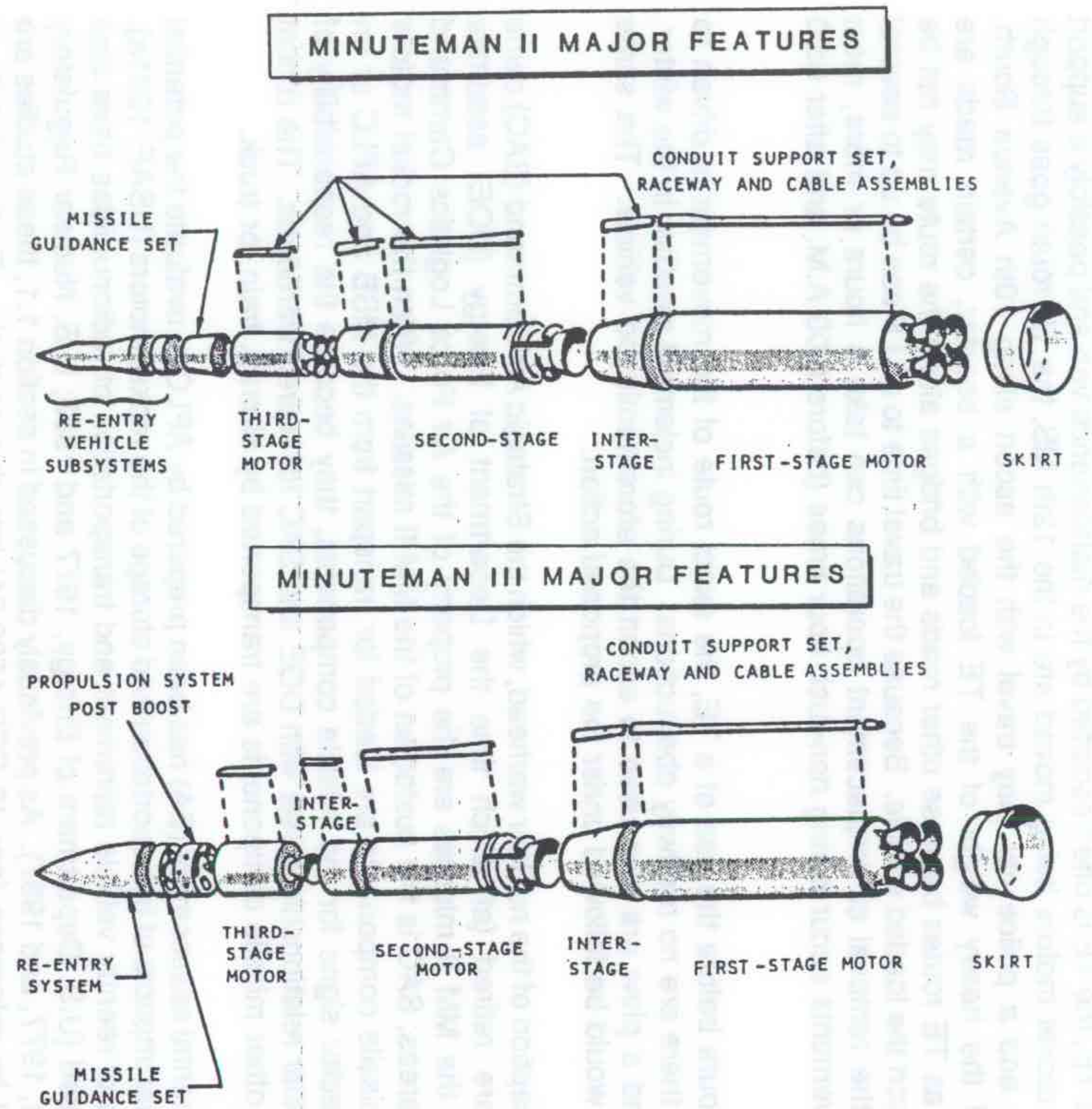
The MM II is a solid-fuel missile with three rocket motor stages and one warhead. The missile is 57.6 feet long, 6 feet in diameter, and weighs approximately 73,000 pounds. The three rocket motors make up the lower part (booster) of the missile, and the guidance and control (G&C) system and reentry vehicle (RV) rest on top of the booster (figure 2.2.1-1). When emplaced, the top of the missile is several feet below the launcher door.

The MM III is also a three-stage, solid propellant, missile (figure 2.2.1-1). The missile is approximately 60 feet long, 6 feet in diameter, and weighs approximately 78,000 pounds. The first and second stage rocket motors are identical to the MM II missile, but the third stage is different and uses a single, fixed nozzle with liquid injection thrust vector control (LITVC). A unit known as the PBCS is comprised of a missile guidance system (MGS) and a propulsion system rocket engine (PSRE). Whereas the MM II only contains one warhead, the MM III employs a multiple independently targetable reentry vehicle (MIRV) system.

Under the proposed action, the missiles would be removed from the LFs under the same procedures as under current maintenance operations. The removal and transport of the missiles from the LFs does not introduce any new procedures or techniques; the same methods applicable to current operations would be applied to the proposed action. The procedures are proven and would involve experienced personnel. Under a recent program to replace the second stage of the booster system, five to eight boosters were transported each month from the deployment area at Malmstrom AFB, to the MSB, and then to Hill AFB, Utah (USAF, 1991a). Malmstrom AFB is only performing failure movements (replacing missile components as needed) for MM IIs at the present time; approximately one missile is being replaced each month. Additionally, MM IIIs undergo periodic depot maintenance. Under the proposed action, an average of two MM II missiles would be removed each month and replaced with the MM III missiles. Weather conditions, equipment breakdown, and holidays would cause the missile removal and transport rate to vary.

For current operations, the first day of a missile movement operation typically involves the removal and transport of the guidance system, reentry system and for the MM III missile, the PSRE. The special vehicle used to transport an RV and G&C system for the MM II missile is referred to as an RV/G&C van. The MGS, PSRE (which together comprise a PBCS), and the reentry system components of a MM III missile are transported to and from the MSB in payload transporters (PTs). For safety and security reasons, the reentry system and the PBCS are transported in separate PTs. An RV/G&C van and a PT serve the same purpose, but for different missiles.

Once the RV/G&C van (for MM II operations) and PTs (for MM III operations) are properly prepared for movement, the vehicle(s) leave the site escorted by security forces to counter potential threats the vehicle might encounter while enroute to the MSB. Any



Source: U.S. Air Force, 1988

Figure 2.2.1-1 MM II and MM III Missile Stages

maintenance vans carrying materiel and personnel that were involved in removing the reentry vehicle, guidance, and PSRE systems are not part of the convoy. It is likely that there will only be one van per site during this phase of the removal action.

Sometime after the RV and MGS are removed, a special vehicle known as a transporter-erector (TE) would arrive at the LF with a maintenance vehicle and maintenance personnel. Either the MM II or MM III rocket motors can be removed and transported by the TE. The TE container can move from a horizontal to vertical position, then a cable hoisting system can lower or raise the booster. Once the rocket motors are removed and stored in the TE, the TE is often escorted by the maintenance van and possibly a support van. If the rocket motors being moved are in the 12th MS, the TE route goes through Great Falls and a police car may travel with the escort along 10th Avenue South. Because of the heavy weight of the TE loaded with a booster, certain roads are designated as TE routes because other roads and bridges along the route may not be able to support the loaded vehicle. Because the travel time to an LF can be up to several hours and the removal or emplacement operations can take 8 hours or more, most convoy movements occur during non-rush hour times (before 6:00 A.M. and after 6:00 P.M.).

Within 24 hours before the use of a TE, the exact route of the movement is driven to ensure that there are no roadway obstructions. During inclement weather in the winter, a sander and a plow are also used to escort the aforementioned vehicle. The same procedures would be followed under the proposed action.

With the exception of the nuclear warhead, which the Strategic Air Command (SAC) owns until they are retired (at which time the Department of Energy (DOE) assumes ownership), the MM II missiles are the property of the Air Force Logistics Command (AFLC), whereas, SAC is the custodian of the MM II missiles. When the rocket motors and other missile components are loaded for transport from the MSB and AFLC or an AFLC contractor signs for the missile components, they become the responsibility of AFLC; a similar relationship exists with DOE and SAC for retired warheads. The rocket motors and other missile components are transported by aircraft, train, or truck.

An environmental assessment (EA) has been prepared by AFLC to evaluate the potential environmental impacts of transportation and storage of the rocket motors (USAF, 1991a). The impacts of reentry vehicle retirement and transportation of radionuclides have also been assessed (U.S. Department of Energy, 1977 and 1983; U.S. Nuclear Regulatory Commission, 1977, and 1987). As previously discussed in section 1.1, these studies are incorporated by reference (per 40 CFR 1502.21) into this analysis. Further details of potential environmental impacts involving rocket motor and reentry vehicle handling and transportation are presented in section 4.7 and appendix C. Chapter 5 of this EA discusses further details regarding the potential environmental impacts of rocket motor handling, movement, and storage.

2.2.2 Missile Support Base (MSB) Facilities

A number of MSB facilities support the 341 MW mission and would be involved in the proposed action. Figure 2.2.2-1 illustrates the location of these facilities. To help maintain proficient operations and maintenance crews, training facilities are located at the MSB. A missile maintenance training area (building 219), a model LF outfitted with a full-scale launcher and underground access, allows the maintenance crews to train on base, rather than drive approximately 30 minutes to the nearest LF. Additionally, a training launch control center for combat crew training is located within building 769.

The RV/G&C vans and PTs are stored at the Maintenance Complex Buildings (3080 and 3081). When a PT or RV/G&C van returns to the base carrying a weapon, the first stop is made at the Weapons Storage Area (WSA) in the northeast area of the base. The propulsion system (PSRE) is also stored in a bunker at the WSA. The RV is stored at the WSA until it is shipped to another SAC base (transfer), AFLC facility (refurbishment), or DOE facility (retirement). If the PSRE and MGS are attached (a PBCS), then the whole unit is stored at the WSA. If unattached, then the MGS is taken to the Electrical Laboratory and stored in a vault. The MGS and PSRE may be transported to AFLC facilities for maintenance (Hill AFB or Newark Air Station, Ohio).

Under the proposed action, the existing handling and transportation procedures for each MM II RV and MGS system would be followed: the RVs are scheduled for retirement and would be shipped (by DOE safe secure transport (SST) or Air Force airlift) to Pantex, near Amarillo, Texas, or other classified DOE holding facilities; the MGSs would be inspected at Malmstrom AFB. Some of the MGSs would be retired and shipped to Newark Air Station for dismantlement. The other MGSs would be sent to Hill AFB for storage as replacement units or to Pueblo Army Depot in Colorado for reuse in the Reentry System Launch Program. The reentry system, PSRE, and guidance system for the MM III missiles would be shipped to Malmstrom AFB, stored in the appropriate area, and transported to the deployment area for emplacement in an LF.

Loaded TEs returning to the MSB drive to the roll-transfer building (1845) where the booster is placed in a storage container for shipment by plane, rail, or truck to Hill AFB. A ballistic missile transporter (BMT) can be used to store the missile for transport by rail or road, and a shipping and storage container for ballistic missiles (SSCBM) is used for air or rail transport. The roll-transfer process is reversed for missiles arriving from Hill AFB. The facility can handle up to two transfers per day. After a booster has been emplaced, the TE returns to the proof-load test facility at the MSB (building 122) to re-tension the cable hoists. At this facility, a pit with hydraulic systems is used to test hoists and tension them, if required.

The movement of the rocket motors is primarily dependent on four factors: storage capacity, processing capability, transport container availability, and transport availability. Normally, the rocket booster stays on base for no longer than 4-5 days, and one spare is always on base. There are only five pads available for storage of rocket motors

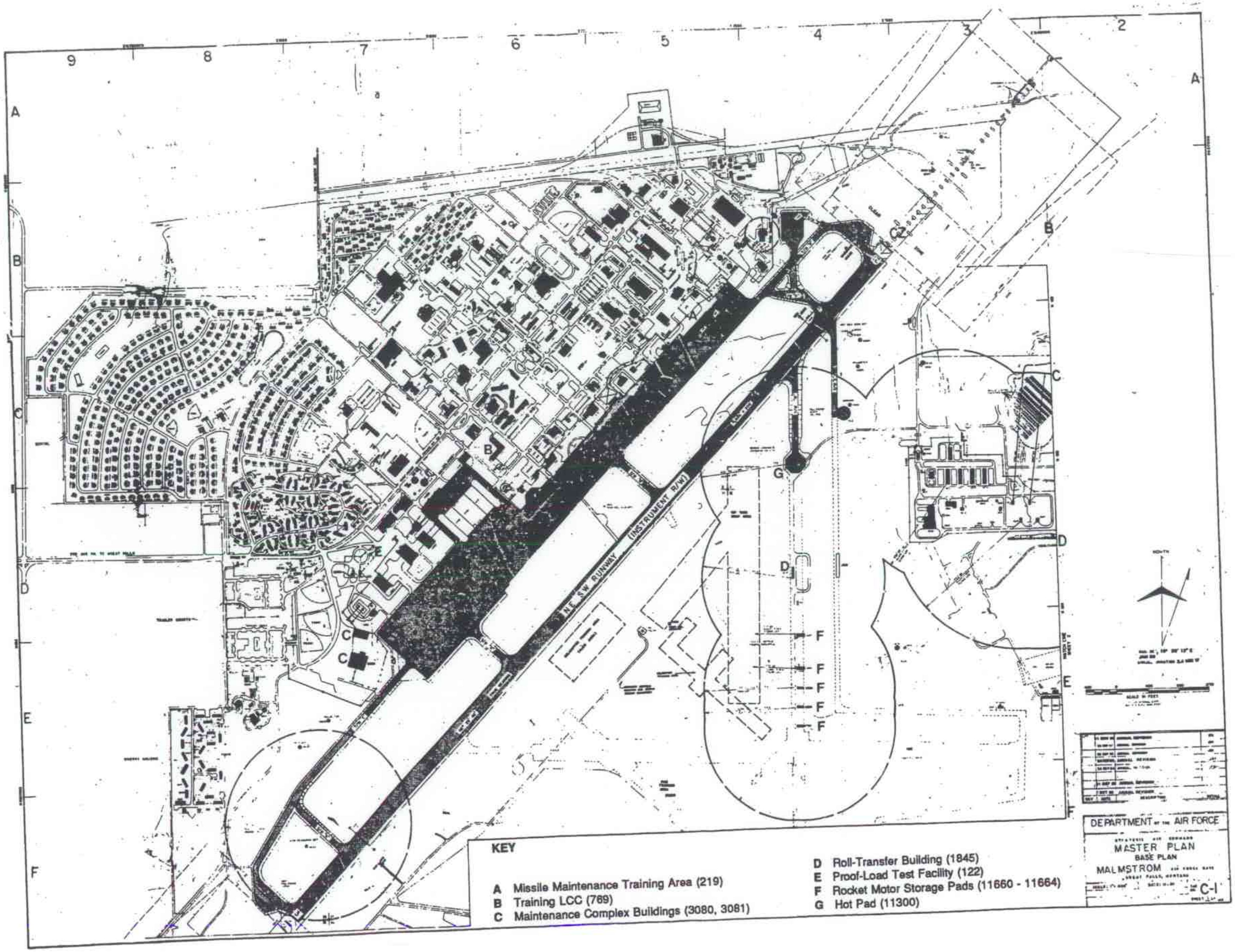


Figure 2.2.2-1 Missile Support Base Facilities of the 341 SMW

(facilities 11660-11664). With regards to processing capability, the roll-transfer facility can handle two loading or unloading of rocket motors per day. Malmstrom AFB has four TEs and may possibly obtain another TE. Availability of the containers is limited. AFLC has only 14 SSCBMs and 18 BMTs that are capable of transport for all of the 1,000 MM II and MM III missiles currently deployed. Loading and unloading of rocket motors and other MM components is performed at the hot pad (11300) located off the runway. Loading and unloading of MM components by train is performed at the missile rail unloading facility (89900). Because of the capability to fly from Hill AFB to Malmstrom AFB, and back in one day, C-141 transport of MM components is the preferred mode of transport. Moving components by BMT road transport would take two days for a round trip and a round trip by rail transport may take several days.

Support vehicles for maintenance operations include periodic maintenance vans, 5-ton "M-vans", 2.5-ton vans, protos (pick-up trucks with enclosed backs), and pick-up trucks. These vehicles carry tools, test equipment, cables, brackets, site power cables, and other equipment.

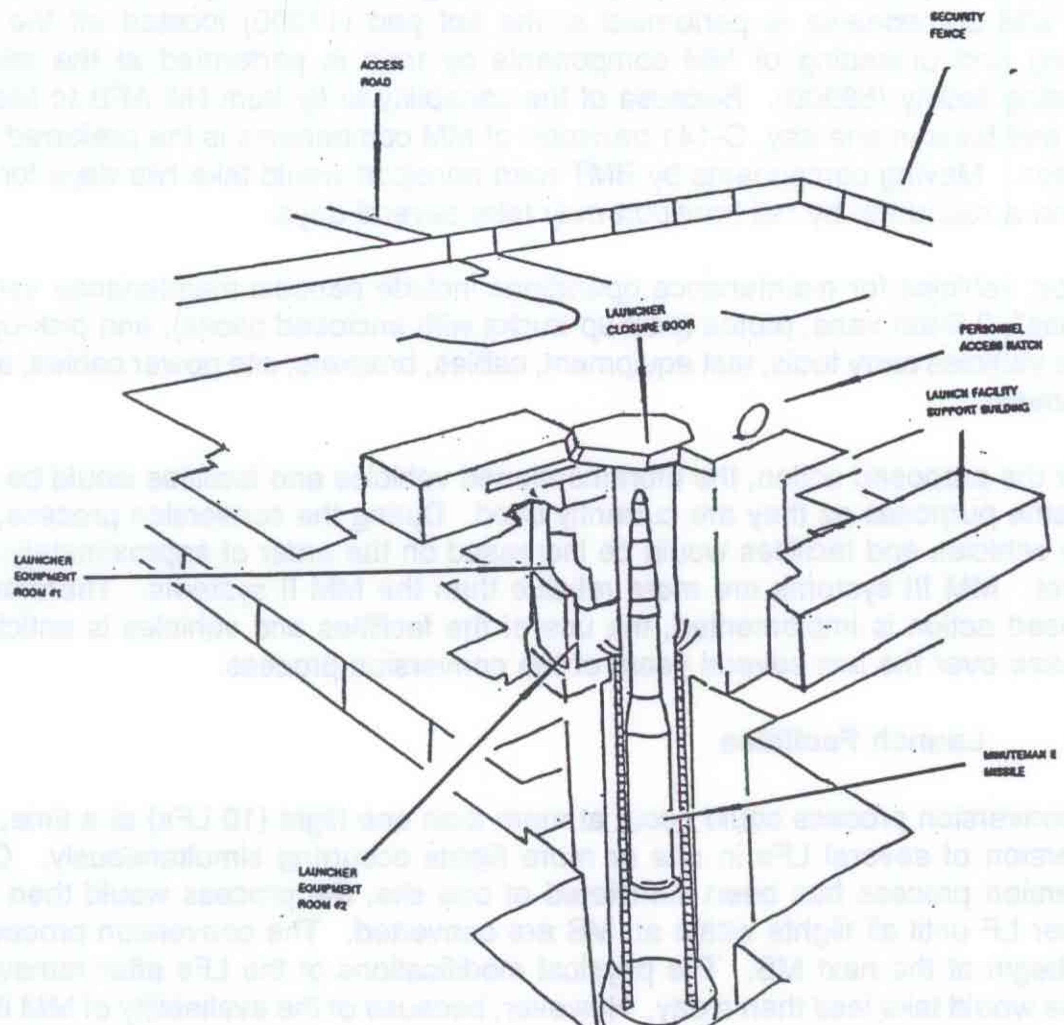
Under the proposed action, the aforementioned vehicles and facilities would be used for the same purposes as they are currently used. During the conversion process, the use of the vehicles and facilities would be increased on the order of approximately 25 to 50 percent. MM III systems are more reliable than the MM II systems. Therefore, if the proposed action is implemented, the use of the facilities and vehicles is anticipated to decrease over the last several years of the conversion process.

2.2.3 Launch Facilities

The conversion process could occur at more than one flight (10 LFs) at a time, with the conversion of several LFs in one or more flights occurring simultaneously. Once the conversion process has been completed at one site, the process would then begin at another LF until all flights within an MS are converted. The conversion process would then begin at the next MS. The physical modifications of the LFs after removal of the missile would take less than a day. However, because of the availability of MM III system components and the reprogramming of the computers necessary to operate the system, the labor at the LF may be spread over a six day period. Considering that the proposed action is scheduled to be completed within 6 years starting in October 1991, an average of one LF would be converted for use by an MM III missile every two weeks.

A launch facility consists of a launcher and an associated launch facility support building (LFSB) within an average site area of 1.6 acres enclosed by a security fence (figure 2.2.3-1).

Activities at each LF involving missile removal and emplacement would occur within the fenced area. A slight adjustment to lengthen the slack on the umbilical cable inside the launch tube would be performed and the suspension system for the missile would be checked and adjusted, if necessary, to handle the slightly heavier MM III missile.



Source: US Air Force. 1988.

Figure 2.2.3-1 Launch Facility and Grounds

A software change would be required to support the MM III system. This would involve replacing a tape drum on site. No other portion of the LF would be modified as part of the proposed action.

2.2.4 Launch Control Facilities

Under the proposed action, the only activity proposed to occur at the LCFs would be to modify the software within the launch control center (LCC). The software upgrade is needed to support the software upgrade at the LF. With MIRVs and an improved range of targeting options, the computer programs for managing and operating the missiles are more complex. The LCCs would have their software converted to AM-CDB—software designed for MM III systems.

2.2.5 Facilities Outside of the MSB and Deployment Area

The main facilities involved in the conversion process other than Malmstrom AFB include Hill AFB, Utah and DOE facilities (see figure 2.2-2). Disposition of some missile components could go either directly to Newark Air Station or indirectly through Hill AFB. Pueblo Army Depot would receive some MGSs indirectly through Hill AFB. Additionally, some of the MM II components recovered from the conversion could be sent directly to Whiteman AFB or Ellsworth AFB. Much of the equipment and the MM II missiles themselves are the property of the AFLC. As previously mentioned, once the rocket motors are removed from the LF and transported to the MSB, AFLC would handle and manage the motors to their final disposition. AFLC also has personnel assigned at Malmstrom AFB as part of the Rivet MILE (Minuteman Integrated Life Extension) Program that has helped upgrade and maintain the MM II system.

Vandenberg AFB, California has test launch complexes for MM II and MM III missile systems, as well as for other ballistic missile systems. The base provides training for operations crews for all ballistic missile bases. Each year, Vandenberg AFB hosts the "Olympic Arena" contests that fosters competition among teams from various ballistic missile bases. The event gauges the skill of the operations and maintenance personnel, evaluates the system efficiency, promotes teamwork, and enhances morale. Under the proposed action, the training program for other bases with ICBM missile systems would continue. There are two dedicated MM II training simulators used in conjunction with the MM II program.

The warheads scheduled for retirement would be returned to the Department of Energy (DOE) in accordance with the provisions contained in AFR 136-2, The Logistics Movement and Handling of Nuclear Cargo. Once returned to DOE, the warheads would be disposed of per internal DOE procedures at a rate consistent with the Presidential Stockpile Memorandum. Further discussion of the handling of reentry vehicles is provided in section 4.7.2.1 and appendix C.

2.2.6 Personnel

A variety of crews work in concert to operate and maintain the MM II system at Malmstrom AFB, including missile maintenance teams (MMT), missile handling teams (MHT), missile crews, and security police.

An MMT of 5 people (a chief, two topside technicians, a boardman, and a cageman) travel to the site to remove the top portion of a missile (excludes the booster). Two members of the organizational missile maintenance squadron (341 OMMS) drive the RV/G&C van or PT and the other three specialists drive in a support van with two security police. There are a total of five maintenance crews available with four usually working full-time and one extra crew.

To handle the rocket motors, an MHT of four people is required. Currently there are four MHT teams with three working full time and one spare team. These teams emplace and remove stages, operate roll-transfer facilities, and perform maintenance on and operate the TEs.

The missile system is monitored by a combat crew of two officers stationed underground in the LCC at each LCF. Currently, there are 78 crews available for the MM II system and 32 crews available for the MM III system (341 MW/DOV, 1991).

Another group that works to support the 341 MW at Malmstrom AFB is the security police group (840 SPG). These teams are based at the LCF and MSB and serve to escort the RV/G&C vans, TEs, and PTs, secure the LFs whenever a crew is performing maintenance, and patrol the deployment area.

Because the same MHT handle MM II and MM III stages, no additional training would be required for these teams. However, the MMT currently maintaining MM II systems would require training in order to perform maintenance on MM III systems. Additionally, the missile combat crew members currently operating the MM II system would need to undergo a training program prior to monitoring and operating of the MM III system. Initial cadre training for four missile crews will take place at Vandenberg AFB. Subsequent training of missile crews will take place at Malmstrom AFB and will occur in the same order as conversion by squadron.

As of the fourth quarter, Fiscal Year 1991, there are 601 officers, 3,513 enlisted personnel, and 410 civilians associated with the 341 MW (includes the MM II and the MM III program) at Malmstrom AFB.

If implemented, the conversion action at Malmstrom AFB would continue over approximately six years. During the final year of the phaseout and thereafter, Malmstrom AFB would send personnel to Vandenberg AFB for training only on the MM III system. Two squadrons at Vandenberg AFB are dedicated to providing training and evaluation support for the MM system: the 4315th Combat Crew Training Squadron and the 3901st

Strategic Missile Evaluation Squadron. Minor personnel reductions at Vandenberg AFB are anticipated as a result of retiring the MM II system at Ellsworth AFB, Malmstrom AFB, and Whiteman AFB (HQ SAC/DOMM, 1990).

2.2.7 Service Contracts

To maintain the capability of the 341 MW, the roads from the MSB to and within the deployment area need to be kept in acceptable condition. The Air Force provides funding through the Federal Highway Administration to the State and county Departments of Transportation for the maintenance and improvements of these routes. Under the proposed action, the funding for these roads would be continued.

The LFs and LCFs use electricity provided by rural power companies as their primary source of power. Diesel generators at the sites serve as backup power sources. Under the proposed action, the funding for these electricity contracts would be continued.

2.3 THE NO ACTION ALTERNATIVE

Under the "no action" alternative, the MM II system would not be phased out. Instead, the maintenance of the system would continue. As indicated in section 2.2.1, missiles are removed routinely from launchers for maintenance and replacement. Missile removal operations under the no action alternative would be essentially the same as under the proposed action, except that this no action alternative would continue the present operations for re-installation of refurbished MM II missiles.

The continuation of operations would include, but is not limited to, the following activities: the hardened intersite cable system (HICS) would be maintained; maintenance, routine replacement, and upgrade of support equipment in the LFs and LCFs would continue as at present; the MSB facilities would continue to be used according to their existing purposes as described in section 2.2.2; and personnel of the 341 MW and support organizations would continue to manage, operate, and maintain the MM II missile system.

As under the proposed action, electricity contracts for the deployment area would continue to be renewed and funds provided by SAC through the Federal Highway Administration to the State and county transportation departments for the upkeep and improvement of roads from the MSB to and within the deployment area also would continue. In addition, under the no action alternative, training and testing activities for the MM II system would continue at Vandenberg AFB.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER EVALUATION

Other alternatives that were considered but eliminated from further detailed evaluation include: changing the MWs selected for phaseout/conversion, shortening the conversion process, lengthening the conversion process, or converting only one or two MM II MSs to MM III systems.

2.4.1 Change in MW Selected for Phaseout/Conversion

In separate actions, SAC proposes to phaseout the MM II system at Ellsworth AFB (proposed to commence in FY 92) and at Whiteman AFB (proposed for commencement in FY 94). Since three bases currently host the MM II system, alternatives to the proposed action to convert the MM II system at Malmstrom AFB could include phaseout without conversion at Malmstrom AFB or conversion at one of these other installations rather than at Malmstrom (a draft environmental impact statement (EIS) on the proposed action and alternatives to the action at Ellsworth AFB has been published and a final EIS is being prepared). For several reasons, such alternatives are not reasonable and therefore were not further analyzed. This conclusion is based on the needs of national defense and costs of upgrading, as well as current capabilities and ages of the systems.

A crucial part of the SAC mission is nuclear strategic deterrence. However, because of budgetary constraints, SAC must ensure that the weapon systems in place can provide for the national defense in the most effective manner at the least cost. If SAC is to select a system for phaseout or conversion, it must make that selection based on the capabilities of the system involved.

A comparison of the Malmstrom AFB and Whiteman AFB system capabilities with those of Ellsworth AFB leads to the conclusion that phaseout of the MM II system at Malmstrom or Whiteman AFB in lieu of phaseout at Ellsworth AFB is not a reasonable alternative to the proposed actions.

First, because the system at Malmstrom AFB is located at a higher elevation, it has slight advantages in ranging (i.e., the ability to strike targets at greater distances) over the missile system at Ellsworth AFB. Second, the systems at Malmstrom AFB and Whiteman AFB have received system upgrades which have significantly increased the capabilities and survivability of these systems. These upgrades have not been performed at Ellsworth AFB, resulting in a system that is less capable and less survivable than those at the other two bases. Phaseout of either the Malmstrom or Whiteman systems in lieu of the Ellsworth MM II would result in the phaseout of a more capable and up-to-date system; this would not be a reasonable alternative.

Specifically, the result of the upgrades at Malmstrom and Whiteman AFBs have resulted in systems that have enhanced "hardness" (i.e., the ability to survive a nuclear strike), better retargeting capabilities (the Malmstrom and Whiteman systems can be remotely retargeted from the launch control center, while individual teams must be dispatched to each missile LF at Ellsworth AFB to accomplish retargeting operations, resulting in a significant difference in the times necessary to retarget missiles), and greater accuracy. These capabilities are not shared by the Ellsworth system. (More detailed discussion of the specific nature of these upgrades and the capabilities they provide is classified Secret.

They are discussed in the classified documents "Bullet Background Paper on Malmstrom Minuteman (MM) II vs. Ellsworth Retirement," Major Curry, HQ SAC/XOBM, 3 Oct. 1990, and "Position Paper," Major Johnson, HQ SAC/XOBM, 14 Dec. 1989.) If SAC were to attempt to add the modifications onto the Ellsworth system at this time it would require an additional estimated investment of over one billion dollars. This would be in addition to the cost for the subsequent conversion of the system to handle the MM III missile.

Finally, the missile wing at Malmstrom AFB currently hosts 50 MM III missiles in addition to 150 MM II missiles. As such, much of the infrastructure is already in place to support conversion of the entire wing to the MM III. For example, trained MM III crews and maintenance personnel, as well as maintenance facilities and equipment, are already in place at Malmstrom. These infrastructure needs would have to be met anew at Whiteman or Ellsworth AFBs if these systems were to be kept on line and converted to handle the MM III missile, as is the current proposal for the Malmstrom system.

Phaseout with or without conversion of the Whiteman AFB system could not occur prior to actions at Malmstrom AFB or Ellsworth AFB because of Congressional direction. Public Law 101-510, National Defense Authorization Act, FY 1991, Section 2307, provides that "The Secretary of the Air Force shall provide that the installation which receives the last operational upgrade for the Minuteman II missile system shall be the installation from which the last Minuteman II is retired." Since Whiteman AFB was the last system to be upgraded, this provision would preclude phaseout or conversion of the Whiteman system prior to the actions proposed for the other two bases.

If the order of the base actions were modified, the environmental impacts incurred from performing MM II system phaseout/conversion would not vary from those impacts predicted for the proposed actions; the impacts would occur at an earlier or later time.

2.4.2 Shortening or Lengthening the Conversion Process

Shortening the conversion process is not tenable because of the limitations in availability of MM III components and the stress a shortened schedule would cause on the logistics for transportation and storage of MM II and MM III missile components. Lengthening the conversion process would not make efficient use of Air Force resources given the current budgetary constraints for MM II maintenance.

Environmental impacts from shortening the conversion process would occur over a shorter period of time and resources would be affected to a greater, but still insignificant, degree in comparison to impacts expected under the proposed action. Lengthening the conversion process would cause the same impacts to resources but to a slightly less degree than under the proposed action.

2.4.3 Conversion of One or Two MSs

Converting only one or two MSs would not be feasible for the aforementioned reasons. The MM III system is more reliable (fewer maintenance actions) and provides a better strategic deterrence than the MM II system.

The same types of environmental impacts would occur under this partial conversion alternative as would occur under the proposed action but to a lesser degree in an aggregate sense.

2.5 COMPARISON OF PROPOSED ACTION WITH NO ACTION ALTERNATIVE

The key differences among the proposed action and no action alternative are the minor physical adjustments at the LFs and LCFs that would be performed, the slight increase in transportation requirements, the short-term increase in workload for the maintenance and security police (replacement of MM IIs with MM IIIs would reduce the maintenance schedule over time as MM IIIs are more reliable than MM IIs), and the retraining of some maintenance teams and combat crews that would occur under the proposed action. As previously discussed, the same equipment, maintenance techniques, personnel, and vehicles would be used for the proposed action that are currently being used.

Compared to the proposed action, the no action alternative would cause no new, additional impacts. Therefore, the following incremental impacts could continue to be incurred:

- Soil sterilization around the LFs and LCFs could cause potential herbicide residue accumulation in the soil.
- Wear on service roads used by TE, RV/G&C vans, and other MM II vehicles would cause erosion and siltation.
- Vehicular traffic associated with operations and maintenance of the MM II workforce would cause air pollutant emissions.
- The MM II workforce would use utilities (water, sewage, energy) and services (police, fire, health care, schools).
- Operation and maintenance of the MM II system would cause direct and indirect employment.

3.0 AFFECTED ENVIRONMENT

This chapter begins with a discussion of the history, mission, and current operations of Malmstrom AFB, followed by a description of the area's present environmental and socioeconomic resources. The resources described have the potential to be affected by the alternatives discussed in chapter 2.0. Those resources that are more likely to be affected by the alternatives (transportation, for example) are described in more detail than those resources that are unlikely to be affected by the actions (geology and water, for example). Resources that would not be affected by the proposed action or the no action alternative include the visual and aesthetic environment (the facilities in the deployment area are fairly unobtrusive and the presence of Air Force vehicles in the area has already been established) and land use, including political boundaries and zoning (no additions of land, changes in land use, or sales of land would occur).

3.1 DESCRIPTION OF MALMSTROM AFB AND THE DEPLOYMENT AREA

3.1.1 History of Malmstrom AFB

Malmstrom AFB began as an outgrowth of using Great Falls Airport to transport war materials to the Allies as part of the Lend-Lease Act during World War II. When the flow of materials overwhelmed the airport, East Base was constructed, opening on December 15, 1942. After World War II, the base was used by the Military Air Transport Service to train C-54 transport crews. The Strategic Air Command assumed control of the base on February 1, 1954 when it activated the 407th Strategic Fighter Wing (SFW). On October 1, 1955, the base was renamed Malmstrom AFB in honor of Colonel Einar Axel Malmstrom. When the 407 SFW was deactivated on July 1, 1954, the 4061st Air Refueling Wing (AREFW) became the host unit. The 4061 AREFW was deactivated on July 15, 1961, when the 341st Strategic Missile Wing (SMW) was activated. The 10th Strategic Missile Squadron (SMS) was activated on December 1, 1961 with the deployment of 50 Minuteman (MM) IA (first model of MM) missiles. By May 1, 1962, the 12 SMS and the 490 SMS were activated, bringing the total number of MM I missiles deployed to 150. These are currently the 10, 12, and 490 Missile Squadrons (MSs). A Force Modernization Program began in November 1962 and was completed in May 1969; Minuteman I ICBMs were replaced with Minuteman II ICBMs. Launch facilities (LFs) and launch control facilities (LCFs) were completely retrofitted to deploy the new ICBMs. On April 1, 1966 the 564 SMS (currently the 564 MS) was activated at Malmstrom AFB and became operational in April 1967 with the deployment of 50 Minuteman II ICBMs. By July 1975, the Minuteman II ICBMs of the 564 SMS were replaced with Minuteman III ICBMs. The improved launch control system was implemented for the 150 MM II LFs and 15 LCFs in 1979. The 301 AREFW was last activated on 5 January 1988. On July 7, 1989, the 40th Air Division was activated at Malmstrom AFB as part of SAC's 15th Air Force and was deactivated in June 1991.

3.1.2 Mission and Operations

The 341 MW hosts the 301 AREFW, the 840th Support Group (SUPTG), and associated tenant functions (USAF, 1989a). The 301 AREFW operates the KC-135R Stratotanker (see table 3.1.2-1). Another mission of the 301 AREFW is to coordinate and direct all air refueling operations between parent commands. The 301 AREFW also has a field training attachment of personnel allocated for performing training on the T-38 aircraft. These aircraft are used to perform training for KC-135R operations. The 341 MW maintains three MSs of Minuteman II ICBMs and one MS of Minuteman III ICBMs in a constant state of readiness.

Table 3.1.2-1
Current Aircraft and Operations

Unit	Aircraft Type	Approximate Number	Estimated Monthly Sorties
301 AREFW	KC-135R	16	60
301 AREFW	T-38	2	75
Det 5, 37 ARS	UH-1N	8	175

Source: USAF, 1989a.

3.1.3 Installation Environmental Management

U.S. Air Force installations engage in many operations and activities which can cause environmental impacts on public health and the environment if not controlled or properly managed. Many of these activities and operations are governed by Federal regulations, state and local regulations, or DoD and U.S. Air Force regulations. The environmental management program at Malmstrom AFB is administered by the Environmental Planning Branch (DEV) under the 840th Civil Engineering Squadron (CES). The squadron provides support to the 341 MW and the 301 AREFW. It has primary responsibility for environmental compliance with Federal, State of Montana, local, DoD, and U.S. Air Force regulations.

To ensure that operations and activities of USAF installations do not result in serious deficiencies of compliance with environmental requirements, yearly evaluations have been established as a means of achieving compliance.

The following text briefly describes the baseline for the environmental management areas of hazardous wastes, solid wastes, waste water, air emissions, installation restoration program, and other programs such as wildlife, forestry, and agriculture.

3.1.3.1 Hazardous Wastes

All hazardous wastes generated by Malmstrom AFB activities are managed by Malmstrom AFB. The Defense Reutilization and Marketing Office (DRMO) at the MSB is responsible for providing the proper storage of the wastes and arranging for transport to EPA-approved treatment and disposal facilities. The installation stores the wastes at a centralized collection/accumulation point and at the DRMO permitted storage facility. Wastes are not allowed to be stored in the centralized accumulation point for more than 90 days.

The wastes include spent sodium chromate solution, batteries and battery acid, oils, paints, thinners, solvents, and other regulated wastes. Hazardous materials that are routinely handled during maintenance activities are discussed in section 3.7. On-base hazardous waste generation in calendar year 1990 amounted to approximately 30,000 pounds (USAF, 1991d). Of this amount, approximately 1,500 to 2,000 pounds was generated by MM II activities (840 SUPTG/DEV, 1991).

3.1.3.2 Solid Wastes

Solid waste collection and disposal is provided by the City of Great Falls and private firms. A total of 4,188 tons per year or approximately 11 tons per day were removed in 1987 (USAF, 1989a). Refuse from the launch control facilities is brought back to the base, placed in a dumpster, and removed by the private contractor along with other wastes. Currently, the city's landfill is estimated to have a lifespan of 1.5 years, while a private site is projected to be useable for 75 years. The city has started action to acquire a new landfill site.

The Air Force operates a Resource, Recovery, and Recycling Program on base for metals, paper, cardboard, and tires.

3.1.3.3 Wastewater

Wastewater treatment for Great Falls and Malmstrom AFB occurs at an activated sludge facility owned by the City of Great Falls and operated under service contract with a private sewage treatment management firm. The facility is currently processing an average of 10 million gallons per day (MGD) and operating at 48 percent of its 21 MGD treatment capacity (USAF, 1991b). Discharges to the Missouri River consistently meet Montana Pollutant Discharge Elimination System permit requirements. Malmstrom AFB discharged 0.64 MGD to this plant in FY 1990. Adequate capacity will be available in the existing MSB main to handle any additional flows in the future and the present contract with the city allows for the treatment of 0.82 MGD (300 MG annually) of effluent.

3.1.3.4 Air Emissions

The 840 SUPTG/DEV is responsible for ensuring that all applicable air quality standards and air permit requirements are complied with.

3.1.3.5 Installation Restoration Program

Sites that may be contaminated with hazardous waste or have been found to be contaminated at Malmstrom AFB are being investigated and cleaned up through DoD's Installation Restoration Program (IRP). Malmstrom AFB has identified 21 IRP sites. Currently, 14 of these sites are undergoing remedial investigation and feasibility studies. Nine sites have been identified as requiring no further action and these sites should be closed out by the end of 1991. One site, the Havre Underground Storage Tanks (ST-21), is in the interim remedial action phase of the IRP process. None of the sites involved in the phaseout/conversion are currently IRP sites (840 SUPTG/DEV, 1991). The IRP program is also managed by the 840th SUPTG/DEV.

3.1.3.6 Other Programs

The 840th SUPTG/DEV oversees the management and execution of other programs such as wildlife and land management.

3.2 AIR RESOURCES

3.2.1 Climate and Meteorology

Malmstrom AFB and the 341 MW deployment area are located on the western edge of the Great Plains, near the eastern edge of the Rocky Mountains. The climate is considered semiarid, with the exception of mountainous areas. The Rocky Mountains and numerous smaller ranges exert a strong regional effect on the weather at the MSB and deployment area. Precipitation is higher and temperatures are lower near the mountains, while precipitation is lower and temperatures are generally higher in the areas east and north of the mountains. The climate is dominated by continental air masses, with invasions of polar and arctic air masses from the north causing extended frigid conditions in the winter. In the summer, continental air masses move in from the southwestern United States, causing hot dry weather, and occasionally warm humid tropical air masses move in from the south. The clash of these air masses cause the area to have severe storms and rapid changes in temperature. On average, about 30 thunderstorms occur each year in the eastern portion of the deployment area, while an average of 50 thunderstorms occur each year in the western portions; these produce hail about 2 times annually, mainly in July and August (Baldwin, 1973). For the state of Montana, an average of 2 tornadoes per year has been recorded (Water Information Center, 1974). Mean monthly temperatures at Malmstrom AFB range from 21 °F in January to 69 °F in July, with similar temperatures throughout the deployment area. Daily temperatures range from -35 °F in winter to 105 °F in the summer.

Prevailing winds are from the southwest during all months at Great Falls, and from the southwest during all months except July and August, when winds are from the west, at Malmstrom AFB. Southwest winds often reach 25 to 50 miles per hour with a mean wind speeds range from 10 miles per hour in summer months to 15 miles an hour in the winter. The area has excellent visibility, ranging between 45 and 65 miles. The relative humidity of the area is usually low, averaging around 30 percent in the summer and 60 percent in the winter.

Total annual precipitation at Great Falls averages 14 inches, with over 50 percent received during April through August. Annual precipitation in the deployment area varies from 12 inches in the northwest to 24 inches near the Little Belt Mountains. Approximately 56 inches of snow falls each year, mainly during November to April.

3.2.2 Air Quality

The National Ambient Air Quality Standards (NAAQS), established by the Environmental Protection Agency (EPA), define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Exceeding a concentration level in that given time period is a violation and constitutes a nonattainment of the pollutant standard. The Montana Clean Air Act, which basically implements the

Federal Clean Air Act, establishes ambient air quality standards to protect human health and the environment (see section 1.4.2). Montana has adopted a more stringent set of standards than the NAAQS, termed the Montana Ambient Air Quality Standards (MTAAQS). Of primary importance (because of the potential for increased traffic) is the ambient air quality standard for visibility (Montana Code Annotated 16.8.822). Table 3.2.2-1 presents the NAAQS and the MTAAQS for total solid particulates and for the six criteria pollutants.

Table 3.2.2-1 Air Quality Standards

Pollutant	Unit	Averaging Time	NAAQS[a]	MTAAQS
O_3	µg/m³	1 hr	235	196
CO	mg/m³	1 hr 8 hr	40 10	26 10
NO_2	µg/m³	1 hr AAM[b]	— 100	564 94
SO_2	µg/m³	1 hr 3 hr 24 hr AAM	— 1,300[c] 365[d] 80[d]	1310 — 262 52
PM_{10}	µg/m³	24 hr AAM	150 50	150 50
TSP	µg/m³	24 hr AAM	150[e] 260[d] 60[e] 75[d]	150[c] 260[d] 60[c] 75[d]
Pb	µg/m³	¼-year	1.5	1.5

[a] Primary and secondary NAAQS standards unless otherwise noted.
[b] Annual Arithmetic Mean.
[c] Secondary standard.
[d] Primary standard.
[e] The NAAQS total suspended particulate (TSP) standards were discontinued on July 1, 1987, with the promulgation of the particulate matter (PM_{10}) regulations. PM_{10} refers to particulate matter with a diameter of less than 10 microns.

In addition to the pollutants specified in table 3.2.2-1, Montana regulates hydrogen sulfide (H_2S) at a level of 70 µg/m³, 1 hour average, not to be exceeded more than once per year, settled particulate matter (mass, using the dust fall method) at a level of 10 g/m², 30-day average, not to be exceeded, and visibility where the scattering coefficient of particulate matter in the ambient air is not to exceed $3 \times 10^{-5}/m^3$, annual average. The visibility provisions are applicable only in Class I areas, designated under the Montana Clean Air Act rules, Prevention of Significant Deterioration (Title 16, chapter 8, subchapters 9 and 10, ARM.

The State of Montana also regulates increases of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and total suspended particulates (TSP) from baseline conditions for Class I and Class II areas at any one location even if this area is within MTAAQS. However, there are exclusions from these regulations for particulate matter (PM_{10}) from construction or temporary emission-generating activities.

The air quality of the deployment area and Malmstrom AFB is good to excellent (Montana Department of Health and Environmental Sciences, 1991). Seven counties, Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Teton, and Wheatland County, contain the MM II deployment area. The deployment area is in attainment status for all criteria pollutants (i.e. all readings are below criteria shown in table 3.2.2-1) (Montana Department of Health and Environmental Sciences, 1991). The non-attainment areas in the transportation network between the MSB and the deployment area include a portion of Great Falls along 10th Avenue South for carbon monoxide (CO), and an old secondary non-attainment area for TSP (also within Great Falls). Although two exceedances of the 8-hr Federal and Montana standard for CO occurred in 1986 (11.5 and 10.7 mg/m^3) and four exceedances occurred in 1987 (13.6, 11.0, 10.9 and 12.7 mg/m^3), only one exceedance was recorded in 1988 (10.9 mg/m^3 in an eight-hour observation) and no exceedances were recorded in 1989 (Department of Health and Environmental Sciences, 1991). The Montana Air Quality Bureau is petitioning the Environmental Protection Agency (EPA) to redesignate the TSP non-attainment area as an attainment area for PM_{10} because the readings for PM_{10} have been below the air quality standard.

Prevention of Significant Deterioration (PSD) Regulations (40 CFR 52.21) define air quality levels that cannot be exceeded by major stationary emission sources in specified geographical areas. Major stationary sources are usually sources that emit more than 100 tons per year of a specific pollutant. PSD regulations establish limits on the increments of SO_2 and total suspended particulates (TSP) that may be emitted above a premeasured amount in each of three class areas. Class I areas are pristine areas and include National Parks and Wilderness areas. All other areas in the United States are classified as Class II, where moderate, well-controlled industrial growth could be permitted. Four PSD Class I areas border the deployment area: Bob Marshall Wilderness Area, Gates of the Mountains Wilderness Area, Scapegoat Wilderness Area, and UL Bend Wilderness Area (figure 3.2.2-1). Bob Marshall Wilderness is approximately 12 miles from the nearest LF, Gates of the Mountains Wilderness Area is approximately 15 miles from the nearest LF, Scapegoat Wilderness Area is approximately 10 miles from the nearest LF, and UL Bend Wilderness Area is approximately 40 miles from the deployment area. Three LFs are within Lewis and Clark National Forest (two in Cascade County and one in Judith Basin County), several LFs are within a few miles of National Forests, and several LFs are within a few miles of National Wildlife Refuges (NWR), including Pishkun NWR, Benton Lake NWR, Charles M. Russell, Willow Creek, and War Horse NWR. Freezeout Lake (a State Wildlife Refuge) is within the western portion of the deployment area and Giant Springs State Park is northeast of Great Falls, approximately 10 miles from the closest LF.

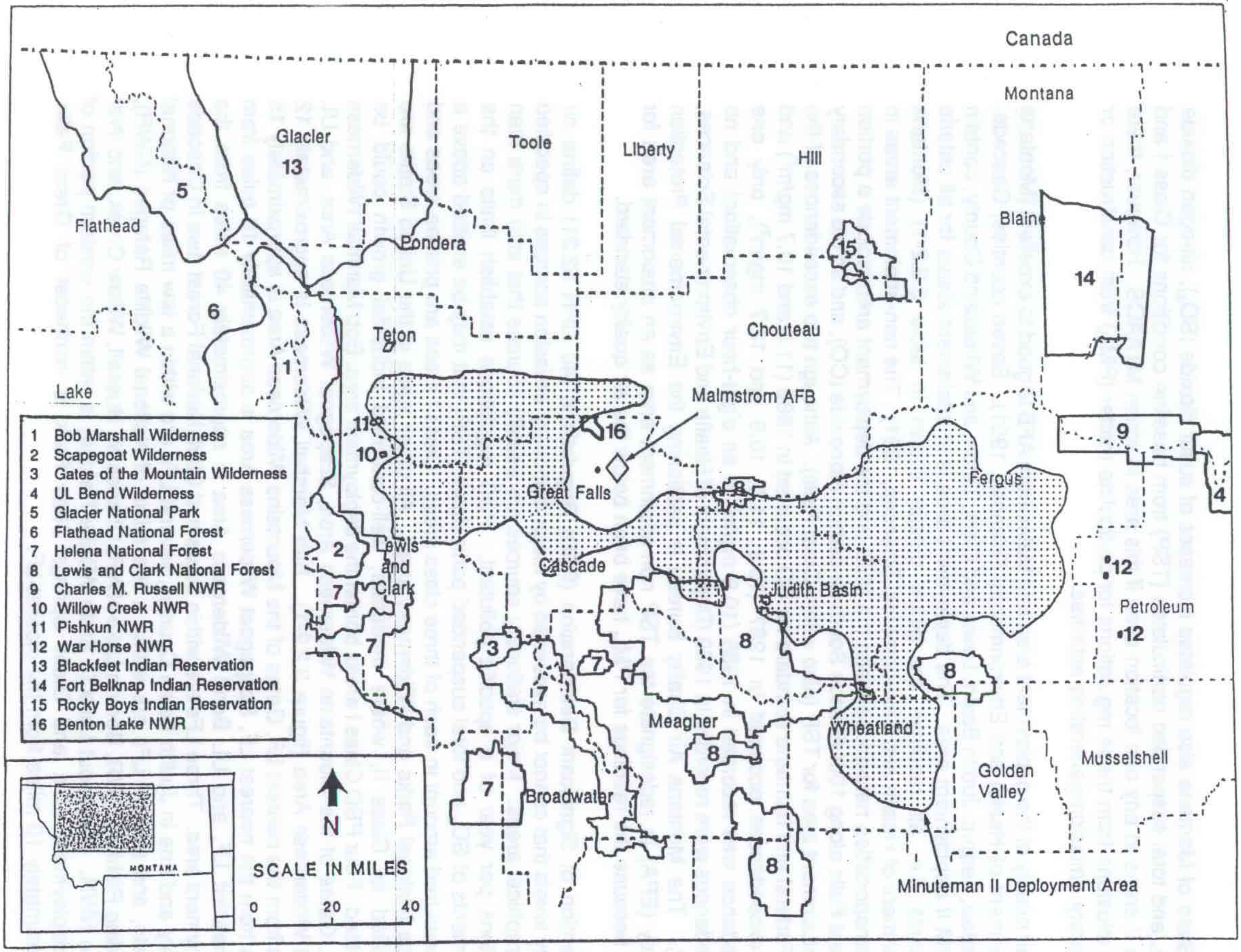


Figure 3.2.2-1 Sensitive Areas near the Deployment Area

3.3 GEOLOGICAL RESOURCES

3.3.1 Physiography and Topography

The MSB and MM II system deployment areas are part of the Missouri Plateau, located in the physiographic region known as the Great Plains. The deployment area is comprised of rolling terrain with buttes and tablelands, with isolated mountain ranges rising 2,000 to 4,000 feet above the plains in southern and western portions of the deployment area.

3.3.2 Geology

Shales and sandstones of Cretaceous age (65 to 136 million years old) comprise the main outcrops observed within the deployment area. The underlying rocks are older and are predominantly sedimentary in nature, with Precambrian igneous and metamorphic rocks as the lowest layer. Outcrops of the older rocks occur south of the deployment area (Downey, 1986).

Northern portions of the deployment area were glaciated. Most of the major drainageways have deposited glacial drift of silt, sand, and gravel along their banks. The Quaternary (less than 1.5 million years old) glacial till and stream deposits in the deployment area provide aggregate suitable for road base or concrete production (USAF, 1987). All of the non-mountainous land in the deployment area has potential to produce oil or gas (USAF, 1991b). Oil and gas exploration is occurring throughout the deployment area as evidenced by the large portions of land leased within the region. About 50 percent (or 99) of the MM II and MM III launch facilities are located within 0.5 mile of an oil or gas lease, and 62 of them border a lease (USAF, 1987). Coal fields of sub-bituminous coal exist within the central portion of the deployment area and in a few instances are being commercially mined (USDA, 1988; USAF, 1987).

3.3.3 Soils

The MM II deployment area and the MSB area contain complex soil associations, including more than 50 soil series classified into three subgroups: Argiborolls, Torriorthents, and a variety of mountain and highland soils (figure 3.3.3-1). Most soils in the deployment area are clay and silt dominated, are moderately susceptible to water erosion, and slightly to moderately susceptible to wind erosion. Slopes where LFs and LCFs are located vary from less than 2 percent to 30 percent. Most of the soils in this region are well drained; the depth to the water table is more than 60 inches in most areas. Permeability of the soil varies widely, depending upon the parent material of the soil (soils developed from sandy materials have greater permeability than those developed from clay); most of the soils are moderately permeable. However, many of these soils have a claypan below the surface, which is a layer of dense clay that is hard when dry and pliable when wet, with a slow permeability. The shrink-swell potential of most soils is moderate to high. A soil with a high shrink-swell potential shrinks when it

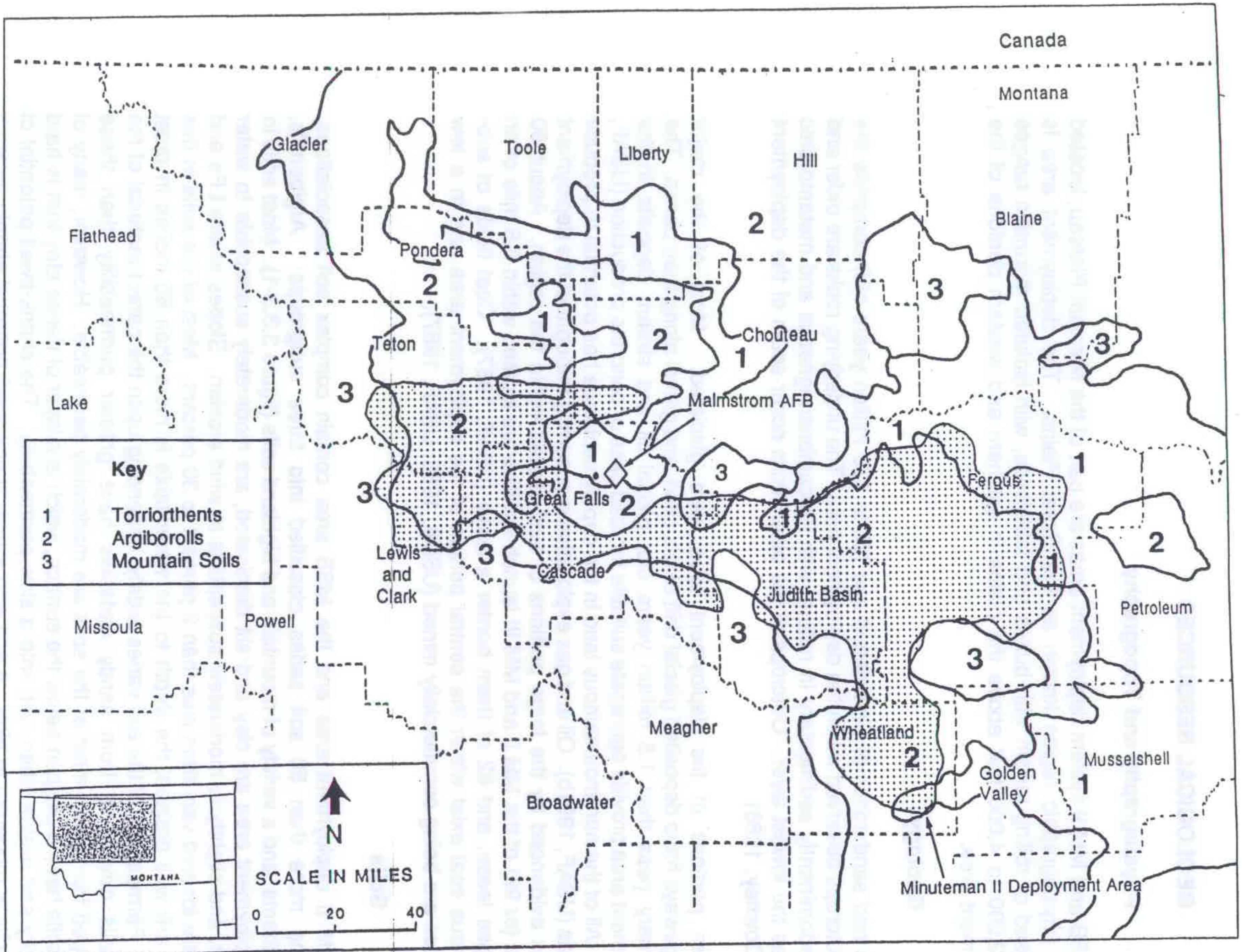


Figure 3.3.3-1 Soil Types of the Deployment Area

is dry and swells when it is wet. The high shrink-swell potential and low strength of many soils in the region cause severe construction limitations because of their poor engineering characteristics. Most soils in the deployment area are poor fill material because of their shrink-swell potential and low strength (USDA, 1967; USDA, 1982; USDA, 1988).

Argiborolls and related soils dominate the deployment area. These soils have a clayey texture and are found in cool, somewhat dry conditions. The soils of the foothills of the Rocky Mountains on the west edge of the deployment area and isolated mountain ranges throughout eastern portions of the deployment area are mainly Cryoborolls and Cryochrepts. These soils are typically thin and exist on slopes of 8 to 30 percent. They are not well developed because of the slopes and the cool climate of the mountains. Soils in river valleys, primarily Torriorthents and Torrifluvents, were formed from alluvium and glacial outwash. Torriorthents, because of their clayey texture and location on slopes ranging from 10 to 40 percent, are moderately to highly susceptible to wind and water erosion. Some of the LFs in flights E, G, I, J, and O are in areas of Torriorthents where the erosion of soil is a moderate hazard.

3.3.4 Geologic Hazards

Geologic hazards that exist in the region include mass movements, landslides, earthquakes, and faulting (Montana Bureau of Mines and Geology, 1991; USAF, 1987).

Portions of the deployment area are underlain by Cretaceous-age shale which has a moderate to high potential for producing landslides. Landslides are of two basic types: deep-seated slides which involve soil and bedrock to a depth of several meters, and shallow-seated slides which involve only soil. Deep-seated slides occur in all areas of shale, especially in valleys and near rivers, while shallow-seated slides occur mainly in mountainous areas and in areas of glacial deposits. Incidence of landslides in areas of shale depends upon slope, rainfall, and runoff. The incidence of landslides is generally higher from mid-March through June because of higher rainfall and snowmelt, and a more active freeze-thaw cycle (personal communication with Montana Bureau of Mines and Geology, 1991). Slides tend to occur after periods of heavier rainfall or snowmelt. Most landslides involve fine material (soil) or particles up to baseball-sized rocks. Most slides involve a slump in the slope; an average of 3 or 4 times a year (in the road maintenance district centered in Great Falls), a slide causes minor damage to a highway, closing one lane of the road temporarily. Most events occur quickly, moving material rapidly. On average, Judith Basin County has a higher incidence of landslides damaging roads than the area around Great Falls. Additionally, secondary and county roads are more vulnerable to landslide damage than primary roads (personal communication with Montana Department of Highways, 1991).

The deployment area is subject to seismic events of scattered, low-level intensity. On the modified Mercalli scale, these seismic events range from V to VII (approximately 4.2 to 5.8 on the Richter scale). Earthquakes of this magnitude could be expected to cause slight damage. The faults near the MM II deployment area are predominately of

Quaternary age (personal communication with Montana Bureau of Mines and Geology, 1991). These faults are located to the north and west of the MM II deployment area. Since 1982, there have been 10 earthquakes with a magnitude greater than 3.0 on the Richter scale within a 80 mile radius of Great Falls, Montana. One event, near Monarch, was within the deployment area. This earthquake had a magnitude of 3.4 on the Richter Scale and occurred on January 16, 1984. Within the last 9 years, the greatest magnitude earthquake to occur within a 160 mile radius of Great Falls was a 4.9 (Richter Scale) tremor east of Seeley Lake on April 1, 1985. Historically, the greatest magnitude earthquake to occur within 160 miles of Great Falls was a 6.7 (Richter Scale) tremor in 1925 (approximately 100 miles outside the deployment area). Seismic waves radiate efficiently through the bedrock of this area; quakes occurring near Helena or Three Forks could be felt around Great Falls. The probability of an earthquake occurring at a given time and location cannot be accurately calculated because the fault lines in this area are too short (personal communication with Montana Bureau of Mines and Geology, 1991).

3.4 WATER RESOURCES

3.4.1 Ground Water

The ground-water resources of the area (primarily deep aquifers) are abundant. Unconsolidated alluvium and bench deposits comprise the near surface aquifers (typical well depths are from 20 to 40 feet). Other major ground-water aquifers in the deployment region include glacial deposits, the Judith River and Two Medicine formations, the Eagle/Virgelle Formation, the Kootenai Formation, and the Madison aquifer (USAF, 1987; USDA, 1982; USDA, 1988). These water-bearing layers are separated by impermeable layers of shale. The majority of wells in the deployment region tap into the unconsolidated geology near the surface adjacent to the Missouri River and other major drainageways. However, near the LFs, most wells tap aquifers from 100 to 900 feet deep (USAF, 1987). Development of ground water as a resource is in the beginning stage in the deployment area and has been hindered by the great depth of most of the aquifers that can produce a sufficient quantity of water (USDA, 1988; USAF, 1991b).

Water from the unconsolidated alluvium, bench, and glacial deposits is locally variable in quality depending upon the level of total dissolved solids. Water quality depends upon local geology, precipitation, and the length of time that groundwater is contained within the rock (if groundwater is contained within an aquifer for a long period of time, more minerals can dissolve into the groundwater). Total dissolved solids typically average around 500 mg/liter, but may be as high as 2,500 mg/l in some areas making it unsuitable for domestic use (USAF, 1987). Ground-water quality generally decreases with depth, ground water from the deeper aquifers is highly mineralized (USAF, 1991b; USDA, 1988).

3.4.2 Surface Water

The major surface water body in the deployment area, the Missouri River, is the source of potable water for Great Falls and Malmstrom AFB. The stream is classified as a wild and scenic river from the confluence with the Teton River to the confluence with the Musselshell River—a stretch of 150 miles north east of the MSB. The streamflow in the region is derived primarily from snowmelt and greater rainfall along the Continental Divide to the west of the deployment area. With the exception of mountainous areas, the deployment area is in a semi-arid climate which produces little runoff (0.5 to 5.0 in/yr). Runoff in western portions near the Rocky Mountains averages between 5 and 20 inches per year (van der Leeden, et al., 1990). Most of this runoff originates in the mountains. Runoff is typically greater between April and August from snowmelt and greater rainfall.

Surface water quality tends to be good in the mountains but variable in the plains. The Missouri River carries large quantities of sediment, and some agricultural runoff, after it leaves the mountains and flows through the Northern Great Plains (USAF, 1987). Acidic mine wastes are another constituent of surface waters in the region (USAF, 1991b).

3.5 BIOLOGICAL RESOURCES

3.5.1 Vegetation

Malmstrom AFB, with a semiarid climate, lies within a grassland biome and native grasslands occur within 1 mile of the MSB. The undeveloped portion of the MSB includes rye and crested wheatgrass. Trees such as ash, American elm, plains cottonwood, honey locust, Russian olive, willow, Scotch pine, and Colorado blue spruce have been planted throughout the cantonment area, along streets, and other open areas. Much of the area surrounding the base is presently used for agriculture (primarily wheat).
Much of the deployment area, once covered by native grassland, has been converted to agriculture and presently produces wheat, alfalfa, and barley. Approximately 61 percent of the area along T/E routes is cropland, while 38 percent supports native vegetation. Much of the native vegetation occurring in the deployment area is characterized as mixed-grass prairie. The most common grassland type in the deployment area is the grama-needlegrass-wheat-grass type. Principal species include blue grama, needle-and-thread, western wheatgrass, bluebunch wheatgrass, and sedges. Large amounts of Sandberg bluegrass and prairie junegrass are distinguishing characteristics of this grassland type. Blue grama, fringed sagewort and annual species increase on overgrazed sites.

Transitions from lower elevations to mountains (and areas of greater precipitation) support rolling grassland interspersed with patches of timber. Ponderosa pine, Douglas fir, spruce, juniper are the dominant trees at low to intermediate elevations and subalpine fir, Englemann spruce, and white-bark pine occur at higher elevations.

3.5.2 Aquatic

Malmstrom AFB lies on a broad plateau that does not contain any major wetlands, although one small wetland (ponded water and cattails in a drainage near the Weapons Storage Area) and one artificial pond occur on base. River drainages in the region support substantial fisheries and riparian wetlands. Numerous wetlands and prairie potholes occur in the northwestern one-third of the Minuteman II deployment area and include Benton Lake, Blackhorse Lake, and Freezeout Lake. The deployment area includes a number of excellent fisheries and wetlands, west of Great Falls, along the Rocky Mountain Front Range, and within the northern drainage of the Yellowstone River. Fishing is the dominant outdoor recreational activity in the deployment area because of these aquatic assets. These streams are considered moderate to substantial fisheries resources with respect to habitat and overall resource values by the Montana Department of Fish, Wildlife and Parks and considered moderate fisheries resources for sport fisheries (though a large number are of substantial value). Appendix A of the Draft Environmental Impact Statement for the Small ICBM Program at Malmstrom AFB (USAF, 1987) includes a description of existing environmental conditions at launch facilities near aquatic habitats, which include wetlands. The findings of this analysis are incorporated by reference (per 40 CFR 1502.21) into this EA. The Small ICBM EIS can be reviewed through the Base Environmental Planning Office at Malmstrom AFB (840 SUPTG/DEV). Copies of the document were also provided to libraries throughout the deployment area, including the state library in Helena, MT.

Riparian forests of cottonwood, box elder, and willow, with cattails and other herbaceous vegetation are common in the floodplains of the major drainages throughout the deployment area. Smaller streams tend to support shrubby riparian species such as willows. The riparian wetlands are important to waterfowl and other species (especially in the deployment area east of Great Falls, which lacks other major types of wetlands).

Swamps, ponds, and prairie potholes are common in the deployment area northwest of Great Falls and represent a major supplement to riparian wetlands in that area. This portion of the deployment area is a major waterfowl flyway because of Benton Lake, Blackhorse Lake, Freezeout Lake, and numerous other wetlands. Many of these wetlands are maintained as easements or fee-owned lands by the USFWS.

3.5.3 Wildlife

The vegetation types that occur throughout the deployment area provide habitat for numerous wildlife species. Several big game species occur in the deployment area, including mule deer, white-tailed deer, pronghorn antelope, elk, bighorn sheep, and black bear. These species provide important recreation for hunters in the region, as well as for those who pursue nonconsumptive activities such as wildlife photography.

In addition to the big game species, other game species such as grouse, partridge, wild turkey, ring-necked pheasant, and mourning dove occur in the deployment area. Migratory waterfowl also occur in the region and are dependent on the rivers, lakes, and ponds scattered throughout the area. Duck and goose nesting and wintering areas are concentrated along the major rivers, at Benton Lake National Wildlife Refuge, and Freezeout Lake Wildlife Management Area.

The region also supports numerous furbearers including mink, marten, fisher, river otter, muskrat, raccoon, badger, and skunk. Predators such as the coyote, mountain lion, bobcat, and red fox also occur in the deployment area.

Smaller species of mammals, such as the jackrabbit, ground squirrel, and black-tailed prairie dog, occur in virtually every habitat within the areas of direct surface disturbance.

The common loon, horned grebe, western grebe, and double-crested cormorant are a few of the bird species inhabiting the lakes and rivers in the region. An abundance of shorebirds, such as the spotted sandpiper, willet, and American avocet, also occur in wetland areas. The coniferous forests provide valuable habitat for numerous bird species including hummingbirds, flycatchers, sparrows, grouse, and woodpeckers. In addition, many raptor species such as the northern goshawk, Cooper's hawk, northern harrier, rough-legged hawk, and red-tailed hawk are found in the deployment area.

The study area does not support a diverse group of herpetofauna (reptiles and amphibians). The rivers, streams, and ponds do support a few turtle species (snapping turtle, western painted turtle, and ornate box turtle), as well as one salamander species and five frog species. Lizard species, such as sagebrush lizard and prairie lizard, are fairly common in the sagebrush and prairie areas. The bullsnake, western garter snake, and prairie rattlesnake also occur in the area.

3.5.4 Threatened, Endangered, or Candidate Species

In accordance with Section 7(c) of the Endangered Species Act, the U.S. Fish and Wildlife Service (USFWS) was consulted concerning the presence of threatened or endangered species within the project area (see Appendix A). The USFWS identified several federally listed threatened, endangered, or candidate fauna species that are likely to occur, or are known to occur, throughout the deployment area. No Federally-listed threatened or endangered plant species are known to occur in the deployment area. A listed species, provided protection under the Endangered Species Act, is so designated because of danger of its extinction. The USFWS denotes the status of species that are candidates for listing as threatened and endangered by Category classification. A Category 1 candidate is a species about which sufficient information exists to support its being listed as threatened or endangered, but the proposed rules for listing have not yet been issued. A Category 2 candidate is a species being considered for listing, but information about it is insufficient to merit listing. Category 3 includes species that were once considered for listing but are no longer being considered. Nearly all species listed as threatened or endangered at the State level are also listed at least as candidates at the Federal level. Table 3.5.4-1 identifies Federal- and State-listed endangered, threatened, or candidate fauna species in the vicinity of the deployment area as provided by the USFWS and the Montana Department of Fish, Wildlife, and Parks. The first nine species listed are threatened or endangered. Candidate species are provided in the table because the duration of the proposed action (6 years) is sufficiently long enough that candidate species may be listed. No Federally-listed threatened and endangered species are known to occur on base. Three Federal-candidate bird species (the ferruginous hawk, long-billed curlew, and the Swainson's hawk) and one state-recognized species (the upland sandpiper) may occasionally occur on base.

The American peregrine falcon is known to occur within the deployment area, where it is primarily associated with lakes, rivers, and marshes. Peregrines are also known to remain in the area through the winter; however, the exact locations are not known. Aeries are believed to occur within Lewis and Clark, Cascade, and Chouteau counties, and nesting activities may also occur in other areas within the deployment area. In addition, Montana hosts approximately 60 known bald eagle breeding pairs, with several nesting sites occurring in or near the deployment area. Approximately 450 to 500 eagles remain in Montana through the winter with many concentrated along the Missouri River. A raptor staging area for spring migration also occurs within the deployment area along the Missouri River southwest of Great Falls. This area is utilized by bald eagles.

Table 3.5.4-1 Federal- and State-Listed Threatened, Endangered, or Candidate Species Found Within or Near the Deployment Area

Scientific Name	Common Name	Status
Scaphirhynchus albus	Pallid sturgeon	E, S2
Grus americana	Whooping crane	E, S2
Sterna antillarum	Least tern	E, S2
Charadrius melodus	Piping plover	T, S3
Haliaeetus leucocephalus	Bald eagle	E, S2
Falco peregrinus	Peregrine falcon	E, S1
Canis lupus	Gray wolf	E, S1
Ursus arctos	Grizzly bear	T, S3
Mustela nigripes	Black-footed ferret	E, S2, SH
Histrionicus histrionicus	Harlequin duck	S2
Felis lynx	Lynx	C2, S4
Lampropeltis triangulum	Milk snake	S1
Charadrius montanus	Mountain plover	C2, S2
Vulpes velox	Northern swift fox	C2, S1
Sorex preblei	Preble's shrew	C2, S3
Amphispiza belli	Sage sparrow	S2
Euderma maculatum	Spotted bat	C2, S1
Bartramia longicauda	Upland sandpiper	SU
Bufo hemiophrys	Canadian toad	S1
Buteo regalis	Ferruginous hawk	C2, S3
Numenius americanus	Long-billed curlew	C2, S4
Gulo gulo	Wolverine	C2, S4

KEY
C1 = Category 1 candidate species
C2 = Category 2 candidate species
C3 = Category 3 candidate species
E = Endangered
T = Threatened

S1 = Critically endangered in Montana
S2 = Endangered in Montana
S3 = Threatened in Montana
S4 = Apparently secure in Montana
SU = Possibly in peril in Montana, but status uncertain; more information needed
SH = Historically known in Montana; may be rediscovered

Source: USAF, 1991b; Personal communications from Fish and Wildlife Service, July 1991; and Montana Department of Fish, Wildlife and Parks, July 1991.

Other wildlife species listed as threatened or endangered that may occur within the deployment area include the grizzly bear, gray wolf, least tern, piping plover, pallid sturgeon, whooping cranes, and black-footed ferret.

Primary grizzly bear habitat is located outside the deployment area along the Rocky Mountain Front Range; however, grizzly bears are known to occur within the western region of the deployment area. The wolf may occur in the same general forest habitat as the grizzly bear; however, the wolf population is currently at a very low level and wolves are probably very rare in the deployment area.

The least tern nests during summer months in eastern Montana; recent sightings of nests have been east of the deployment area. However, the least tern occurs as a seasonal migrant within the deployment area. Piping plovers nest in eastern Montana, generally in the same area as least terns. Recent sightings have occurred toward the east end of Fort Peck Reservoir and other areas of eastern Montana. The piping plover occurs as a seasonal migrant within the deployment area, and a few nesting plovers may occur within the deployment area (U.S. Fish and Wildlife Service, 1991).

The pallid sturgeon, listed as endangered October 9, 1990, occurs in the Missouri River below the mouth of the Marias River, just to the north of the deployment area.

Whooping cranes migrate through Montana from nesting grounds in Canada. Other flocks nest in southwestern and northeastern Montana. Most sightings of whooping cranes in the last 30 years have occurred outside of the deployment area.

No known populations of black-footed ferrets occur in Montana. Black-footed ferrets can be found in association with prairie dog towns. Because the eastern portion of the deployment area contains prairie dog towns, the possibility exists for black-footed ferrets to inhabit this area.

3.6 CULTURAL RESOURCES

Cultural resources include four elements: prehistoric, historic, Native American, and paleontological resources. The description of the potentially affected cultural resources is focused on the deployment area because those at the MSB would not be affected. More than 300 sites have been recorded in the deployment area.

3.6.1 Prehistoric and Historic Resources

Prehistoric resources are physical properties resulting from human activities predating written records. They are generally identified as either isolated artifacts or sites. Sites are often delineated through intensive archaeological surveys. Approximately 470 acres on base and 1,350 acres adjacent to the northern and eastern base boundaries have been surveyed for cultural resources.

Prehistoric sites in the deployment area include limited use camps such as plant processing sites or hunting stands; habitation sites, including stone circle sites and rockshelters; antelope or buffalo kill and butchering sites; rock art sites (petroglyphs or pictographs); quarries and lithic sources; and rock cairns and alignments. Sacred areas may appear in the form of medicine wheels, vision quest sites, eagle-catching pits, rock figures, burials, and ritual structures (e.g. sweatlodges). General trends in site locations suggest that habitation sites occur near the edges of ridges or bluffs. Buffalo or kill sites are located in breaks and bluffs along major drainages, and hearth scatters and butchering/processing sites occur along drainage terraces. Early Middle Prehistoric sites are very rare in the area.

Sites are also present within the region that are important to Montana's history in mining, missionary, agriculture, ranching, military, and transportation activities. The historic period in Montana began about 1800 when the Lewis and Clark Expedition, following the Missouri River, passed through the area during the westward trek to the Pacific Ocean. About 640 sites have been recorded that relate to the wide variety of historic activities that have occurred since 1800. Historic bridges comprise approximately 150 of the sites, and an addition 150 buildings or other types of structures may be found in urban historic districts that have been listed in the National Register of Historic Places (NRHP). More than 200 Euro-American sites have been recorded in the region. These include: mines and their associated structures; homesteads, ranches, sheep camps, line shacks, and corrals associated with agriculture; sawmills and caps associated with the lumber industry; military posts; residences and public buildings in towns and cities; trails, roads, railroad construction camps, and railroad grades associated with exploration and transportation; and fur trading posts.

Formal consultation with the State Historic Preservation Officer (SHPO) of Montana was performed (see Appendix A) according to federal Section 106 requirements. Historic and architectural sites that are listed or eligible for listing in the NRHP exist in or near the deployment area. Approximately 234 historic sites and 4 districts in the deployment area have been listed in the NRHP. None of the listed sites exist on Air Force property. Any unnamed sites are not likely to be found near LFs because historic and archeological sites usually occur within one-quarter mile of water, on river terraces, or near a sudden vertical change in the topography. The locations for LFs were partly chosen to be on relatively flat ground away from water courses or steep topography.

Historic highway and railroad bridges are of concern to the Montana State officials. The Montana State Highway Department conducted a statewide bridge survey from 1979 to 1981, and more than 500 bridges were listed. Within the nine counties of the 341 MW deployment area, 90 bridges were recorded to Historic American Engineering Record standards, and 14 of them are considered significant for engineering properties. None of the bridges recorded in that study were evaluated for historic significance under the NRHP criteria. As part of the Small ICBM study conducted at Malmstrom AFB, analysis of state bridge inventories revealed 152 bridges in the study area old enough to qualify for the NRHP (USAF, 1987). Bridges that have been upgraded since construction, which implies that their integrity has been damaged, may no longer be eligible for historic listing.

3.6.2 Native American Resources

A number of Native American groups have, at one time, occupied or passed through the deployment area. Native american groups known to have used the project area include Shoshone, Bannocks, Salish, Northern Paiute, Kootenai, Blackfeet (Piegan and Blood), Flathead, Nez Perce, Crow, Gros Ventre (Astina), Chippewa-Cree, Assiniboine, Sioux, Arapaho, and Cheyenne. The Northwest boundary of the deployment area is near the Blackfeet Indian Reservation.

Potential sacred or ceremonial areas include vision-quest sites, rock art, Sun Dance grounds, large tepee rings (diameters greater than 10 meters), medicine wheels, cairns, eagle catching pits, and burials. The most sensitive sites are burial grounds and four are known to occur in the deployment area: on Arrow Creek in Fergus County, on Deep Creek and near Priest Butte in Teton County, and at St. Peter's Mission Cemetery near Cascade. One major sacred area has been located at the confluence of the Sun and Missouri Rivers, and possible vision-quest sites have been reported south of the Sun River on Square Butte. None of these sites exist on Air Force property.

3.6.3 Paleontological Resources

Paleontological resources consist of the physical remains of extinct lifeforms or extinct species that may still have living relatives. These include fossilized remains of animals and plants or parts of, casts or molds of the same, or trace fossils such as impressions, burrows, and tracks.

Few legal mandates protect fossils. They are not protected by legislation on either private or Department of the Interior lands in the United States. However, the Montana Environmental Policy Act and Montana Antiquities Act protect paleontological finds on

State lands in Montana, and U.S. Forest Service regulations (CFR 1986, 36 CFR 261) protect vertebrate and unique fossils on U.S. Forest Service administered lands. Additionally, some fossil localities may qualify for recognition under the National Landmarks Program (CFR 1979, 36 CFR 61).

Some of the best preserved and most unique fossil localities in North America occur in the Malmstrom AFB deployment area. Sites date from the paleo-Indian (ca. 10,000 B.C. - 5,500 B.C.) and Archaic (ca. 5,500 B.C. - A.D. 1800). Surface or near-surface bedrock units in the deployment area generally occur with 10 feet of the surface. Mississippian limestones (Madison and Big Snowy groups) are exposed in many of the mountain ranges or north-central Montana. The most important Mississippian unit in this area is the Bear Gulch Limestone. This Limestone is a member of the Heath Formation which, in turn, is the uppermost formation of the Big Snowy Group. The only known surface outcrop of this important fossiliferous units occurs east of Lewistown. The Bear Gulch Limestone is important because it contains vertebrate faunal assemblages characterized by excellent preservation. This deposit is considered the third most rich and diverse fossil-bearing formation in the world after the Jurassic Solnhofen Limestone in Bavaria and Burgess Shale in Canada.

3.7 HEALTH AND SAFETY/HAZARDOUS MATERIALS

This resource category addresses issues that may pose a threat or danger to the safety, health, and well-being of the general public. This includes the handling, storage, and disposal of hazardous wastes; the handling and storage of nuclear materials; explosives safety; and transportation accident potential. Potential effects to health and safety related to air quality and noise are discussed separately in sections 3.2 and 3.8, respectively.

The Air Force has formal safety programs addressing missile logistics that provide detailed safety requirements, training, and a mandatory reporting system for identifying and preventing safety-related problems. Missile facilities are regularly inspected to ensure compliance with rigid safety criteria.

3.7.1 Transportation and Handling Safety

Safety provisions are incorporated into all aspects of missile maintenance and transportation. The Air Force has a good record of safe handling and maintenance of missiles. Approximately 500,000 road miles have been driven by transporter-erectors carrying MM missiles (I, II, and III) between all deployment bases and launch facilities. In roughly 30 years, only six rollover accidents have occurred, with none involving propellant ignition. The AFLC is preparing an environmental assessment on the transportation and disposition of missile motors from Malmstrom AFB under AFLC custody. The study evaluates accident scenarios and discusses the safety record of rocket motor transport (AFLC, 1991a). No serious accidents involving transport of the guidance system, reentry system, and the PSRE have occurred.

Transportation of MGs and boosters is performed under Technical Order 35D3-11-52-2 and other Air Force Regulations (as described in section 1.4.9) by highly trained and qualified personnel. Equipment used is certified and TE routes are surveyed periodically, including bridges, to ensure structural soundness. A high level of security is required and operations take place only during good weather conditions.

Operations with nuclear weapon systems must undergo a series of reviews to ensure safe operation according to Department of Defense Directive 3150.2, Safety Studies and Reviews of Nuclear Weapon Systems, February 8, 1984. An initial safety study must be completed in the weapon design stages, another safety study is conducted before the weapon system becomes operational, and an operational safety review is conducted within two years of the weapon system becoming operational and a minimum of every five years while the weapon system is operational.

No significant radiation hazard to civilians or military personnel occurs from normal handling of nuclear warheads. The radiation exposure levels have been measured and are found to be well within established federal guidelines.

The probability of an accidental explosive detonation at an LF is infinitesimal. No accidental detonation or release of plutonium has occurred involving handling of a Minuteman ICBM warhead within the deployment area, at the MSB, or enroute between the two areas. Section 4.7 and appendix C discuss the potential environmental impacts of a release of nuclear material.

Transportation of RVs and RSs is performed under DoD Directive 4540.5, Movement of Nuclear Weapons by Noncombat Delivery Vehicles, by highly trained and qualified personnel. All equipment used for transporting RVs and RSs is nuclear certified. Transportation routes are periodically surveyed and bridges are inspected for structural soundness. A high level of security is required and operations take place only during good weather conditions (the absence of deep snow or ice, high winds, or temperature extremes).

Quantity distance arcs for safety from accidental detonation of explosives have been established for the deployment facilities. A distance of 1,200 feet from the LF was designed to preclude structures from this safety zone. When explosives are handled, only the minimum number of personnel required are allowed within this area.

The Air Force has instituted a rigorous training program for individuals that handle the various components of the MM II missiles. The number of transportation mishaps is negligible relative to the number of miles driven. For example, only minor vehicle accidents have occurred during the past year as part of the Rivet MILE program (approximately 75,000 miles per month driven) and missile engineering vehicles were not involved in an accident last year (16,000 miles per month driven) (341 MW/SEG, 1991). The accident rate per hour for personal injuries involving maintenance of the missiles is also negligible.

3.7.2 Hazardous Materials

Hazardous wastes are generated at Malmstrom AFB during daily routine operation and maintenance of the missile system. The wastes are collected in 55-gallon drums at the generation site. The containerized hazardous waste is then transported to the centralized waste accumulation site on the base for temporary storage for up to 90 days. The containerized waste is stored, removed, and disposed of from the base through the DRMO-Great Falls. Hazardous wastes are managed in compliance with the Resource Conservation and Recovery Act (RCRA) and Montana Administrative Rules. Under RCRA, a hazardous waste is any liquid, solid, semisolid, or contained gas that is specifically listed as a hazardous waste in 40 CFR 261.30 through 261.33, or exhibits a characteristic of hazardous waste (ignitability, corrosivity, reactivity, or toxicity) as determined by prescribed analytical procedures. RCRA specifies the requirements for identifying, classifying, generating, transporting, tracking, storing, treating, disposing, or otherwise managing hazardous waste.

The following subsections describe the types and quantities of hazardous materials that are handled during normal maintenance operations.

3.7.2.1 Asbestos

If asbestos poses a health danger from the release of airborne fibers (when it is in a friable state), it is Air Force policy to remove or encapsulate it. Asbestos is regulated under the Clean Air Act (CAA) because it is a designated hazardous air pollutant. The CAA requires that EPA must be notified before demolishing or renovating a facility containing friable asbestos. Before a site can be considered environmentally safe, all friable asbestos must be encapsulated or removed from LFs and LCFs and disposed of in a permitted landfill licensed to handle asbestos-containing materials.

Each LF and LCF has an asbestos-covered plenum that connects the diesel electric units (DEUs) with the wall of the containment building. The exhaust system associated with the DEU also contains asbestos insulation. Floor tiling and some pipe insulation at the LCF may contain asbestos. No asbestos is known to be within the launcher.

3.7.2.2 Polychlorinated Biphenyls (PCBs)

The electronics components in 16 LFs still contain small amounts of PCBs (341 FMMS/MBASE, 1991). The electronics drawers with PCBs are being replaced. The sealed electrical power filters and capacitors are processed as PCB (over 500 ppm). PCBs must be handled, stored, and disposed of in accordance with regulations promulgated under the Toxic Substance Control Act (TSCA). The PCBs are collected and labeled at the launch facility or launch control facility and returned by the MMT to the MSB for temporary storage in building 411 until a DRMO-Great Falls contractor removes the material within 90 days to an EPA-approved disposal facility.

3.7.2.3 Sodium Chromate Solution

Sodium chromate solution is used at the LFs as a coolant for the guidance system. The mass of the solution is 3 percent sodium chromate ($Na_2CrO_4 \cdot 10H_2O$), 2 percent sodium hydroxide, 5 percent dimethoxane (a broad-spectrum antimicrobial agent), and 90 percent water. Recent tests on the solution revealed an average chromium concentration of approximately 3.5 mg/L (840 SUPTG/DEV, 1991). If the toxicity characteristic leaching procedure (TCLP), determines a total leachable chromium (all valences) concentration that meets or exceeds 5 mg/L, residual or spent liquid is considered a hazardous waste subject to the requirements of RCRA. Based on the concentration of chromate in solution of approximately 3.5 mg/L, it is unlikely that the concentration of chromium would equal or exceed the TCLP standard. However, the base has been handling the spent sodium chromate solution as a regulated hazardous waste, as well as the rags used to clean up residual liquid.

Before the guidance system is removed, the sodium chromate solution is purged with nitrogen gas, collected in a specially marked 5- to 10-gallon container, and transported to the MSB for collection and storage in a 35-gallon drum. When the container is full, the drum is transferred to the central accumulation point and prepared for transfer to DRMO-Great Falls for contractor shipment, storage, and treatment at an EPA-approved disposal facility. The rags and gloves contaminated with sodium chromate solution are also stored at the centralized accumulation point as a hazardous solid waste. The amount generated during current maintenance operations is less than 100 kg per site (840 CES/DEV, 1991).

3.7.2.4 Monomethyl Hydrazine, Nitrogen Tetroxide, and Freon

The main boosters of both MM IIs and MM IIIs are solid-fueled. There are no liquid fuels in the MM II missile. However, the propulsion system rocket engine (PSRE) in the MM III missile is dependent on small amounts of monomethyl hydrazine (fuel), nitrogen tetroxide (oxidizer) to assist in vectoring the reentry system platform. The amount of monomethyl hydrazine and nitrogen tetroxide is approximately 10 gallons each. Freon is used to assist in vectoring the missile (341 MW/MBQ). However, these liquids are not handled by the maintenance teams. The liquid fuels and freon are internal to the systems and are not drained or refilled. Handling of these liquids is performed at AFLC facilities. The PSRE units are typically handled at Hill AFB, Utah, which has a specially trained spill response team to handle any spills of these liquids.

3.7.2.5 Diesel Fuel

Diesel is used as a fuel for the back-up generators at the LFs and LCFs and provide a heating fuel for the support buildings at each LCF. Diesel fuel is not a hazardous waste but is a regulated substance subject to Subtitle I of RCRA, the Underground Storage Tank (UST) program. All tank contents must be disposed of in accordance with applicable state regulations. If disposed of, diesel fuel that has been contaminated with a hazardous substance will be removed from the tank and placed in appropriately labeled 55-gallon drums for transport to the MSB for hazardous waste disposal action as previously discussed. In addition, because the flash point of diesel fuel is less than 140 °F (DF-2 has a flash point of 125 °F), it would then be considered an ignitable hazardous waste, subject to RCRA requirements if discarded. However, as long as the product will be used for its intended purpose, it is not considered a hazardous waste.

3.7.2.6 Herbicides

A number of herbicides have been used to suppress weed growth around the LFs since they were established in the early 1960s. Currently, Arsenal® (which contains imazapyr as the active ingredient) is the main herbicide of choice. The herbicides are applied during late spring and early summer at rates below the maximum prescribed by the manufacturer. The amount of herbicides used for crops within the deployment area is undoubtably substantially more than the quantities used by the Air Force.

3.7.2.7 Potassium Hydroxide Batteries

Each missile guidance system (MGS) contains a potassium hydroxide battery for power after launching from the LF. These batteries are considered class C explosives, labeled corrosive, and contain approximately 1 quart of potassium hydroxide. After the MGS is dropped off at the Electronics Laboratory, the batteries are removed and stored in a cabinet within the MGS vault. The Minuteman II and III batteries are about the size of a small toaster, with the MM II battery being slightly smaller. The batteries are stored in containers, and then installed in the guidance system. The battery is also taken out when the guidance system is readied for storage or shipping.

3.7.3 Underground Storage Tanks

A 1,000-gallon underground storage tank (UST) at each LCF is used to store heating oil for the support facilities. Large USTs at each LF (1,500 gallons) and LCF (12,000 gallons) contain diesel fuel to run back-up power generators. The USTs are regulated for overfill protection, secondary containment, and leak detection standards and must be upgraded by December 1998. All USTs installed prior to 1975 must be tightness tested annually, starting in 1991. Those USTs installed prior to 1965 must be tightness tested first, then the requirement is increased every five years. Once the system is upgraded, annual testing is part of the system. Out of 269 tanks recently tightness tested for leaks, only one tank was leaking and the tank has been removed and site remediation work is in progress (840 SUPTG/DEV, 1991). As part of the UST upgrade, a vapor monitoring system will be included in the tank system and halon will be used during testing. Current plans are to have all tanks at the MSB and deployment area of Malmstrom AFB upgraded by 1993-1994 (840 SUPTG/DEV, 1991). Any spill or leak of diesel fuel would be cleaned up according to applicable Montana Administrative Rules.

The USTs at LFs and LCFs are periodically drained, cleaned, scrubbed, and treated. The product is withdrawn and stored for reuse, workers (contractor or Air Force) enter the tanks and remove sludge from the bottom of the tanks, the sludge is placed in 55-gallon drums (the drums are transported to DRMO if the Air Force performs the action), the sludge is properly disposed of, the tanks are inspected for integrity, and the product originally removed would be returned to the UST. The amounts of sludge removed from LF and LCF USTs have been less than 100 kg per site.

An annual cathodic protection survey for the USTs is performed and further inspections are based on monthly power meter readouts. An inspection would also be performed if work proposed for the site would disturb the site topography. If soil is excavated and a UST or piping is being repaired or replaced, an inspection to ensure cathodic protection would be performed.

3.8 NOISE

Sounds which disrupt normal activities or otherwise diminish the quality of the environment are designated as noise. Noise can be stationary or transient, intermittent or continuous. The human response to noise is generally divided into three categories: physiological, which is primarily hearing loss; behavioral, which includes speech and sleep interference; and subjective, which is predominantly annoyance.

Noise produced by aircraft during takeoff and landing operations are of major interest. These noises fall into a broad range of "transient" noises, which come and go in a finite period of time. Dependent primarily on the type of aircraft, type of operations, and distance from the observer to the aircraft, the maximum flyover noise levels will vary widely in magnitude ranging from levels undetectable in the presence of other background noise, to levels sufficiently high to create feelings of annoyance, or to levels that interfere with speech or sleep. The duration of the noise will also vary depending on the proximity of the aircraft, speed, and orientation with respect to the observer.

Community response to aircraft noise is not based on a single event, but on a series of events over the day. Factors that have been found to affect the subjective assessment of the daily noise environment include the noise levels of individual events, the number of events per day, and the time of day at which the event occurs. Most environmental descriptors of noise are based on these three factors, although they may differ considerably in the manner in which the factors are taken into account.

The descriptor of a 24-hour daily noise environment is the Day-Night Average Sound Level (L_{dn}). To compute an L_{dn}, a single noise event is measured with corrections added for the number of events and the time of day. A 10-decibel penalty is added for noise that occurs during the nighttime hours of 10 P.M. to 7 A.M. The L_{dn} descriptor is accepted by federal agencies as a standard for estimating noise impact and establishing guidelines for compatible land uses. The USAF has adopted the L_{dn} as the measure for noise regulations, which is employed universally as a descriptor of community noise environments.

The Air Force examined the effects of aircraft noise and accidents on communities near Air Force installations and developed the Air Installation Compatible Use Zone Program (AICUZ). Air Force Regulation 19-9 outlines the objectives of the AICUZ program: to protect Air Force installations from incompatible land use and to assist local, State, and Federal officials in protecting and promoting public health, safety, and welfare by providing information on aircraft accident potential and noise. Federal agencies accept the L_{dn} descriptor as a standard for estimating noise impact and establishing guidelines for compatible land uses. Under Housing and Urban Development (HUD) criteria, areas of 75 L_{dn} or greater are considered unacceptable living environments. The number of daily aircraft operations directly affects the level of noise in the vicinity of the air force base. The predominant noise in the vicinity of Malmstrom is the result of KC-135R refueling aircraft operations. No significant noise impacts were found to occur from the

KC-135R operations (USAF, 1989a). Military Airlift Command (MAC) C-141s are non-host or transient aircraft that also conduct operations at Malmstrom AFB and contribute to the average daily level of aircraft noise. These aircraft are used to transport MM II and MM III components, primarily boosters, to maintenance facilities.

Measures are taken to keep noise levels on Malmstrom AFB at a minimum by continuously evaluating aircraft operations. Engine runups are directed into blast deflectors or occur in designated areas to minimize people's exposure to noise.

Background noise levels in the deployment area are similar to those in other rural areas. Natural noise sources make the major contributions to ambient noise levels in the largely undeveloped deployment area. In many areas, wind is probably the greatest of noise sources, especially during the spring when wind speeds tend to reach a maximum. Elevated levels of natural noise also occur during rainstorms. Outdoor daytime residual noise levels at remote wilderness sites are about 16 L_{dn}, while agricultural areas range from 35 to 45 L_{dn} (USAF, 1987).

In addition to routine maintenance at LFs which requires the use of maintenance vehicles, movements of rocket boosters and missile components occur in separate, large vehicles (TEs, PTs, and RV/G&C vans). Two to four missile movements (one to two recycles) occur per month. The vehicles used to maintain and move the missiles contribute to the level of noise both in the deployment area and on base. Noise levels on the base at residence locations range from 51 to 75 L_{dn} and are influenced primarily by aircraft operations, vehicular traffic, maintenance equipment, and construction (USAF, 1989a). Traffic in the deployment area is sporadic--nearly all the roads have a level of service (LOS) class A (section 3.9 discusses baseline transportation information). Average noise levels temporarily increase and approach 50 L_{dn} as traffic proceeds through the deployment area.

3.9 TRANSPORTATION

The primary road network in the Great Falls area includes four east-west roads (U.S. 2 and 12, Montana State Highways 81 and 200) and eight north-south roads (I-15, U.S. 87/89, 191, and 287, Montana State Highways 3, 19, and 80) (USAF, 1986). Malmstrom AFB is reached by U.S. 87/89 and State Highway 200. The principal city streets in Great Falls follow a grid-type network of north-south and east-west roads. The most heavily used road in the city is four-lane 10th Avenue South, also considered as part of U.S. 87/89, which is one of the primary access roads to Malmstrom AFB. This highway is located immediately south of the base. Although 10th Avenue South is the most congested street in Great Falls, most TE movements occur during non-rush hour times (before 6:00 a.m. and after 6:00 p.m.).

Transporter-erectors (TEs), support vans, and other vehicles are driven on some of the principal city streets (e.g., 10th Avenue S.) through Great Falls and the primary highways leading to Malmstrom AFB. While there are specially designated TE routes, mainly because of restrictions regarding the size and weight of the vehicle, other vehicles (e.g., support vans, maintenance vehicles, reentry vehicle/guidance and control (RV/G&C) vans, and payload transporters (PTs)) may also follow these routes.

Level of Service (LOS), ranging from A (best) through F (worst), is a qualitative measure incorporating various factors (i.e., speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs) provided by a road facility under a particular volume condition. The LOS along the TE graveled routes is designated as LOS A and most primary roads through Great Falls are designated as LOS A or B (USAF, 1987). Traffic flows are low, with moderate flows occurring along primary and urban routes.

The 1985 average daily traffic (ADT) flow entering or leaving Malmstrom AFB by the main gate at 2nd Avenue North was 10,538 vehicles. The section of 10th Avenue North leading to the commercial gate had a 1985 ADT of 3,584. There are no significant congestion areas except during the peak periods (7:30 - 9:00 A.M. and 3:30 - 5:00 P.M.) when occasional, short delays occur at the gate for those entering the base. Another gate exists along U.S. 87/89 at the south end of the base; this is primarily used by military traffic commuting to the Weapons Storage Area and the eastern part of the base.

A transportation plan for 1990-2010 has been prepared by the Great Falls City-County Planning Board (1990). The Plan contains recommendations for immediate and long-range improvements to roads in the Great Falls urban area. Table 3.9-1 outlines the improvement projects for Great Falls in the near future. A number of factors were used to support the planning process. Accident rates and levels of service were two of the factors assessed. Recommendations for widening areas of 10th Avenue South were included in the plan. An earlier version of the plan (Great Falls City-County Planning Board, 1988) provided current traffic volumes of 8,000 to 33,000 vehicles per day, with

Table 3.9-1
Committed and Recommended Short Range Improvements
Great Falls, Montana

Location	Description	Estimated Cost[1]
Committed Improvements		
15th Street & River Drive	Upgrade signals and add right turn lane	$ 100,000
15th Street North	Rehabilitate concrete	$ 244,000
River Drive	Repave and striping	$ 113,000
Northwest Bypass	Repave and striping	$ 135,000
3rd Street NW/Smelter Avenue	Repave and striping	$ 485,000
14th & 15th Streets North	Install rubberized railroad crossing	$ 69,730
Recommended Improvements: Capacity Problems		
10th Avenue South & 38th Street	Add right turn lane	$ 7,500
10th Avenue South & 49th Street	Add left turn lane	$ 7,500

[1] Includes construction costs only. Does not include engineering, right of way or utility costs, if any.

Source: Great Falls City-County Planning Board, 1988.

Note: Other minor improvements have been recommended, but not cost-estimated.

a projected increase by the year 2010 to 12,941 to 41,212 vehicles per day, an increase of approximately 25 percent.

There are approximately 3,500 total miles of roads in the deployment area, approximately 787 miles of which are gravel roads, and there are a total of 1,707 miles of TE routes, consisting mostly of asphalt (56 percent) and gravel (43 percent) surface (USAF, 1981). The main transportation routes to and from Malmstrom AFB are paved roads and proceed to secondary and gravel roads to the LFs and LCFs. For the 12 MS (a MM II squadron and 564 MS (a MM III squadron), TEs travel west on U.S. 87/89 toward 10th Avenue South. To reach the 10 MS and 490 MS, TEs travel east on U.S. 87/89.

A 4-inch layer of gravel—which exceeds State or local minimum requirements—must be maintained on the gravel roads used by the TEs for safe and dependable movements in all weather conditions. Therefore, since the late 1960's, the Air Force has financed the re-graveling of county roads used for missile transport. Roads are periodically graded to improve the surface, but this is not done annually. These projects are jointly funded with a county or completely funded by SAC. The funds are disbursed from HQ SAC to the Federal Highway Administration based on an agreement with SAC at Malmstrom AFB and the counties in the deployment area. Throughout the deployment area, the Air Force has improved the road network by creating roads and paying for improvements to the roads that existed before MM II deployment.

The accident rate per miles driven for Air Force vehicles is very low (section 3.7.1). Two accidents have occurred with rocket motors going to or from Malmstrom AFB since the MW was activated in 1961 (HQ SAC/LGBX, 1991). No accidents involving PT or RV/G&C vans have occurred—because of the convoy movement of these vehicles and the delicacy of the movement issue, chances of an accident are minimized. The most recent accident involved a ballistic missile transporter being driven by a contractor from Malmstrom AFB to Hill AFB.

Before each missile movement, the transport route from the MSB to the LF is travelled by a maintenance vehicle to check road conditions. Twelve missile recycle actions are scheduled to occur within the next fourteen months. Table 3.9-2 contains the average number of miles driven per year in support of the 341 MW.

Table 3.9-2 Average Mileage Driven in Support of the 341 MW Mission

Division	Avg. mileage/year	Avg. mileage/month
840 TRANS	701,094	58,425
840 CES	1,208,982	100,749
341 FMMS	1,635,565	136,297
840 Supply	89,407	7,451
341 DCM	116,298	9,692
840 SVS	103,302	8,609
840 MSSQ	24,068	2,006
40 AD Safety	12,790	1,066
840 SPG	3,521,108	293,426
341 SMW/DO	1,343,920	111,993
2153 COMM	277,395	23,116
Totals	9,033,929	752,830

Source: 341 SMW/MBMS, 1991

Note: Data is from the beginning of March 1990 through the end of February 1991. The mileage reported for some of the divisions, including the 840 SPG and 840 CES, includes an unknown amount allocated to SMSB operations unrelated to the 341 SMW. Mileage for the 341 OMMS is included in the mileage listed for the 341 FMMS.

Because of the close proximity to Hill AFB, air, rail, and road are all available modes of transportation for the missile components. Based on time criteria, air is the ideal mode of transport. Two C-141 aircraft are available to handle the transport of missile containers for all MM II and MM III missiles. Transport by road may be affected by weather conditions (e.g., peaks of activity occurring during winter months can often be attributed to inclement weather) and transport by rail is influenced by scheduling and the availability of trains.

3.10 SOCIOECONOMICS

Six major socioeconomic resources are described below: employment, income, population, housing, education, and utilities. Income changes would be expected to influence a larger region than the county in which the MSB resides (Cascade) and are described for the area within a 50-mile radius of Malmstrom AFB; most of the other resources are summarized for Cascade County only. A comprehensive description of the affected environment may be found in the Small ICBM Program EIS (USAF, 1987).

3.10.1 Employment

Malmstrom AFB employment totaled 4,524 military and civilian personnel in the fourth quarter of FY91 (table 3.10.1-1). Authorizations for 16 operations and security personnel and 8th Field Missile Maintenance Squadron (FMMS) personnel were rescinded; the need for adding authorizations for maintenance personnel is currently being evaluated.

Table 3.10.1-1 Malmstrom AFB Employment FY91, 4th Quarter

	Officers	Enlisted	Civilian	Total
Total	601	3,513	410	4,524
Missile Group				
Operations and Security	347	1,057	4	1,408
Strategic Missile Wing	16	143	1	160
OMMS	7	158	1	166
FMMS	8	173	12	193
Source: HQ SAC/XPM, 1991				

3.10.2 Income

Total military and civilian payroll totalled approximately $99,852,000 in FY91 (table 3.10.2-1). This personal income is estimated to have resulted in $60,709,000 spent (approximately 60 percent of the total payroll) within a 50-mile radius of the base for local goods and services.

3.10.3 Population

Cascade County had a 1990 population of 77,691, a decrease of 3.7 percent from the 1980 population. No reliable projections are available for future population levels (personal communication with University of Montana, 1991).

Table 3.10.2-1 FY91 Base Payroll and Local Income Generated					
	FY90 Average Payroll per Employee	FY91 Employment	FY91 Payroll	Multiplier	FY91 Local Income Generated
Military	$ 21,124	4,114	$ 86,904,136	0.591	$ 51,360,344
Civilian	$ 31,580	410	$ 12,947,800	0.722	9,348,312
Total		4,524	$ 99,851,936		$ 60,708,656
Source: USAF, 1990a; HQ SAC/XPM, 1991					

3.10.4 Housing

The housing stock in Cascade County was 33,063 units in 1990 and estimated to be 34,000 by 2000 (personal communication with Montana Census and Economic Data Center, 1991). Using an average 0.26 percent average annual growth rate, it is estimated there would be 33,149 units in FY92 and 33,235 units in FY93. The vacancy rate in 1990 was 8.9 percent, with approximately 2,900 available units. Assuming the vacancy rate remains constant, there would be about 2,950 available units in FY92 and 2,960 in FY93.

3.10.5 Education

There have been significant changes in the number of students enrolled in Cascade County schools over the past ten years. School enrollments decreased from 14,950 in 1980 to 13,900 in 1985, a decline of 1,050, or approximately 7 percent (USAF, 1991b).

3.10.6 Utilities

Electrical services to Malmstrom AFB and Cascade County are provided by the Montana Power Company (MPC), a private utility, and three electric cooperatives, Fergus, Sun River, and Marias River. The Great Falls Gas Company and MPC supply the base and surrounding counties with natural gas. Potable water for Malmstrom is supplied by Great Falls, with storage capacity on base. The launch control facilities obtain water supplies from wells and/or local community water supplies. Malmstrom utilizes the city of Great Falls sewage treatment plant; wastewater at the LCFs is treated in sewage lagoons. The capacity of all utilities currently exceeds peak demand (USAF, 1991b).

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4.0 ENVIRONMENTAL CONSEQUENCES

For this environmental assessment (EA), a structured, integrated process was used to identify the possible environmental effects arising from activities associated with implementation of the proposed action or no action alternative. The likely major elements of the proposed action and no action alternative were identified and the major activities associated with these elements were evaluated. For each major activity, the types of effects that activities could generate were defined in various environmental resource areas. This process enabled the identification of the effects in one resource that are generated by an activity (direct effects) and also by an activity's effects on another resource (indirect, secondary, or higher order effects).

As specified in section 3.0, those resources that would not be affected by the alternative actions were not described and those that would be unlikely to be affected were not described in the same level of detail as those that would likely be affected. The same rationale holds true for the analysis of potential environmental impacts in chapter 4 of this EA.

The significance—the importance—of an environmental impact depends on several factors including the following:

- The magnitude—the size of the change in the baseline condition.
- The likelihood—the chance of the change occurring if the action is taken.
- The context—the setting or frame of reference. This has both spatial (geographic) and temporal (timeframe) meanings: the significance of an impact can vary in local vs regional vs national vs global contexts. Similarly, impact significance can be different in the short term vs the long term.
- The intensity—the severity of an impact (as the term is used by CEQ at 40 CFR 1508.27). Included in this factor are considerations of the following:
  - The severity of adverse effect components within overall impacts that have both beneficial and adverse components.
  - The degree of adverse effect on specific resources or concerns (such as public health, endangered species, historic places).
  - The potential for violation of laws or regulations.
  - The potential of this action as precedent.
  - The degree of uncertainty and unknowns.
  - The degree of potential controversiality.
  - The uniqueness of the setting.
  - The relation to other actions with potential cumulative (additive) effects;
- The permanence, the reversibility of the impact, and the resilience of the affected resource.

These factors were considered for each resource area and allowed the formulation significance criteria to serve as guidelines for categorizing the significance of impacts. These criteria take into account all the relevant significance factors. The estimated environmental impacts of the proposed action and the no action alternative were evaluated, then compared to the significance criteria to determine the potential significance of the predicted impacts. For this analysis, short-term impacts are those that would occur during the conversion process and long-term impacts would occur after completion of the conversion process. The results of this analysis are presented in the following sections.

4.1 MALMSTROM AFB

4.1.1 Mission and Operations

There would be no significant change in Malmstrom AFB's mission and operations if the proposed action was adopted or the current operations continued (no action). The only difference in the mission would be an entire deployment area with MM III missiles rather than the 50 Minuteman (MM) III and 150 MM II missiles currently deployed. As previously discussed in chapter 2, there is a negligible difference in the maintenance and operation of the different MM missiles.

4.1.2 Installation Environmental Management

There would be no significant change in the installation's environmental management of the operations and missions occurring at Malmstrom AFB if the proposed action was adopted or the current operations continued (no action). The same wastes would be handled, the same air emissions would occur, and the environmental considerations would be the same. There is a negligible difference between the MM II and MM III missiles and no new considerations would need to be accounted for if all the MM II missiles were replaced with MM III missiles.

4.2 AIR QUALITY

The air quality at the missile support base (MSB) and the deployment area would be affected by activities associated with the proposed action or alternatives. The air quality would be affected along transportation routes and at intermittent periods at distinctly separate sites within the deployment area.

The significance of impacts to air quality is based on Federal, State, or local pollution regulations or standards. A significant impact would be a violation of the National Ambient Air Quality Standards (NAAQS) or Montana Ambient Air Quality Standards (MTAAQS), further exceedance of a nonattainment criterion, a more than 5-percent increase in criteria pollutant concentrations, or exposure of sensitive receptors to increased pollutant concentrations. A beneficial impact to air quality would be a reduction in baseline emissions.

4.2.1 Analysis Methods

The analysis was based on a review of existing data and publications, such as the Montana air quality data and information summary for 1988 and 1989 (Montana Department of Health and Environmental Science, 1991), on the potentially affected area. The review covered National Environmental Policy Act (NEPA) documents, the base comprehensive plans, EPA regulations, emissions from equipment and vehicles used in converting the MM II system to a MM III system, and a review of the current level of vehicular traffic at the sites. The review centered on whether Malmstrom AFB is in attainment status with the NAAQS; the current force structure; proximity of major sources of pollutants, such as metropolitan areas; and the local meteorological conditions. Against this information background, the analysis investigated the potential for assumed air emissions to exceed standards.

4.2.2 Potential Impacts of the Proposed Action (Conversion)

Air emissions from aircraft, vehicle traffic at the MSB and to and from the deployment area, and equipment used at the LFs were qualitatively evaluated.

Aircraft emissions were not directly evaluated in a detailed manner as part of this study. The rationale for this determination is twofold: first, the environmental impacts of the transport of the MM II boosters to Hill AFB by aircraft, train, or truck are being evaluated by the Air Force Logistics Command (AFLC) in a separate document (USAF, 1991a); second, and more importantly, the number of C-141 transport trips relative to current base flight operations would be negligible. Over a period of six years, and assuming that all rocket boosters would be moved by aircraft, there would be approximately one flight operations per week regarding the movement of the booster: a C-141 would fly in, have a booster loaded, and fly out the same day. Compared to a rate of 60 estimated monthly sorties for KC-135R aircraft in the 301st Air Refueling Wing (AREFW) and 175 estimated monthly sorties for UH-1N helicopters of the 37th Air Rescue Squadron (ARS), the contribution of air emissions from four additional C-141 flights per month would be negligible. An evaluation of the current aircraft emissions and the projected emission increase incurred for activation of a second KC-135 squadron revealed that the current attainment status for criteria pollutants in the area of Malmstrom AFB would be maintained (USAF, 1989a). Under the proposed conversion action, a negligible long-term change in aircraft emissions from the current baseline would occur.

The same rationale applies to not performing a detailed evaluation of the emissions from traffic at the MSB. A slightly higher rate of activity (approximately 25 percent) than the current maintenance schedule and replacement of one missile per month would cause a slight short-term increase in base activity during the conversion process. Over the long term, the vehicular emissions would differ negligibly from those currently occurring.

Vehicles used by the Air Force in the conversion process would include TEs, PTs, RV/G&C vans, security vehicles, maintenance vehicles, and vans. The amount of traffic to, from, and within the deployment area is predicted to increase by approximately 25 percent over the short term. Section 4.9 evaluates the change in traffic volume and patterns under the proposed action and no action alternative. Because Air Force vehicles and equipment would only be used over a short time at a particular site, the impact on air quality from this activity is negligible and is not evaluated further.

The main constituents of the exhaust from vehicles and heavy equipment include CO, nitrogen oxides (NO_x), hydrocarbons, and suspended particulate matter. As discussed in section 3.2, there have been some exceedances of the 8-hour standard for carbon monoxide along 10th Avenue South, the route that would be driven by TEs during conversion of the 12 MS. However, in 1988 there was only one exceedance and in 1989 there were no exceedances (Montana Department of Health and Environmental Sciences, 1991). Because the traffic associated with maintenance and missile movements would usually pass through this area before 6 AM and after 6 PM, and the total contribution of Air Force vehicular traffic associated with the 341 MW would comprise only an insignificant fraction of the daily traffic along 10th Avenue South (8,000 to 33,000 vehicles per day), no significant impacts to air quality from vehicular emissions are projected.

The air quality in the deployment area and at the MSB is excellent and health effects attributable to the air quality are negligible. Because the proposed action differs minimally from the current program activities, no adverse health impacts from pollution are expected to occur.

4.2.3 Potential Impacts of the No Action Alternative (Continued Operation)

Continued operation of the MM II missile system would result in continued emissions from vehicular traffic at the MSB and to and from the deployment area. Air emissions caused by transporting missile components from Malmstrom AFB to other DoD facilities, as described in section 2.2.5, would continue to occur under the no action alternative. No significantly adverse impacts would occur to air quality under this alternative.

4.2.4 Mitigation Measures

While no significant air quality impacts are expected to occur, the following mitigation measure could be implemented to reduce air emissions and provide a more pleasant living environment:

- Maintain any equipment used during the conversion according to EPA product standards

4.2.5 Unavoidable Impacts

The proposed action would result in an unavoidable, negligible increase in combustive emissions from the use of vehicles and equipment.

4.3 GEOLOGICAL RESOURCES

Geological resources are limited nonrenewable resources vulnerable to deterioration by physical disruptions. Significant impacts on geological resources occur when a local or regional resource is depleted, a fault is activated, a slumping or movement event causes injuries or irreparable damage, accelerates the rate of erosion, degrades soil characteristics, and reduces productivity by a loss of vegetation. When a resource is not important to a region or is only slightly affected, a negligible impact is said to have occurred. A beneficial impact will occur when a hazard potential is reduced.

4.3.1 Analysis Methods

The geological resources within the deployment area were studied to determine the potential impacts to geological resources from the proposed action and the no action alternatives. Documents and maps containing information from previous studies on the geology, soil surveys, and geologic hazards were examined. The documents that were reviewed included Federal and State reports, geotechnical papers from the United States Geological Survey (USGS) and the State of Montana, USDA Soil Conservation Survey maps (USDA,1967; USDA, 1982; USDA, 1988), and topographic maps (7-1/2 minute series). Interviews with personnel from the Montana Bureau of Mines and Geology were conducted. The review centered on the regional geology, local and regional soils, and geologic hazards. The component activities and procedures of the system phaseout and conversion were then considered against this background of existing characteristics of the resource.

4.3.2 Potential Impacts of the Proposed Action (Conversion)

4.3.2.1 Physiography and Topography

No impacts to the physiography of the region or the topography of the LFs, LCFs, or the MSB would occur as a result of implementing the proposed action.

4.3.2.2 Geology

The thick layers of sedimentary rocks in the deployment area would not be adversely affected by activities conducted for the proposed action. Even though 62 of the launch facilities are adjacent to oil and gas leases, the proposed action would not impact these mineral properties. Other mineral sources would likewise not be affected.

4.3.2.3 Soils

No construction activities would occur at the LFs or LCFs as part of the proposed action. However, some erosion of soils can be expected from the use of heavy vehicles along gravel roads in the deployment area. Particulate matter in the form of dust could be disturbed and moved by wind, therefore causing erosion. This impact is not anticipated to be any different than is currently occurring and would not be a significantly adverse affect.

A coincident action that is required for implementing the proposed action, expansion of the gravel maneuver area, is described in chapter 5.

4.3.2.4 Geologic Hazards

As described in section 3.3, the deployment area is subject to landslides and earthquakes. However, these hazards are slight; most of the landslides produce only minor debris on roads, and the earthquakes that have occurred within the last 10 years are of a slight magnitude (a maximum of 3.4 on the Richter Scale within the deployment area and 4.9 on the Richter Scale within 60 miles of the deployment area). Historically, the strongest earthquake to occur was near Three Forks (approximately 100 miles outside the deployment area) in 1925, with a magnitude of 6.7 on the Richter Scale. However, none of these quakes were known to have produced ground faulting. The probability of an earthquake occurring at a given time and location cannot be accurately calculated because the fault lines in this area are too short (personal communication with Montana Bureau of Mines and Geology, 1991). The relative stability of the deployment area makes it improbable that the vehicle movements and activities associated with removing the MM II missile and substituting an MM III missile would create a geologic hazard. Coincidentally, it is highly unlikely that a noticeable earthquake or landslide would affect the conversion program.

4.3.3 Potential Impacts of the No Action Alternative (Continued Operation)

Continued operation of the MM II system would not produce any new geologic hazards or new impacts to the geology and soils within the deployment area. Current impacts on the geological resources are negligible. Continued herbicide application to the graveled areas would continue the potential leaching of herbicides into the ground water and its transport into surface water by means of soil erosion.

4.3.4 Mitigation Measures

No significant adverse impacts from implementing the proposed action are anticipated so no mitigation measures are proposed.

4.3.5 Unavoidable Impacts

Soil and gravel would be disturbed, but not to a significantly adverse degree, as a result of the movement of vehicles and equipment along gravel roads.

4.4 WATER RESOURCES

Water resources are a finite but renewable resource. The introduction of chemicals and physical disturbances may degrade water quality and quantity. The proposed replacement of MM II missiles with MM III may have a negligible impact on the water resources. A significant impact would occur if an aquifer or surface water body would be damaged in terms of water quality and/or quality. A negligible impact is when there are no measurable changes in water quality or quantity. A beneficial impact would be improved water quality.

4.4.1 Analysis Methods

Conversion activities were assessed to predict potential siltation of streams or movement of contaminants to ground water or surface water. Historical records of spills at LFs and LCFs and herbicide use at the LFs were evaluated to assess the potential for water contamination. An early process in the analysis was to define the extent of the deployment area and examine its water resources. Documents from previous studies of ground water, surface water, and water quality were examined to determine whether relevant information had been collected to support the analysis of the conversion action and the no action alternative. These documents included Federal and State reports, geotechnical papers from the USGS and the State of Montana, and USGS topographic maps (7-1/2 minute series). The review centered on the proximity of launchers to dams, perennial streams, and other bodies of water, in addition to the regional hydrogeology and water quality.

4.4.2 Potential Impacts of the Proposed Action (Conversion)

4.4.2.1 Ground Water

Conversion of the LFs and operation and maintenance of the LFs after their conversion would not produce any new impacts to the ground-water resources within the deployment area. Soil sterilants would continue to be used and could potentially leach into the ground water. However, based on computer modelling for a similar study, it is anticipated that pesticide leaching would occur only within the root zone (approximately three feet) and would not affect deep or shallow aquifers (USAF, 1991c). All operations at the LFs and LCFs would occur within the security fence and no disturbance of aquifers is anticipated.

4.4.2.2 Surface Water

The proposed activities could alter the surface water hydrology by causing dust to settle in nearby water bodies and cause erosion from the area of the launch facilities.
The levels or dust and erosion would be similar to those produced by existing operations. The semi-arid climate of the deployment area produces minimal precipitation runoff which should not significantly adversely affect surface water quality.

4.4.3 Potential Impacts of the No Action Alternative (Continued Operation)

Continued operation of the MM II system would not produce any new impacts to water resources within the deployment area. Current impacts on the water resources are negligible. The same amounts of erosion and transport of herbicide-laden water or sediment onto nearby ground- or surface-water bodies would still occur.

4.4.4 Mitigation Measures

No significant adverse impacts from implementing the proposed action are anticipated so no mitigation measures are proposed.

4.4.5 Unavoidable Impacts

Soil and gravel would be disturbed, but not to a significantly adverse degree, as a result of the movement of vehicles and equipment along gravel roads. The dust could settle in surface water bodies.

4.5 BIOLOGICAL RESOURCES

Native or naturalized plants and animals, and the habitats in which they occur, are collectively referred to as biological resources. Particularly important are plant and animal species that are protected under the Endangered Species Act.

Impacts on biological resources would be significant if species are lost, with little likelihood of their successful existence or reestablishment after implementing the proposed action. An insignificant, yet adverse, impact would result if the disturbed population could be reestablished to its original state and condition, or the population is sufficiently large or resilient to respond to the proposed action without measurable change. An increase in population numbers and species viability, or enhanced habitat would be viewed as a beneficial impact.

4.5.1 Analysis Methods

The analysis methods used to determine potential impacts of activities associated with the proposed action and other alternatives consisted of a review of existing data and previously written environmental documents for the deployment area. The Montana Department of Fish, Wildlife and Parks was informally consulted for technical assistance in identifying significant biological resources and the status of threatened, endangered, and candidate species in the deployment area.

4.5.2 Potential Impacts of the Proposed Action (Conversion)

4.5.2.1 Vegetation

Most of the LFs are in upland areas of predominantly grassland vegetation and cropland. However, all conversion activities at the LFs would occur within the security fence, which is a graveled, unvegetated area. The conversion activities will not have an adverse effect on the surrounding vegetation.

4.5.2.2 Aquatic

No significant ground disturbance would occur during the conversion process that would increase soil erosion from wind and water runoff. Thus, no significant adverse impacts on aquatic resources, including wetlands, from runoff would occur in the project area.

4.5.2.3 Wildlife

The level of activity in the immediate vicinity of the LFs would not significantly differ from what currently occurs. The short-term increase in Air Force vehicular traffic on deployment area roads could temporarily disturb resident wildlife. However, because the routes to each LF are different, the impact of any additional vehicles or increased activity would be short-term and no significant impacts such as habitat abandonment or decreased reproduction in feral or domestic herds are expected.

4.5.2.4 Threatened, Endangered, and Candidate Species

No Federal- or State-listed threatened or endangered species have been found on base or at any LF sites. No Federal- or State-listed threatened or endangered plant species have been found in the deployment area. Because the conversion program, other than transportation of missile components to and from the site, would be confined to the area within the security fence, no new areas would be disturbed (no habitat used by the endangered species would be lost). Therefore, disturbance of prairie dogs and any potential black-footed ferrets preying on the community would be unlikely. No impacts are expected to occur to protected birds that migrate through the deployment area, such as the peregrine falcon (*Falco peregrinus*) and bald eagle (*Haliaeetus leucocephalus*).

4.5.3 Potential Impacts of the No Action Alternative (Continued Operation)

Continued operation of the MM II system would primarily involve routine missile maintenance and replacement activities. Runoff from the LF area would continue during periods of precipitation resulting in a negligible change from current levels. Stream sedimentation and some leaching of herbicides used to control vegetation within the security fence area would continue to occur.

These events have not resulted in any significant adverse effects on the aquatic environment. The no action alternative would have insignificant adverse impacts on biological resources. Under this alternative, any impacts to the resource would remain unchanged.

4.5.4 Mitigation Measures

Because no significant adverse impacts to biologic resources would be expected, no mitigation measures are presented.

4.5.5 Unavoidable Impacts

The proposed action would not result in any significant unavoidable adverse impacts to biological resources.

4.6 CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources whose values may be easily diminished by physical disturbances. This resource element constitutes those items, places, or events considered important to a culture or community for reasons of history, tradition, religion, or science. The criteria used to determine the significance of impacts on cultural resources include the effects on National Register of Historic Places (NRHP) eligibility, future research potential, or suitability for religious or traditional uses. Impacts would be significant if they result in the physical alteration, destruction, or loss of a resource listed, or eligible for listing, in the NRHP, or considered important to Native American groups. Adverse impacts would be insignificant if slight portions of the resource are affected or the value of the resource is not that important. The proposed action would be beneficial if it protected or reconstructed the resource.

4.6.1 Analysis Methods

The analysis consisted of a review of existing data, publications, and previously written environmental documents to determine the extent and value of prehistoric and historic, Native American, and paleontological resources that may be affected. The Montana State Historic Preservation Officer (SHPO) was formally consulted for technical assistance in identifying resources of specific concern or value in the deployment area.

4.6.2 Potential Impacts of the Proposed Action (Conversion)

4.6.2.1 Prehistoric and Historic Resources

Most LFs are in upland areas, not within areas viewed as high-density zones for prehistoric resources, such as adjacent to streambanks, river terraces, or vertical changes in topography; therefore, no impacts on prehistoric resources are expected to occur. The conversion activities proposed at the LFs and LCFs would occur within the security fences. Listed historic and architectural resources occur in community settings distant from any LFs. These resources would not be affected by the proposed action.
The proposed action would impact historic resources eligible for listing, specifically bridges in the deployment area used by TE vehicles, if changes or modifications to the resource were required. A TE vehicle carrying MM II rocket motors weighs 140,487 pounds while the same TE vehicle carrying MM III rocket motors weighs 144,323 pounds. However, no changes or modifications to bridges are currently scheduled; therefore, impacts to any structures eligible for listing in the NRHP are not expected to occur. If any bridges potentially considered as historic structures are required to be upgraded in the future to account for this increase in weight or for maintenance or significant repairs, the SHPO should be consulted further as to the extent of their eligibility.

4.6.2.2 Native American Resources

The proposed action would not involve any activities that would disrupt Native American resources or disturb ongoing religious ceremonies. Activities other than transportation of missile components would occur within the confines of the LF security fence and no unusually loud noise levels are expected that could disturb vision quests or nearby ceremonies.

4.6.2.3 Paleontological Resources

The proposed action would not involve any activities outside the LF security fence area that would disturb or destroy paleontological resources; therefore, no impacts on this resource are expected.

4.6.3 Potential Impacts of the No Action Alternative (Continued Operation)

Because the continuation of operations primarily involve routine missile maintenance and replacement, impacts on cultural resources would be negligible. Under this alternative, any impacts to the prehistoric and historic, Native American, and paleontological resources would remain unchanged.

4.6.4 Mitigation Measures

The proposed action would not result in significant adverse impacts to cultural resources; therefore, no mitigation measures are presented.

4.6.5 Unavoidable Impacts

The proposed action would not result in any significant adverse unavoidable impacts to cultural resources on base or in the deployment area. Bridges that may be historic resources would continue to be used because there may not be a route for a TE to get to a particular LF without traveling over one or more potentially historic bridges.

4.7 HEALTH AND SAFETY/HAZARDOUS MATERIALS

Human health and safety may be affected by activities associated with the proposed action and the no action alternative. Base personnel performing the actions would follow protective guidelines and regulations when handling explosives and hazardous materials, and transporting missile components.

If the workers or the general public were to be exposed to hazardous materials, such as PCBs, sodium chromate solution, or a transportation accident, human health and safety could be significantly affected. Adverse, significant impacts could also occur if workers violate required procedures. Development of improved handling procedures for the removal of PCBs, sodium chromate solution, and nuclear material would have beneficial impacts in the deployment area. Beneficial impacts could occur if the amount of hazardous wastes generated and/or disposed of is decreased or if previous wastes are removed or cleaned up.

4.7.1 Analysis Methods

The analysis methods focused on the concerns related to the handling of explosive material, the handling of hazardous materials and wastes, and the risks of transporting rocket motors (missile boosters). The first step in analyzing hazardous materials was to investigate the methods prescribed for handling explosives and hazardous substances to determine whether handling the substances poses a significant health risk. The level of personnel training was also evaluated. The likelihood of a transportation accident was evaluated, as were the potential effects if the accident involved a missile booster that ignited or caught on fire from the accident or a reentry vehicle released radioactive materials. Documents pertaining to handling precautions, toxicity of substances, and transport risk were studied. EPA-issued regulations, and applicable State regulations would be followed when handling any hazardous waste found or generated at facilities in the deployment area. These materials are being handled at various AFBs, including Malmstrom AFB.

The analysis was based on available information on the presence and use of hazardous materials in the LFs and LCFs in relation to existing regulatory requirements. The types of activities proposed for the conversion program and specified guidelines for performing the actions were reviewed.

Accidents in handling and transporting missile components (rocket motors, RVs, etc.) are potential human health and safety risks; therefore, the analysis focused on the three primary elements of such risks: the hazard/accident mechanism, the accident likelihood, and the severity of human health consequences if such an accident were to occur. Military and civilian transportation statistics were used in addition to information from knowledgeable military personnel.

4.7.2 Potential Impacts of the Proposed Action (Conversion)

4.7.2.1 Transportation and Handling Safety

Removing missile components from their launch tubes and transporting them to storage or elimination facilities poses a low likelihood of accidents during transportation, with an even lower chance that such accidents could damage public health or the physical environment.

Moving the missile components to and from the deployment area for maintenance is an ongoing activity. Conversion would slightly increase the pace of this activity in the short-term, and would reduce maintenance activities in the long-term (because of the improved reliability of MM III systems). To the extent that a small transportation hazard exists, it would be further reduced once the conversion program has been completed. Though the impacts could be severe within the immediate area of an accident involving a propellant fire or the release of radioactive materials from an RV, the probability of such an event is extremely low (USAF, 1986; USAF, 1987; USAF, 1989b). Appendix C describes the potential impacts resulting from various severe transportation accident scenarios.

High levels of maintenance activities at the deployment areas occurred during the replacement of the second stage rocket booster (see section 2.2.1). Missile movements have decreased during the last year and only failure movements are being performed. Assuming that the accident rate for personal injuries per man hour remains constant, the increased workload would likely result in more injuries. The tasks associated with maintaining Minuteman systems will be identical to previous maintenance tasks with ongoing maintenance training activities and safety inspections. As a result of clearly defined and executed guidelines and procedures, the potential for any increase in personal injuries would likely be negligible.

4.7.2.2 Hazardous Materials

Hazardous waste collected during any conversion process and related activities would be managed in compliance with the Resource Conservation and Recovery Act (RCRA) and all applicable Montana Administrative Rules and regulations. Phaseout of the MM II missiles and conversion to a MM III system would have minor consequences on generating and disposing of hazardous wastes on Malmstrom AFB. The current site maintenance activities generate less than 100 kilograms of waste per month (each site therefore qualifies as a conditionally exempt small quantity generator under 40 CFR 261.5) and the proposed activities would negligibly affect the total quantity of waste generated per site.

The proper removal of hazardous materials would have a short-term and long-term beneficial impact on the public. The following subsections pertain to the material's toxicity and precautions that workers must take when handling these materials.

4.7.2.2.1 Asbestos

The exhaust system and a plenum of the diesel electric units at the LFs and LCFs contain asbestos and are handled during typical maintenance activities. Because these would not be handled in the conversion process, no impacts to health and safety are anticipated.

4.7.2.2.2 PCBs

Polychlorinated biphenyls (PCBs) are suspected human carcinogens. Handling of the electricity filters and electronic hardware would be conducted to prevent exposing workers or the public to PCBs. All filters suspected of containing PCBs would be handled by base personnel and if the component is being disposed of, would be packaged and transported to a storage site on base that meets the specified criteria (per 40 CFR 761.65) and would be disposed of through the Defense Reutilization and Marketing Office (DRMO) in compliance with the Toxic Substance Control Act (TSCA). No adverse effects to human health and safety are anticipated during handling of the PCBs. Once removed from the deployment area, a long-term benefit of not having PCBs at the former LF and LCF sites would result.

4.7.2.2.3 Sodium Chromate Solution

The sodium chromate solution to be removed from the guidance system prior to transport contains hexavalent chromium, a known human carcinogen. Dimethoxane, an antimicrobial agent added to the solution, is an ester of acetic acid, has a low acute oral toxicity, and is considered a carcinogen (Gosselin, et al., 1984). Sodium hydroxide is a caustic substance. Proper clothing and protective gear for handling the sodium chromate solution would be followed to the extent it is occurring under current operations. The potential impact to the health and safety of workers and the general public from removing the sodium chromate solution is negligible as long as safety precautions, proper packaging, and proper disposal are carried out.

4.7.2.2.4 Monomethyl Hydrazine, Nitrogen Tetroxide, and Freon

As discussed in section 3.7.2.4, the hypergolic fuel mixture consisting of monomethyl hydrazine (MMH) and nitrogen tetroxide is contained within the MM III propulsion system rocket engine (PSRE) and would not be directly handled by maintenance personnel. The PSRE would be removed or emplaced to, from, and within the MSB and deployment area without draining or filling the fuel system. These fuels would eventually be handled at an Air Force Logistics Center. The personnel handling the PSRE are trained in handling precautions and spill response measures. As mentioned in section 3.7.2.4, freon is contained in the LITVC. However, freon is inert, nontoxic, and noncorrosive. No significant adverse impacts to personnel are likely from handling the PSRE or LITVC system.

4.7.2.2.5 Diesel Fuel

Diesel fuel would not be handled as part of the conversion process; therefore, no effects from exposure to diesel fuel would occur.

4.7.2.2.6 Herbicides

For the environmental impact statement evaluating the impact of the MM II system phaseout at Ellsworth AFB, a computer model (Groundwater Loading Effects on Agricultural Management Systems (GLEAMS)) was used to estimate the possibility of residues of pesticides (includes herbicides and insecticides) remaining in the soil from long-term use (USAF, 1991c). Results from the model runs showed that the majority of pesticide residues are nearly totally degraded within 1 year of application. If the residues were persistent, workers would be exposed to inhalation and dermal penetration of the herbicides through disturbance of the gravel area during the conversion process. At the predicted minute concentrations, the potential exposures of workers and the general public to pesticide residues during disturbance of the sites would be insignificant.

4.7.2.2.7 Potassium Hydroxide Batteries

The potassium hydroxide batteries for the missile guidance systems (MGSs) are routinely handled by trained personnel. During storage at the Electronics Facility, the batteries are removed and kept separate from each MGS. No new procedures would be implemented during the proposed action and no new impacts are projected to occur.

4.7.2.3 Underground Storage Tanks

The underground storage tanks (USTs) would not be disturbed as part of the conversion process; therefore, no health or safety impacts regarding the tanks are anticipated.

4.7.3 Potential Impacts of the No Action Alternative (Continued Operation)

If operation of the MM II missile system were continued, hazardous substances would continue to be used and handled at the LFs and LCFs. Batteries from the MGSs would continue to be handled, PCB-containing filters would continue to be removed, sodium chromate solution would continue to be purged from the MGS prior to transport, and other typical maintenance duties would continue to be performed. The risk of accidental detonation or accidental ignition of a rocket motor are remote but remain possibilities under this alternative. No significant impacts to public health are anticipated.

4.7.4 Mitigation Measures

Because of the low likelihood of accidents affecting human health and safety, no additional mitigation measures are proposed beyond the already stringent safety precautions used by DoD.

The regulatory framework in this arena provides the guidelines and practices to minimize adverse impacts from hazardous waste generation, disposal, and management. If proper procedures are followed during the removal process, adverse impacts to the environment would be negligible and the overall effect would be positive. All procedures would be in compliance with the appropriate regulations to ensure that potential impacts remain insignificant. Mitigation measures for the Air Force for response to contamination caused or discovered during the conversion program include the following:

- Maintain an updated spill response plan.
- If contamination from a leak is detected, notify the proper authorities and ensure that the contamination does not spread.

4.7.5 Unavoidable Impacts

The increased short-term generation of liquid sodium chromate solution waste, and associated solid waste, as part of the conversion activity is an unavoidable impact.

Under the proposed action or no action alternative, there are no plans to treat the soil to reverse the soil sterilant effects because the LF gravel maneuver area would continue to be used and vegetative growth is undesirable.

4.8 NOISE

Certain activities that would be associated with the proposed action or alternatives could influence the noise environment. Impacts on the environment would be related to the magnitude of noise caused primarily by vehicle and equipment noise associated with conversion of the MM II system to a MM III system. Noise-sensitive receptors, such as churches, hospitals, and wildlife could be adversely affected by equipment and traffic noises.

The basis of determining the significance of the impacts to the biological and human environment is primarily the difference between the baseline noise environment and that of the noise environment generated by any additional equipment or traffic noise associated with the proposed action. An appreciable increase in the background noise level (low 30 L_{dn} range) would be perceived as an annoyance impact. Increases in noise that exceed ambient noise levels by more than 5 dBA would be clearly noticeable and represent an adverse impact. A noticeable decrease in noise levels would represent a beneficial impact.

4.8.1 Analysis Methods

The analysis was based on review of a number of sources: publications; transportation and noise data; and maps of the deployment area. The review focused on the current and projected noise levels from ground traffic and air traffic. The difference in noise levels was compared to determine whether a significant annoyance impact would occur or is occurring.

4.8.2 Potential Impacts of the Proposed Action

The noise levels generated by the TEs, PTs, RV/G&C vans, and other AF vehicles involved in the conversion process would be comparable to the existing noise of normal missile movement operations, as described in section 3.8. Vehicles at Malmstrom AFB are involved in the transport of several rocket boosters and other missile components per month. A 25 percent increase in Air Force vehicular traffic is expected to occur during the conversion. Thus, noise levels would increase at the major locations of motor-vehicle-related noise. These locations include US Highway 87/89, 57th Street (US 87) Bypass, 2nd Avenue North, 10th Avenue South, 10th Avenue North, and primary and secondary streets within the base and the southeast section of Great Falls. Air Force vehicular traffic involved in the transport of rocket components represents an incremental fraction of total traffic volume on these roads and a 25 percent increase in Air Force vehicular traffic is not expected to cause ambient noise level to increase by more than 5 dBA and would not represent an adverse impact. Noise levels from traffic in the deployment area would not be expected to appreciably increase from what was described in section 3.8. The conversion process will not involve any loud single noise events that would startle wildlife. Consequently, no adverse impacts are expected to the noise environment of the deployment area during the conversion. After conversion, traffic noise associated with the LF and LCF sites would continue, producing no net change in noise.

The main mode of transport for the MM II and MM III rocket boosters to and from Malmstrom AFB is by air transport. MM II rocket motors are projected to be removed from the deployment area and shipped to a storage facility at an average rate of approximately one every two weeks, with a MM III arriving from Hill AFB also one every two weeks. A C-141 aircraft that is certified to carry Minuteman II and III rocket motors would fly into Malmstrom AFB to pick up the booster and fly out during the same day. The average number of C-141 operations carrying MM II and MM III rocket motors is expected to increase slightly during the conversion period. This increase in operations and associated noise increases would be negligible because the conversion process would be taking place over 6 years. Approximately two additional C-141 operations would occur per week over the 6 years as the MM IIs are taken to a storage facility and MM III are transported to Malmstrom. This number is even conservative at least for the first 4 years of the conversion process because C-141 operations associated with maintenance of the MM II will decline and thus, offset this increase. During the fifth and sixth year the MM IIIs that were repostured during the first and second years of the conversion process will require routine maintenance assuming a 4-year maintenance schedule and thus, no offset will occur. This negligible increase C-141 operations will cause no significant adverse impacts to the airfield noise environment.

The magnitude of equipment noise at the LFs would be comparable to that of the AF equipment routinely used for missile removal and replacement. Consequently, the noise impacts from equipment at the LF would be negligible.

4.8.3 Potential Impacts of the No Action Alternative (Continued Operation)

Continued operation of the MM II system would not change the present noise environment. Normal missile removal and replacement, maintenance, and other activities would continue. No new noise impacts would occur.

4.8.4 Mitigation Measures

While no significant noise impacts are expected to occur, the following mitigation measures could be implemented to reduce noise impacts and provide a more pleasant living environment:

- Conduct additional C-141 operations only between the daytime hours of 7:00 A.M. and 7:00 P.M.
- Maintain any equipment used during the conversion according to EPA product standards.

4.8.5 Unavoidable Impacts

The continued noise generated from C-141 aircraft operations, traffic, and missile maintenance and conversion equipment represents an adverse unavoidable impact to the noise environment of the base and the deployment area during and following the conversion process. However, the proposed action represents no significant change to the affected environment and thus no additional significant adverse unavoidable impacts will occur during and following the conversion process.

4.9 TRANSPORTATION

The transportation network at the MSB, and to, from, and within the deployment area could be adversely affected by the proposed action or alternatives. Damage or deterioration of roads, annoyance of drivers with additional traffic, and increased risk of traffic accidents are some of the impacts that could occur. Impacts to the transportation system would be significant if the level of service (LOS) is reduced below level B, major repairs to the roads would be necessary as a result of activities associated with the proposed action or alternatives, or the accident rate increases by more than 2 percent. Negligible impacts would occur if the LOS remains at B or A levels, the accident rate varies by less than 2 percent, or the roads only need minor repairs. Beneficial impacts would include an improvement in the LOS from B to A or a decrease in the accident rate by 2 percent.

4.9.1 Analysis Methods

The analysis is primarily concerned with assessing changes from existing road conditions, traffic safety, and traffic volume as a result of implementing the proposed action or alternatives. Information provided by Malmstrom AFB and by the Montana Department of Transportation on the traffic routes, type of vehicles, frequency of trips, and road improvement programs were examined and compared to baseline conditions to determine if a significant adverse affect would likely occur under each of the alternatives analyzed.

4.9.2 Potential Impacts of the Proposed Action (Conversion)

A typical maintenance schedule involves removing between one to two missiles and transporting them from LFs to the MSB for servicing each month. During a recent program in which the second stage of the MM IIs needed to be replaced, four to eight movements were done per month. A missile movement involves a maintenance vehicle traveling the route from the MSB to the LF to check road conditions before the service trip. As part of the same missile movement, a Federal marshall escort, a reentry vehicle and guidance control system (RV/G&C) van (or two PTs for a MM III missile), and a transporter-erector (TE) travel from the MSB to the LF to recover segments of a missile and transport them back to the MSB for maintenance or shipment. Another missile movement with the same group of vehicles is made from the MSB to the LF to put in a replacement missile. The flights or squadrons that are operative during the conversion process may have an occasional missile removed for maintenance (approximately one per month).

The major transportation change from existing conditions is anticipated to be a slightly increased rate of missile movements over the current replacement schedule of one missile per week. A total of 450 missile movements would occur under the proposed conversion: 150 MM II missiles would be removed and 150 MM III missiles would be emplaced, each MM III missile requiring the use of two PTs, as well as a TE and other vehicles. Over the last two years (1989 and 1990), there was an average of 40 total missile movements which is equivalent to 20 missile recycles (341 MW/MBMS, 1991). Under the proposed action, approximately one MM II missile will be removed and replaced with a MM III missile (one recycle) every two weeks (26 recycles per year). Therefore, during the conversion process, it is estimated that the total mileage driven in support of the MM II squadrons would increase by approximately 25 percent. Because some missiles may be scheduled for annual maintenance just before they would be removed as part of the conversion process, it is possible that the maintenance trip would be deferred and thus the overall increase in traffic and missile movements would be somewhat less than the estimated 25 percent increase. Over the long term, the MM III missiles are more reliable than the MM II missiles and the mileage driven by vehicles supporting the 341 MW mission is expected to be slightly less than that currently being driven. The LOS for the routes traveled by the vehicles involved in the conversion process, and for general maintenance, operation, and protection of the system, is not projected to change and the transportation network would be negligibly affected. A negligible impact is expected because the routes tend to be used during off-peak hours and the LOS is generally stressed the most during peak rush hours.

Assuming the current rate of accidents per mile driven (several minor accidents per several hundred thousand miles) would be similar under the proposed action, an increase in mileage associated with the proposed action would likely lead to several more accidents per year, although the increase from current levels is not expected to be significant.

The level of service (LOS) for the roads that are part of the transportation network between the deployment area and the MSB is at level A and B for the majority of the routes. The traffic counts on the more heavily traveled road indicate (as shown in section 3.9) that the number of Air Force vehicles supporting the 341 MW mission constitute a negligible proportion of the overall traffic flow. Therefore, the LOS would not be degraded as a result of implementing the proposed action.

Funding for the upkeep and improvement of the TE routes and other roads would continue under the proposed action; no degradation in road quality should occur.

4.9.3 Potential Impacts of the No Action Alternative (Continued Operation)

No significant change from the present LOS, accident rates, and road deterioration would occur under this alternative. Normal maintenance, supply, communications, and security trips to and from the LFs and LCFs would continue, as described in section 3.9. Additionally, funds for the upkeep and improvement of gravel TE routes would continue.

4.9.4 Mitigation Measures

While no significant transportation impacts are expected to occur, the following mitigation measure could be implemented to reduce the risk of increasing the LOS and accident rate:

- Flexible work schedules can be established to reduce peak-hour traffic flows.

4.9.5 Unavoidable Impacts

The increase in traffic predicted for the proposed action would be an unavoidable impact. This traffic increase would likely have a short-term negligible impact, as described in section 4.9.2.

4.10 SOCIOECONOMICS

The socioeconomic environment would be affected by the proposed conversion. The resulting changes in housing demand, services, and employment are evaluated to determine the significance of impacts. A significant adverse impact is a decrease of more than 2 percent annually from the projected level of the socioeconomic characteristic. In the short-term, a decline of this magnitude could weaken local labor and housing markets as well as local services. In the long term, it could change a community's existing structure and organization. A negligible impact represents an annual change of less than 2 percent from the projected level of the socioeconomic characteristic. This change would not be noticeable in housing demand, school enrollment, public service demands, or local government revenues or expenditures. Beneficial impacts were identified without regard to a specific level. A beneficial impact results from increased growth that strengthens employment opportunities and the local tax base, but without stressing community infrastructure and fiscal resources.

4.10.1 Analysis Methods

Measures used for impact analysis include employment, population, housing and residence data, and school enrollments. Information was gathered from recent environmental documents and conversations with Air Force personnel.

4.10.2 Potential Impacts of the Proposed Action (Conversion)

4.10.2.1 Employment

Additional personnel authorizations would result in a temporary increase in base employment from FY92 to FY97, assuming a 6-year conversion period (table 4.10.2.1-1). Approximately 240 personnel allocated to a second squadron of KC-135R aircraft would be added to Malmstrom AFB in late 1992. The additional personnel associated with the KC-135R are not listed in table 4.10.2.1-1 nor further discussed in section 4.10; the cumulative socioeconomic impacts of the KC-135R and conversion actions are presented in chapter 5. In both FY92 and FY93 there would be a 0.9-percent increase in total base employment as operations and security personnel are added. The end of these authorizations at the end of FY97 would result in a decline in employment of approximately 1.8 percent to pre-conversion FY91 levels. The temporary operations and security personnel could be transferred to jobs at other Federal installations when the proposed action is completed. This level of change is negligible.

4.10.2.2 Income

The payroll income of the additional personnel would result in a $951,000 increase over total FY91 base income in FY92 and a $1,922,000 increase each year from FY93 through FY97 (table 4.10.2.2-1). This estimate, based on average 1990 payroll (USAF, 1990a), represents an increase of 0.9 percent over total FY90 military and civilian total payroll.

Using a multiplier of 0.591 (the average of military on- and off-base multipliers—factors that demonstrate the multiplied value of each dollar spent in nearby communities)(USAF, 1990a)), this increase in personal income is estimated to result in an additional $562,000, a negligible increase, spent within a 50-mile radius of the base in FY92 and an additional $1,136,000 annually from FY93 to FY97. Local spending and payroll would diminish to near FY91 levels after the authorizations are rescinded.

Table 4.10.2.1-1
Personnel Changes from Conversion with Projected Base Employment

FY 98 Base After Deactivation/Conversion	4th Quarter FY91 Employment	Base Personnel Changes				Projected Employment
		FY92	FY93	FY97	Total	
Operations and Security						
Officers	347		+1	-1	0	347
Enlisted	1,057	+45	+45	-90	0	1,057
Civilians	4					4
Total	1,408	+45	+46	-91	0	1,408
Total Base Employment	4,524	+45	+46	-91	0	4,524

Source: HQ SAC/XPM, 1991.

Table 4.10.2.2-1
FY92 and FY93 Payroll and Local Income Generated

	Total Additional Employees	Additional Payroll	Total Employees	Total Payroll	Multiplier	Local Income Generated
FY92						
Military	45	$ 950,580	4,159	$ 87,854,716	0.591	$ 51,922,137
Civilian	0	0	410	12,947,800	0.722	9,348,312
Total	45	$ 950,580	4,569	$100,802,516		$ 61,270,449
FY93						
Military	91	$ 1,922,284	4,205	$ 88,826,420	0.591	$ 52,496,414
Civilian	0	0	410	12,947,800	0.722	9,348,312
Total	91	$ 1,922,284	4,615	$101,774,220		$ 61,844,726

Source: USAF, 1990a; HQ SAC/XPM, 1991.

4.10.2.3 Population

Using 1990 base personnel data (USAF, 1990a), a military employee/dependent ratio was calculated to estimate the total number of people which would be directly affected by the conversion program. With an increase of 45 and 46 personnel in FY92 and FY93, respectively, total population is expected to increase by 75 and 77 people. This would represent an increase of 0.1 percent of the estimated County population in both years. In FY97, county population would decrease approximately 0.2 percent, a negligible amount, when the temporary personnel and their families leave the region.

4.10.2.4 Housing

Assuming that all temporary personnel and their families would live in Cascade County, projections of housing stock and vacancy rates for FY92 through FY97 demonstrate adequate housing would be available (see section 3.10.4); no new housing would need to be constructed.

4.10.2.5 Education

The proportion of military dependents which would be school-age children is not known. However, if all of the dependents of the temporary personnel were school-age children, the enrollment of an additional 30 children in FY92 and 31 children in FY93 would not likely exceed available capacity and would constitute a negligible change.

4.10.2.6 Energy

There would be a temporary increase in utility demand as a result of the slight increase in population from FY92 to FY97. Current information suggests that peak capacity at utilities would be adequate to meet this increase. There would be no new or increased requirements for energy in the deployment area.

4.10.3 Potential Impacts of the No Action Alternative (Continued Operation)

Continued utilization of the MM II system would result in the continued socioeconomic impacts of supporting the current 4,524 personnel and their families. No new positions for security police would be authorized. Present demand for housing, education and energy would continue. No new impacts would occur as a result of implementation of the no action alternative.

4.10.4 Mitigation Measures

Because no significant impacts are projected to occur to the socioeconomic indicators, no mitigation measures are proposed.

4.10.5 Unavoidable Impacts

No significant unavoidable impacts would occur under the proposed action or the no action alternative.

5.0 CUMULATIVE IMPACTS

The phaseout of the Minuteman II (MM II) missile system and subsequent conversion to MM IIIs would proceed with other recently implemented, or presently proposed actions taking place during approximately the same timeframe. Information on the cumulative impacts of other programmed operations, plans, or force structure changes, can be provided to program planners to assist in making decisions that might influence the environment. The individual impacts of the proposed or other actions may be insignificant, but collectively they may pose a significant impact. Therefore, the additive effect of the proposed phaseout/conversion is evaluated within the project itself, and with these other related and unrelated actions to determine if cumulative impacts could occur to the biophysical and human environment. A brief description of the other proposed or implemented actions is provided, followed by a general discussion of impact analyses of the environmental resources.

5.1 DESCRIPTION OF ACTIONS

KC-135R Air Refueling Wing: A second squadron of KC-135R aircraft and its operational maintenance and associated support organizations will be deployed to Malmstrom AFB in late 1992. The aircraft will be located on existing ramp space and will utilize both new and renovated operation and maintenance facilities at the base. There is expected to be an increase of approximately 3,500 annual flying hours and an increase of 240 personnel from this action (USAF, 1989a; 840 CSG/DEV, 1991).

Peacekeeper Rail Garrison Program: Malmstrom AFB was one of 10 bases being considered as deployment locations for the Peacekeeper Rail Garrison (none of the other locations would be in Montana). However, Malmstrom AFB is not currently being considered as a deployment location for this program (341 MW/MBQ). This program proposes to place Peacekeeper missiles in railroad trains that could be dispersed over the existing nationwide commercial rail network during times of strategic warning. During normal peacetime conditions, the trains containing the missiles would be housed in a garrison—a permanent, secure military facility.

Small Intercontinental Ballistic Missile Program: The Air Force proposes to develop a new, small intercontinental ballistic missile (ICBM) that will be compatible with both mobile and fixed basing modes. The first 200 missiles could be deployed to existing launch facilities (LFs) that surround Malmstrom AFB. No other sites evaluated for the hosting of other squadrons of small ICBMs are in Montana. The road system would be improved where necessary to accommodate the hard mobile launcher vehicles. The earth-covered shelters would be constructed near or on the LF sites. New military family housing would be constructed adjacent to the base. The program could potentially increase the local population by over 20 percent (USAF, 1987).

Launch Facility Gravel Pad Extension: A new payload transporter type III (PT-III) van will replace the existing vans that transport the MM missiles. Because the PT-III is longer than the existing van, the safe maneuverability of the PT-III on the LF pad is limited. Two areas at each LF will be graveled, covering approximately 500 square feet (840 CSG/DEL, 1991). The pad extension will occur within the existing fenced area. The project is scheduled to begin in July 1991, and all 150 LFs will be completed by fiscal year 1993.

Underground Storage Tank Program: In compliance with existing underground storage tank (UST) regulations, the USTs at the LFs and launch control facilities will either be replaced or have leak detection and overflow/overfill protection systems installed. This program will require additional ground disturbance and surface grading at the sites.

REACT: In the next several years, the LCFs within the deployment area are scheduled for an upgrade. The work will be performed by an Air Force Logistics Command contractor.

Phaseout of the MM II System at Ellsworth AFB and Whiteman AFB:
Concurrent with the Strategic Air Command conversion of the MM II system at Malmstrom AFB, the Air Force Logistics Command will be sending C-141 transport aircraft to the base and perhaps driving missile transporters to retrieve the MM II boosters. The phaseout and retirement of the MM II system at Ellsworth AFB will commence during fall of 1991, the same time period for the start of the conversion at Malmstrom AFB. The proposed action at Ellsworth AFB is being evaluated separately (USAF, 1991c). Additionally, the deactivation of the MM II system at Whiteman AFB is scheduled to commence in late 1993. Because there are a limited number of rocket motor shipping containers, a limited number of C-141 aircraft capable of carrying the boosters, and only a limited number of pads (5) on base for storing rocket motors, the process for moving the boosters must be efficiently planned to prevent a slowdown of the schedule. Only 14 shipping and storage containers for ballistic missiles (air and rail transport) and 18 missile transporters (road or rail transport) exist that are capable of transport (OO-ALC/LMMA, 1991). Currently, two C-141 aircraft are capable of moving the rocket motors. By the end of the year, it is projected that four more aircraft will be serviceable (OO-ALC/LMMA, 1991).

5.2 Cumulative Impact Analysis

The proposed action consists primarily of a series of repetitive actions at isolated locations. Impacts at particular sites (e.g. dust or traffic congestion), although negligible when considered separately, could have the potential to constitute a significant impact when considered collectively. Because no significant impacts to the biophysical environment have been identified for the proposed action, the likelihood of a cumulative effect occurring is negligible. Additionally, significant cumulative impacts for the proposed action or no action alternative are unlikely to occur because of the long distances between sites and the fact that only several sites may be hosting conversion activities at any one time.

Ground disturbance during the gravel pad extension and UST programs may impact—yet insignificantly—air, water, geology, and other resources. During these construction programs, soils are more likely to erode and could become windborne or transported by runoff. Upon consideration of the potential environmental impacts of the gravel pad extension project, a categorical exclusion was prepared. These programs will not occur concurrently with the proposed action at any one site, thus, the cumulative effect of these actions having a significant impact to the aforementioned resources is highly unlikely.

Previous environmental analysis and documentation completed for the beddown of the KC-135R air refueling squadron indicated that potential long-term, significant cumulative impacts could occur if the Peacekeeper Rail Garrison and Small ICBM programs were also implemented (USAF, 1989a). Since Malmstrom AFB is no longer a candidate for the Peacekeeper Rail Garrison program, significant cumulative impacts as a result of this program will not occur. With the Small ICBM program the local socioeconomic, geology, and air environment and transportation network could be significantly impacted, with the impact being beneficial for the local economy. The insignificant and negligible impacts to the socioeconomics and transportation identified for the phaseout/conversion of the MM II system would not further aggravate or add to any potential cumulative impacts. The Small ICBM program has not received final approval and funding for its complete procurement, production, and deployment.

The environmental analysis for the KC-135R action indicated that moderately significant impacts could result from increased traffic congestion along 10th Avenue South and at the base gates during peak employment after 1992 (USAF, 1989a). The proposed conversion action will result in a slight increase in trips by the (TE) vehicles on 10th Avenue South. Because these TE trips would occur during non-peak traffic hours, the potential for cumulative impacts to the transportation network would also be negligible if the beddown of the KC-135R squadron and the proposed action should occur within the same time period. With the personnel increases for the KC-135R action and conversion action, base employment is projected to increase by 331 people and cause negligible socioeconomic impacts to the base and surrounding communities. The increase in payroll income would result in more local spending, a beneficial impact.

The REACT program would involve activities at the LCFs. Because minimal work would be performed at the LCFs under the proposed conversion program, the conversion activities are unlikely to cause a cumulatively significant impact to occur.

AFLC has prepared an environmental assessment (EA) on the transportation of rocket motors to Hill AFB for storage (USAF, 1991a). The AFLC analysis is incorporated by reference into this EA (per 40 CFR 1502.21). A summary of the document follows:

> The AFLC analysis evaluates the potential environmental impacts beginning from the signing for custody of the rocket motors by Ogden Air Logistics Center (OO-ALC) or an AFLC contractor. Historically, boosters have been transported to or from Hill AFB by air (54%), rail (20%), and highway (36%). There are no plans

for altering the modes of transportation for MM II boosters so a similar proportional relationship of transportation mode is likely to apply to the MM II missile phase out.

Under the proposed action, the boosters will be transported to Hill AFB in shipping containers with environmental control units to regulate the storage temperature. Upon arrival, the booster will be moved to a processing facility. Air-shipped boosters arrive in a shipping and storage container for ballistic missiles (SSCBM) and are placed on a ballistic missile trailer (BMT). The process of handling the motors will be identical to current operations. Rail shipments arrive as a combination SSCBM/BMT and are transferred from the rail car. Truck shipments move on site in a missile transporter (MT) tractor/trailer combination. The shipping containers are brought to a processing facility for separation into the three motor stages. The booster, in its carriages, is rolled from the shipping container into the facility. Hardware on the boosters will be removed at this time and the individual motors will be readied for storage. Individual stages can be moved in trucks configured for routine operation on public roads. Environmental control of the motors are maintained during their transport.

Storage at Hill AFB or its associated storage area, the Utah Test and Training Range (UTTR), will occur in specially designed structures. Earth-covered bunkers, above-ground reinforced concrete buildings covered with earth, would be used at Hill AFB, and two types of storage buildings, one type with a reinforced concrete floor, roof, and walls and the other type with a reinforced concrete floor and metal roof and walls, would be used at the UTTR.

No new construction would occur at Hill AFB or the UTTR and no new procedures will be implemented; consequently, impacts to the soils, vegetation, land use, cultural resources, air quality, and water quality in these areas are predicted to be negligible. A small increase in highway traffic between Hill AFB and the UTTR would occur but the impacts to the transportation network, acoustic environment, and air quality would be slightly adverse, but negligible during the MM II rocket motor transportation and storage program. Over the long term, decreased traffic with a negligible benefit to air quality, acoustic environment, and transportation networks would occur. Socioeconomic impacts in the area would be negligible. Over the long term, only 10 to 20 workers would be reassigned upon completion of this program. There would also be a slight increase in air, highway, and rail traffic from the MM II bases to Hill AFB during the deactivation/conversion programs. The Air Force has been handling and transporting boosters for over 30 years and has an excellent safety record. No health and safety impacts are anticipated from the proposed action. The study concluded that there would be no significant impacts to the aforementioned resources from the long-distance transportation of rocket motors. The EA evaluated a maximum credible event to investigate the environmental impacts of an extreme scenario occurring (an airplane transporting a booster crashes in a populated area). While fatalities and adverse environmental impacts were predicted by the extreme scenario, the event is highly unlikely to occur and consequently, the risks associated with such an event are considered to be acceptable.

A finding of no significant impact for the AFLC action has been signed. Consideration of the potential environmental impacts of handling and storage of the rocket motors from the launch facilities to the missile support base and then to Hill AFB reveals no significantly adverse cumulative impacts of the combined projects. Although concurrent actions involving the MM II missiles would be occurring at Hill AFB and Ellsworth AFB starting in late 1991, and at Whiteman AFB starting in late 1993, these areas are physically separated from Malmstrom AFB. Consequently, there is no situation where an impact that is not significant at several bases can be considered as a cumulatively significant impact. One possible situation affecting all of these bases involves the dependency on shared resources of a limited quantity: booster shipping containers and MTs. However, storage capacities at each base would not be exceeded and boosters would not be brought in without an empty storage container in reserve at the MSB. The rocket motors would remain at the launch facilities until available space opens up from the shipment of a rocket motor to Hill AFB, or an empty shipping container is sent to the MSB. A significant cumulative impact caused by these limited resources is therefore unlikely.

In conclusion, there does not appear to be any situation that, by itself would be considered a negligible impact, but which would become cumulatively significant when evaluated with interrelated impacts from other actions.

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This environmental assessment has been prepared by the Department of the Air Force with contractual assistance from LABAT-ANDERSON Incorporated.

The following Air Force personnel managed and directed the EIS:

George Gauger	20 years experience, manager and planner
Lance Grolla	30 years experience, manager and planner

The following LABAT-ANDERSON staff members contributed to the preparation of this report:

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Brian Goss	6 years experience, geosciences and environmental impact assessment, hazardous materials
Carmen Hansen	2 years experience, information processing
Mary King	1 year experience, environmental impact assessment, transportation
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APPENDIX A

Correspondence with Federal and State Agencies

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ENVIRONMENTAL SCIENCE AND POLICY, OMAHA OFFICE
1501 J.F. KENNEDY DRIVE, BELLEVUE, NEBRASKA 68005
FAX (402) 291-2836 (402) 291-2362

June 27, 1991

Mike Aderhold
Regional Supervisor
MT Department of Fish, Wildlife, and Parks
P.O. Box 6610
Great Falls, MT
59406

Dear Mr. Aderhold,

On 15 April 1991, the Department of Defense publicly announced plans for the deactivation of the Minuteman (MM) II missile system at Malmstrom AFB and conversion of the system to accept MM III missiles. According to the National Environmental Policy Act (NEPA), the Air Force must assess the potential environmental impacts of the proposed action and possible alternatives. The Air Force Directorate of Environmental Management for the Headquarters Strategic Air Command is preparing an environmental assessment on this proposed program and is requesting your input.

In the event that deactivation and conversion of the 341st Strategic Missile Wing occurs, the following actions would take place. The 150 MM II missiles within the deployment area (several thousand square miles around Great Falls [maps enclosed]) would be removed from the launch facilities and replaced with 150 MM III missiles. A slight adjustment to the umbilical cords inside the launch facilities would be performed and the suspension system would be adjusted to handle the slightly heavier MM III missile. Finally, data base software would be modified and loaded into each launch facility. The personnel, types of vehicles, transportation routes, and maintenance routines would be the same as those used with the current systems. The only change in the current routine would be a slight, yet temporary, increase of approximately 25 percent in Air Force vehicular traffic during early phases of the deactivation/conversion. The proposed action is planned to to occur in stages over 6 years.

We would appreciate your assistance in gathering data pertinent to the environmental impact analysis process regarding your potential areas of concern. Please review the potential action described above for Malmstrom Air Force Base and identify any pertinent concerns regarding the potential environmental impacts of the action.

We are particularly interested in your determination whether any State-listed endangered or threatened species, as well as any species currently proposed for protection, may reside within or migrate through this area. The State of Montana had previously assisted the Air Force in defining habitat and migratory areas of threatened, endangered, and proposed species for the Draft Environmental Impact Statement on the Small

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Intercontinental Ballistic Missile Program (June 1987). I am submitting the applicable portion of this document for your consideration. If it is more convenient to note any differences from the lists of species previously provided, please respond in that manner.

LABAT-ANDERSON Incorporated is assisting HQ SAC/DEV in the preparation of this environmental assessment. Please submit the requested information directly to the address specified on the letterhead. If you have any questions, please contact Brian Goss of LABAT-ANDERSON (402-291-2362) or Lance Grolla of HQ SAC/DEVP (402-294-3684).

Sincerely,

LABAT-ANDERSON Incorporated

Brian Goss

Brian Goss
Project Director

Montana Department of Fish, Wildlife & Parks

4600 Giant Springs Road
P.O. Box 6610
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July 3, 1991

Brian Goss
Labat-Anderson Incorporated
1501 J.F. Kennedy Drive
Bellevue, NE 68005

Subject: Malmstrom Minuteman Conversion

Dear Mr. Goss,

I received your correspondence Monday, July 1, 1991.

We reviewed the, "Biological Resources and Threatened and Endangered Species" section of the June, 1987 draft EIS and the Small ICBM Program. It is generally well written and accurate.

Since 1987, more emphasis has been given to wetland areas by our agency as well as the federal Fish and Wildlife Service.

Montana now has two more "endangered" and one more "threatened" species that may occur in the "region of influence" of your project. The interior population of the least tern (Sterna antillarum) was listed as "endangered" June 27, 1985. Each year this animal is observed farther west along in the Missouri River drainage. The same is true of the piping plover (Charadrius melodus) which was listed as "threatened" January 10, 1986.

The pallid sturgeon was listed as "endangered" October 9, 1990 and is found in small numbers in the Missouri River below the mouth of the Marias River.

We do not believe that the proposed conversion project will significantly affect any of Montana's nine threatened or endangered animals.

We are a little concerned about the 25 percent increase in traffic at your remote sites. More and more we are appreciating the importance of habitat security for big game animals. Increased regular traffic can influence the movements and distribution of big game. Temporary traffic increases however should not be a problem.

Enclosed are a couple of articles summarizing the status of Montana's threatened and endangered species.

I hope this helps.

Sincerely,

Mike Aderhold

MIKE ADERHOLD
Region Four Supervisor

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June 27, 1991

Gary Wood
U.S. Fish and Wildlife Service
MT Field Office
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Dear Mr. Wood,

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We are particularly interested in your determination whether any Federal-listed endangered or threatened species, as well as any species currently proposed for protection, may reside within or migrate through this area. The U.S Fish and Wildlife Service had previously assisted the Air Force in defining habitat and migratory areas of threatened, endangered, and proposed species for the Draft Environmental Impact Statement on the Small Intercontinental Ballistic Missile Program (June 1987). I am

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submitting the applicable portion of this document for your consideration. If it is more convenient to note any differences from the lists of species previously provided, please respond in that manner.

LABAT-ANDERSON Incorporated is assisting HQ SAC/DEV in the preparation of this environmental assessment. Please submit the requested information directly to the address specified on the letterhead. If you have any questions, please contact Brian Goss of LABAT-ANDERSON (402-291-2362) or Lance Grolla of HQ SAC/DEVP (402-294-3684).

Sincerely,

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IN REPLY REFER TO:

FWE-61130-Billings
M.10-DOD Informal

July 2, 1991

Mr. Brian Goss
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Dear Mr. Goss:

This responds to your letter dated June 27, 1991, with enclosures, which requested our comments on any threatened and endangered species and other fish and wildlife concerns associated with the proposed deactivation of the Minuteman II missile system in Montana and conversion of the system to accept Minuteman III missiles.

The Federally-listed endangered and threatened species which may occur within the project area or nearby are the bald eagle (<u>Haliaeetus leucocephalus</u>), peregrine falcon (<u>Falco peregrinus</u>), piping plover (<u>Charadrius melodus</u>), least tern (<u>Sterna antillarum</u>), black-footed ferret (<u>Mustela nigripes</u>), grizzly bear (<u>Ursus arctos horribilis</u>), gray wolf (<u>Canis lupus</u>), and pallid sturgeon (<u>Scaphirynchus albus</u>). Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the Department of Defense, as the responsible Federal agency, must determine if the proposed actions may affect these endangered species. If you or the Department of Defense determine that any of these species may be affected, it will be necessary to initiate formal consultation with this office. The following information and recommendations may aid you in that determination.

We have reviewed the materials submitted with your June 27 letter, including the excerpts from a June 1987 Environmental Impact Statement on the Small Intercontinental Ballistic Missile Program. The information included in those excerpts on listed species appears generally accurate and appropriate for use in preparing the environmental assessment for the proposed Minuteman system conversion, except that the least tern (endangered), piping plover (threatened), and pallid sturgeon (endangered), are not included or discussed as federally listed species.

In this regard, we note the following: (1) The least tern is known to nest on Fort Peck Reservoir and the Missouri River downstream, and on the lower Yellowstone River, within Montana. It uses sandbars and bare areas on islands, as well as wide beaches of the reservoir, for nesting, and undoubtedly occurs as a seasonal migrant inside the Minuteman deployment area. (2) Like the least tern, the piping plover uses Fort Peck Reservoir and the Missouri River, and possibly the lower Yellowstone, for nesting, but is a more common nester on barren flats of saline lakes and other wide, unvegetated beaches of impounded waters in northcentral and northeastern Montana. It is possible that a few nesting plovers may occur within the deployment area shown on the map provided with your June 27 letter, although none have been documented in recent years. The species undoubtedly occurs at times within this area as a seasonal migrant. (3) The pallid sturgeon is known to occur in the lower Yellowstone River at least as far upstream as Intake, and may occur as far upstream as Cartersville, Montana. It also occurs in the Missouri River below Fort Peck Reservoir, and in the river above Fort Peck Dam from the reservoir to some unknown upstream point (but not above Maroney Dam).

The three listed species, as described above, should be considered in your environmental assessment, along with those previously addressed in the materials submitted with your June 27 letter. However, considering the specific nature of the proposed action as described in your letter (i.e., the conversion involves only minor adjustments to the "umbilical cords" inside the launch facilities, and similarly limited, on-site adjustments to the missile suspensions systems, plus an estimated 25 percent increase in Air Force vehicular traffic in the deployment area for a temporary period), we do not expect any project related impacts to these species.

For the same reasons, we do not anticipate measurable adverse impacts to other fish and wildlife resources.

Sincerely,

John G. Wood

for Dale Harms
Assistant Field Supervisor
Montana/Wyoming Field Office

cc: Suboffice Coordinator, USFWS, Fish & Wildlife Enhancement (Billings, MT)

JGW/dc

"Take Pride in America"

LABAT-ANDERSON INCORPORATED
ENVIRONMENTAL SCIENCE AND POLICY, OMAHA OFFICE
1501 J.F. KENNEDY DRIVE, BELLEVUE, NEBRASKA 68005
FAX (402) 291-2836 (402) 291-2362

June 27, 1991

Mark Baumler
State Historical Preservation Office
225 N. Roberts
Helena, MT 59620

Dear Mr. Baumler,

On 15 April 1991, the Department of Defense publicly announced plans for the deactivation of the Minuteman (MM) II missile system at Malmstrom AFB and conversion of the system to accept MM III missiles. According to the National Environmental Policy Act (NEPA), the Air Force must assess the potential environmental impacts of the proposed action and possible alternatives. The Air Force Directorate of Environmental Management for the Headquarters Strategic Air Command is preparing an environmental assessment on this proposed program and is requesting your input.

In the event that deactivation and conversion of the 341st Strategic Missile Wing occurs, the following actions would take place. The 150 MM II missiles within the deployment area (several thousand square miles around Great Falls [maps enclosed]) would be removed from the launch facilities and replaced with 150 MM III missiles. A slight adjustment to the umbilical cords inside the launch facilities would be performed and the suspension system would be adjusted to handle the slightly heavier MM III missile. Finally, data base software would be modified and loaded into each launch facility. The personnel, types of vehicles, transportation routes, and maintenance routines would be the same as those used with the current systems. The only change in the current routine would be a slight, yet temporary, increase of approximately 25 percent in Air Force vehicular traffic during early phases of the deactivation/conversion. The proposed action is planned to to occur in stages over 6 years.

We would appreciate your assistance in gathering data pertinent to the environmental impact analysis process regarding your potential areas of concern. Please review the potential action described above for Malmstrom Air Force Base and identify any pertinent concerns regarding the potential environmental impacts of the action.

We are particularly interested in identifying National Register sites and other cultural resources potentially affected by the potential action. The State Historic Preservation Office had previously assisted the Air Force in defining cultural resources within the deployment area and at the main operating base for the Draft Environmental Impact Statement on the Small Intercontinental Ballistic Missile Program (June 1987). I am submitting the applicable portion of this document for your consideration. If it is more convenient to note any differences from the information previously provided in this study, please respond in that manner.

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LABAT-ANDERSON Incorporated is assisting HQ SAC/DEV in the preparation of this environmental assessment. Please submit the requested information directly to the address specified on the letterhead. If you have any questions, please contact Brian Goss of LABAT-ANDERSON (402-291-2362) or Lance Grolla of HQ SAC/DEVP (402-294-3684).

Sincerely,

LABAT-ANDERSON Incorporated

Brian G. Goss

Brian G. Goss
Project Director

State Historic Preservation Office
Montana Historical Society
Mailing Address: 225 North Roberts • Helena, MT 59620-9990
Office Address: 102 Broadway • Helena, MT • (406) 444-7715

July 22, 1991

Brian G. Goss
Labat-Anderson Inc.
1501 J.F. Kennedy Drive
Bellevue, NE. 68005

RE: Malstrom AFB Conversion of Minuteman Missle Systems: EIS Review

Dear Mr. Goss:

Thank you for soliciting our comments on the above project. We understand that the proposed conversion From MMII to MMIII missles will only involve upgrades and improvements within the existing launch facilities. It is also our understanding that no new ground disturbing impacts will take place under the proposal nor will new road or facility construction occur. As such, we believe that the proposed conversion action has little likelihood for impacting historic or prehistoric sites eligible for listing on the National Register of Historic Places.

Thank you for consulting with us.

Sincerely,

David Schwab

David Schwab
State Archaeologist

File:AirForce: Malstrom

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OCTOBER 1991

FINAL
ENVIRONMENTAL COMPLIANCE PLAN

CONVERSION OF THE MINUTEMAN II TO THE MINUTEMAN III MISSILE SYSTEM AT MALMSTROM AIR FORCE BASE, MONTANA

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, STRATEGIC AIR COMMAND
OFFUTT AFB, NE

TABLE OF CONTENTS

APPENDIX B

Compliance Plan

NOTE: This plan is also published separately to allow distribution as needed

APPENDIX B

ENVIRONMENTAL COMPLIANCE PLAN

1.0 SUMMARY AND CHECKLIST

A compliance plan has been prepared to assist the personnel at Malmstrom Air Force Base (AFB) in performing the conversion of the Minuteman (MM) II system to a MM III system. The plan is designed to specify regulations that must be followed during the conversion, to identify personnel responsible for various facets of the conversion, and to specify actions that must occur to maintain the operations within compliance requirements of Federal, Air Force, State, and local restrictions. The compliance plan is an appendix to the environmental assessment (EA) on the potential impacts of the conversion, and potential alternatives to the conversion. The following checklist items summarize some critical items described in the EA:

- ☐ A copy of the EA can be found at the environmental planning office (840 SUPTG/DEV) and the Deputy Base Civil Engineers office (840 SUPTG/DE) in building 470 at Malmstrom AFB, MT.
- ☐ The 840 SUPTG/DEV is the office of primary responsibility for ensuring that the operations are in compliance with all applicable regulations.
- ☐ Compliance inspections of the base operations, which would include the inspection of several launch facilities (LFs) and launch control facilities (LCFs), must be performed yearly.
- ☐ The Deputy Base Civil Engineer is responsible for ensuring that the inspections are performed in a timely and adequate manner.
- ☐ A wide variety of experience is required to perform the compliance inspections. A team of inspectors is assembled from experts in hazardous waste, safety requirements, and other personnel.
- ☐ Each LF and LCF is a conditionally exempt, small quantity generator of hazardous waste with a limit of 100 kg of waste allowed per month. If this total is exceeded, each site would need an Environmental Protection Agency (EPA) generator identification (ID) number.

2.0 INTRODUCTION

The U.S. Air Force proposes to phaseout and remove 150 intercontinental ballistic missiles (ICBMs) from the MM II LFs in the deployment area of Malmstrom AFB and replace them with 150 MM III missiles. The deployment area currently hosts 50 MM III missiles in launch facilities (LFs) that would not be directly affected by the proposed action. A slight adjustment to the missile umbilical would be made and the suspension system would be checked and adjusted, if necessary, to handle the slightly heavier MM III missile. The drawers containing missile software would be removed from each LCF, then transported to the missile support base (MSB) for modification to support the MM III system. Software for use with the MM III system would be substituted for the existing software and loaded into each LF and LCF. Conversion under the proposed action would proceed sequentially from one missile squadron to another over a 6-year period starting in October 1991.

Under the proposed action, the missiles would be removed from the LFs under the same procedures as under current maintenance operations. The removal and transport of the missiles from the LFs does not introduce any new procedures or techniques; the same methods applicable to current operations would be applied to the proposed action. The procedures are proven and would involve experienced personnel. Some training of maintenance and operations personnel that work solely on the MM II system would be required.

The environmental impacts of the conversion process are evaluated in an EA prepared in accordance with Air Force Regulation (AFR) 19-2, 40 Code of Federal Regulation (CFR) 1500 et seq., and 42 United States Code (USC) 4321 et seq. A copy of the EA can be found at the office of the 840 SUPTG/DEV and at the office of the Deputy Base Civil Engineer (Building 470, phone number (406) 731-6188) at Malmstrom AFB, MT.

The 840 SUPTG/DEV is the office of primary responsibility for ensuring that the operations are in compliance with all applicable regulations. Compliance inspections for operations at Malmstrom AFB must be performed on a yearly basis. After two consecutive years of internal inspections, an external inspection is performed every third year. The Deputy Base Civil Engineer is responsible for ensuring that the inspections are performed in a timely and adequate manner. A wide variety of experience is required to perform the compliance inspections. A team of inspectors is assembled from experts in hazardous waste, safety requirements, and other personnel.

3.0 PURPOSE

This environmental compliance plan (ECP) provides the guidance and information that Air Force personnel performing the conversion need to ensure compliance with Federal, State of Montana, and Air Force regulations and procedures for environmental protection. The ECP is based on the appropriate regulations governing the proposed conversion activities, which are identical to current activities.

4.0 REGULATIONS THAT APPLY TO CONVERSION ACTIVITIES

A description of regulations relevant to the proposed Minuteman conversion program at Malmstrom AFB is provided in section 1.4 of the EA. The regulations that are most pertinent to the conversion program apply to the handling, management, storage, transportation, and disposal of hazardous materials and wastes.

Waste sodium chromate solution would be handled during the conversion and PCBs might be handled. Other hazardous materials transported and handled during the conversion include potassium hydroxide batteries in the missile guidance systems, the solid rocket motors, and the monomethyl hydrazine and nitrogen tetroxide fuel within the propulsion system rocket engine.

The Hazardous Materials Transportation Act (HMTA)(49 United States Code (USC) 1802-1805, 1808) governs the proper transport of the hazardous materials (49 Code of Federal Regulations (CFR) 171 and 172). The Resource Conservation and Recovery Act (RCRA)(42 USC 6901), as amended by the Hazardous and Solid Waste Amendment (Public Law 98-616) governs the regulation and management of hazardous wastes (40 CFR 261 and 262). The Toxic Substances Control Act (TSCA) requires EPA to regulate the use, storage, and disposal of polychlorinated biphenyls (PCBs)(40 CFR 761).

With respect to the handling, management, and transport of hazardous materials and wastes, the State of Montana has primacy and has adopted the federal regulations promulgated by the Environmental Protection Agency (EPA). For the conversion activities, there are no additional State restrictions beyond the practices specified in the 40 CFR sections.

Air Force regulations pertaining to the transport of missile components are mentioned in section 1.4.9 of the EA. Other AFRs do not add requirements beyond those practices specified in 40 CFR sections.

5.0 COSTS OF COMPLIANCE

The proposed conversion activities do not differ in nature from those activities that are currently involved in the operation and maintenance of the Minuteman II missile system. Based on conversations with base personnel and review of the internal environmental compliance assessment and management program report (USAF, 1990b) investigations of the current practices revealed no significant compliance issues regarding the current missile system. The investigations determined that cost-effective methods for transporting and storing hazardous waste are being implemented. Therefore, there would be no additional costs for complying with the required regulations.

6.0 SPILL RESPONSE

Because the activities associated with the conversion program would be identical to those currently being performed, the methods of spill response would also apply to the conversion activities. The individual LF sites are conditionally exempt, small quantity generators of hazardous waste (see section 7.0 of this plan); therefore, no official site-specific spill prevention and countermeasures plan is required.

Sodium chromate solution is the only liquid that will be handled as part of the conversion activities (it is also handled under routine maintenance operations), other than fuel for the vehicles, that is considered a hazardous liquid. Batteries for the guidance control system contain potassium hydroxide and the propulsion system rocket engines contain monomethyl hydrazine and nitrogen tetroxide; however, these fluids are not directly handled by personnel assigned to Malmstrom AFB.

There are approximately 10 gallons of sodium chromate solution per launch facility, as such, only minimal amounts could be spilled. The vehicles that transport the equipment and personnel for maintaining the deployment area sites are equipped with absorbent booms in case any sodium chromate is accidentally spilled. The contaminated booms would be transported back to the base in appropriately labeled containers that would be treated as hazardous waste containers (because of the dilute nature of the solution (approximately 3.5 parts per million (ppm) total chromium), it is possible that the liquid, as well as the solid waste, may not be hazardous according to the toxicity characteristic leaching procedure (TCLP); if the solution is not considered hazardous by this test, the solution could still be considered a corrosive hazardous waste if the pH of this solution is less than 2 or exceeds 12.5. However, recent pH tests on the solution revealed a pH between 2 and 4 (840 Strategic Clinic/SGPB, 1991). The handling of the waste is further described in sections 7.0 and 8.0 of this plan.

7.0 HAZARDOUS WASTE MANAGEMENT

7.1 Minimization of Hazardous Waste

The types and quantities of hazardous waste that are currently generated, and would be generated under the conversion program, such as sodium chromate and PCBs, are minimal. At each LF and LCF, there are some sealed electrical components, such as power filters and capacitors, that are assumed to contain PCBs (this assumption is based on the manufacturer and the date of manufacture) but the quantities of fluids are on the order of one to three ounces and do not contain sufficient free liquid for adequate laboratory analysis. The amount of sodium chromate solution at each LF is approximately only 10 gallons. Because only one site is generally worked on per maintenance crew per day, and the site may not be revisited for maintenance within the next year, the amounts of PCBs and sodium chromate solution transported allow the site to be considered as a conditionally exempt small quantity generator (no more than 100 kilograms [approximately 20 gallons] of waste per month) under 40 CFR 261.5.

Air Force personnel attempt to minimize the waste produced by proper handling of the materials and segregation of wastes.

7.2 Identification of Hazardous Waste

Any rags or gloves that were used in the handling of potential PCB components are treated as PCB-contaminated items. Any rags and gloves that are used in handling sodium chromate solution, and absorbent booms and other materials used to clean up a spill, would be identified as a hazardous waste. The sodium chromate materials are properly identified for labeling purposes as: Waste Sodium Chromate, liquid or solid, TCLP exceedance for chromium, EPA ID# D007.

7.3 Storage of Hazardous Waste

The hazardous wastes that would be generated as part of the conversion program would be packaged in adequate containers that are not incompatible with the waste. For example, any acids or bases generated would not be stored in metal containers. Because the sodium chromate solution contains sodium hydroxide, this liquid is best transported in plastic containers and the containers must be properly handled and in good condition, closed when not in use, and approved by the Department of Transportation (DOT), as specified by 40 CFR 265.171-173(a).

7.4 Labeling of Containers

Containers of hazardous waste must be labeled before transport. If the equipment containing the potential PCB filters is removed for transport, the equipment would be considered as a "PCB article" and articles do not require an M_L marking (PCB label) under 40 CFR 761.40. If the filters are removed and placed in a container, an M_L marking would be required. The containers used for shipping the sodium chromate solution or solid hazardous waste must be suitably marked with the words "Hazardous Waste."

7.5 Removal/Disposal of Waste

The wastes generated at the sites would be transported back to the missile support base. Wastes, as well as hazardous materials (both previously mentioned in section 4.0 of this plan), would be transported in various vehicles. Most of the vehicles containing these materials would be maintenance vehicles. However, payload transporters (PTs) would be carrying the hazardous liquids contained in the propulsion system rocket engine (PSRE) (monomethyl hydrazine and nitrogen tetroxide) and missile guidance system (MGS) (potassium hydroxide). The amount of monomethyl hydrazine and nitrogen tetroxide in the PSRE is approximately 10 gallons each. A reentry vehicle/guidance and control (RV/G&C) van is used for transport of the MM II MGS and RV. Although these hazardous materials are reusable and not considered hazardous waste, their transport is governed by applicable EPA and DOT regulations. The batteries in the MGS are considered class C explosives and labeled corrosive. Because each battery contains approximately 1 quart of liquid, placarding of the vehicle to denote the corrosive materials is not necessary. If the quantity exceeded 1,000 pounds (454 kg), the vehicle would need to be placarded as "DANGEROUS". The PSRE fuels are considered corrosive and ignitable hazardous materials by EPA, and as an oxidizer (nitrogen tetroxide) and a corrosive and flammable liquid (monomethyl hydrazine) by DOT. Because the quantity of fuel labeled corrosive in the PSRE is approximately 10 gallons and weighs significantly less than 1,000 pounds (454 kg), placarding of the vehicle to denote the corrosive materials is not necessary.

Vehicles returning to the base would not need to have a placard stating transport of PCBs unless they carry more than 45 kg of PCB articles. PCB articles and containers are transported to the PCB storage facility, Building 411, for storage and must be placed in an area that is clearly marked with an M_L marking.

Waste sodium chromate solution is classified by DOT as an "other regulated material-type E" (ORM-E) for hazardous materials, and is thereby exempt under the placarding requirements stated in 49 CFR 172.500(b)(2)(Subpart F). If the pH of the solution is less than 2 or exceeds 12.5, the solution would be considered as a corrosive waste (D002). However, the waste has not been treated as a corrosive waste because the pH ranges between 2 and 4 (see section 6.0 of this plan). Also, the quantities of waste are well below the 1,000 pound limit (454 kg) for requiring placarding of vehicles transporting corrosive wastes.

Vehicles transporting hazardous waste must be placarded if the waste falls under the categories listed in Tables 1 and 2 of the aforementioned 49 CFR section. All wastes transported should be accompanied with a material safety data sheet (MSDS) that is carried in the cab of the transporting vehicle.

No more than 55 gallons of hazardous waste may be stored at satellite accumulation points (40 CFR 262.34(c)(1)), provided that the requirements of 265.171-173(a) are met, and the container is marked as hazardous waste. Building 3081 contains the satellite accumulation point for sodium chromate solution waste and solid waste generated from handling the solution. The centralized accumulation point for the sodium chromate wastes and other wastes is adjacent to building 412. Occasionally, PCBs are stored at the satellite accumulation point for several days before being moved to the PCB storage facility at Building 411.

The waste must be picked up from a satellite accumulation point by trained hazardous waste handlers and delivered to the centralized hazardous waste storage facility once the container is full, or within 3 days after the quantity exceeds 55 gallons. If the material is not removed within 3 days after the quantity exceeds 55 gallons, other more restrictive regulations must be followed. PCB articles must not be kept in temporary storage for more than 30 days.

8.0 HAZARDOUS MATERIALS HANDLING

Sodium chromate solution would be handled and PCBs could be handled during the conversion program. Potassium hydroxide batteries for the missile guidance system would also be handled. The concentration of PCBs in electrical components, such as sealed power filters and capacitors, is unknown. Because the amounts of liquid in the capacitors and electric filters that could contain PCB are too small to provide a representative test (more than one filter would have to be opened, drained, and have the liquid collected for testing), they are treated as if they exceed 500 ppm PCB. Only limited amounts of PCBs could be handled as part of the conversion activities. Electronics drawers within the launch control center at each LCF would be handled during the conversion process but those at the LFs would be handled only during normal maintenance activities. Most of the drawers have had potential PCB filters and capacitors removed. Therefore, handling of PCBs may occur but would be limited to only several situations at particular LCFs.

Trained missile maintenance technicians are responsible for the proper handling and usage of these hazardous materials. The technician is responsible for maintaining MSDSs for all hazardous materials in vehicles transporting the materials, and that the proscribed safety precautions be followed when handling hazardous materials. The training that personnel receive regarding the handling of hazardous materials would be continued under operations as part of the conversion program.

9.0 ROCKET MOTOR TRANSPORT

Rocket motors that comprise the booster of the MM II and MM III missiles are transported to and from the MSB and the deployment area by transporter-erectors (TEs). Although the MM II rocket motors to be removed are not considered to be hazardous wastes, the TEs must carry placards that designate the cargo as an ignitable material, as required by the HMTA. The placards would be placed on the back of the TE whenever the rocket motors are transported, and removed when the cargo is empty. A class B explosive placard would also be placed on each side of the TE. In addition, an MSDS must be carried in the tractor when the rocket motors are being transported.

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APPENDIX C

Safety Considerations

APPENDIX C

SAFETY CONSIDERATIONS

An evaluation of the phaseout and conversion of the Minuteman (MM) II system to a MM III system has identified an overall insignificant, if not negligible, impact to the biophysical and human environment of Malmstrom Air Force Base (AFB) and throughout the deployment area. This appendix describes the safety programs used by the Air Force to reasonably ensure that the probability of the accidents described in the following sections is remote. A wide range of accident scenarios is possible; some of the more severe accident scenarios are analyzed in terms of potential environmental impacts. It is highly unlikely that any of these accident scenarios would occur.

Removing missiles from their launch tubes and transporting them to storage or elimination facilities poses a low likelihood of accidents during transportation, with an even lower chance that such accidents could damage public health or the physical environment. Movement of missile components are performed according to safety standards and procedures, and weapons are regularly inspected, as described in section 3.7.1.

The Strategic Air Command (SAC) is responsible for all missile components, i.e., reentry vehicles (RV), missile guidance systems (MGS), and boosters while they are in the deployment area or at the missile support base (MSB). When RVs are scheduled for retirement, they are shipped to Department of Energy (DOE) facilities. If DOE transportation is backlogged, some of the RVs slated for retirement could be shipped by the Air Force to the DOE holding area. If they are shipped by DOE, they are DOE's responsibility when they leave the MSB. If they are shipped by the Air Force, they are the Air Force's responsibility until they arrive at DOE facilities (HQ SAC/LGWN, 1991). The DOE is responsible for manufacturing, transporting, and retiring nuclear weapons when they are no longer in the Air Force's custody. The impacts of reentry vehicle retirement have been assessed in other documents, including: <u>Final Environmental Impact Statement, Rocky Flats Plant Site, Golden, Colorado</u> (U.S. Department of Energy, 1977) and <u>Final Environmental Impact Statement, Pantex Plant Site, Amarillo, Texas</u> (U.S. Department of Energy, 1983). The findings of these documents are incorporated into this environmental assessment (EA) by reference according to 40 CFR 1502.21. Section 1.1 discussed where these documents can be obtained. These documents evaluated the impacts of nuclear weapon component production and the assembly, maintenance, and decommissioning of RVs. The final environmental impact statement for the Pantex plant concluded that there have not been any direct measurable effects on the health and safety of the general public and no significant impacts to the environment or the health and safety of the general public are expected to occur; the plant will continue to operate according to DOE standards.

AFLC is responsible for shipping MGSs from the MSB to various locations. Some of the MGSs will be retired; these will be shipped to an AFLC facility. Some MGSs will be reused within the MM II system; these will be stored at an AFLC facility until they are needed. Some of the MGSs would be used for another Air Force program, the Reentry System Launch Program. AFLC is also responsible for shipping the boosters from the MSB to AFLC facilities at Ogden Air Logistic Center, Hill AFB.

Propellant Safety

The Air Force has stringent requirements to be met regarding the transport of rocket motors (see section 3.7.1). The issue of the potential risks of rocket motor transport has been evaluated in several environmental documents prepared to evaluate the potential environmental impacts of various Air Force missile programs (USAF, 1986; USAF 1987; USAF, 1989b). An EA has been prepared (USAF, 1991a) that evaluates, among other MM II rocket motor transport and disposition issues, the potential impacts of an accident involving propellant ignition; based on the results of this EA, a finding of no significant impact was signed. The findings of the MM II rocket motor EA and the other mentioned environmental documents are incorporated by reference (per 40 CFR 1502.21) into this EA. The following text summarizes the results of the aforementioned studies.

Accidental ignition of a booster caused by static discharge, lightning, impact, or a fire or explosion could cause the propellant to burn so rapidly that it has some partial explosive effect. If a transportation accident occurred in which a missile motor ignited, the following may result: fire and heat; an explosive blast; a propulsion of the rocket motor; and toxic emissions. The major emissions for MM II rocket motors include aluminum oxide (Al_2O_3), nitrogen (N_2), carbon monoxide (CO), carbon dioxide (CO_2), hydrochloric acid (HCl), and water (H_2O). The severity of human health consequences could depend on the proximity to and number of people exposed. Similarly, environmental damage, such as damage to crops or other vegetation, would depend on the nature and proximity of such resources.

If an ignition accident occurred, the dispersion of toxic emissions is likely the main consequence that could be experienced outside of the immediate vicinity (i.e., a few hundred feet if the motor does not exit from the vehicle) of the accident site. If this unlikely event occurred in a populated area, then as many as several thousand individuals could be exposed, for a few minutes to approximately one-half hour, to concentrations of HCl not generally considered to pose a risk to human health. A few individuals could experience eye, respiratory tract, and skin irritation. In an open environment where accidental ignition would occur, the carbon monoxide readily combines with oxygen to form CO_2, and CO levels would not exceed health standards.

An even more extreme case is conceivable; that is, an accidental ignition during a rainstorm. (Water cannot be used to extinguish a propellant fire). While modeling data for such a scenario are not available, the emissions could likely be less dispersed and could reach ground level at higher concentrations than in clear weather. However, the scrubbing effect of the rain could eventually reduce the gaseous concentrations.

As indicated earlier (section 3.7.1), any transportation accident involving ignition of missile propellant is very unlikely. If such an unlikely event were to occur in rural areas, the location for most of the roads between the MSB and the deployment area, health effects on nearby drivers or residents are far less likely than in an urban setting with higher population densities.

If a motor containing an explosive propellant were to be detonated in an accident (an MM II stage three motor contains class 1.1 propellant and is considered an explosive propellant), the shock wave and heat from the blast could damage vehicles and structures, and injure individuals. An explosion of a booster could scatter debris and propellant up to 700 feet from the blast. Fire could engulf this area and the radiant heat could cause injury up to an additional 200 feet. A shock wave may cause window breakage and other minor damage up to 2100 feet from the blast (USAF, 1991a). Information on the potential combustion products and their dispersion was unavailable for this study. The motor also could ignite and leave the vehicle, breaking away from the protective equipment. While this event is extremely unlikely (based on the Air Force's long history of safe handling of missiles), the potential hazard would be significant.

Moving the missiles to and from the deployment area for maintenance is an ongoing activity. Conversion would not increase the pace of this activity in the short-term, and would reduce it in the long-term. To the extent that a small transportation hazard exists, it would be further reduced once the conversion program is completed.

Nuclear Safety

Scenarios evaluating the improbable release of radioactive materials through an accident during transport, or at the launch facility have been evaluated in other EISs that considered potential operations and environmental impacts at and around Malmstrom AFB, and other AFBs (USAF, 1986; USAF, 1987; USAF, 1989b; USAF, 1991e). For the action described in the studies of Peacekeeper and Small ICBM systems, the RV was transported together with the MGS and booster (from the MSB to the deployment area). For MM II and MM III systems, these components are transported separately, reducing the probability or magnitude of any potential impacts from an accident. Other documents have evaluated the transportation of radioactive materials in various environments: Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes (U.S. Nuclear Regulatory Commission (USNRC), 1977), Shipping Container Response to Severe Highway and Railway Accident Scenarios (U.S. Nuclear Regulatory Commission, 1987), Final Environmental Impact Statement, Rocky Flats Plant Site, Golden, Colorado (U.S. Department of Energy, 1977) and Final Environmental Impact Statement, Pantex Plant Site, Amarillo, Texas (U.S. Department of Energy, 1983).

These documents assessed the risk of transporting radioactive materials ranging from spent nuclear fuel and other industrial applications to radioactive source materials for medical diagnosis and treatment. The Final environmental Statement on the

Transportation of Radioactive Material by Air and Other Modes concluded that radiation exposure of transport workers and of members of the general public along transportation routes occurs from the normal permissible radiation emitted from packages in transport. The effect of this exposure is believed to be negligible. Examination of the consequences of a major accident and assumed subsequent release of radioactive material indicates that the potential consequences are not severe for most shipments of radioactive material. However, in the unlikely event of a plutonium or polonium release in a densely populated area, the effects could be severe. The Transportation of Radionuclides in Urban Environs: Draft Environmental Assessment examines four potential sources of radiation exposure: incident-free transport, vehicular accidents, human errors, and hostile acts or sabotage of shipments. The assessment concluded that the risks associated with such transportation are low, although severe accidents in urban areas have the potential for large radiological and economic consequences. Shipping Container Response to Severe Highway and Railway Accident Scenarios concluded that approximately 99.4 percent of truck accidents and 99.7 percent of rail accidents do not cause significant structural damage to spent fuel casks or significant releases of radioactive material. Other types of containers were not assessed.

A release of radioactive materials during transport would require a series of events, with a very low probability that all of the events necessary for a plutonium release would occur (HQ SAC/LGWN, 1991).

As stated in section 3.7, the probability of an accidental explosive detonation of an RV or release of radioactive materials at an LF is infinitesimal. No accidental release of radioactive materials or detonation has occurred involving handling of an ICBM warhead within the deployment area, at the MSB, or enroute between the two areas. In contrast, for commercial transfer of radioactive materials (isotopes for nuclear medicine, industrial products, and nuclear reactor fuel), there were 20 incidents of radioactive material release out of 2,190,000 packages shipped in 1975 (a ratio of approximately 1:100,000)(USNRC, 1977). About two-thirds of the release incidents occurred during truck shipments, and about one-third during air shipments of radioactive material. Of the release incidents that occurred during truck shipments, approximately one-half involved vehicular accidents; the rest were caused by handling accidents or improper packaging. All of the releases which occurred during air shipments were caused by handling accidents, damage by other freight, or improper packaging. No releases of radioactive material were reported as a result of rail shipment of these materials (USNRC, 1977).

The RV, which contains the nuclear warhead, would be handled by trained personnel. The handling procedures and design of the system (as described in section 3.7) were established to prevent a mishap with the nuclear device. The safety design and evaluation criteria for nuclear weapon systems (AFR 122-10) specifies a less than 1 X 10^{-9} probability of an unintentional significant nuclear yield (greater than four pounds TNT equivalent) per weapon per stockpile lifetime in normal environments. When probabilities for accidental releases or detonation were calculated, events such as transportation accidents, lightning strikes, earthquakes, or in-silo accidents were considered abnormal environments (USAF, 1991e). The same regulation specifies a less than 1 X 10^{-6} probability of an unintentional significant nuclear yield per weapon per stockpile lifetime in abnormal environments. The warheads would not be handled in an armed state, reducing the likelihood of inadvertent nuclear detonations (IND).

In June 1990, the House Armed Services Committee chartered a group headed by Dr. Sidney Drell of the Stanford Linear Accelerator Center to evaluate the safety of U.S. nuclear weapons if they are involved in accidents (USAF, 1991e). The specific issues to be addressed were IND and plutonium release (Pu dispersal). The risk of IND or Pu dispersal is defined as the probability and consequences of an event occurring. The probability of an accident or abnormal environment causing an inadvertent nuclear detonation or release of plutonium (Pu) is a combination of the probability of an accident or abnormal environment occurring and the likelihood of the RVs response. Two possible hazardous conditions may arise in a serious accident: a loss of shielding efficiency of the RV or a loss of containment or detonation of the conventional explosives and subsequent dispersal of the radioactive material. The probability of an IND is extremely remote; the physics of a nuclear explosion requires precise timing mechanisms for even a small nuclear yield. Therefore, a nuclear chain reaction can occur only if all of the high explosives are ignited at precisely timed intervals (USDOE, 1983). Therefore, its potential affects are not further discussed. Although the probability of Pu dispersal are negligible, the consequences could be significant in a localized area. Therefore, the risks of IND or Pu dispersal are believed to be negligible.

The RV remains in a carefully controlled, benign environment site (in the LF or WSA) for most of its deployment time. There is little likelihood of an accident or event introducing an abnormal environment to the warhead here, therefore the overall probability of an IND or Pu dispersal is very low. The Drell Commission study (USAF, 1991e) considered accident scenarios for an in-silo event. If the stage three propellant were detonated through an accidental fire, Pu could be dispersed. The probability of an IND is negligible and the likelihood of propellant detonation is low because of the precautions and safeguards in place. The system is grounded for electrical shock and all power to the missile is removed before any maintenance or removal activities take place (HQ SAC/LGBX, 1991). Two other accident scenarios were considered in which Pu dispersal was judged to be likely: an aircraft accident while carrying the RV or projectile penetration of the RV.

Other accident scenarios may not result in Pu dispersal: these include lightning strikes at the MSB and vehicle accidents. Lightning strikes to a loaded reentry vehicle guidance and control (RVG&C) van or at the LF are not likely to result in Pu dispersal (USAF, 1991e). The probabilities of any of these accidents occurring is remote. As previously stated, in approximately 30 years of transporting Minuteman ICBMs, there has never been an incident involving Pu dispersal or IND (USAF, 1989b, USAF, 1991e).

Potential Impacts of Pu Dispersal

The predicted environmental impacts resulting from an accident would only be significant within the immediate accident area (USAF, 1987; USAF, 1989b). The area affected would depend upon the type of accident scenario and the resulting events. If the radioactive materials in the RV were released into the atmosphere as a result of a fire, the extent of dispersion would depend upon meteorological conditions at the time of a mishap. Important factors include wind speed and direction, atmospheric stability (the rate at which air rises or descends within the atmosphere), and the presence or absence of precipitation.

The impact from a potential dispersion of radioactive material depends upon the physical and radiological characteristics of the material released. Warheads contain uranium (U) and weapons-grade plutonium (Pu) of two isotopes: Pu-239 and Pu-241. If these materials were released in an accident, Pu would cause the most serious radiation exposure hazard (USAF, 1989b). Pu-241 primarily emits beta particles with a small fraction of gamma rays and alpha particles. Pu-239 emits primarily alpha particles, and a small amount of gamma rays. U-238 is primarily an alpha-emitter, with a small amount of gamma radiation. Thus, alpha particles would be the primary radiation exposure hazard from the release of radioactive materials (USAF, 1987; USAF, 1989b; Shapiro, 1990).

Alpha particles are composed of two protons and two neutrons; these are emitted by an atomic nucleus during alpha decay. Alpha particles move much slower than beta particles and gamma rays and impart a greater amount of energy to an absorbing medium than beta particles and gamma rays over a much shorter distance (Shapiro, 1990). Alpha particles have a short range, approximately 3.5 cm in air or 44 µm in human skin at 5.0 Mev (Piesinger,1980). Alpha particles emitted by radionuclides cannot penetrate through the dead outer layer of the skin and thus do not constitute an external hazard. They can cause damage only if the alpha-emitting radionuclides are ingested or inhaled and the alpha particles are consequently emitted immediately adjacent to or inside living matter (Shapiro, 1990).

Plutonium oxidizes readily upon warming in moist air (National Council on Radiation Protection (NCRP), 1979). The most common oxide is plutonium dioxide (PuO_2). PuO_2 is generally insoluble in water (USNRC, 1977).

Previous studies (USAF, 1986; USAF, 1987; USAF, 1989b) predicted that no significant impacts to groundwater quality could be expected because most of the plutonium released would be in a relatively insoluble form (PuO_2) that would bind to soil particles. Surface water quality could be affected in a limited area from surface water runoff and settling of plutonium particles on surface water. This could pose a limited risk to plants and animals, depending upon the amount and concentration of radioactive material deposited in the surface water (USAF, 1987; USAF, 1989b). Plants uptake only a small fraction of Pu when it is present in the soil (USNRC, 1977).

Air quality and biological resources could be adversely affected, especially if the plutonium is dispersed in the atmosphere. Some of the radioactive material could settle on areas where vegetables, fruits, grains, and livestock feed are grown. The affected food would have to be removed and destroyed. The amount of radioactive material reaching humans would likely be small because of the extensive cleanup that would occur following an accident and because of the relative insolubility of the plutonium (USAF, 1989b).

Human health impacts could be severe, primarily from inhalation of alpha-emitting radionuclides, within the immediate accident vicinity (USAF, 1986; USAF, 1987; USAF, 1989b; NCRP, 1979; Shapiro, 1990). Three important factors influencing the severity of health effects to humans are the distance from the source of radioactive particles , the length of exposure, and the amount and type of shielding from the radioactive particles (Shapiro, 1990). The external exposure of humans (or animals) to a cloud of plutonium would not result in significant health effects (USAF, 1986; USAF, 1987). The effect of beta particles and gamma rays would be small, and alpha particles have a short penetrating range (approximately 44 micrometers in skin, which is within the layer of dead cells which protect the inner layers of skin). The inhalation or ingestion of alpha-emitting radionuclides would have an adverse effect upon internal body tissues; the most critical, in terms of mortality risk, are bone and bone marrow, lungs, and liver. The amount of plutonium inhaled would depend upon meteorological conditions and the amount and type released. If the wind speed was between five and eight miles per hour, wind direction was constant, release time was approximately one hour, and precipitation was negligible, a person located approximately 500 to 1,000 feet downwind of the release site could inhale 0.65 µg (0.04 µCi) of plutonium (USAF, 1986; USAF, 1987). This is equivalent to the maximum permissible body burden (continual working lifetime dose) of plutonium for occupational exposures (NCRP, 1979).

After inhalation, plutonium is solubilized by body fluids, including blood, and redistributed within the body. It is deposited primarily in the skeleton and liver. However, if the inhaled plutonium is an insoluble form, especially PuO_2, it is retained in the lungs for approximately 1000 days (NCRP, 1979). Although some studies suggest that the rate of cancer or other harmful effects is increased after significant radiation exposure, it is extremely difficult to determine the risk of cancer throughout the lifetime of the individual as a function of dose (NCRP, 1979; Shapiro, 1990). The analysis must consider a minimum latent period, the rate of appearance of cancer with time following the latent period, and the period of time over which the cancers will appear (Shapiro, 1990). While several studies have attempted to model the risk of cancer from various dose levels of radiation exposure (NAS-NRC, 1980 as cited in Shapiro, 1990), the estimates are believed to be crude. Therefore, the risks of cancer will not be further assessed at this time.

In summary, though the impacts could be severe within the immediate area of an accident involving the release of radioactive materials from an RV, the probability of such a release is extremely low (USAF, 1986; USAF, 1987; USAF, 1989b). In approximately 30 years of handling the Minuteman systems, there has never been an incident involving accidental nuclear detonation or plutonium release. The probabilities of accidents involving IND or Pu dispersal are remote, although the consequences could be locally significant. In conclusion, the risk (probability combined with consequences) of handling and transporting missile components is negligible.

APPENDIX D

Finding of No Significant Impact

ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFR	Air Force Regulation
CFR	Code of Federal Regulations
DE	Base Civil Engineer
DEV	Directorate of Environmental Management
DoD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
ECP	Environmental Compliance Plan
EPA	Environmental Protection Agency
HMTA	Hazardous Materials Transportation Act
ICBM	Intercontinental Ballistic Missile
ID	Identification
kg	kilograms
LCF	launch control facility
LF	launch facility
MGS	missile guidance system
MM	Minuteman
MSB	missile support base
MSDS	material safety data sheets
ORM	other regulated material
PCBs	polychlorinated biphenyls
ppm	parts per million
PSRE	propulsion system rocket engine
PT	payload-transporter
RCRA	Resource Conservation and Recovery Act
RS	reentry system
RV	reentry vehicle
RV/G&C	reentry vehicle/guidance and control

SGPB	bioenvironmental engineering
SUPTG	Support Group
TCLP	toxicity characteristic leaching procedure
TE	transporter-erector
TSCA	Toxic Substance Control Act
USAF	United States Air Force
USC	United States Code

DEFINITIONS

environmental assessment (EA)—an assessment of potential environmental impacts to determine whether or not an environmental impact statement must be prepared.

launch control facility (LCF)—facility for monitoring and operating intercontinental ballistic missile systems. The facility has living quarters for missile crews and security police.

launch facility (LF)—an underground silo and support building for ballistic missiles.

Minuteman—three-stage, solid-propellant, rocket-powered ICBM.

missile guidance system (MGS)—provides computer guidance of reentry vehicle after launch of the missile.

missile support base (MSB)—the primary military base.

payload transporter—a vehicle used to transport the RV, MGS, and/or PSRE of a missile from the missile support base to the deployment area.

permit—license granting permission for an action.

propulsion system rocket engine (PSRE)—rocket engine used for vectoring reentry vehicles to its target(s).

reentry vehicle (RV)—unit which delivers warhead(s) to a target.

reentry vehicle/guidance and control (RV/G&C) van—A vehicle used to transport the reentry vehicle and missile guidance set of a Minuteman II missile to or from the missile support base to the deployment area.

transporter erector (TE)—a vehicle used to emplace or remove ICBM boosters (rocket motors), and transport them to and from the missile support base and the deployment area.

ENVIRONMENTAL COMPLIANCE PLAN

1.0 SUMMARY AND CHECKLIST

A compliance plan has been prepared to assist the personnel at Malmstrom Air Force Base (AFB) in performing the conversion of the Minuteman (MM) II system to a MM III system. The plan is designed to specify regulations that must be followed during the conversion, to identify personnel responsible for various facets of the conversion, and to specify actions that must occur to maintain the operations within compliance requirements of Federal, Air Force, State, and local restrictions. The compliance plan is an appendix to the environmental assessment (EA) on the potential impacts of the conversion, and potential alternatives to the conversion. The following checklist items summarize some critical items described in the EA:

- ☐ A copy of the EA can be found at the environmental planning office (840 SUPTG/DEV) and the Deputy Base Civil Engineers office (840 SUPTG/DE) in building 470 at Malmstrom AFB, MT.

- ☐ The 840 SUPTG/DEV is the office of primary responsibility for ensuring that the operations are in compliance with all applicable regulations.

- ☐ Compliance inspections of the base operations, which would include the inspection of several launch facilities (LFs) and launch control facilities (LCFs), must be performed yearly.

- ☐ The Deputy Base Civil Engineer is responsible for ensuring that the inspections are performed in a timely and adequate manner.

- ☐ A wide variety of experience is required to perform the compliance inspections. A team of inspectors is assembled from experts in hazardous waste, safety requirements, and other personnel.

- ☐ Each LF and LCF is a conditionally exempt, small quantity generator of hazardous waste with a limit of 100 kg of waste allowed per month. If this total is exceeded, each site would need an Environmental Protection Agency (EPA) generator identification (ID) number.

2.0 INTRODUCTION

The U.S. Air Force proposes to phaseout and remove 150 intercontinental ballistic missiles (ICBMs) from the MM II LFs in the deployment area of Malmstrom AFB and replace them with 150 MM III missiles. The deployment area currently hosts 50 MM III missiles in launch facilities (LFs) that would not be directly affected by the proposed action. A slight adjustment to the missile umbilical would be made and the suspension system would be checked and adjusted, if necessary, to handle the slightly heavier MM

III missile. The drawers containing missile software would be removed from each LCF, then transported to the missile support base (MSB) for modification to support the MM III system. Software for use with the MM III system would be substituted for the existing software and loaded into each LF and LCF. Conversion under the proposed action would proceed sequentially from one missile squadron to another over a 6-year period starting in October 1991.

Under the proposed action, the missiles would be removed from the LFs under the same procedures as under current maintenance operations. The removal and transport of the missiles from the LFs does not introduce any new procedures or techniques; the same methods applicable to current operations would be applied to the proposed action. The procedures are proven and would involve experienced personnel. Some training of maintenance and operations personnel that work solely on the MM II system would be required.

The environmental impacts of the conversion process are evaluated in an EA prepared in accordance with Air Force Regulation (AFR) 19-2, 40 Code of Federal Regulation (CFR) 1500 et seq., and 42 United States Code (USC) 4321 et seq. A copy of the EA can be found at the office of the 840 SUPTG/DEV and at the office of the Deputy Base Civil Engineer (Building 470, phone number (406) 731-6188) at Malmstrom AFB, MT.

The 840 SUPTG/DEV is the office of primary responsibility for ensuring that the operations are in compliance with all applicable regulations. Compliance inspections for operations at Malmstrom AFB must be performed on a yearly basis. After two ~~consecutive years of internal inspections, an external inspection is performed every third~~ year. The Deputy Base Civil Engineer is responsible for ensuring that the inspections are performed in a timely and adequate manner. A wide variety of experience is required to perform the compliance inspections. A team of inspectors is assembled from experts in hazardous waste, safety requirements, and other personnel.

3.0 PURPOSE

This environmental compliance plan (ECP) provides the guidance and information that Air Force personnel performing the conversion need to ensure compliance with Federal, State of Montana, and Air Force regulations and procedures for environmental protection. The ECP is based on the appropriate regulations governing the proposed conversion activities, which are identical to current activities.

4.0 REGULATIONS THAT APPLY TO CONVERSION ACTIVITIES

A description of regulations relevant to the proposed Minuteman conversion program at Malmstrom AFB is provided in section 1.4 of the EA. The regulations that are most pertinent to the conversion program apply to the handling, management, storage, transportation, and disposal of hazardous materials and wastes.

III missile. The disassembled missile would be removed from each LCF, [illegible] to the missile support base (MSB) [illegible] to support the MM III system. [illegible] for use with the [illegible] would be [illegible] the existing [illegible] under the proposed [illegible] would [illegible] from one missile [illegible] to another [illegible] beginning in October [illegible].

[illegible]

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4.0 REGULATIONS THAT APPLY TO CONVERSION ACTIVITIES

[illegible]

Waste sodium chromate solution would be handled during the conversion and PCBs might be handled. Other hazardous materials transported and handled during the conversion include potassium hydroxide batteries in the missile guidance systems, the solid rocket motors, and the monomethyl hydrazine and nitrogen tetroxide fuel within the propulsion system rocket engine.

The Hazardous Materials Transportation Act (HMTA)(49 United States Code (USC) 1802-1805, 1808) governs the proper transport of the hazardous materials (49 Code of Federal Regulations (CFR) 171 and 172). The Resource Conservation and Recovery Act (RCRA)(42 USC 6901), as amended by the Hazardous and Solid Waste Amendment (Public Law 98-616) governs the regulation and management of hazardous wastes (40 CFR 261 and 262). The Toxic Substances Control Act (TSCA) requires EPA to regulate the use, storage, and disposal of polychlorinated biphenyls (PCBs)(40 CFR 761).

With respect to the handling, management, and transport of hazardous materials and wastes, the State of Montana has primacy and has adopted the federal regulations promulgated by the Environmental Protection Agency (EPA). For the conversion activities, there are no additional State restrictions beyond the practices specified in the 40 CFR sections.

Air Force regulations pertaining to the transport of missile components are mentioned in section 1.4.9 of the EA. Other AFRs do not add requirements beyond those practices specified in 40 CFR sections.

5.0 COSTS OF COMPLIANCE

The proposed conversion activities do not differ in nature from those activities that are currently involved in the operation and maintenance of the Minuteman II missile system. Based on conversations with base personnel and review of the internal environmental compliance assessment and management program report (USAF, 1990b) investigations of the current practices revealed no significant compliance issues regarding the current missile system. The investigations determined that cost-effective methods for transporting and storing hazardous waste are being implemented. Therefore, there would be no additional costs for complying with the required regulations.

6.0 SPILL RESPONSE

Because the activities associated with the conversion program would be identical to those currently being performed, the methods of spill response would also apply to the conversion activities. The individual LF sites are conditionally exempt, small quantity generators of hazardous waste (see section 7.0 of this plan); therefore, no official site-specific spill prevention and countermeasures plan is required.

Sodium chromate solution is the only liquid that will be handled as part of the conversion activities (it is also handled under routine maintenance operations), other than fuel for the

vehicles, that is considered a hazardous liquid. Batteries for the guidance control system contain potassium hydroxide and the propulsion system rocket engines contain monomethyl hydrazine and nitrogen tetroxide; however, these fluids are not directly handled by personnel assigned to Malmstrom AFB.

There are approximately 10 gallons of sodium chromate solution per launch facility, as such, only minimal amounts could be spilled. The vehicles that transport the equipment and personnel for maintaining the deployment area sites are equipped with absorbent booms in case any sodium chromate is accidentally spilled. The contaminated booms would be transported back to the base in appropriately labeled containers that would be treated as hazardous waste containers (because of the dilute nature of the solution (approximately 3.5 parts per million (ppm) total chromium), it is possible that the liquid, as well as the solid waste, may not be hazardous according to the toxicity characteristic leaching procedure (TCLP); if the solution is not considered hazardous by this test, the solution could still be considered a corrosive hazardous waste if the pH of this solution is less than 2 or exceeds 12.5. However, recent pH tests on the solution revealed a pH between 2 and 4 (840 Strategic Clinic/SGPB, 1991). The handling of the waste is further described in sections 7.0 and 8.0 of this plan.

7.0 HAZARDOUS WASTE MANAGEMENT

7.1 Minimization of Hazardous Waste

The types and quantities of hazardous waste that are currently generated, and would be generated under the conversion program, such as sodium chromate and PCBs, are minimal. At each LF and LCF, there are some sealed electrical components, such as power filters and capacitors, that are assumed to contain PCBs (this assumption is based on the manufacturer and the date of manufacture) but the quantities of fluids are on the order of one to three ounces and do not contain sufficient free liquid for adequate laboratory analysis. The amount of sodium chromate solution at each LF is approximately only 10 gallons. Because only one site is generally worked on per maintenance crew per day, and the site may not be revisited for maintenance within the next year, the amounts of PCBs and sodium chromate solution transported allow the site to be considered as a conditionally exempt small quantity generator (no more than 100 kilograms [approximately 20 gallons] of waste per month) under 40 CFR 261.5.

Air Force personnel attempt to minimize the waste produced by proper handling of the materials and segregation of wastes.

7.2 Identification of Hazardous Waste

Any rags or gloves that were used in the handling of potential PCB components are treated as PCB-contaminated items. Any rags and gloves that are used in handling sodium chromate solution, and absorbent booms and other materials used to clean up a spill, would be identified as a hazardous waste. The sodium chromate materials are

properly identified for labeling purposes as: Waste Sodium Chromate, liquid or solid, TCLP exceedance for chromium, EPA ID# D007.

7.3 Storage of Hazardous Waste

The hazardous wastes that would be generated as part of the conversion program would be packaged in adequate containers that are not incompatible with the waste. For example, any acids or bases generated would not be stored in metal containers. Because the sodium chromate solution contains sodium hydroxide, this liquid is best transported in plastic containers and the containers must be properly handled and in good condition, closed when not in use, and approved by the Department of Transportation (DOT), as specified by 40 CFR 265.171-173(a).

7.4 Labeling of Containers

Containers of hazardous waste must be labeled before transport. If the equipment containing the potential PCB filters is removed for transport, the equipment would be considered as a "PCB article" and articles do not require an M_L marking (PCB label) under 40 CFR 761.40. If the filters are removed and placed in a container, an M_L marking would be required. The containers used for shipping the sodium chromate solution or solid hazardous waste must be suitably marked with the words "Hazardous Waste."

7.5 Removal/Disposal of Waste

The wastes generated at the sites would be transported back to the missile support base. Wastes, as well as hazardous materials (both previously mentioned in section 4.0 of this plan), would be transported in various vehicles. Most of the vehicles containing these materials would be maintenance vehicles. However, payload transporters (PTs) would be carrying the hazardous liquids contained in the propulsion system rocket engine (PSRE) (monomethyl hydrazine and nitrogen tetroxide) and missile guidance system (MGS) (potassium hydroxide). The amount of monomethyl hydrazine and nitrogen tetroxide in the PSRE is approximately 10 gallons each. A reentry vehicle/guidance and control (RV/G&C) van is used for transport of the MM II MGS and RV. Although these hazardous materials are reusable and not considered hazardous waste, their transport is governed by applicable EPA and DOT regulations. The batteries in the MGS are considered class C explosives and labeled corrosive. Because each battery contains approximately 1 quart of liquid, placarding of the vehicle to denote the corrosive materials is not necessary. If the quantity exceeded 1,000 pounds (454 kg), the vehicle would need to be placarded as "DANGEROUS". The PSRE fuels are considered corrosive and ignitable hazardous materials by EPA, and as an oxidizer (nitrogen tetroxide) and a corrosive and flammable liquid (monomethyl hydrazine) by DOT. Because the quantity of fuel labeled corrosive in the PSRE is approximately 10 gallons and weighs significantly less than 1,000 pounds (454 kg), placarding of the vehicle to denote the corrosive materials is not necessary.

Vehicles returning to the base would not need to have a placard stating transport of PCBs unless they carry more than 45 kg of PCB articles. PCB articles and containers are transported to the PCB storage facility, Building 411, for storage and must be placed in an area that is clearly marked with an M_L marking.

Waste sodium chromate solution is classified by DOT as an "other regulated material-type E" (ORM-E) for hazardous materials, and is thereby exempt under the placarding requirements stated in 49 CFR 172.500(b)(2)(Subpart F). If the pH of the solution is less than 2 or exceeds 12.5, the solution would be considered as a corrosive waste (D002). However, the waste has not been treated as a corrosive waste because the pH ranges between 2 and 4 (see section 6.0 of this plan). Also, the quantities of waste are well below the 1,000 pound limit (454 kg) for requiring placarding of vehicles transporting corrosive wastes.

Vehicles transporting hazardous waste must be placarded if the waste falls under the categories listed in Tables 1 and 2 of the aforementioned 49 CFR section. All wastes transported should be accompanied with a material safety data sheet (MSDS) that is carried in the cab of the transporting vehicle.

No more than 55 gallons of hazardous waste may be stored at satellite accumulation points (40 CFR 262.34(c)(1)), provided that the requirements of 265.171-173(a) are met, and the container is marked as hazardous waste. Building 3081 contains the satellite accumulation point for sodium chromate solution waste and solid waste generated from handling the solution. The centralized accumulation point for the sodium chromate wastes and other wastes is adjacent to building 412. Occasionally, PCBs are stored at the satellite accumulation point for several days before being moved to the PCB storage facility at Building 411.

~~The waste must be picked up from a satellite accumulation point by trained hazardous~~ waste handlers and delivered to the centralized hazardous waste storage facility once the container is full, or within 3 days after the quantity exceeds 55 gallons. If the material is not removed within 3 days after the quantity exceeds 55 gallons, other more restrictive regulations must be followed. PCB articles must not be kept in temporary storage for more than 30 days.

8.0 HAZARDOUS MATERIALS HANDLING

Sodium chromate solution would be handled and PCBs could be handled during the conversion program. Potassium hydroxide batteries for the missile guidance system would also be handled. The concentration of PCBs in electrical components, such as sealed power filters and capacitors, is unknown. Because the amounts of liquid in the capacitors and electric filters that could contain PCB are too small to provide a representative test (more than one filter would have to be opened, drained, and have the liquid collected for testing), they are treated as if they exceed 500 ppm PCB. Only limited amounts of PCBs could be handled as part of the conversion activities. Electronics

drawers within the launch control center at each LCF would be handled during the conversion process but those at the LFs would be handled only during normal maintenance activities. Most of the drawers have had potential PCB filters and capacitors removed. Therefore, handling of PCBs may occur but would be limited to only several situations at particular LCFs.

Trained missile maintenance technicians are responsible for the proper handling and usage of these hazardous materials. The technician is responsible for maintaining MSDSs for all hazardous materials in vehicles transporting the materials, and that the proscribed safety precautions be followed when handling hazardous materials. The training that personnel receive regarding the handling of hazardous materials would be continued under operations as part of the conversion program.

9.0 ROCKET MOTOR TRANSPORT

Rocket motors that comprise the booster of the MM II and MM III missiles are transported to and from the MSB and the deployment area by transporter-erectors (TEs). Although the MM II rocket motors to be removed are not considered to be hazardous wastes, the TEs must carry placards that designate the cargo as an ignitable material, as required by the HMTA. The placards would be placed on the back of the TE whenever the rocket motors are transported, and removed when the cargo is empty. A class B explosive placard would also be placed on each side of the TE. In addition, an MSDS must be carried in the tractor when the rocket motors are being transported.

FINDING OF NO SIGNIFICANT IMPACT

CONVERSION OF THE MINUTEMAN II MISSILE SYSTEM TO THE MINUTEMAN III MISSILE SYSTEM MALMSTROM AIR FORCE BASE, MONTANA

INTRODUCTION

The Department of Defense (DoD) is planning the phaseout or conversion of the Minuteman (MM) II missile system—currently the oldest deployed system in the intercontinental ballistic missile (ICBM) force. The Titan I and II systems, and the MM I missiles have been retired; phaseout or conversion of the MM II system would leave the newer MM III and Peacekeeper missiles as the remaining elements in the ICBM force.

The underlying purpose of and need for the conversion process proposed for the MM II Missile Squadrons (MSs) within the 341st Missile Wing (MW) at Malmstrom AFB is to remove the oldest system from the ICBM force, while retaining a newer and more cost-effective strategic deterrence. Phaseout of the MM II missiles at Ellsworth AFB and Whiteman AFB are scheduled to occur concurrently with the conversion action at Malmstrom AFB. These actions are the subject of other environmental documents. An environmental assessment for the transportation and storage of MM II rocket motors from Malmstrom AFB, Ellsworth AFB, and Whiteman AFB has been prepared by the Air Force Logistics Command and a finding of no significant impact has been signed. The findings and analysis of the rocket motor analysis are incorporated by reference (per 40 CFR 1502.21) into this analysis.

THE ACTION

The 341 MW operates and maintains the Minuteman missile system at Malmstrom Air Force Base (AFB), Montana. Of the 200 MM missiles in launch facilities (LFs) in the deployment area of Malmstrom AFB, 150 are MM IIs and 50 are MM IIIs. The U.S. Air Force will remove the 150 MM II missiles from the LFs and replace them with 150 MM III missiles. The conversion will proceed sequentially from one missile squadron to another over a 6-year period starting in October 1991. A slight adjustment to the missile umbilical will be made and the suspension system will be checked and adjusted, if necessary, to handle the slightly heavier MM III missile, and software will be modified to support the MM III system.

The missiles will be removed from the LFs using the same procedures and the same transport, maintenance, and support vehicles as under existing maintenance operations. The removal and transport of the missiles from the LFs will not introduce any new procedures or techniques; the same methods applicable to current MM III operations will be applied to this action. The procedures are proven and will involve experienced personnel. Adequate storage and handling facilities exist to facilitate the conversion.

During the conversion process, the use of particular vehicles to transport missile components, personnel, and equipment will increase; the number of annual missile recycles (removing one missile and emplacing another) will increase from approximately 20 to 26. Other missions in support of the MW, such as communications and operations, will incur a negligible increase in vehicle usage. Some training of operations and maintenance crews that work solely with the MM II system will be necessary. Activities at each LF involving missile removal and emplacement will occur within the fenced security area.

Taking no action was the only alternative fully evaluated for the phaseout and conversion process planned for Malmstrom AFB. The maintenance, operation, and modernization of the MM II system would continue under the no action alternative, resulting in no new significant impacts. Other alternatives considered but eliminated from further evaluation include: changing the MW selected for conversion and/or phaseout, shortening the conversion process, lengthening the conversion process, or only converting one or two MSs. These alternatives were considered unreasonable because of the existing infrastructure at Malmstrom AFB to support an MM III conversion, the age of the MM II missiles, ranging and targeting capabilities, system hardness, Congressional direction, and the need to maintain strategic deterrence within the constraints of the DoD budget.

ENVIRONMENTAL EFFECTS

An evaluation of the phaseout and conversion of the MM II system to an MM III system has identified an overall insignificant, if not negligible, impact to the biophysical and human environment of Malmstrom AFB and throughout the deployment area.

The proposed action will have negligible impacts to the geological, water, biological, and cultural resources. Any sensitive noise receptors within the deployment area would be affected to the same extent as under existing operations. During the conversion process, there will be additional activity at the LFs and a slight increase in the number of trips by the transporter-erector, maintenance, and support vehicles along 10th Avenue South in Great Falls, MT. These actions will have a temporary adverse impact on the local air quality by increasing fugitive dust and air pollutant emissions. However, the impact will be short-term and insignificant. Because the MM III system is more operationally reliable than the MM II system, the long-term impact of converting the system would be beneficial because of the reduction in the amount of maintenance and vehicle trips to the deployment area.

Although there will be a short-term increase in the number of vehicle trips, the accident rate is expected to remain relatively constant because use of the local and regional transportation network occurs primarily during off-peak hours. The likelihood of the conversion process having an affect to the health and safety of workers exposed to hazardous materials is low because of the low quantities of hazardous materials handled, the mechanics of the handling process, and the required use of safety equipment. The mpact from a transportation accident that would cause a propellant fire or release of radioactive material would be significant within the immediate accident vicinity. However, the risk (probability and consequences) of an accident is negligible.

Existing safety programs ensure that the probability of accidents in handling and transporting missile components is remote. The probability of a release of radioactive material is even less than the probability of an accident occurring. In approximately 30 years of handling MM systems, there has not been a rocket motor propellant fire or an incident involving accidental nuclear detonation or plutonium release.

The local socioeconomic environment will not experience any significant impacts. The action will result in a temporary increase in the number of personnel at Malmstrom AFB. The planned increase in security personnel to assist in the conversion process is less than a one percent increase per year for two years; at the end of the conversion process, these authorized positions would be eliminated.

The Base Civil Engineer has the responsibility to ensure the conversion process complies with all applicable Federal, State, and local environmental regulations. An environmental compliance plan was included as part of the environmental assessment.

CONCLUSION

In accordance with the Council on Environmental Quality regulations implementing the National Environmental Policy Act of 1969, as amended, and Air Force Regulation 19-2, an assessment of the identified environmental effects has been prepared. It has been determined that the phaseout of the MM II missile system and conversion to the MM III system will have no significant impacts on the quality of the human environment and no mitigation measures are necessary or required. Thus, an environmental impact statement is not required.

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