PROPOSED FINAL

ENVIRONMENTAL ASSESSMENT FOR THE MINUTEMAN III PROPULSION SYSTEM ROCKET ENGINE LIFE EXTENSION PROGRAM

May 2003

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USAF Contract No.: F42650-98-D-0065
Task Order No.: 0023

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Finding of No Significant Impact for the Minuteman III Propulsion System Rocket Engine Life Extension Program

Description of the Proposed Action

The U.S. Air Force intends to refurbish up to 586 Minuteman III (MM III) Propulsion System Rocket Engine (PSRE) systems and replace components as necessary to extend the service life to the year 2020. The PSREs would be ground transported between three Air Force Base (AFB) wings, Hill AFB in Utah, the Freeport Center in Clearfield, Utah, the Survivability and Vulnerability Integration Center (SVIC) in Utah, and White Sands Testing Facility (WSTF) in New Mexico. The purpose of this Environmental Assessment (EA) is to review environmental impacts associated with the PSRE Life Extension Program (LEP).

In the proposed action, receiving, disassembly, kit installation, final functional testing activities, post-firing activities, and post-firing component storage for the PSRE would be completed at Hill AFB and at a contractor's facility in Freeport Center by government personnel. Included in the proposed action is the refurbishment of the shipping and storage containers used to transport the PSRE. Shipping container refurbishment would occur at Hill AFB and would involve transport of the shipping containers from Building 2016 to Buildings 2014 and 847, where refurbishment would occur. As part of the proposed action, selected PSRE units in refurbished shipping containers would be transported to and from SVIC or WSTF for testing as required. The environmental impacts of the activities occurring at both SVIC and WSTF have been addressed separate from this EA, however the transportation to and from SVIC and WSTF, PSRE post-firing transportation, as well as certain post-firing activities completed at Buildings 2016 and 1804 at Hill AFB have been assessed.

Summary of Environmental Impacts

This section describes the effects that the proposed action would have on the existing conditions at Hill AFB, the contractor facility at Freeport Center, and the typical transportation corridors. The effects or impacts of the proposed action can be beneficial or adverse, and short-term or long-term, as discussed below.

Surface Water

No surface water bodies or surface water drainage patterns are expected to be impacted by the proposed action.

Groundwater

Groundwater conditions are not expected to be affected by the proposed action.

Geology and Soils

The proposed action does not contain any soil disturbing operations and there are no expected effects to either the geology or soils from this action.

Vegetation

Vegetation would not be disturbed or impacted under the proposed action. Therefore, there are no anticipated impacts to vegetation.

Wildlife

Under the proposed action, wildlife habitats, food sources and wildlife species would not be impacted. Therefore, there are no anticipated impacts to wildlife from the proposed action.

Air Quality

There would be no anticipated significant impact to air quality from the minor use of hazardous materials within the available facilities at Hill AFB and Freeport Center.

Emissions associated with the PSRE transportation routes would include the mobile emissions from the transport trucks. These mobile emissions from registered trucks should be accounted for in the Transportation Plans of the nonattainment and maintenance areas through which the PSRE transportation trucks pass. As a result, there would be no significant air quality impacts from the transportation of the PSRE during the proposed action.

Archaeological, Historical, and Cultural Resources

There are no ground disturbing activities and existing facilities would be used for the proposed action. Therefore, no impact would occur to any archaeological, historical, and cultural resources under the proposed action.

Land Use

There would be no impact to current land use in the vicinity of the proposed action.

Noise

There are no significant adverse impacts to noise from the proposed action at Hill AFB, Freeport Center, or in the vicinity of the transportation routes.

Health and Safety

The proposed actions at Hill AFB and Freeport Center have been evaluated, risks have been minimized, and potential concerns have been mitigated in previous activities and in program planning. Therefore, there are no anticipated adverse impacts to health and safety from the proposed actions at Hill AFB and Freeport Center.

The Air Force has an excellent safety record for PSRE transport; strict procedures and guidelines are followed. Additionally, all components of the proposed action have explicit and safe policies and guidelines to ensure the health and safety of all involved as well as the health and safety of the general public. All regulations, policies, technical orders and operating instructions would be carefully followed and strictly enforced, additionally the use of government personnel drivers, dual drivers, specialized transport equipment, multiple PSRE per load, and transport during daytime hours are good management practices which reduce safety risks.

The proposed action would ensure continued availability of the MM III missiles for homeland security purposes.

Hazardous Materials and Hazardous Wastes

The proposed action at Hill AFB and Freeport Center has been evaluated with regards to hazardous materials and wastes; the usage of hazardous materials would be small, risks have been minimized, and potential concerns have been mitigated in previous activities and in program planning. In the unlikely event of a transportation accident, emergency procedures are in place to ensure swift and safe resolution.

Transportation

No significant disturbance or impact is expected to occur to the existing transportation system at Hill AFB or along the typical transportation routes under the proposed action.

Socioeconomic Conditions

The various MM III programs employ approximately 1,200 military, Department of Defense (DoD), civilian, and contracting personnel from various military bases and civilian companies. Approximately nine additional personnel would be employed from Hill AFB as a result of the proposed action. Continuation of the MM III programs at Hill AFB would have positive economic impact in the region.

Environmental Justice

Environmental justice analyses for National Environmental Policy Act (NEPA) documents attempt to determine whether a proposed action disproportionately impacts minority and poor populations. Because the PSRE LEP would not result in any significant impacts to the surrounding community, no such analysis was conducted.

Cumulative Impacts

There would be no anticipated adverse cumulative impacts expected from the actions required for the PSRE LEP. The proposed action would require negligible workforce growth to support the PSRE Life Extension Program (LEP). The traffic created from the proposed action would not contribute significantly to congestion on base. Air emissions from incidental chemical usage would have a negligible impact on regional air quality and the National Ambient Air Quality Standards.

Conclusion

Based on the results of this Environmental Assessment (EA), no significant adverse environmental impacts are expected due to the actions of the PSRE LEP at Hill AFB, the Freeport Center, or along the typical transportation routes provided all policies, procedures and regulations are strictly followed. Therefore, in accordance with 32 CFR 989, a Finding of No Significant Impact (FONSI) may be issued, and preparation of an Environmental Impact Statement (EIS) is not necessary.

Hill Air Force Base, Utah

_____ _____

Authorized Signature Date

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LIST OF ACRONYMS

AF	Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFPD	Air Force Policy Directive
amsl	above mean sea level
AR	Army Regulation
bgs	below ground surface
CATEX	Categorical Exclusion
CO	carbon monoxide
CFR	Code of Federal Regulation
DCG	Disaster Control Group
DoD	Department of Defense
DOT	Department of Transportation
DTTS	Defense Transportation Tracking System
EA	Environmental Assessment
ECZ	explosive clear zone
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESOH	Environmental, Safety, and Occupational Health
FONSI	Finding of No Significant Impact
GSA	Gas Storage Assembly
HAP	Hazardous Air Pollutant
HAZMAT	hazardous materials
HWCF	Hazardous Waste Control Facility
ICBM	Intercontinental Ballistic Missile
LEP	Life Extension Program
LM	Logistics Missile
LMES	Logistics Missile Engineering and Safety
MAMS	Missile Assembly Maintenance and Storage
MILCON	Military Construction
MM	Minuteman
MMH	monomethylhydrazine
MPTS	Minuteman PSRE Test Set
MT	Montana

NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
ND	North Dakota
NO_2	nitrogen dioxide
NTO	nitrogen tetroxide
O_3	ozone
PCB	polychlorinated biphenyl
Pb	lead
PM-10	particulate matter (less than 10 microns)
PSA	Propellant Storage Assembly
PSRE	Propulsion System Rocket Engine
PT	Payload Transporter
SO_2	sulfur dioxide
SPI	Special Packing Instruction
SVIC	Survivability and Vulnerability Integration Center
TO	Technical Order
UT	Utah
U.S.	United States
USAF	United States Air Force
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WSTF	White Sands Testing Facility
WY	Wyoming

EXECUTIVE SUMMARY

The U.S. Air Force intends to refurbish up to 586 Minuteman III (MM III) Propulsion System Rocket Engine (PSRE) systems and replace components as necessary to extend the service life to the year 2020. The PSREs would be ground transported between three Air Force Base (AFB) wings, Hill AFB, a contractor's facility at Freeport Center in Clearfield, Utah, the Survivability and Vulnerability Integration Center (SVIC) in Utah, and White Sands Testing Facility (WSTF) in New Mexico.

Based on specific PSRE handling requirements, a viable location for the MM III PSRE refurbishment program must have unique facilities with specific capabilities. There were three alternative operations considered and eliminated from further analysis by the U.S. Air Force to complete the required upgrading for the PSRE. These alternatives included complete PSRE replacement, PSRE refurbishment at each wing, and enlargement of existing facilities at Hill AFB.

In the proposed action, receiving, disassembly, kit installation, final functional testing activities, post-firing activities, and post-firing component storage for the PSRE would be completed at Hill AFB Building 2016, and the Freeport Center contractor facility by government personnel. Included in the proposed action is the refurbishment of the shipping and storage containers used to transport the PSRE. Shipping container refurbishment would occur at Hill AFB and would involve transport of the shipping containers from Building 2016 to Buildings 2014 and 847, where refurbishment would occur. As part of the proposed action, selected PSRE units would be transported to and from SVIC or WSTF for testing as required. The environmental impacts of the activities occurring at both SVIC and WSTF have been addressed separate from this EA, however the transportation of PSRE to and from SVIC and WSTF, PSRE post-firing transportation, as well as certain post-firing activities completed at Buildings 2016 and 1804 at Hill AFB have been assessed.

The no-action alternative was also evaluated in this EA. The indirect impacts of the no-action alternative are anticipated to create significant negative impacts to the nation. With the no-action alternative the MM III would degrade and become unusable, thus reducing homeland security for the United States. Additionally with the MM III no longer in operation, there would be a large negative impact to the work force that maintains the MM III programs.

A summary of the impacts from the proposed action and the no-action alternative is provided in Table ES-1. It is not anticipated that the proposed action would have significant adverse environmental impacts, however, the no-action alternative would, in time, compromise national defense and adversely affect the MM III program work force.

Table ES-1. Anticipated Environmental Consequences from the MM III PSRE LEP

Environmenta Issues	Proposed Action Alternative	No-Action Alternative
Surface Water	No impact.	No impact.
Groundwater	No impact.	No impact.
Geology and Soils	No impact.	No impact.
Vegetation	No impact.	No impact.

Environmenta Issues	Proposed Action Alternative	No-Action Alternative
Wildlife	No impact.	No impact.
Air Quality	No significant adverse impact. Negligible emissions from incidental chemical usage would be well ventilated.	No impact.
Cultural Resources	No impact.	No impact.
Land Use	No impact.	No impact.
Noise	No significant adverse impact. A slight increase in transport noise may occur, but interior noise would be mitigated with noise protection equipment, and increases in transportation noise levels would be negligible.	No impact.
Health and Safety	No anticipated adverse impact. Previous operations and program planning have mitigated and minimized proposed action risks and concerns. Regulations, policies, technical orders and operating instructions are in place for PSRE handling and transport. Transportation safety risks have been addressed.	National security may be compromised due to the non-replacement of aged-out MM III missiles.
Hazardous Materials and Hazardous Waste	No anticipated adverse impacts. Minor quantities of hazardous materials and hazardous wastes would be used and generated. Previous operations and program planning have mitigated and minimized proposed action risks and concerns.	No impact.
Transportation	No significant anticipated impacts. Traffic increase on the transportation corridors and to the proposed action areas would be minimal. All routes to be used are paved and well used.	No impact.
Socioeconomics	No adverse impact.	Negative adverse impacts to the workforce that operates the MM III programs with the degradation of the MM III missile.
Environmental Justice	No impact.	No impact.

Section 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The U.S. Air Force intends to refurbish up to 586 Minuteman III (MM III) Propulsion System Rocket Engine (PSRE) systems and replace components as necessary to extend the service life of the PSRE to the year 2020. The proposed action involves the refurbishment of MM III PSRE from three wings: FE Warren Air Force Base (AFB), Wyoming; Malmstrom AFB, Montana; and Minot AFB, North Dakota. The PSREs would be ground transported between the three wings, Buildings 1804 and 2016 at Hill AFB in Utah, the Joint Refurbishment Center at the Freeport Center in Clearfield, Utah, the Survivability and Vulnerability Integration Center (SVIC) in Ogden, Utah, and the White Sands Testing Facility (WSTF) near Las Cruces, New Mexico (Figure 1-1). The purpose of this Environmental Assessment (EA) is to review environmental impacts associated with the PSRE Life Extension Program (LEP).

1.2 Background

The PSRE is a liquid propellant rocket propulsion system that provides the thrust capability for deployment of the MM III Re-entry Vehicle. The purpose of the PSRE is to provide precise impulse increments to the Re-entry Vehicle while on a ballistic trajectory at altitudes above 300,000 feet (TRW, 1997). The PSRE primarily consists of a gas storage assembly, two propellant storage assemblies (fuel and oxidizer), a gimbaled axial engine, and ten attitude control engines. A cylindrical metal shell approximately 52 inches in diameter and 18.88 inches long encases the PSRE components. The PSRE uses a hypergolic mixture of nitrogen tetroxide (NTO) as the oxidizer and monomethylhydrazine (MMH) as the fuel. There are approximately 157 pounds NTO and 99 pounds MMH in the PSRE independently stored in two propellant storage assemblies. The total weight of the PSRE when loaded is 605 pounds (ARC, undated).

Two main components of the PSRE are the Propellant Storage Assemblies (PSAs) and the Gas Storage Assembly (GSA). The PSAs are separate stainless steel tanks used to store the MMH and NTO liquids. These liquids, when mixed in proper quantities, ignite spontaneously creating a means for rocket propulsion. The tanks are cylindrical with a maximum outside diameter of 13.83 inches and an overall length of approximately 37 inches (ARC, undated, and TRW, 1997). The GSA is used to store the helium gas pressurant during ground storage and strategic alert, and is the energy source for the release of the propellants from the PSA while the PSRE is in full operation (ARC, undated).

1.3 Need for the Proposed Action

A triad of strategic forces exists and has been deemed fundamental to the National Security Strategy. The strategic triad consists of land-based Intercontinental Ballistic Missiles (ICBMs), air-based strategic bombers, and sea-based submarine-launched ballistic missiles. Each leg of the triad contributes unique attributes that enhance deterrence and reduce risk: ICBMs provide prompt response, bombers provide flexibility, and submarines provide survivability (URS, 2001). A December 1997 Life Extension Assessment Program identified that in order to maintain the MM III fleet, refurbishments to the PSRE were required. The MM III weapon system is planned to become the ICBM component of the strategic triad and is required to provide nuclear deterrence.

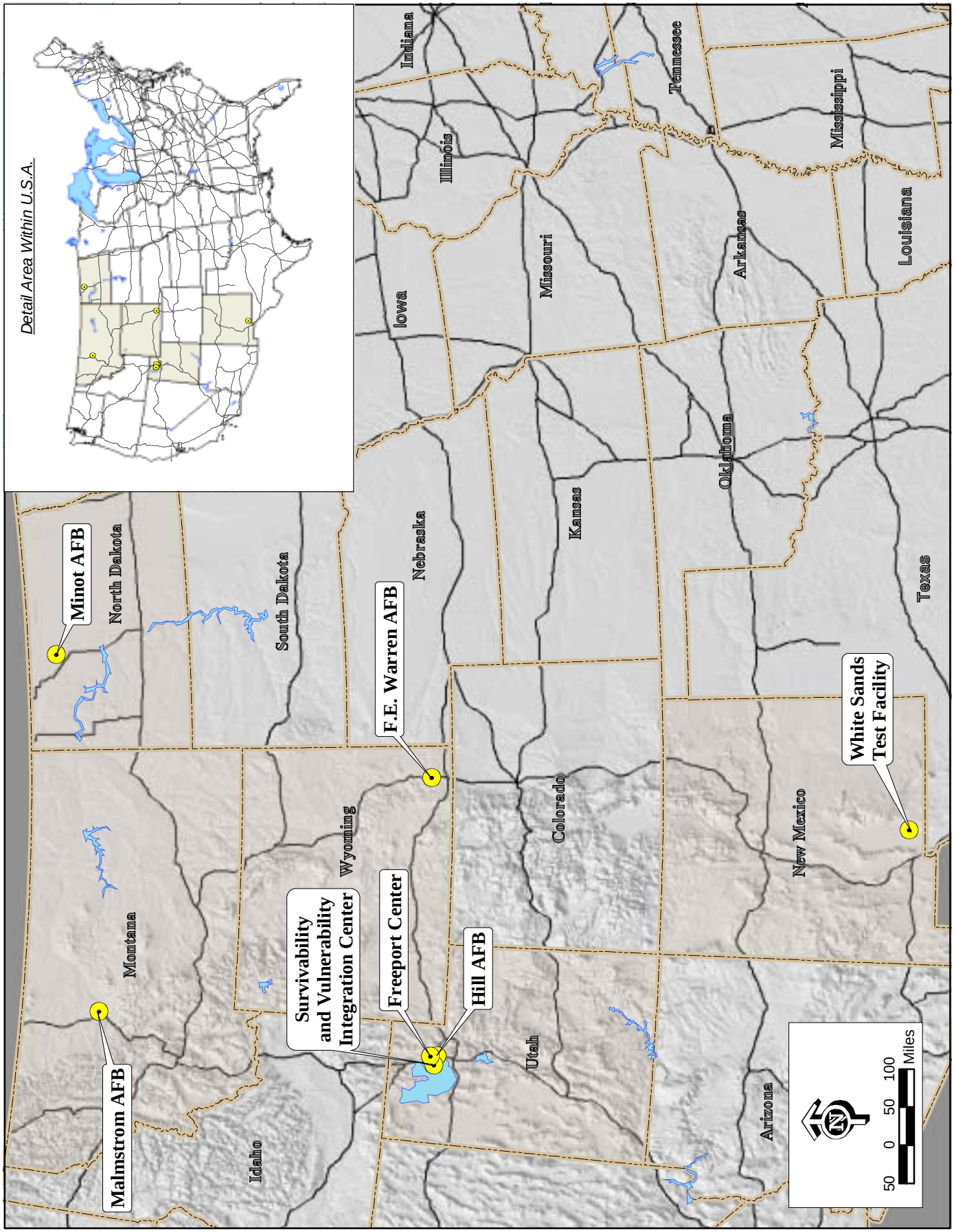


Figure 1-1. PSRE LEP Site Locations

The PSRE LEP is a part of the effort to extend the operational life of the MM III missile. The refurbishment would correct age-related degradations, reduce life cycle costs, and support MM III life extension while maintaining existing weapon system reliability. The deficiencies identified (e.g., relief valve aging, titanium pressure sensing tube cracking, and fuel flex line cracks) may cause system failure/loss of performance and, in turn, potential mission failure. Other deficiencies (e.g., staging connector aging and actuator motor performance) would impact weapon system availability in addition to reducing system performance (U.S. Air Force, 2002).

1.4 Applicable Requirements

There are several regulatory environmental and procedural requirements that apply to the proposed action. The significant requirements are described below.

1.4.1 National Environmental Policy Act Requirements for Air Force Actions

The National Environmental Policy Act (NEPA) of 1969 requires federal agencies to analyze the potential environmental impacts of a proposed action and to evaluate reasonable alternative actions. The results of the analyses are used to make decisions or recommendations on whether and how to proceed with those actions. *32 Code of Federal Regulations (CFR) 989, Environmental Impact Analysis Process,* describes the process of preparing an EA for proposed actions on Air Force property. Based on the EA, either a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) is prepared. Both *32 CFR 989* and the implementing regulations of NEPA (*40 CFR 1500*) were followed in preparing this EA.

1.4.2 Military Requirements

All handling of the PSRE and shipping containers would be accomplished in accordance with long-standing Military Standards, Department of Defense (DoD) Instructions, Business Practices, and Air Force Instructions to ensure safety and correct action. Appendix A is a list of the PSRE LEP environmental, safety, and occupational health references. Additional references, such as Technical Orders (TOs), are used to ensure safety and proper handling in all phases of PSRE production and maintenance. *Special Packaging Instruction (SPI) DSTDS-01440* details the method and requirements for safe and correct loading of the PSRE into PSRE shipping containers and onto transport vehicles.

1.4.3 Air Quality Requirements

Air Force Policy Directive (AFPD) 32-70, Environmental Quality requires an Air Force air quality compliance program. *Air Force Instruction* (*AFI) 32-7040 -– Air Quality Compliance* implements the specific requirements of a program for compliance with applicable Federal, State, and local standards for air quality. The air quality compliance program addresses prevention, control, abatement, documentation, and reporting of air pollution from stationary and mobile sources. *AFI 32-7040* is not intended to duplicate Federal, State and local standards, but provides a framework within which to maintain compliance with existing standards. The instruction identifies responsibilities, and where appropriate, refers to existing standards as the basis for compliance.

The *Federal Conformity Rule (40 CFR 93.153)*, also known as the General Conformity Rule, is the enactment of the conformity provision established in the Clean Air Act requiring federal facilities to determine if federal actions are within set U.S. Environmental Protection Agency (EPA) air pollution limits. A conformity study must be completed prior to commencing any action that is federally funded, licensed, permitted, or approved. If a conformity analysis and determination indicates the action does not conform to an applicable implementation plan, the action cannot proceed (US Air Force, 2000).

1.4.4 Hazardous Materials

AFI 32-4002, Hazardous Material Emergency Planning and Response Compliance, implements *AFPD 32-40*, *Disaster Preparedness*, by outlining procedures for planning for and responding to Federal, State, local, and DoD emergencies involving hazardous materials (HAZMAT). It covers HAZMAT emergency planning and response, training, risk management, notification, and reporting. In general, this AFI identifies procedures necessary to ensure compliance with existing Federal, State, and local HAZMAT emergency planning and response regulations.

Air Force Manual (AFMAN) 91-201 – Explosives Safety Standards, implements the specific guidance necessary to meet the objectives of *AFPD 91-2 – Safety Programs* and *DoD 6055.9-Std. – DoD Ammunition and Explosives Safety Standards*. It established a central source for explosive safety criteria and provides detailed requirements for transporting explosives and for operating vehicles and materials handling equipment in explosives locations.

1.4.5 Transportation Requirements

The proposed action includes transport on public roadways. When the PSREs are transported on the transportation corridors, Department of Transportation (DOT) regulations are applicable. Additionally, for each state that the PSRE is transported through, the commercial carrier is required to obtain a DOT permit.

From *49 CFR*, the Federal Motor Carriers Guide, United States Department of Transportation, the Parts that apply include:

- *325 – Compliance with Interstate Motor Carrier Noise Emission Standards*;
- *355 – Compatibility of State Laws and Regulations Affecting Interstate Motor Carrier Operations*;
- *382 – Controlled Substances and Alcohol Use and Testing*;
- *383 – Commercial Driver's License Standards; Requirements and Penalties*;
- *385 – Safety Fitness Procedures*;
- *386 – Rules of Practice for Motor Carrier Safety and Hazardous Materials Proceedings*;
- *391 – Qualifications of Drivers*;
- *395 – Hours of Service of Drivers*; and
- *397 – Transportation of Hazardous Materials; Driving and Parking Rules*.

Military documents that regulate the transport of the PSRE are the *Army Regulation (AR) 55-162 – Permits for Oversize, Overweight, or other Special Military Movement on Public Highways in the United States* and *AFI 24-201 – Cargo Movement*. *AR 55-162* establishes procedures for securing permits for the movement of military owned and operated vehicles and for commercial movements of military cargo exceeding legal weight limitations over public highways in the United States. *AFI 24-201*

– *Cargo Movement* assigns responsibilities and provides guidance and procedures on the planning, documentation, funding and other actions associated with the movement of Air Force cargo in support of various operations, including peacetime operations.

1.5 Scope and Organization of This Document

The remainder of this document is organized as follows:

- Section 2 provides a description of the alternative actions being proposed, including the no-action alternative;
- Section 3 describes the existing environmental conditions at Hill AFB, Freeport Center and along the transportation corridors;
- Section 4 identifies the potential environmental consequences associated with implementation of the proposed action and no-action alternatives;
- Section 5 presents a list of the preparers of this report;
- Section 6 contains a list of offices, agencies, and persons contacted for information used in the report; and
- Section 7 includes a list of references.

Section 2
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section describes the proposed action and alternative actions that have been considered by the U.S. Air Force for the refurbishment of up to 586 MM III PSRE.

2.1 Selection Criteria

Based on specific PSRE handling requirements, a viable location for the MM III PSRE refurbishment program must have numerous capabilities. The capabilities needed for the program would not be required in each building, however, the total capability of all program facilities must include:

1. facilities capable of conducting the PSRE energetics disassembly process;
2. Class 100,000 clean rooms;
3. overhead hoist;
4. facility ground and energetics storage capacity;
5. shop/air/nitrogen/helium gas supply;
6. room for various test stands;
7. trained personnel competent to disassemble, reassemble, refurbish, and test MM III PSREs;
8. remote test capability; and
9. explosive distance/clear zone requirements associated with the use of associated ordnance and propellants.

2.2 Alternatives Considered but Eliminated from Further Analysis

There were three alternative operations considered by the U.S. Air Force to complete the required upgrading for the PSRE. These alternatives included complete PSRE replacement, PSRE refurbishment at each wing, and enlargement of existing facilities at Hill AFB.

2.2.1 Complete PSRE Replacement

Complete PSRE replacement was analyzed as an alternative during the initial planning stages of the LEP. During analysis, it was determined that significant amounts of design effort and environmental resources would have been required, creating excessive time requirements and costs. The complete PSRE replacement option was eliminated from further consideration because the proposed action alternative was determined to be a much more environmentally and economically viable option.

2.2.2 Refurbishment at Each Wing

This alternative action would encompass the same refurbishment requirements as the proposed action, however, the refurbishment would occur at each individual wing. This alternative would reduce transportation between Hill AFB and Freeport Center, however, the select refurbished PSRE would still require testing either at the proposed action facilities or at new facilities. In this alternative, new refurbishment facilities would be required at each of the three wings, and facilities would need to meet the selection criteria. The proposed action alternative was determined to have much less cost and much less potential for environmental impacts than would be associated with the triplicate facility construction required for this alternative. Therefore, this alternative was eliminated from further consideration.

2.2.3 Enlargement of Existing Facilities at Hill AFB

Major design and construction would have been necessary to enlarge Building 2016 or 2014 to accommodate the extra space required for complete refurbishment activities at Hill AFB. This would have required Military Construction (MILCON) funding which was unavailable. The program was

funded with development funding and was unable to acquire MILCON funding. This alternative was eliminated from further consideration.

2.3 No-Action Alternative

Under the no-action alternative, the requirement to refurbish the PSRE identified in the December 1997 Life Extension Assessment Program would not be met. In the no-action alternative, five components and two electrically operated ordnance components that require replacement would not be replaced. The no-action alternative is not considered a reasonable option because it prohibits the extension of the service life of the PSRE to the year 2020. The no-action alternative would ultimately degrade the MM III system reliability/availability and affect mission readiness of the U.S. military.

2.4 Proposed Action

The selection criteria listed in Section 2.1 would be fulfilled by the proposed action in the operation of the PSRE LEP. In the proposed action, the PSRE would be transported from the three wings (FE Warren AFB, Malmstrom AFB, and Minot AFB) to Hill AFB, Building 2016. Handling of all energetics would be conducted at Hill AFB in existing facilities. Receiving, disassembly, kit installation, and final functional testing activities would be completed at Hill AFB, Building 2016 and at the contractor facility at Freeport Center where the non-energetic refurbishment process would be conducted by government personnel. Kits containing critical components necessary for the refurbishment activity would be provided to the Air Force through a contracting action. The Air Force would perform the actual MM III refurbishment process utilizing kits provided. Refurbished units would be returned to operational PSRE wings for reinstallation on boosters in launch facilities. New transportation equipment would be procured under the PSRE LEP as necessary to support the LEP schedule. The new transportation equipment would be maintained by MAK personnel in Hill AFB Building 847.

Selected units would be transported to and from SVIC or WSTF for testing as required. Testing activities associated with this program would include mass properties testing at SVIC, dynamic tests at SVIC, and static tests at WSTF. Activities occurring at both SVIC and WSTF are presented here for information purposes. The environmental impacts of certain activities at these locations have been addressed separately. The environmental impacts of activities included in this EA are described in the following sections. The AF Form 813 (for SVIC) and the WSTF Form 423-A applications with NEPA Categorical Exclusion (CATEX) documentation are provided in Appendix B.

Included in the proposed action is the refurbishment of the shipping and storage containers used to transport the PSRE. Shipping container refurbishment would occur at Hill AFB and would involve transport of the shipping containers from Building 2016 to Buildings 2014 and 847, where refurbishment would occur.

2.4.1 Refurbishment of the PSRE

The following sections detail the components involved in the refurbishment aspect of the PSRE LEP.

2.4.1.1 Transportation Operations

The action of removing the PSREs from their silos is considered routine maintenance and, thus, out of the scope of this EA. In preparation for truck transport, the liquid propulsion system is separated from the other MM III rocket motors at the silo. The PSRE is loaded into the Payload Transporter (PT) and transported to the wing. At the wing, the PSRE is transferred to a shipping and storage container then loaded onto transport trucks. Once the PSRE is loaded on the transport truck, the scope of this EA

begins. The MM III PSRE would be transported to and from each of the three wings on typical routes to Hill AFB. Although drivers would choose their own transportation routes, for the purposes of this EA, the typical routes were determined to be major highways and interstate roadways between the three wings and Hill AFB. Figure 2-1 shows the typical routes that have been assessed for the transport of the PSRE. During transportation to and from the three wings, the PSRE would have all components intact and would be transported in a shipping and storage container, on an air-ride, enclosed, semi-trailer flatbed truck. To support the LEP schedule, up to four commercial tractors and up to four custom semi-trailers would be purchased for PSRE transport to and from Hill AFB and the three missile wings. The semi-trailers would be equipped with capability for MMH/NTO detection and environmental control systems. Appendix C shows photographs of the PSRE and the PSRE shipping container.

In the refurbishment process, the PSRE would also be transported back and forth between Building 2016 at Hill AFB and the contractor facility in Building A-15 of the Freeport Center. Figure 2-2 shows the process flow for the transportation operations. In this stage of the refurbishment, the pyrotechnics, PSAs and GSA would be absent from the PSRE. The PSRE would be transported between Hill AFB and Freeport Center on an enclosed medium duty truck. The anticipated production and delivery schedule for the PSRE initiating in 2004 is shown in Table 2-1. To support the PSRE LEP, up to two medium duty, air ride trucks would be purchased for transporting inert PSREs to and from Hill AFB and the contractor facility at Freeport Center. The typical route between Hill AFB and Freeport Center is shown in Figure 2-3, and was determined to be major highways and interstate roadways between the two locations.

Table 2-1. PSRE Proposed Remanufacture Production and Delivery Schedule (with a 10 month Lead Time Delivery)

Month/Year	200	200	200	200	200	200	201	201	Tot
January		2	8	8	8	8	8	8	
February		2	8	8	8	8	8	8	
March		2	8	8	8	8	8	8	
April		2	8	8	8	8	8	8	
May		4	8	8	8	8	8	4	
June		4	8	8	8	8	8	4	
July		4	8	8	8	8	8	4	
August		4	8	8	8	8	8	4	
September		8	8	8	8	8	8		
October		8	8	8	8	8	8		
November		8	8	8	8	8	8		
December	2	8	8	8	8	8	8		
Totals	**2**	**56**	**96**	**96**	**96**	**96**	**96**	**48**	**58**

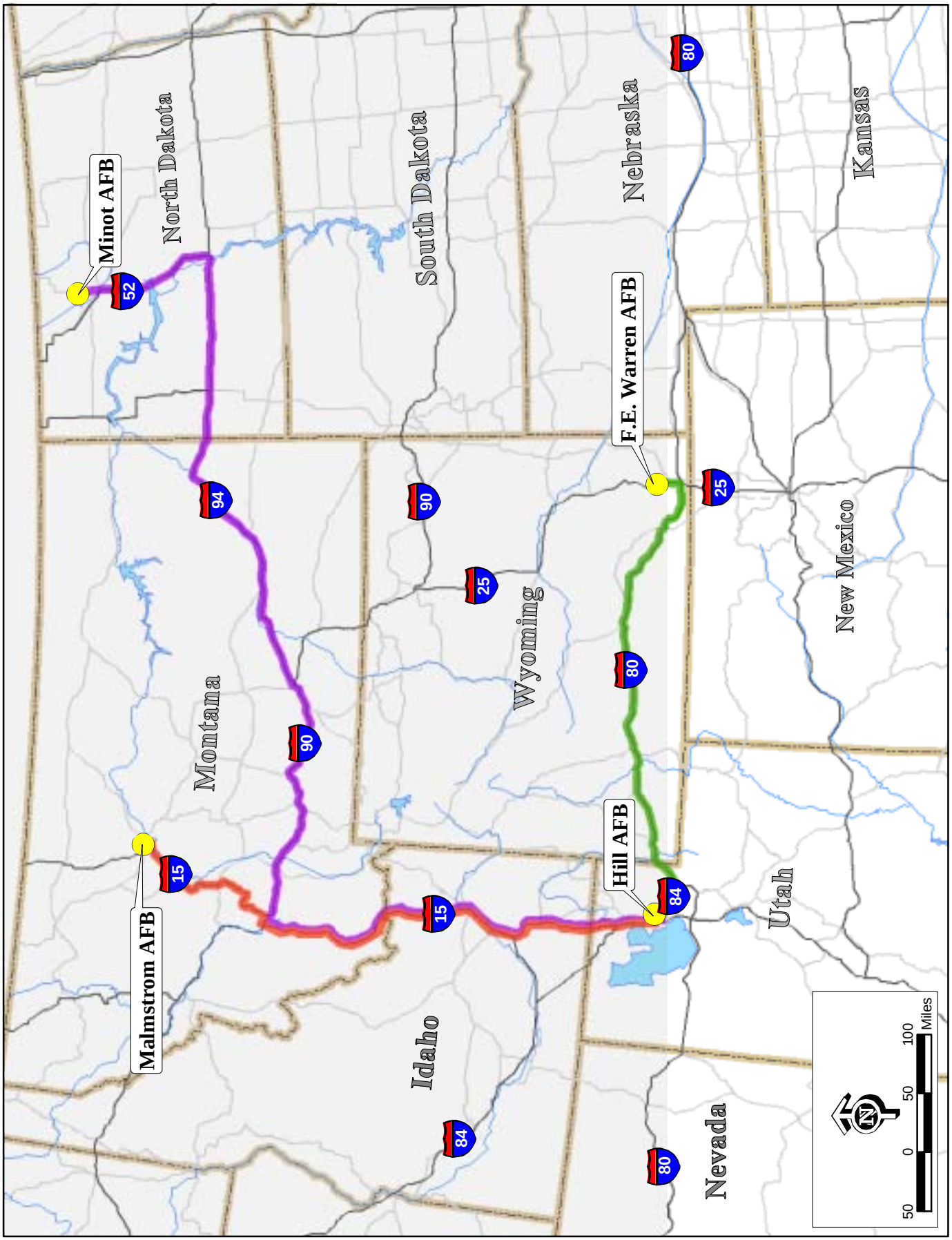


Figure 2-1. Typical Transportation Routes Between Hill AFB and the Three Wings

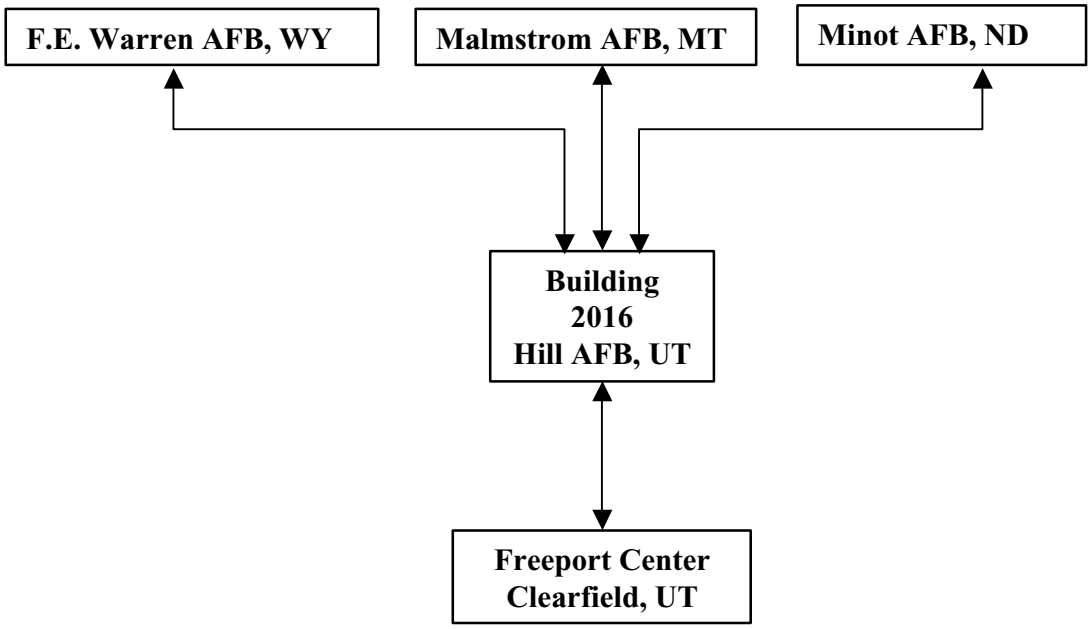


Figure 2-2. PSRE LEP Refurbishment Transportation

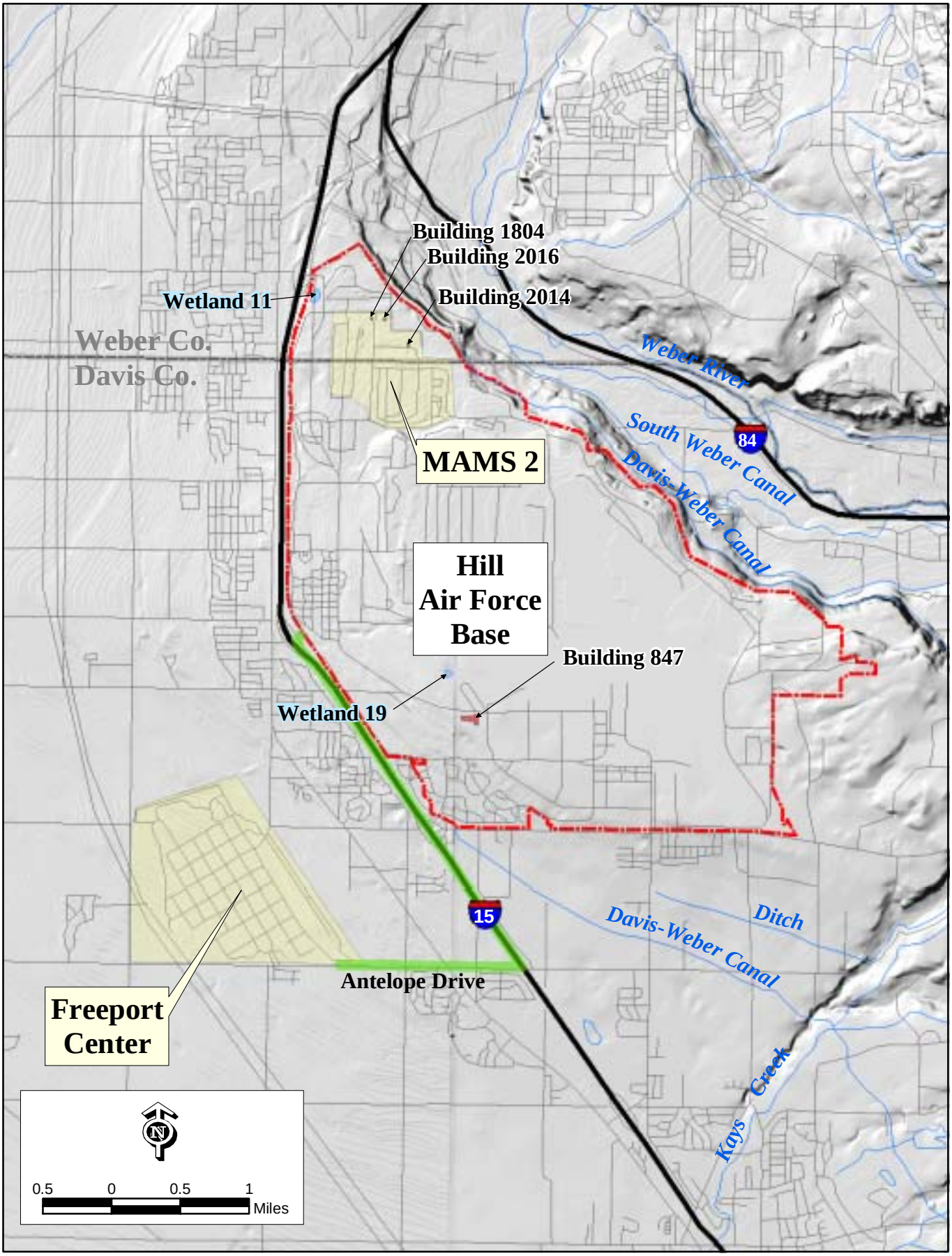


Figure 2-3. Typical Transportation Route Between Hill AFB and Freeport Center

2.4.1.2 Refurbishment Operations

The PSRE LEP activities at Building 2016 (i.e. facility enhancements, etc.) have been determined to be under a CATEX and will not be evaluated in this EA. Information has been provided for background purposes only. From the wings, the PSRE would be taken to Building 2016 located in the Missile Assembly Maintenance and Storage 2 (MAMS 2) area at Hill AFB. Here, both the shipping and storage container and the PSRE would be cleaned. The PSRE would be removed from the shipping and storage container, inspected, and the refurbishment process would begin. The pyrotechnics, GSA, and PSAs would be removed from the PSRE and stored in appropriate storage facilities at Building 2016 until required for re-assembly. Subsequent to the removal of the pyrotechnics, GSA, and PSAs, the PSRE would be transported to the Freeport facility for further refurbishment by government personnel. Figure 2-4 shows the location of the contractor facility at the Freeport Center.

At the Freeport Center, approximately nine government personnel would be completing refurbishment tasks. Of the activities planned for the Freeport facility, only those conducted by government personnel will be evaluated in this EA. The PSRE would be cleaned and refurbished with select new components. Electrical tests and pressure tests with nitrogen to leak test components would be completed. A small amount of isopropyl alcohol could be used in the refurbishment process, in addition to a non-caustic alkaline detergent. A ventilated clean room with air hoods and continuous air samplers would be utilized for the refurbishment of the engines and smaller components. In the alkaline cleaning process, the wastewater from cleaning operations would be discharged into the municipal sewer system, highly diluted from the large amount of distilled water used in the process.

Upon completion of refurbishment activities at Freeport Center, the PSRE would be transported back to Building 2016 for reassembly and refurbishment with the refurbishment kits provided by the contractor. These kits would consist of mechanical parts such as screws and washers, the ordnance and the pyrocartridge kits. After the refurbishment was complete, the PSRE would be reassembled, tested, packaged in shipping containers, and transported back to the wings (with the exception of the PSRE selected for testing, as detailed in Section 2.4.2).

2.4.2 Testing of the PSRE

In addition to the refurbishment activities, there are three types of testing that would be completed on select PSRE: mass properties testing at SVIC, dynamic tests at SVIC, and static firing at WSTF. Mass properties testing would involve measurement of the weight and center of gravity of the PSRE. Dynamic testing would involve acceleration, vibration, and shock testing of the PSRE at the SVIC. The final type of testing, static firing of the PSRE would occur at WSTF. Appendix C shows a photograph of the SVIC Shaker Building testing equipment.

The PSRE selected for the mass properties testing would be one in 20, or five PSRE a year during full rate production. The PSRE selected for dynamic testing would be one in 96, or one PSRE a year during full rate production. Two additional PSREs would undergo dynamic testing at program start-up. These PSREs would be qualification units for the program. The PSREs that undergo dynamic testing also would complete static testing at WSTF.

Figure 2-4. Detailed Location of Contractor Facility at Freeport Center.

2.4.2.1 Transportation Operations

As with the refurbishment of the PSRE, the PSRE would first arrive from each of the three wings at Building 2016 at Hill AFB. For mass property testing, the separation charge would be removed prior to packaging the PSRE in a shipping container and transporting via an air-ride semi-trailer truck to SVIC. After mass property testing, the PSRE would be returned to Building 2016 where the remaining pyrotechnics, GSA, and PSAs would be removed, and the PSRE would be transported to Freeport Center for further refurbishment operations. Upon completion of refurbishment at the Freeport facility, the PSRE would be transported back to Building 2016 where the GSA, PSAs, ordnance module, and pyrocartridge would be reinstalled, system-tested, packaged in a shipping container, and transported via air-ride, enclosed, semi-trailer to SVIC for a second and final set of mass properties tests. After the final mass property tests, the PSRE would be packaged in a shipping container and transported via an air-ride, enclosed, semi-trailer truck back to Building 2016 where the separation charge would be reinstalled. Upon completion, the PSRE would be packaged in a shipping container and transported back to the wings. The typical route between Hill AFB and SVIC is shown in Figure 2-5, and was determined to be major highways and interstate roadways between the two locations.

The same transportation sequence would apply for the dynamic testing, with the exception that the PSRE would not be transported back to the wings but to WSTF. The PSRE transported for dynamic testing at SVIC, and static testing at WSTF would be a complete PSRE without the separation charge, and would be packaged in a shipping container and transported via an air-ride, enclosed, semi-trailer flatbed truck. Subsequent to testing at WSTF, the post-fired PSRE would be transported first to Building 2016 at Hill AFB and then the contractor facility at Freeport Center for post-firing activities. After Freeport Center, the components comprising the post-fired PSRE would be transported to Building 1804 at Hill AFB for storage. The typical route between Hill AFB and WSTF is shown in Figure 2-6, and the typical route between Hill AFB and the contractor facility at Freeport Center are shown in Figure 2-3. These routes were determined to be major highways, and local and interstate roadways between the locations. Figure 2-7 is a summary of the typical transportation routes for the PSRE LEP.

2.4.2.2 Testing Operations

The PSRE LEP effort at SVIC Buildings 850 and 853 were determined to be under a CATEX through AF Form 813. The White Sands PSRE LEP test activity was deemed adequately covered in an existing Environmental Resource Document by the resident National Aeronautics and Space Administration (NASA) Environmental Program Manager through WSTF Form 423-A (reference ROEC No RD011, dated September 1999).

Testing operations are discussed for informational purposes only. Figures 2-8 and 2-9 illustrate the flow processes for the PSRE undergoing materials, dynamic and static testing activities.

Mass Properties Testing

Mass properties testing entails weighing and center of gravity testing for the PSRE. Figure 2-8 illustrates the transportation of PSRE for mass properties testing.

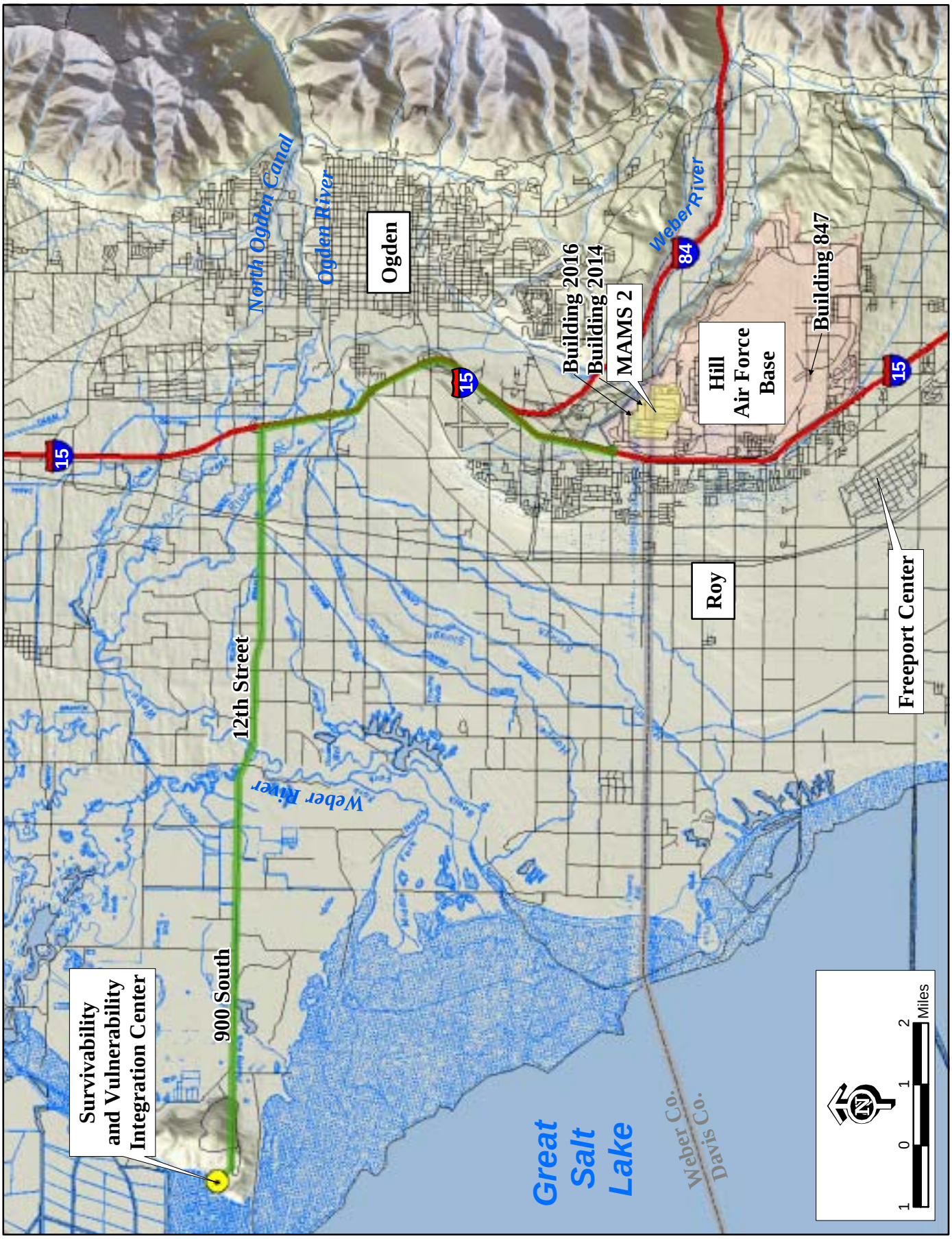


Figure 2-5. Typical Transportation Route Between Hill AFB and Survivability and Vulnerability Integration Center

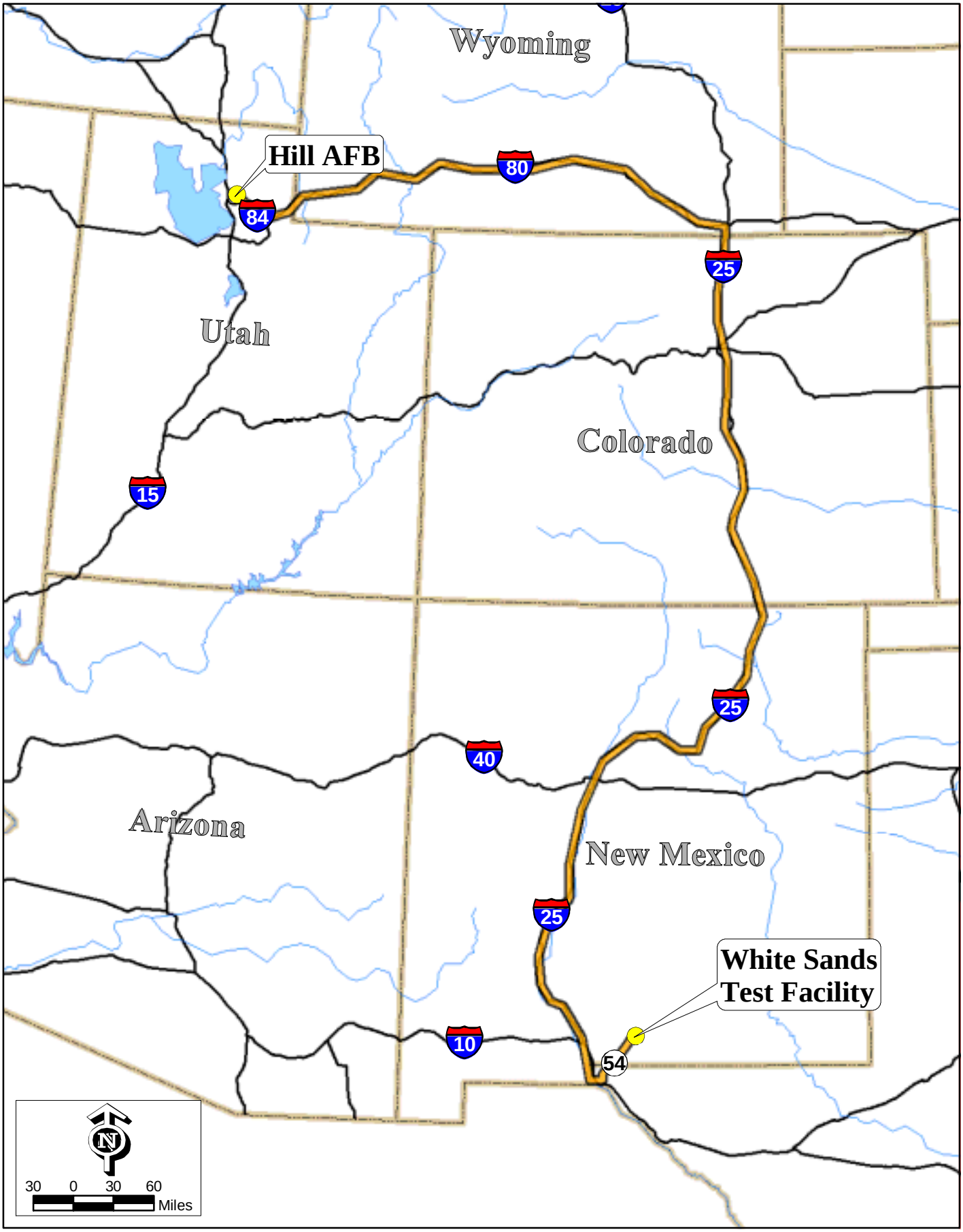


Figure 2-6. Typical Transportation Route Between Hill AFB and White Sands Test Facility

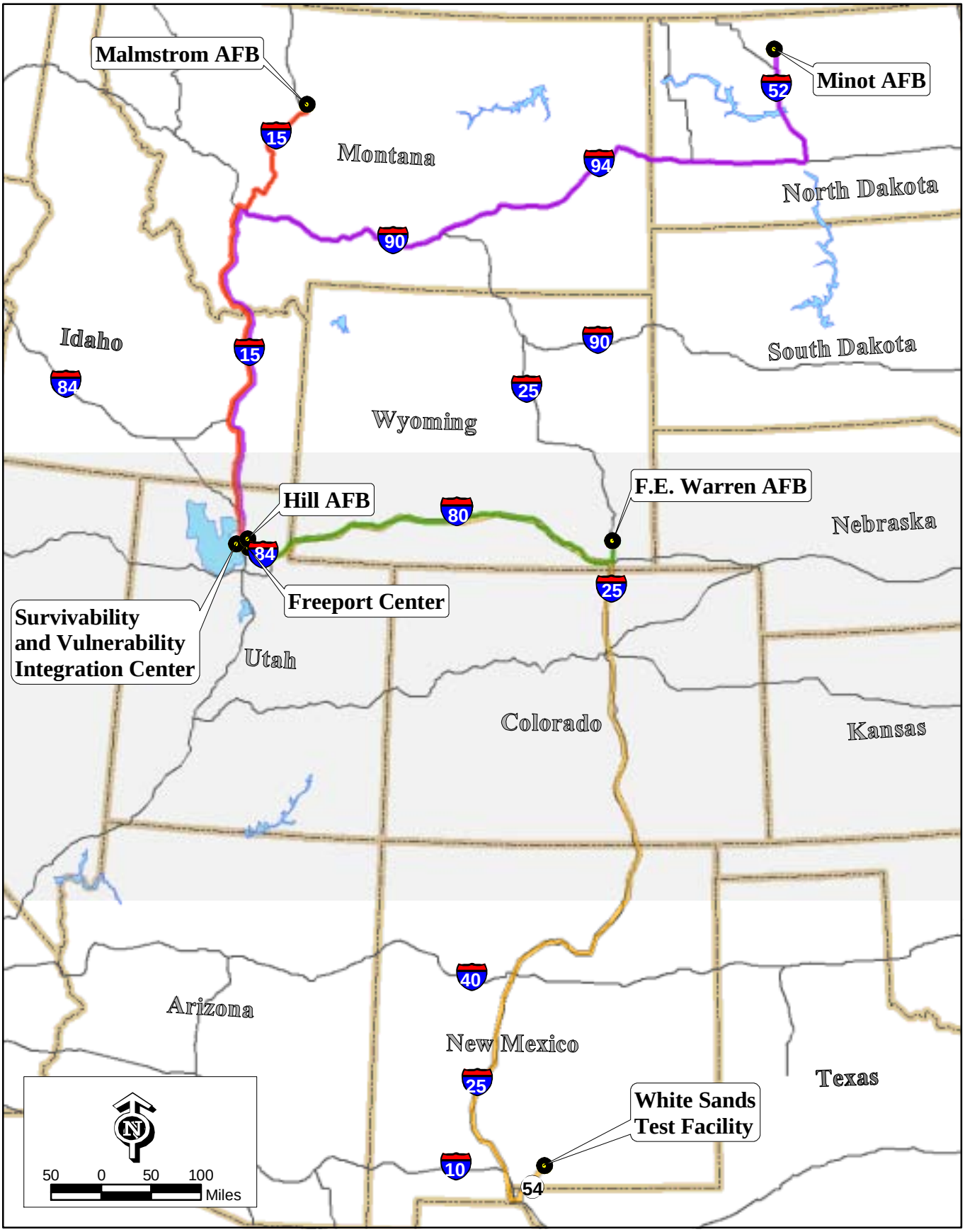


Figure 2-7. Summary of Typical Transportation Routes for the PSRE LEP

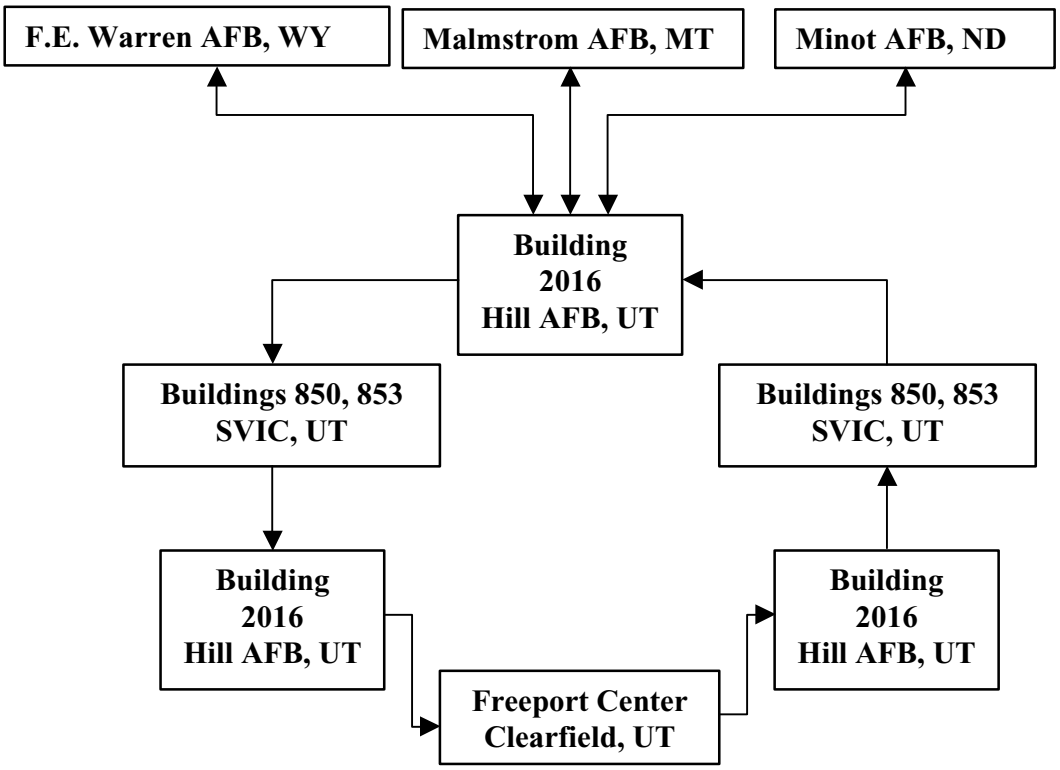


Figure 2-8. PSRE LEP Mass Properties Testing Transportation

Dynamic Testing

This testing includes vibration in the X-,Y- and Z-axis, acceleration testing, and shock testing. Between each test, the PSRE is electrically tested on the Minuteman PSRE Test Set (MPTS) and inspected in a clean room to check for any damage to the PSRE. The testing occurs in a strict environment with specialized equipment and facilities.

Static Testing

Testing and decontamination conducted at WSTF, New Mexico, has been coordinated with appropriate NASA/WSTF personnel. This testing and decontamination is not assessed in this EA. Subsequent to testing at WSTF, the post-fired PSRE would be transported to Building 2016 at Hill AFB for additional tear-down, venting and MMH/NTO measurement. These actions are not included in the Building 2016 CATEX and are included in this EA. No use of cleaning solvents or any other hazardous materials are planned as part of the post-firing tear-down and inspection activities at Building 2016. After the tear-down, venting, and measurement actions at Building 2016, the inert PSRE would be transported to the contractor facilities at Freeport Center for further tear-down and inspection. The post-firing activities at the contractor facilities at Freeport Center would be completed by contractor personnel and are not included in the scope of this EA. Once the post-firing sequence has been completed, the components once comprising the PSRE would be transported from the contractor facility at Freeport Center to Building 1804 at Hill AFB for storage.

Figure 2-9 illustrates the progression of PSRE for dynamic and static testing.

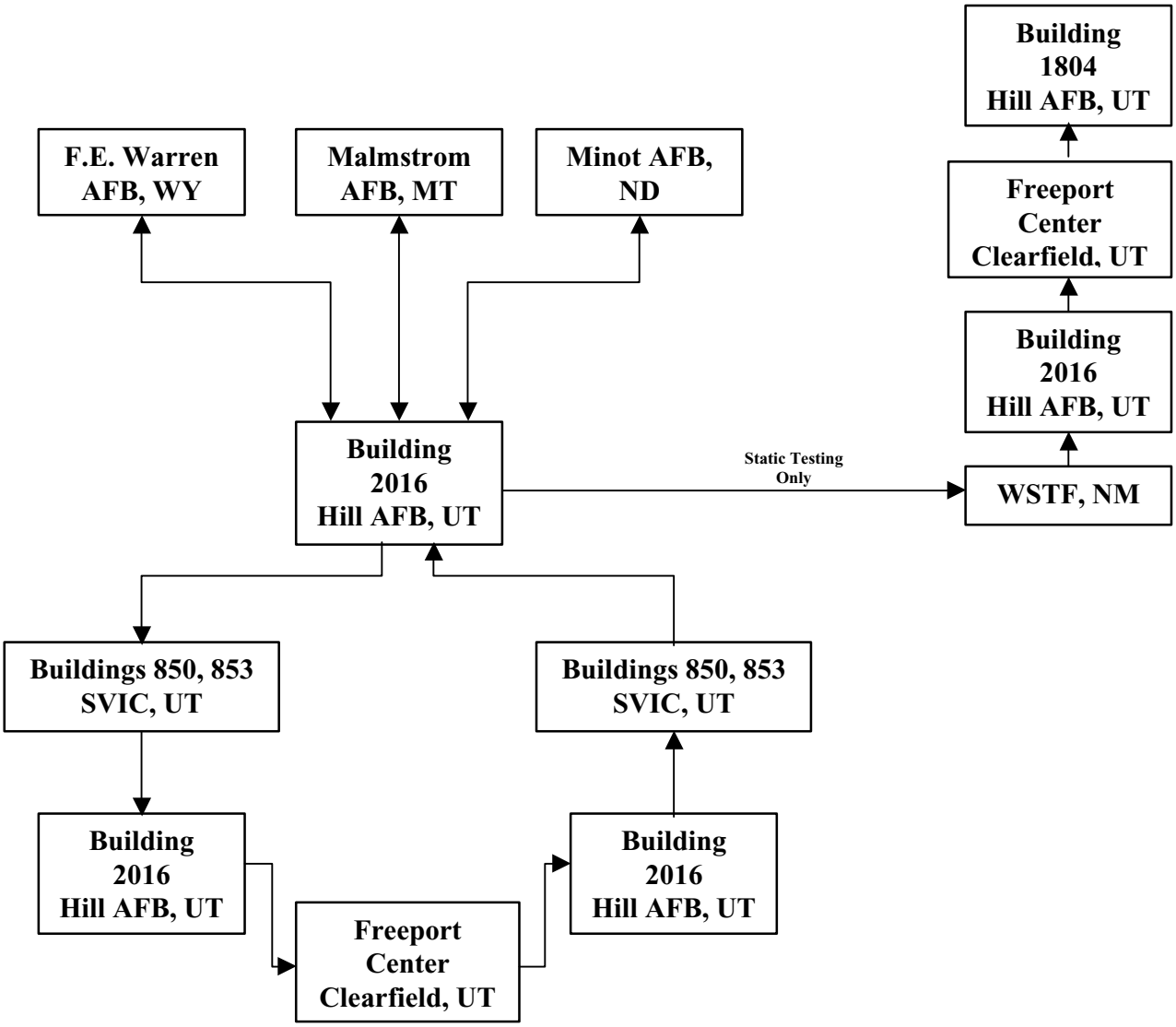


Figure 2-9. PSRE LEP Dynamic and Static Testing Transportation

2.4.3 Shipping Containers

The refurbishment of the PSRE shipping containers would occur at Hill AFB at Building 847, with shipping container storage at Building 2014. The following sections detail the components that would be involved in the refurbishment aspect of the shipping containers for the PSRE LEP.

2.4.3.1 Transportation Operations

The process of refurbishing the shipping containers would remain at Hill AFB. The PSRE would be removed from the shipping containers at Building 2016, and the shipping containers would be transported in an enclosed medium duty truck to Building 847 for refurbishment. After refurbishment, the shipping containers would be transported back to Building 2016, and could be briefly at Building 2014 for storage and/or acceptance testing. Figure 2-10, illustrates the transportation of the PSRE shipping containers for refurbishment.

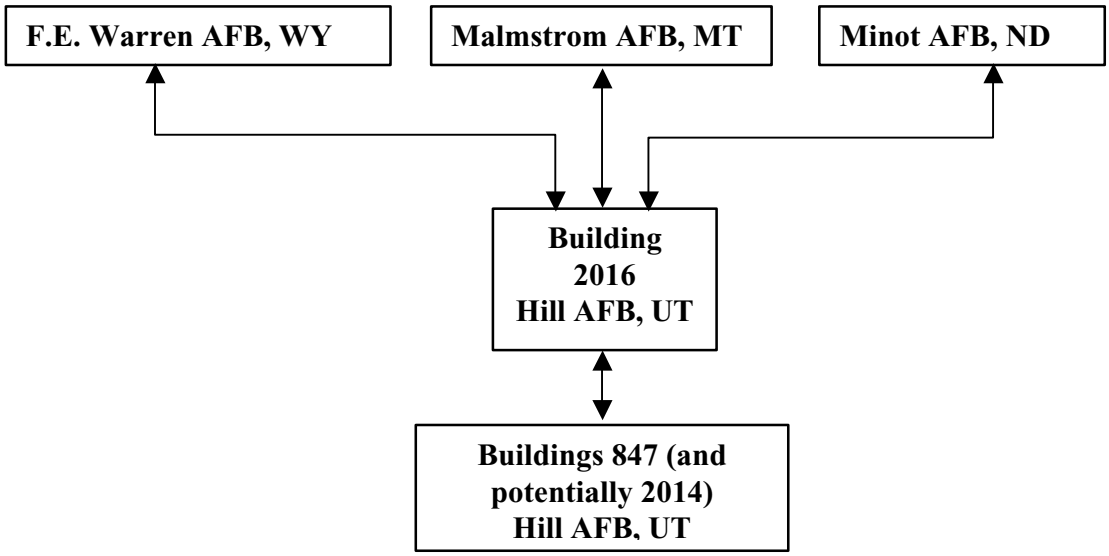


Figure 2-10. PSRE Shipping Container Refurbishment Transportation

In the proposed action, PSRE shipping containers would be transported to Hill AFB Building 847 at a rate of six per month beginning in March 2005 and completing in December 2005 (total of 59). The total number of shipping containers refurbished could be increased by twelve over the course of March 2005 and February 2006. The shipping containers would be refurbished as necessary to accommodate the PSRE refurbishment schedule, therefore the shipping containers would be stored and used as needed to transport the PSRE. The anticipated production and delivery schedule for the MM III PSRE shipping containers is shown in Table 2-2.

Table 2-2. PSRE Shipping Container Proposed Remanufacture Production and Delivery Schedule (with a 4 month Lead Time Delivery)

Month/Year	2005
January	
February	
March	6
April	6
May	6
June	6
July	6
August	6
September	6
October	6
November	6
December	5
Totals	**59**

Note: there is an option to complete 12 more shipping containers plus three spares between March 2005 and February 2006 at a rate of 5 to 6 per month.

2.4.3.2 Refurbishment Operations

Upon arrival at Building 847, the shipping containers would be steam cleaned if required. If necessary, the containers would be stripped down and the soft compliant foam removed. The refurbishment process for the shipping containers would involve restoring any dented or absent hard foam beneath the soft foam and the replacement of the wooden container skids and shock isolators. Specific activities for the refurbishment of the shipping containers would include: shipping container receipt and inspection, removal and replacement of insulative protective foam (as required), removal and replacement of shear mounts, removal and replacement of the heat exchanger, removal and replacement of the container gasket, and inspection and repair of welds (as necessary). A small amount of materials would be used in this process including: soft foam, epoxy adhesive, and isopropyl alcohol.

Section 3
DESCRIPTION OF THE EXISTING ENVIRONMENT

This section describes the general environment at Hill AFB, Freeport Center, and along the transportation routes for the proposed action. The following sections characterize the current physical conditions, natural and historic resources, environmental quality, land use, health and safety, transportation, and socioeconomic conditions at these locations.

3.1 Surface Water

The following subsections describe the surface water resources in the areas of the proposed action.

3.1.1 Hill AFB

Within the boundaries of Hill AFB, there are no streams, rivers or lakes, however wetland and pond areas are present. Drainage for Hill AFB is provided for by three drainage systems located off-base with drainage ponds located throughout the base. Buildings 1804, 2014, and 2016 are closely located in the northern portion of the MAMS 2 area. The closest wetland or pond to Buildings 1804, 2014, and 2016 is Wetland 11, located approximately 0.4 miles to the northwest of the closest building, Building 1804. Building 847 is located in the southern portion of the base (Figure 2-3), with the nearest wetland, Wetland 19, located approximately 0.4 miles to the northwest. The nearest canal system to the proposed action area is the Davis-Weber Canal, located off-base. (USAF, 1989).

3.1.2 Freeport Center

The contractor facility is located at the Freeport Center in Clearfield, Utah. There are no local rivers, or water bodies within Freeport Center. The closest large body of water is the Great Salt Lake located approximately five miles to the west-southwest of Freeport Center.

3.1.3 Transportation Routes

Three Wings

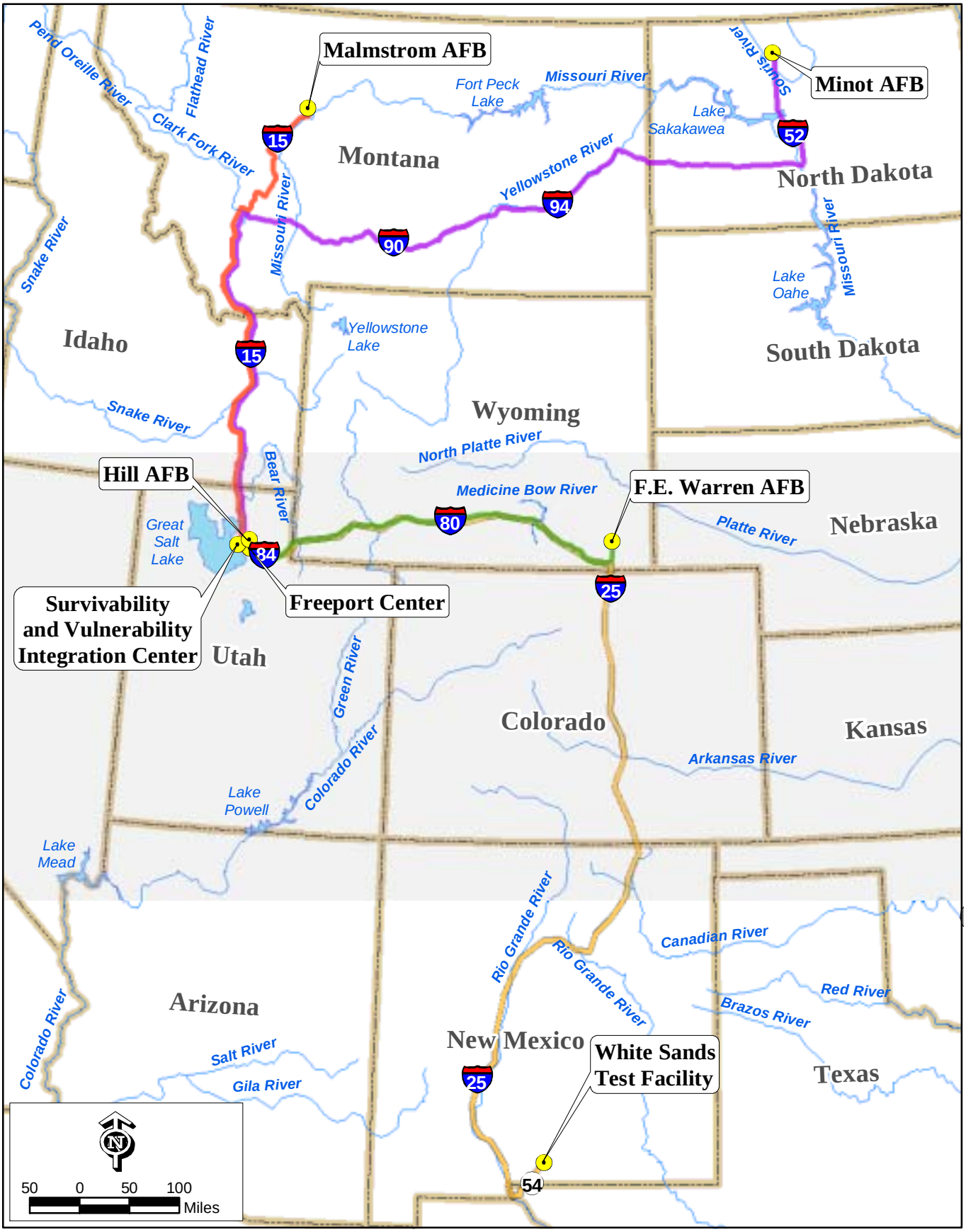
As shown in Figure 3-1, numerous major rivers are situated close to the transportation corridors (U.S. Department of the Interior, 2001). In Utah, the transportation routes cross the Bear River and follow the eastern edge of the Great Salt Lake. In Idaho, the transportation route crosses the Snake River. In Montana, the transportation corridor follows the Yellowstone River west, then crosses the Yellowstone River, the Missouri River and the Clark Fork River. In Wyoming, the transportation route crosses the Medicine Bow River, Green River and the Bear River. In North Dakota, the transport route crosses the Souris River, the Missouri River, and Lake Sakakawea.

Survivability and Vulnerability Integration Center

As seen on Figure 2-5, the typical transportation corridor from Hill AFB to SVIC crosses the Davis-Weber Canal, Willard Canal, Weber Canal (twice), Ogden River (twice), South Branch of the Weber Canal, North Branch of the Weber Canal, Weber River, Little Weber Creek, and numerous smaller drainage ways and canals. The SVIC is located adjacent to the eastern shore of the Bear River Bay of the Great Salt Lake (USAF, 1989).

White Sands Testing Facility

Figure 3-1 shows that a number of major rivers are crossed by the typical transportation corridor from Hill AFB to WSTF. In Wyoming, the transportation corridor crosses the Bear River and the Green River. In Colorado, the transportation corridor crosses the Arkansas River. In New Mexico, the



Source: U.S. Department of Interior, 2001. Environmental Systems Research Institute, Inc. (ESRI) (1999) Geographic Data Technology, Inc

Figure 3-1. Major Streams and Water Bodies

transportation corridor crosses the Canadian River, the Rio Grande River, and follows the Rio Grande River south along I-25.

3.2 Groundwater

The following subsections describe the groundwater resources in the area of the proposed action. The primary aquifers that are located in the proposed action area are presented in Figure 3-2 (U.S. Department of the Interior, 2001).

3.2.1 Hill AFB

Hill AFB is located in the Weber Delta sub-district, where of the three primary aquifers, two are the principal aquifers of the East Shore area. The Sunset and the Delta aquifers are deep, confined aquifers with depths below ground surface (bgs) of 250 to 400 feet and 500 to 700 feet, respectively. These aquifers are recharged through subsurface flow infiltrating fractures and joints in the Wasatch Range and from the under-flow of a deep unconfined aquifer near the mountain front. The third aquifer overlays the Sunset and the Delta aquifers, and is an unnamed, deep unconfined aquifer (Montgomery Watson, 1998).

3.2.2 Freeport Center

As part of the Basin and Range aquifers, all the groundwater in the vicinity of the Freeport Center is ultimately derived from infiltration of precipitation. The Basin and Range aquifers are in unconsolidated sediments and groundwater is generally under unconfined, or water-table conditions at the margins of the basins. However, as the unconsolidated deposits become finer grained toward the centers of the basins, the water becomes confined (USGS, 1995).

A January 2000 letter detailing the findings of a Phase I Environmental Assessment determined that there were no recognized or potential environmental conditions with regard to past or present uses of the Freeport Center Building A-15 property. The Phase I Investigation results were based on a review of available environmental documentation, historical maps and photographs, interviews with property representatives, review of environmental databases, and an onsite visual inspection. During the review, several low concentrations of Volatile Organic Compounds (VOCs) were detected in groundwater. However, all samples with detected concentrations were located hundreds of feet away and the regional contamination issues at Freeport Center did not appear to effect the contractor facilities (Environmental Alliance, Inc., 2000).

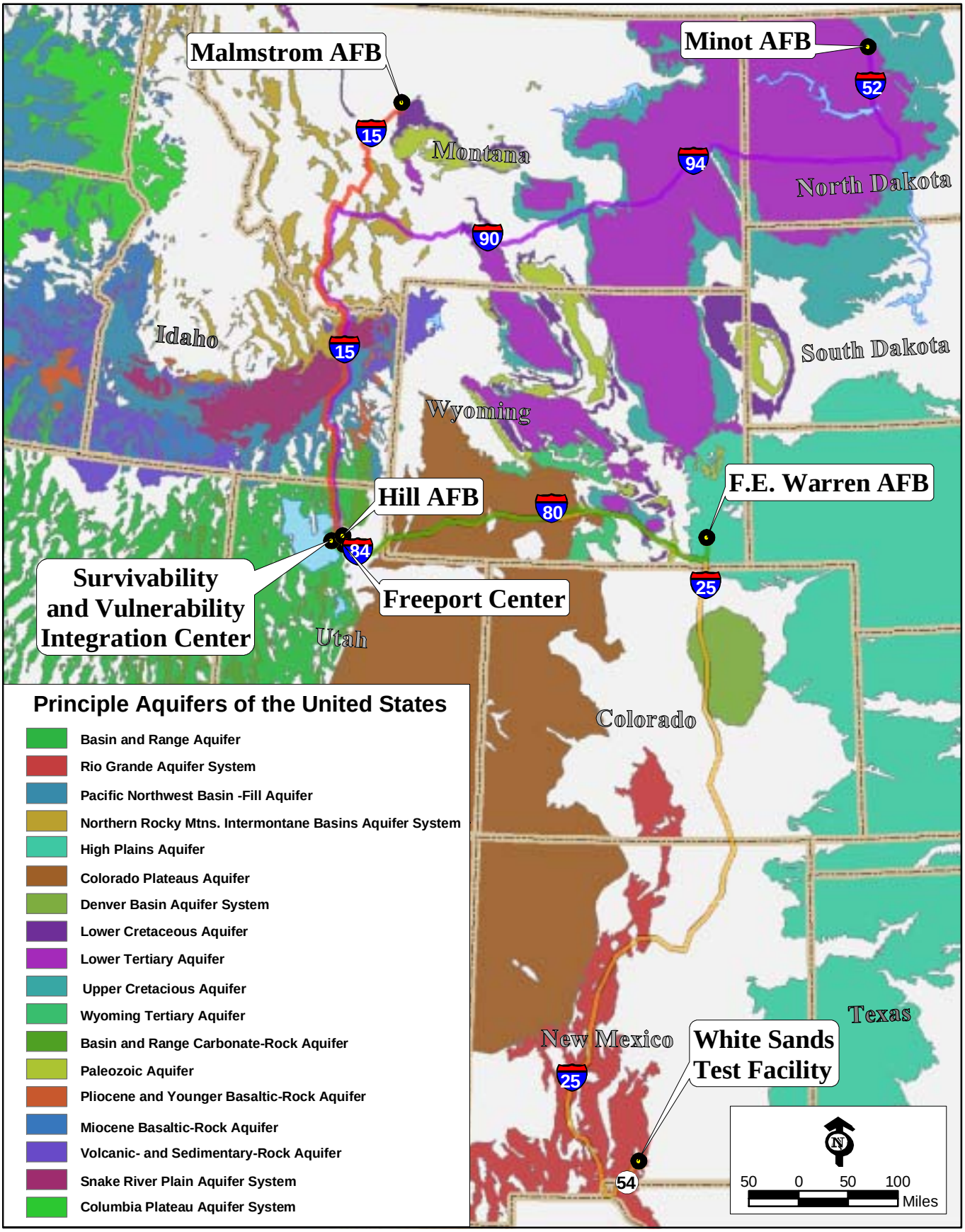
3.2.3 Transportation Routes

Three Wings

The primary aquifers that are located in the proposed action area are presented in Figure 3-2 (U.S. Department of the Interior, 2001).

<u>Utah</u>

All the groundwater in the corridor from Hill AFB to Idaho is ultimately derived from infiltration of precipitation which varies considerably with the elevation and topography of the area. The Basin and Range aquifers are in unconsolidated sediments. The water-yielding materials in this area are in valleys and basins, and consist primarily of unconsolidated alluvial-fan deposits, although locally flood plain and lacustrine (lake) beach deposits may yield water to wells. Groundwater is generally under unconfined, or water-table conditions at the margins of the basins, but as the unconsolidated deposits become finer grained toward the centers of the basins, the water becomes confined. Rarely, basins might be hydraulically connected in the subsurface by fractures or solution openings in the underlying bedrock. These multiple-basin systems end in a terminal discharge area, or sink, from which water leaves the flow system by evaporation. Also, several basins or valleys may develop surface-water drainage that



Source: U.S.Department of the Interior, 2001.

Figure 3-2. Primary Aquifers

hydraulically connects the basins, and groundwater flows between the basins, mostly through the unconsolidated alluvial stream/flood plain sediments (USGS, 1995).

Idaho

Aquifers in Pliocene and younger basaltic rocks characterize the Snake River Plain of southern Idaho. Permeable zones at the tops and the bottoms of the basalt flows yield large volumes of water to irrigation wells. These aquifers also discharge about one million gallons per day to the walls of the Snake River Canyon (USGS, 1994). Pacific Northwest Basin-Fill and Basin and Range Carbonate-Rock aquifers are encountered south of the Snake River Plain aquifer system to just north of the Utah border. In southeastern Idaho, the aquifer system consists primarily of unconsolidated-deposit aquifers (chiefly sand and gravel) that overlie volcanic- and sedimentary-rock aquifers (chiefly Pliocene and younger basaltic rocks) in basins, and aquifers in pre-Miocene rocks (chiefly carbonate rocks) that form mountain ranges between the basins. Fresh groundwater withdrawals are used primarily for public-supply, domestic and commercial, agricultural (primarily irrigation and livestock watering), and industrial purposes (USGS, 1994).

Montana, Wyoming, and North Dakota

Groundwater is obtained primarily from wells completed in unconsolidated-deposit aquifers that consist mostly of sand and gravel, and from wells completed in semiconsolidated- and consolidated-rock aquifers, chiefly sandstone and limestone. The primary aquifers in the North Dakota, eastern Montana, and eastern Wyoming section of the corridor are Upper Cretaceous aquifers and Lower Tertiary aquifers. In the vicinity of Cheyenne, the High Plains aquifer is the primary aquifer system. The High Plains aquifer is the principal source of water in one of the major agricultural areas of the United States. About 20 percent of the nation's irrigated agricultural land overlies the High Plains aquifer, and about 30 percent of the groundwater used for irrigation in the nation is withdrawn from the High Plains aquifer (USGS, 1995). The western area of the Wyoming corridor is primarily the consolidated-rock aquifer systems of the Colorado Plateau. From Malmstrom AFB south to the Idaho border, the Northern Rocky Mountains Intermontane Basins aquifer systems predominate. Agriculture, primarily irrigation, is one of the largest uses of groundwater in these areas (USGS, 1996).

Survivability and Vulnerability Integration Center

All the groundwater in the corridor from Hill AFB to the SVIC is ultimately derived from infiltration of precipitation, which varies considerably with the elevation and topography of the area. The water-yielding materials in this area are in valleys and basins, and consist primarily of unconsolidated alluvial-fan deposits, although locally flood plain and lacustrine (lake) beach deposits may yield water to wells. Groundwater is generally under unconfined, or water-table conditions at the margins of the basins, but as the unconsolidated deposits become finer grained toward the centers of the basins, the water becomes confined (USGS, 1995). Perched water tables, a common phenomenon in the region, have been detected at SVIC (United States Air Force, 1989).

White Sands Testing Facility

Figure 3-2 shows the primary aquifers that are located beneath the typical transportation route from Hill AFB to WSTF.

Utah

From Utah east to mid-Wyoming, the consolidated-rock aquifer systems of the Colorado Plateau aquifers dominate, underlying an area of approximately 110,000 square miles in Western Colorado, northwestern New Mexico, northeastern Arizona, and eastern Utah. Although the quantity and chemical quality of water in the Colorado Plateaus aquifers are extremely variable, much of the land in this sparsely populated region is underlain by rocks that contain aquifers capable of yielding usable quantities of water of a quantity suitable for most agricultural or domestic use (USGS, 1995).

Wyoming

Groundwater is obtained primarily from wells completed in unconsolidated-deposit aquifers that consist mostly of sand and gravel, and from wells completed in semiconsolidated- and consolidated-rock aquifers, chiefly sandstone and limestone (USGS, 1996). The primary aquifers in the eastern Wyoming section of the corridor are Upper Cretaceous aquifers and Lower Tertiary aquifers. In the vicinity of Cheyenne, the High Plains aquifer is the primary aquifer system. The High Plains aquifer is the principal source of water in one of the major agricultural areas of the United States. About 20 percent of the nation's irrigated agricultural land overlies the High Plains aquifer, and about 30 percent of the groundwater used for irrigation in the nation is withdrawn from the High Plains aquifer (USGS, 1995).

Colorado

The Colorado segment of the corridor crosses the Denver Basin Aquifer system and parallels a divide between the High Plains aquifer and the Colorado Plateaus aquifer. The Denver Basin Aquifer system supplies water to rural and suburban residents of much of the plains along the eastern front of the Rocky Mountains in northeastern Colorado. The Denver Basin aquifer system is not well connected to other major aquifers in the area (USGS, 1995).

New Mexico and Texas

As the typical corridor follows I-25 south through New Mexico, the corridor moves from the divide between the High Plains aquifer and the Colorado Plateaus aquifer in northern New Mexico to crossing the Rio Grande aquifer system in lower New Mexico and the northern tip of Texas. Groundwater withdrawal primarily occurs as discharge from pumping wells, with the majority of water used for irrigation of commercial crops. Public water supplies for most cities and communities in the area rely on groundwater, and withdrawal for municipal use is a small but important component of the total withdrawal. Shallow water is withdrawn through drains. In some low-lying areas, irrigation-return recharge has caused the water table to rise so near land surface that waterlogged soil prevents agricultural use of the land. Shallow water tables are prevalent in the part of the Rio Grande Valley near the river and in the closed basin in the northern part of the San Luis Valley (USGS, 1995).

3.3 Geology and Soils

The following subsections describe the geology and soils in the area of the proposed action. The soils of the transportation corridors are classified according to U.S. Soil Taxonomy system. The definitions for the soils are from Encyclopaedia Britannica, 1999-2001, and University of Florida, 2002 and are as follows:

- Alfisol – Alfisols are arable soils with water content adequate for at least three consecutive months of the growing season. Alfisols typically exhibit well-developed, contrasting soil horizons (layers) depleted in calcium carbonate but enriched in aluminum-and iron-bearing minerals.

- Aridisol – Aridisols are dry, desert like soils that have low organic content and are sparsely vegetated by drought-or salt-tolerant plants. Dry climate and low humus content limit their arability without irrigation.

- Entisol – Entisols are soils defined by the absence or near absence of horizons (layers) that clearly reflect soil-forming processes. Entisols are formed on surface features of recent geologic origin, on underlying material that is highly resistant to weathering, or under conditions of extreme wetness or dryness.

- Inceptisol – Inceptisols are soils of relatively new origin and are characterized by having only the weakest appearance of horizons, or layers, produced by soil-forming factors. Inceptisol soil profiles give some indication of clay minerals, metal oxides or humus accumulating in layer, but such accumulation is not sufficient to classify the soil into an order defined by characteristic surface or subsurface horizons.

- Mollisol – Mollisols are characterized by a significant accumulation of humus in the surface horizon, or uppermost layer, which is almost always formed under native grass vegetation. The important mineral nutrients – calcium, magnesium, potassium, and sodium – are found through most, if not all, layers of the Mollisol soil profile.

- Vertisol – Vertisols are clay-rich soils. With the dominant clay minerals, an outstanding feature of Vertisols is that they expand when wet and shrink when dry. Therefore, pronounced changes in volumes with changes in soil moisture result in deep cracks in the dry season and very plastic and sticky soil consistency when wet. A high clay content is also associated with slow permeability and high water adsorption.

The proposed action area is located in various ecosystem provinces as illustrated in Figure 3-3.

3.3.1 Hill AFB

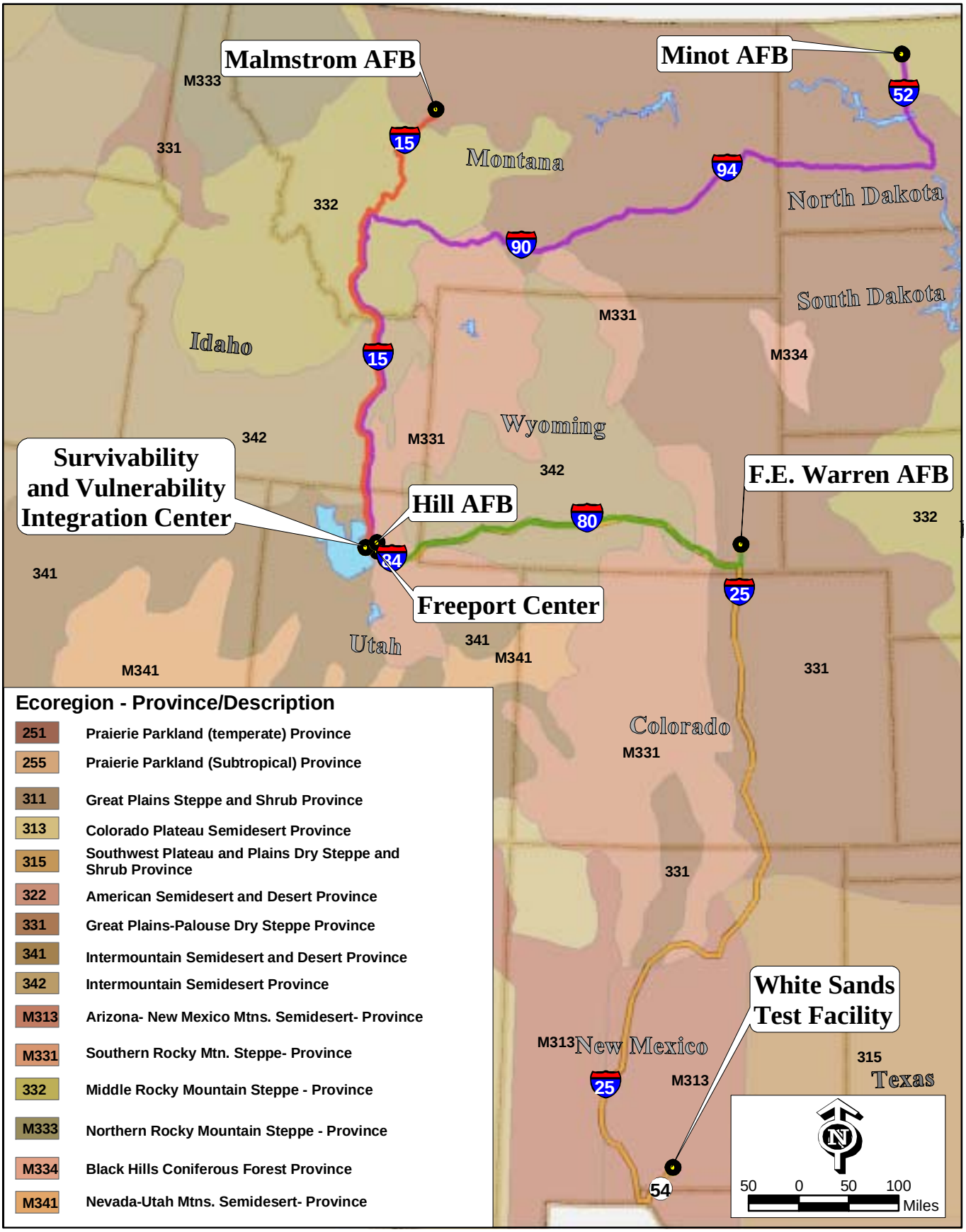
Hill AFB is located on a delta created by the flow of the Weber River into ancient Lake Bonneville. The surficial deposits along the East Shore were deposited during the Alpine and Provo stages of Lake Bonneville and have been grouped into the Alpine and Provo Formations, respectively. In the vicinity of Hill AFB, the Provo Formation consists of gravel and sand is generally 10-30 feet thick. The Provo Formation overlies the Alpine Formation (gravel, sand, clay and silt with interbedded layers of fine sand and clay) which can be 101 to 135 feet thick (Montgomery Watson, 1998).

Soils in the area of Buildings 1804, 2014, and 2016 have been classified as Bingham Gravelly Sandy Loam. These soils are semi-permeable, and fairly droughty. Soils in the area of Building 847 have been classed as Francis Loamy Fine Sand characterized by highly permeability, and low water holding capacity. As a result, this soil is extremely droughty. (USAF, 1989).

3.3.2 Freeport Center

The Freeport Center, located in the Intermountain Desert Province, covers the physiographic section called the Great Basin and the northern Colorado Plateau in Utah. Much of this area is made up of separate basins with the lower parts of many basins having heavy accumulations of alkaline and saline salts. Aridisols dominate all basin and lowland areas with Entisols found in stream floodplains and rocky landscapes.

Environmental Alliance, Inc determined that there were no recognized or potential environmental conditions with regard to past or present uses of the contractor facilities at Freeport Center. During the assessment several low concentrations of VOCs were detected in soil, however, all samples with detected concentrations were located hundreds of feet away from Freeport Center Building A-15. Based on the reviewed data, the regional contamination issues at Freeport Center did not appear to effect the contractor facilities (Environmental Alliance, Inc., 2000).



Source: USDA Forest Service, 1995.

Figure 3-3. Ecosystem Provinces

3.3.3 Transportation Routes

Three Wings

Following the transportation corridors (Figure 3-3), the routes travel through four ecosystem provinces. The geology (geology.about.com, 2002) and soils (USDA Forest Service, 1995) of these ecosystem provinces are listed below.

M331 - Southern Rocky Mountain Steppe

The travel corridor through Utah and parts of Montana, Wyoming, and Idaho are located in the Rocky Mountains, which are as much as 14,000 feet above mean sea level (amsl). Intermontane depressions in this region can be as low as 6,000 feet amsl. In Wyoming and Utah, many high-elevation plateaus are composed of dissected, horizontally layered rocks. The soil orders in this province occur in zones and range from Mollisols and Alfisols in the montane zone to Aridisols in the foothill zone. Due to the steep slopes and recent glaciation, there are also areas of Inceptisols.

342 – Intermountain Semidesert Province

Through southern Idaho and most of Wyoming, the transport route covers the plains and tablelands of the Columbia-Snake River Plateaus and Wyoming Basin. This province has extensive alluvial deposits in the floodplains of streams and in the fans at the foot of the mountains. Dry lakebeds are numerous, and there are extensive eolian deposits, including both dune sand and loess. In the Columbia River Basin, loess deposits are up to 150 feet thick and soils developed from them are correspondingly complex. Aridisols dominate all basin and lowland areas; Mollisols are found at higher elevations. Soils in the Wyoming Basin are alkaline Aridisols. Subsoils contain a layer enriched with lime and/or gypsum, which may develop into a caliche hardpan. Because the basin is semiarid and weathering is slight, soil texture and composition are governed by parent materials. Entisols are found in the Bighorn basin.

331 - Great Plains - Palouse Dry Steppe Province

A blanket of glacial sand and gravel covers three-fourths of North Dakota and continues into Montana and Wyoming. From north of Glacier National Park in the west to the plains in the east and the great Precambrian Belt complex in the Rockies, Montana is glaciated country. The majority of the travel corridor through North Dakota, Montana and immediately around F.E. Warren AFB in Wyoming is characterized by rolling plains and tablelands with occasional valleys, canyons, and buttes. For this province the dominant pedogenic process is calcification, and salinization is dominant on poorly drained sites. Mollisols are typical soils in this province. The humus content in these soils is small due to the sparse vegetation.

332 – Great Plains Steppe Province

This province is located through western Montana and eastern North Dakota and is characterized by flat and rolling plains with relief of less than 300 feet. Most of the lands are young glacial drifts and dissected till plains. The soils of the mixed-grass steppe are primarily Mollisols. Most soils have dark upper horizons.

Survivability and Vulnerability Integration Center

The typical transportation corridor from Hill AFB to SVIC is located in the Great Basin and the northern Colorado Plateau. Aridisols dominate all basin and lowland areas with Entisols found in stream floodplains and rocky landscapes. Soils at SVIC are classified in two general series: the Barton Series, consisting of well drained, medium-textured, gravely soils on strongly sloping to steep hillsides, and the Lakeshore Series consists of deep and poorly drained salty soils normally on flat or nearly level low lake plains (USAF, 1989).

White Sands Testing Facility

Following the typical transportation corridor from Hill AFB to WSTF, the route travels through five ecosystem provinces. The geology (geology.about.com, 2002) and soils (USDA Forest Service, 1995) of these ecosystem provinces are listed below.

M331 - Southern Rocky Mountain Steppe

The travel corridor through Utah and parts of Wyoming and New Mexico are located in the Rocky Mountains, which are as much as 14,000 feet amsl. Intermontane depressions in this region can be as low as 6,000 feet amsl. In Wyoming and Utah, many high-elevation plateaus are composed of dissected, horizontally layered rocks. The soil orders in this province occur in zones and range from Mollisols and Alfisols in the montane zone to Aridisols in the foothill zone. Due to the steep slopes and recent glaciation, there are also areas of Inceptisols.

342 – Intermountain Semidesert Province

Through central Wyoming, the transport route covers the plains and tablelands of the Columbia-Snake River Plateaus and Wyoming Basin. This province has extensive alluvial deposits in the floodplains of streams and in the fans at the foot of the mountains. Dry lakebeds are numerous, and there are extensive eolian deposits, including both dune sand and loess. In the Columbia River Basin, loess deposits are up to 150 feet thick and soils developed from them are correspondingly complex. Aridisols dominate all basin and lowland areas; Mollisols are found at higher elevations. Soils in the Wyoming Basin are alkaline Aridisols. Subsoils contain a layer enriched with lime and/or gypsum, which may develop into a caliche hardpan. Because the basin is semiarid and weathering is slight, soil texture and composition are governed by parent materials. Entisols are found in the Bighorn basin.

331 - Great Plains - Palouse Dry Steppe Province

A blanket of glacial sand and gravel covers the majority of the travel corridor from Cheyenne, Wyoming south through Colorado and into northern New Mexico. This segment of the typical corridor is characterized by rolling plains and tablelands with occasional valleys, canyons, and buttes. For this province the dominant pedogenic process is calcification, and salinization is dominant on poorly drained sites. Mollisols are typical soils in this province. The humus content in these soils is small due to the sparse vegetation.

315 – Southwest Plateau and Plains Dry Steppe and Shrub Province

A small segment of the travel corridor through northeastern New Mexico is a region of flat to rolling plains and plateaus occasionally dissected by canyons at the western end of the Gulf Coastal Plain and the southern end of the Great Plains. Soils in this region are varied, but the different orders are well correlated with the different plant communities. The mesquite-live oak savanna is the only Entisol area in the region. Soils of the mesquite-buffalograss and juniper-oak savannas are almost entirely Mollisols, and island of Alfisols within the area corresponds to the boundaries of the mesquite-oak savanna where Mollisols, Alfisols, and Vertisols occur.

M313 – Arizona – New Mexico Mountains Semidesert Province

The southern portion of the typical corridor through New Mexico and northern tip of Texas consists mostly of steep foothills and mountains but includes some deeply dissected high plateaus. Elevations range from 4,500 to 10,000 feet amsl. Detailed information about the orders of soils is lacking for much of this area. New Mexico is a large state with a wide variety of geologic and tectonic features. However, stony land and rock outcrops occupy large areas on the mountain areas and in the foothills, with Alfisols and Inceptisols dominating upland areas.

3.4 Vegetation

The following subsections describe the vegetative resources in the area of the proposed action.

3.4.1 Hill AFB

The proposed action at the MAMS 2 area for Buildings 1804, 2014, and 2016 would occur within a mowed, developed area that is classed as a mixture of semi-improved and unimproved. The introduced grasses and annual forbs with some ornamental trees, shrubs and grasses that generally represent this area are mowed frequently as a vegetation, fire and pest control measure. The proposed action at Building 847 would occur in an area classified as an improved residential/develop area. In this area, extensive development and maintenance measures are performed and the vegetation is primarily ornamental and is watered, treated, and mowed on a regular basis. Introduced grasses and annual forbs such as cheat grass and crested wheatgrass can be located in these areas (USAF, 1989). At this time, there are no known endangered or threatened vegetative species located within Hill AFB.

3.4.2 Freeport Center

The contractor facilities are located at the existing Building A-15 at the Freeport Center. Building A-15 is located in a developed area with little vegetation. However, native vegetation in the vicinity of Freeport Center would include sagebrush and greasewood or saltgrass.

3.4.3 Transportation Routes

Three Wings

Following the transportation corridors (Figure 3-3), the routes travel through four ecosystem provinces. The vegetation (USDA Forest Service, 1995) of these provinces is listed below.

M331 - Southern Rocky Mountain Steppe

The travel corridor through Utah and parts of Montana, Wyoming, and Idaho have vegetation that is characterized as Southern Rocky Mountain Steppe. The vegetation in this zone is dependent on elevation and latitude. Alpine tundra and the absence of trees characterize the highest elevation (the alpine zone). With a decrease in elevation, the vegetative zones move through the subalpine zone, (characterized by Englemann spruce and subalpine fir), the montane zone (characterized by ponderosa pine, Douglas-fir and sagebrush), and the foothill (woodland) zone (characterized by mountain–mahogany and scrub oak along the border of the Colorado Plateau Province, and alternating ponderosa pine and pinyon-juniper associations).

342 – Intermountain Semidesert Province

Through northern Idaho and most of Wyoming, the primary vegetation is sagebrush or shadescale mixed with short grasses. Near streams and mountains valley bottoms the vegetation becomes willows and sedges grading to greasewood and other alkali-tolerant plants.

331 - Great Plains - Palouse Dry Steppe Province

The vegetation of the majority of the travel corridor through North Dakota, Montana and immediately around F.E. Warren AFB is shortgrass prairie. The steppe is dry and arid approximately half of the year and characterized by short grasses that are usually sparsely distributed, consisting of buffalo grass, sunflower and locoweed, grama, wheatgrass and needlegrass. The Palouse grassland includes shrubs, bluebinch wheatgrass, and bluegrass.

332 - Great Plains Steppe Province

The vegetation of western Montana and around Minot AFB is a mixture of shortgrass and tall grass species including blue grama, hairy grama, buffalo grass, little bluestem, needle-and-thread grass,

wheatgrass, needlegrass, and galleta. Numerous forbs also are present including sunflowers, ragweed and goldenrod.

Survivability and Vulnerability Integration Center

On the route from Hill AFB to SVIC, sagebrush dominates at lower elevations. Other important plants in the sagebrush belt are antelope bitterbrush, shadscale, fourwing saltbrush, rubber rabbitbrush, spiny hopsage, horsebrush, and short-statured Gambel oak. On soils with the highest concentrations of salt, even these shrubs are unable to grow and they are replaced by plant communities dominated by greasewood or saltgrass.

At SVIC, the vegetative cover consists of sandberg bluegrass, greasewood, saltgrass, and pickleweed, which are native plants. No endangered flora species are known to exist on the Air Force property (United States Air Force, 1989).

White Sands Testing Facility

Following the typical transportation corridor from Hill AFB to WSTF, the route travels through five ecosystem provinces. The vegetation (USDA Forest Service, 1995) of these provinces is listed below.

M331 - Southern Rocky Mountain Steppe

The travel corridor through Utah and parts of Wyoming and New Mexico have vegetation that is characterized as Southern Rocky Mountain Steppe. The vegetation in this zone is dependent on elevation and latitude. Alpine tundra and the absence of trees characterize the highest elevation (the alpine zone). With a decrease in elevation, the vegetative zones move through the subalpine zone, (characterized by Englemann spruce and subalpine fir), the montane zone (characterized by ponderosa pine, Douglas-fir and sagebrush), and the foothill (woodland) zone (characterized by mountain–mahogany and scrub oak along the border of the Colorado Plateau Province, and alternating ponderosa pine and pinyon-juniper associations).

342 – Intermountain Semidesert Province

Through northern Idaho and most of Wyoming, the primary vegetation is sagebrush or shadescale mixed with short grasses. Near stream and valley bottoms the vegetation becomes willows and sedges grading to greasewood and other alkali-tolerant plants.

331 - Great Plains - Palouse Dry Steppe Province

The vegetation of the majority of the travel corridor through North Dakota, Montana, Colorado, and immediately around F.E. Warren AFB is shortgrass prairie. The steppe is dry and arid approximately half of the year and characterized by short grasses that are usually sparsely distributed, consisting of buffalo grass, sunflower and locoweed, grama, wheatgrass and needlegrass. The Palouse grassland includes shrubs, bluebinch wheatgrass, and bluegrass.

315 – Southwest Plateau and Plains Dry Steppe and Shrub Province

A small segment of the travel corridor through northeastern New Mexico is characterized by arid grasslands in which shrubs and low trees grow singly or in bunches. On the plains of eastern New Mexico xerophytic grasses (blue gamma and buffalo grass) are the characteristic vegetation. However, in much of this area, mesquite (Prosopis) grows in open stands among the grasses.

M313 – Arizona – New Mexico Mountains Semidesert Province

The southern portion of the typical corridor through New Mexico and northern tip of Texas has vegetational zones resembling those of the Rocky Mountains, but occurring at higher elevations. The foothill zone, which reaches as high as 7,000 feet, is characterized by mixed grasses, chaparral brush,

oak-juniper woodland, and pinyon-juniper woodland. At about 7,000 feet, open forests of ponderosa pine are found, although pinyon and juniper occupy southfacing slopes.

3.5 Wildlife

The following subsections describe the wildlife resources in the area of the proposed action.

3.5.1 Hill AFB

Wildlife at Hill AFB includes large and small mammals, birds, amphibians, and reptiles common to the mountain-brush habitat and the western United States. Mule deer, fox, coyotes, lizards, pheasants, meadowlarks, magpies, mallard ducks, and blue herons have been identified at Hill AFB. Two threatened or endangered species have been noted in the immediate vicinity of Hill AFB – peregrine falcons and bald eagles (Montgomery Watson, 1998). Either of these species may occasionally enter the base boundaries. At this time, there are no known endangered or threatened wildlife species located at the proposed action location.

3.5.2 Freeport Center

The contractor facilities at Freeport Center are situated in a location with little natural vegetation, thus discouraging local wildlife. However, species that are common in the surrounding area include: small mammals such as ground squirrels, kangaroo mice, and wood rats, and raptors such as the ferruginous hawk and various other species of western hawks. The ferruginous hawk is a Utah State Threatened Species (Utah Division of Wildlife Resources, 1998).

3.5.3 Transportation Routes

Three Wings

Following the transportation corridors (Figure 3-3), the routes travel through four ecosystem provinces. The wildlife (USDA Forest Service, 1995) of these ecosystem provinces is listed below.

M331 - Southern Rocky Mountain Steppe

The travel corridor through Utah and parts of Montana, Wyoming, and Idaho are located in the Rocky Mountains, which are inhabited by large mammals, including elk, deer, bighorn sheep, mountain lion, bobcat, beaver, grizzly bear, black bear, and moose. Other wildlife and birds include mice, squirrels, chipmunks, nuthatches, bluebirds, chickadees, grouse, hawks, and owls.

342 – Intermountain Semidesert Province

Through northern Idaho and most of Wyoming, the transport route travels through a province that includes wildlife such as coyote, pronghorn antelope, mountain lion, bobcat, squirrel, prairie dog, jackrabbit, porcupine, moose, elk and deer. This province is an important breeding and resting ground for migrating waterfowl. Birds that inhabit this province include Canada Geese, mallards, grouse, hawk, falcon, and owls. Lizards and rattlesnakes also are present in this area.

331 - Great Plains - Palouse Dry Steppe Province

The majority of the travel corridor through North Dakota, Montana and immediately around F.E. Warren AFB travels through the habitat for such mammals as pronghorn antelope, mule deer, coyote, and white tail deer. Other wildlife includes jackrabbit, desert cottontail, prairie dogs, squirrel, badger, and blackfooted ferret. Birds in this province include prairie chicken, sage grouse, and sharp tailed grouse.

332 - Great Plains Steppe Province

The wildlife through western Montana and around Minot AFB includes mammals such as pronghorn antelope and coyotes. Other wildlife includes jackrabbits, cottontails, squirrels, prairie dogs, gophers, badger, and the blackfoot ferret. The northern portion of this province is an important breeding

area for migrating waterfowl. Birds in this province include the prairie chicken, bobwhite, and sharp tailed grouse.

Survivability and Vulnerability Integration Center

The typical transportation route from Hill AFB to SVIC is located in the Intermountain Semidesert and Desert Province. Few large mammals live in this province, but mule deer, mountain lion, bobcat, and badger occasionally venture into it. Sagebrush provides ideal habitat for pronghorn antelope and whitetail prairie dog. The most common species are such small mammals as ground squirrels, jackrabbits, kangaroo mice, wood rats, and kit foxes. Bird species range from the burrowing owl to specialized species such as sage sparrow and sage thrasher, both found only in sagebrush habitat. Raptors include the American kestrel and golden eagle, along with the ferruginous hawk and various other species of western hawks.

No defined survey of fish or wildlife species has been undertaken at SVIC. According to a document published by the Utah State University Foundation, which inventories flora and fauna at Hill AFB and the UTTR, there are 48 species of mammals and 17 raptor species which are commonly found in the region. It may be assumed for the purpose of this report that these species are found at SVIC. Based on current information, there are no rare and endangered species permanently inhabiting SVIC. Bald Eagles commonly overwinter from September to March and Peregrine Falcons nest and hunt within two miles of the facility (United States Air Force, 1989).

White Sands Testing Facility

Following the typical transportation corridor from Hill AFB to WSTF, the route travels through five ecosystem provinces.

M331 - Southern Rocky Mountain Steppe

The travel corridor through Utah and parts of Wyoming and New Mexico are located in the Rocky Mountains, which are inhabited by large mammals, which include elk, deer, bighorn sheep, mountain lion, bobcat, beaver, grizzly bear, black bear, and moose. Other wildlife and birds include mice, squirrels, chipmunks, nuthatches, bluebirds, chickadees, grouse, hawks and owls.

342 – Intermountain Semidesert Province

Through northern Idaho and most of Wyoming, the transport route travels through a province that includes wildlife such as coyote, pronghorn antelope, mountain lion, bobcat, squirrel, prairie dog, jackrabbit, porcupine, moose, elk and deer. This province is an important breeding and resting ground for migrating waterfowl. Birds that inhabit this province include Canada geese, mallards, grouse, hawk, falcon and owls. Lizards and rattlesnakes also are present in this area.

331 - Great Plains - Palouse Dry Steppe Province

The majority of the travel corridor through North Dakota, Montana, Colorado, and immediately around F.E. Warren AFB travels through the habitat for mammals such as pronghorn antelope, mule deer, coyote, and white tail deer. Other wildlife includes jackrabbit, desert cottontail, prairie dogs, squirrel, badger and blackfooted ferret. Birds in this province include prairie chicken, sage grouse, and sharp tailed grouse.

315 – Southwest Plateau and Plains Dry Steppe and Shrub Province

A small segment of the travel corridor through northeastern New Mexico is a province where animals such as the Mexican ground squirrel, gray fox, whitetail deer, armadillo, ringtail, and raccoon habituate. In limestone caverns there are huge populations of Mexican freetail bats. Birds in this province include: golden-cheeked warbler, black-capped vireo, wild turkey, mourning dove, scaled quail, and bobwhite along with several species of hawks and owls.

M313 – Arizona – New Mexico Mountains Semidesert Province

In the southern portion of the typical corridor through New Mexico and the northern tip of Texas, the animals here include mule deer, mountain lion, coyote, bobcat, deer mouse, longtail weasel, porcupine, golden-mantled ground squirrel, Colorado chipmunk, red squirrel, wood rat, pocket gopher, longtail vole and cottontail. Birds in this province include: northern pygmy-owl, mountain bluebird, Mexican junco, gashawks, and red-tailed hawks. The only widely found reptile is the short-horned lizard.

3.6 Air Quality

The following subsections describe the air quality in the area of the proposed action.

3.6.1 Hill AFB and Freeport Center

Hill AFB is located in Davis County and Weber County, and Freeport Center is located solely in Davis County. Weber County is designated as an area of non-attainment for particulate matter (PM-10) and a maintenance area for carbon monoxide (CO), two of the of National Ambient Air Quality Standards (NAAQS) designated by the Environmental Protection Agency (EPA). The NAAQS include the criteria pollutants of nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), particulate matter (PM-10), and lead (Pb). Davis County is designated by the EPA as a maintenance area for ozone.

Small amounts of hazardous materials resulting in minor amounts of Hazardous Air Pollutant (HAP) and VOC emissions are currently present during the routine refurbishment activities of the PSRE and PSRE shipping containers at Hill AFB. The PSRE refurbishment activities that are evaluated in this EA would occur at the contractor facility at Freeport Center, the PSRE shipping container refurbishment activities would occur at Building 847/2014 at Hill AFB, the PSRE post-firing activities would occur at Building 2016 at Hill AFB, and post-fired PSRE component storage would occur at Building 1804 at Hill AFB.

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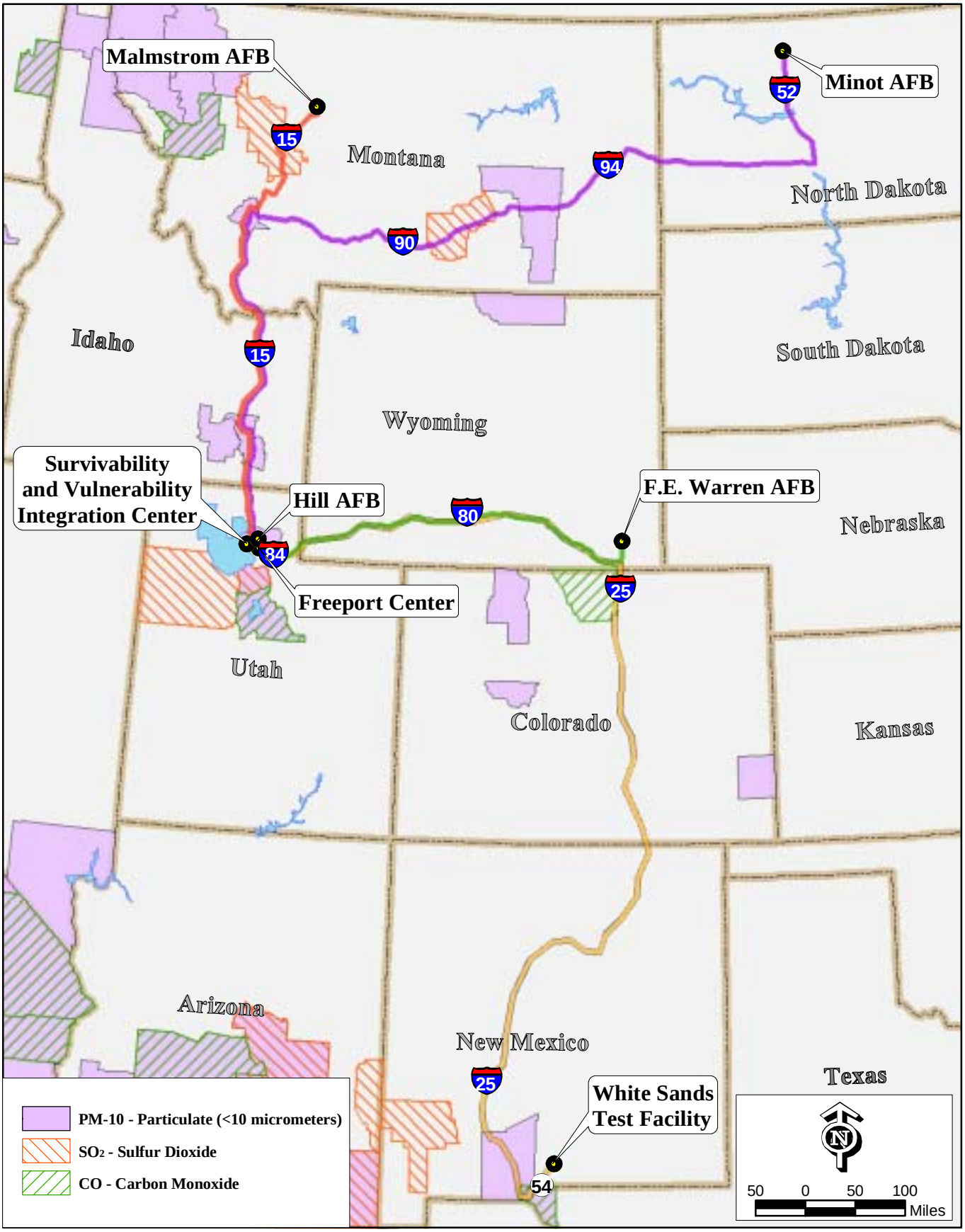
3.6.2 Transportation Routes

As shown on Figures 3-4 and 3-5, areas of non-attainment for the NAAQS pollutants along the typical transportation corridors as designated by the EPA are located:

- around Hill AFB (Ogden, Utah) for PM-10,
- southern Idaho for PM-10,
- Butte Montana area for PM-10,
- East Helena and vicinity, Montana for SO_2 and Pb,
- eastern Montana (Laurel area and Lame Deer area) for SO_2 and PM-10, respectively,
- northern Colorado Fort Collins area for CO,
- southern New Mexico Anthony area for PM-10 and Sunland Park area for O_3; and
- El Paso area for PM-10 and CO

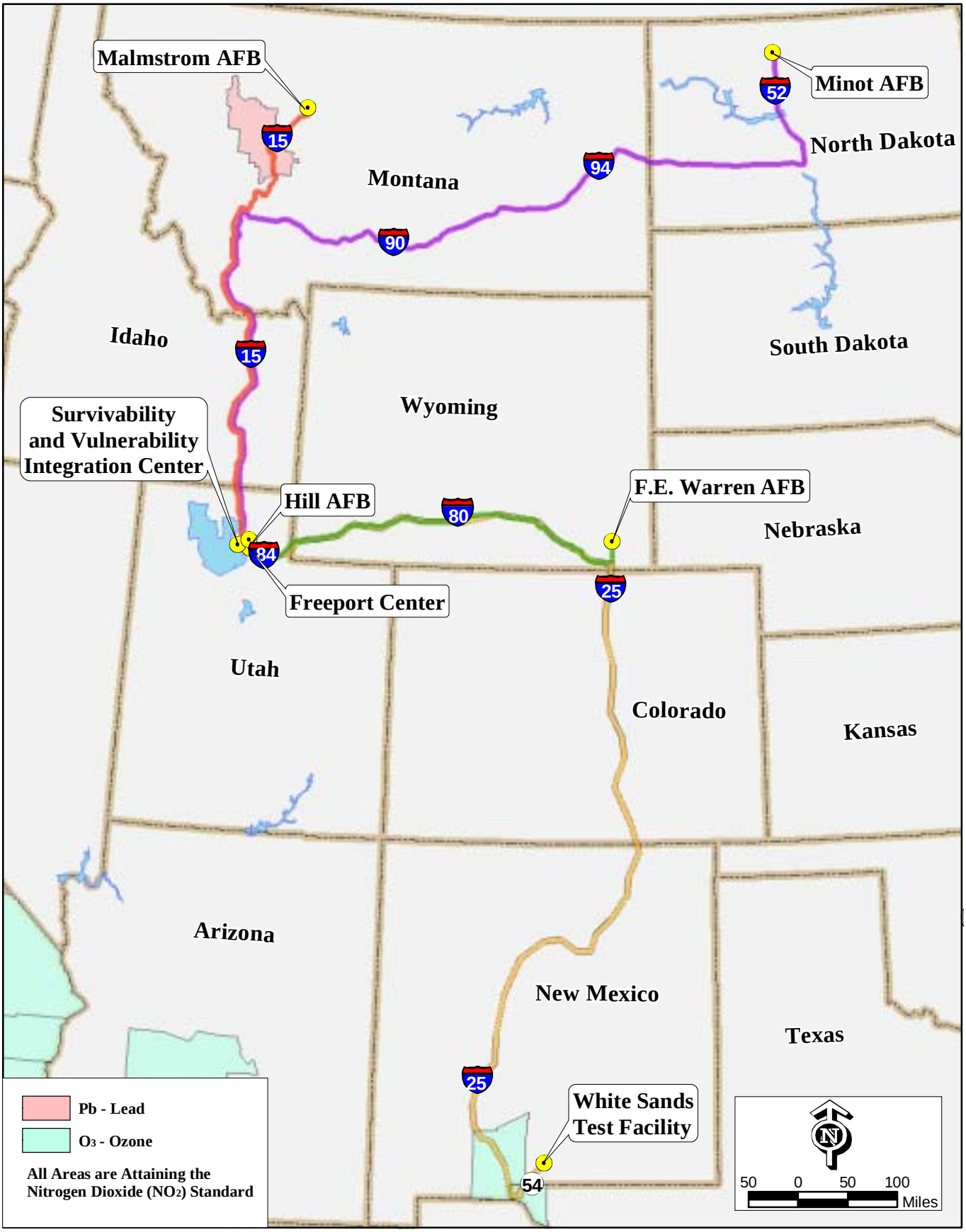
3.7 Archaeological, Historical, and Cultural Resources

The following subsections describe the archaeological, historical, and cultural resources in the area of the proposed action.



Source: EPA, 2003

Figure 3-4. Nonattainment Pollutants (Carbon Monoxide, Sulfur Dioxide, and Particulates)



Source: EPA, 2003

Figure 3-5. Nonattainment Pollutants (Lead, Ozone, and Nitrogen Dioxide)

3.7.1 Hill AFB

Numerous known and unknown archaeological, historical and cultural resources exist at Hill AFB. Cultural resources are continually being identified. However, there are no known cultural resources in the vicinity of the travel routes between Buildings 1804, 2016, 2014, and 847 and routes exiting the base.

3.7.2 Freeport Center

Freeport Center is the location where the historic Clearfield Naval Supply Depot (which supplied the entire Pacific Fleet) was situated during World War II (Freeport Center Associates, 2002). The typical transportation routes at the Freeport Center and in the vicinity of the contractor facilities at Building A-15 are paved, well-used travel routes.

3.7.3 Transportation Routes

All transportation corridors between Hill AFB, the three wings, and the testing facilities are well-used, major travel roadways including interstate highways, state routes, and common local roadways. It is possible that historic or archaeological resources may exist along the routes.

3.8 Land Use

The following subsections describe the land use in the area of the proposed action.

3.8.1 Hill AFB

The transportation routes used at Hill AFB for the proposed action are current roadways and well established travel routes. Land use in the vicinity of the transportation routes at Hill AFB include hazardous operations and associated buffer space areas, aircraft operations and maintenance areas, and industrial operation areas (USAF, 1989).

Hill AFB maintains an area called the base explosive cloud. Facilities that house explosives must be located within the explosive cloud. Outside the radius of impact of the base explosive cloud is the Explosive Clear Zone (ECZ). The proposed actions at Buildings 1804, 2014, and 2016 are located within the explosive cloud. The proposed shipping container refurbishment actions at Building 847 are located in an area classed for industrial operations (USAF, 1989).

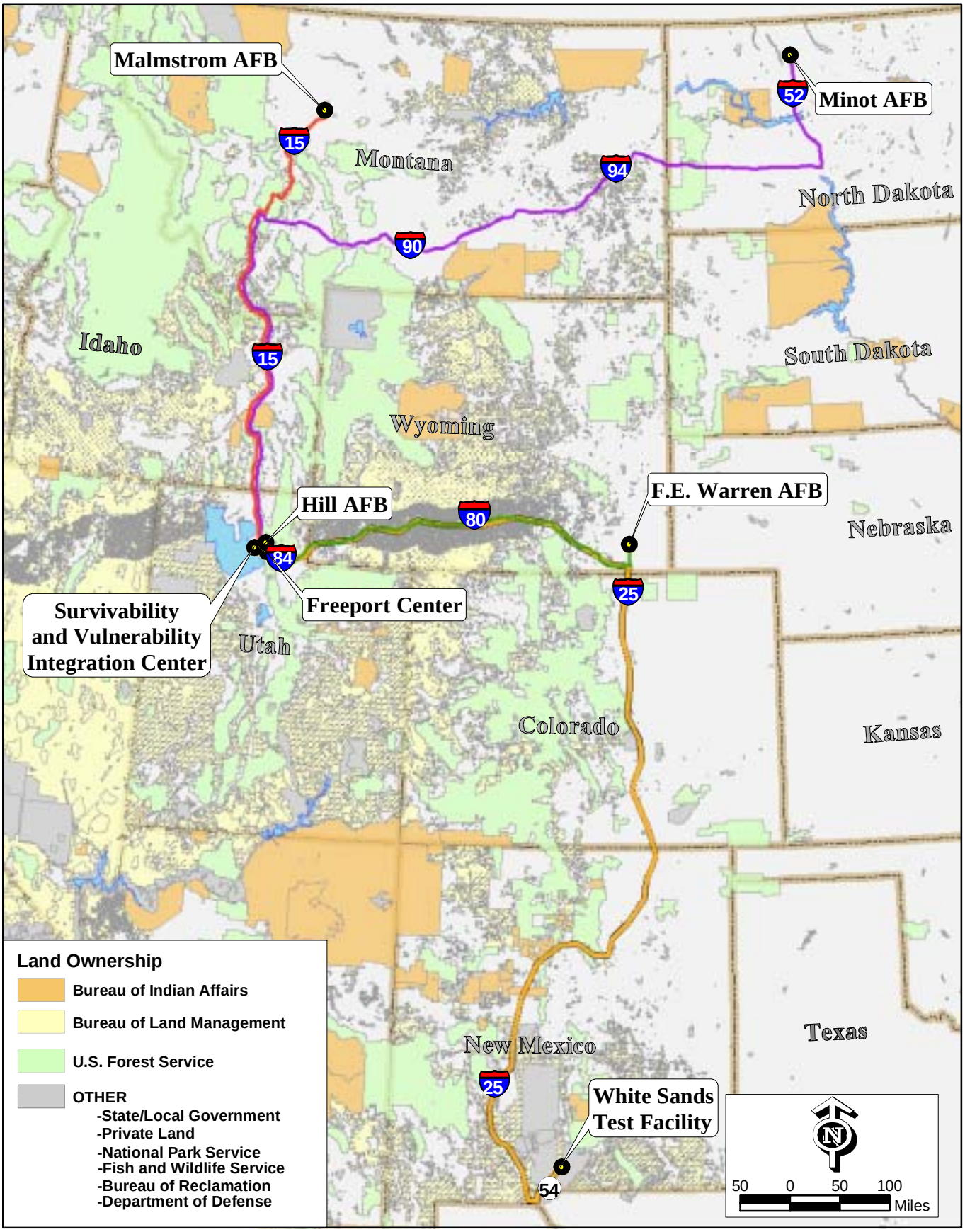
3.8.2 Freeport Center

The Freeport Center provides manufacturing and distribution facilities for companies serving the Intermountain market and all major West Coast markets. There are more than 90 buildings on 735 acres with 80 acres dedicated for future development (Freeport Center Associates, 2002). Freeport Center is Utah's largest industrial park (Columbia Encyclopedia, 2001). Most of the Freeport Center consists of buildings, streets, parking areas, and rail spurs constructed on engineered fill (ERM, 1998). The Freeport Center is located in a predominantly industrial area. Land within a one-mile radius of the subject property includes agricultural, residential, and industrial properties (ERM, 1998).

3.8.3 Transportation Routes

Three Wings

The transportation corridors are well-used traffic routes that are either interstates or state routes. As shown in Figure 3-6, land use along the traffic routes varies and includes Bureau of Indian Affairs land, Department of Defense land, Forest Service land, Fish and Wildlife Service land, and National Park Service land. Other land uses are portrayed on Figure 3-6; these land uses include private land, Bureau of Land Management land, Bureau of Reclamation land, and state and local government land (U.S. Department of the Interior, 2001).



Source: U.S. Department of the Interior, 2001.

Figure 3-6. Land Ownership

Survivability and Vulnerability Integration Center

The transportation route to SVIC is primarily through agricultural land use areas with some commercial and residential land use (U.S. Department of the Interior, 2001).

White Sands Testing Facility

The transportation corridors are well-used traffic routes that are either interstates or state routes. Figure 3-6 shows the land ownership along the route from Hill AFB to WSTF. The land along the typical corridor in Utah and Wyoming is mostly U.S. Forest Service land with other land ownership intermixed as seen on Figure 3-6. Through Colorado the land ownership is also largely U.S. Forest Service with other land ownership and into New Mexico, the Bureau of Indian Affairs, Bureau of Land Management, and Department of Defense increase in Land Ownership. (U.S. Department of the Interior, 2001).

3.9 Noise

The following subsections describe the existing noise environment in the area of the proposed action.

3.9.1 Hill AFB

Hill AFB supports aircraft and logistical operations. In routine daily operations, there is noise from aircraft traffic, large transportation vehicular traffic, maintenance activities, logistical activities, and supporting operations. The noise at Buildings 847, 1804, 2014, and 2016 are concurrent with the operations at Hill AFB.

3.9.2 Freeport Center

The ARC facilities are located at Freeport Center, a commercial and industrial complex where numerous commercial and industrial activities regularly occur. Rail lines and major roadways are in the vicinity of Freeport Center and contribute transportation related noise to the area.

3.9.3 Transportation Routes

Traffic noise exists along the typical transportation routes between Hill AFB, the three wings, and the testing facilities. The traffic corridors include interstate highways and state routes. These corridors are high traffic routes and semi-trucks with trailers are common traffic on these routes.

3.10 Health and Safety

The following subsections describe the current health and safety in the areas of the proposed action.

3.10.1 Hill AFB

Safety at Hill AFB is under the directorate of the Ogden Air Logistics Safety Office, which has four divisions: Weapons Safety, Flight Safety, Ground Safety, and Systems Safety. Transportation of the PSRE shipping containers on Hill AFB would be controlled by safety procedures and military transport guidance. The health of personnel at Hill AFB is under Bioenvironmental Engineering Services.

Bioenvironmental Engineering Services complete Bioenvironmental Engineering Surveys which examine tasks, materials, processes and procedures that may expose personnel to potential health hazards. Bioenvironmental Engineering Surveys were obtained for Buildings 2014, 2016 and 847 and are located in Appendix D. Building 1804 (a storage facility for PSRE stages) is not an area that undergoes Bioenvironmental Engineering Surveys. There has never been an incident of leaking PSREs at this location. In the 2002 Bioenvironmental Engineering Survey of Buildings 2014 and 2016, no deficiencies were observed.

There were four Bioenvironmental Engineering Surveys completed of Building 847 (one for each shop area) in 2001 and 2002. In the Generator Overhaul, Corrosion Control Shop, Missile Ground Control Shop, and Winch Shop surveys, there were no deficiencies noted. In the Missile Transportation Systems Sheetmetal Shop the Pan Breaks used to bend 1/6th grade steel and aluminum was found to be an ergonomic risk factor and was replaced with more ergonomically designed brakes. In the Missile Transportation Systems Welding Shop a fixed ventilation control system on the south wall was found to be inoperable and corrective action ensued.

3.10.2 Freeport Center

The ICBM Prime Integration Contract Team, 2001 report designated a Onsite Environmental Coordinator for the Freeport Center ARC facilities whose responsibilities include: due diligence, pre-audit, permitting/notification, training, compliance audits, hazardous materials/chemical inventory, hazardous materials/chemical storage, air emissions, wastewater/sewer and/or stormwater discharge, stormwater pollution prevention plan, waste management (hazardous and solid waste, used oil), oil storage/spill prevention, emergency response, PCB and asbestos inventory/survey, and reporting. Governmental environmental actions at Freeport Center are coordinated by two Hill AFB MAK staff.

A January 2000 letter by Environmental Alliance, Inc. identified an environmental issue of note that consisted of a small amount of oil staining of the concrete floor inside the warehouse that appeared to be possibly related to an historical air compressor. After further inspection and determining that the stain was surficial in nature, ARC responded by capping the stain with an abrasive disk prior to the resurfacing of the floor to the current epoxy floor covering.

3.10.3 Transportation Routes

A transportation study for the transport of the PSRE was completed by then TRW (now Northrop Grumman) in 2000. The transportation study found that past shipment of the PSRE and current tractor-trailer mileage suggest an accident rate of about 50 accidents per 100 million miles. The study found that increasing the number of units per trailer lowers the number of trucks on the road, and consequently lowers the likelihood of an accident, though more PSRE units are put at risk per trip. To further protect the PSRE units, the study suggested that trucks should be kept on the interstates during daytime hours, when and where there is the least chance of an accident. The transportation study also listed further advantages that would decrease the risk of a transportation incident if Air Force drivers were used, and if special Air Force trailers were acquired to transport the PSRE (ICBM Prime Integration Contract Team, 2000).

The shipping containers for the PSRE contain inherent safety features. These features include temperature control, internal sniffer, and external placards as shown in photos in Appendix C.

WSTF and SVIC are in relatively isolated areas. SVIC is located on the eastern shore of the Great Salt Lake. Because of the security controlled and sometimes hazardous nature of the operations at SVIC, the complex is surrounded by large undeveloped areas of land (USAF, 1989). WSTF is located near Las Cruces, New Mexico. Both testing facilities are guarded and have security controlled entrances to the facilities.

3.11 Hazardous Materials and Hazardous Wastes

The following subsections describe the current hazardous materials and hazardous wastes in the areas of the proposed action.

3.11.1 Hill AFB and Freeport Center

Hazardous materials and wastes are routinely used and generated at Hill AFB. The Hill AFB Hazardous Waste Control Facility (HWCF) operates Hazardous Waste Collection Points. The HWCF

ensures that all hazardous and non-hazardous wastes are properly disposed of in accordance with all state and federal facilities.

The ICBM Prime Integration Contract Team, 2001 report details the contractor's environmental management program. The contractor's program assures compliance with all federal, state, and local regulations, including NEPA requirements, and DoD/industry guidelines and statutes as appropriate, and promotes pollution prevention, hazardous material control, and proper hazardous and solid waste management. The contractor facilities at Freeport Center follow the Environmental Management Plan.

3.11.2 Transportation Routes

The transportation study completed by then TRW in 2000 assessed the probability of a transportation mishap occurring during highway transport of the PSRE from Hill AFB for the duration of the PSRE LEP. The study found that for the initial deployment of the PSRE units to the Air Force Missile Wings and to Hill AFB, Bell Aerospace tallied 1,358,890 miles of "accident and leak free shipment". Since then, an average of 48 units return to Hill AFB for recycling and repairing each year, and about two round trips are made to the wings each month (ICBM Prime Integration Contract Team, 2000). There have been two transportation incidents involving the PSRE within the last six years. In one incident, the PSRE was in the process of being transported between Hill AFB and F.E. Warren AFB when an oncoming highway driver veered into the PSRE transporter lane and caused a head-on collision. The second incident occurred when a driver rear-ended the PSRE transporter. In both cases, there was no damage to the PSRE. In the entire MM III program, there has not been a damaged leaking PSRE from ground transportation operations.

3.12 Transportation

The health and safety of travel on the typical transportation routes between Hill AFB, the three wings, and the testing facilities is under the jurisdiction of each state's Highway Patrol and Department of Transportation, the federal Department of Transportation, the Department of Defense, Logistics Missile Engineering and Safety (LMES) and MAKS.

In the transportation of the PSRE, there is a Commercial Bill of Lading for each shipment. The Commercial Bill of Lading is a signed document that certifies that the shipment materials are properly classified, described, packaged, marked, labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. The Commercial Bill of Lading includes the following details for transporting the packaged PSRE:

- mileage to destination;
- delivery information (point of contact, delivery hours, and any special instructions);
- weight of the cargo;
- special instructions for transport (ie: dual driver, loading and unloading responsibilities, satellite motor surveillance service, transport equipment and tools);
- emergency numbers and back-up numbers; and
- contents (including chemicals involved, amounts of chemicals, hazards of chemicals, serial number, explosive division, DOT Class, and labels required).

The transport vehicles with the PSRE have dual drivers and are under satellite motor surveillance. If the satellite surveillance fails, the required actions are detailed on the Commercial Bill of Lading. These include immediate notification to Defense Transportation Tracking System (DTTS), and the driver must begin a telephonic location/status report every four hours with a final telephonic report upon delivery at destination.

In the report entitled "*Recovery Guide for LMG-30 Transportation and Missile Handling Equipment (T&MHE)*" (OO-ALC/LM Guide 93-3), Appendix IX details the emergency handling and transportation recovery procedures for the PSRE. The document details procedures which apply to accidents and incidents involving a PSRE while it is being handled or transported by a commercial carrier, at the depot storage/processing facility, in a Payload Transporter (PT) van, or at the Launch Facility. Normally the movement of PSRE from Hill AFB to the wings would be under the jurisdiction of a commercial carrier. No recovery operations would be instituted by Air Force personnel until the carrier or local authorities have requested assistance.

3.12.1 Hill AFB

Transporation routes at Hill AFB are paved and well-used roadways. Hill AFB is bounded by I-15 to the west, route 60 to the northeast, and route 193 to the south.

3.12.2 Freeport Center

The Freeport Center is at the hub of the western interstate highway system (Freeport Center Associates, 2002). The north-south Interstate 15 and east-west Interstate 84/80 have local access to the west and northwest. Within Freeport Center, a gridwork of paved roadways are regularly used for commercial and personnel transport. The distance from Hill AFB to Freeport Center is approximately six miles on the typical route south on I-15 and west on Antelope Drive.

3.12.3 Transportation Routes

Three Wings

Hill AFB is easily accessible by various highway roads. The Utah north-south Interstate Highway, I-15, bounds Hill AFB on the west. An east-west highway, Route 193, bounds Hill AFB to the south. To the east, Highways 60 and I-84 parallel the eastern edge of the Base. Highway 26 crosses I-15 to the north of Hill AFB. Entry into Hill AFB can be through one of four gates: the South Gate, South West Gate, Roy Gate and the North Gate. Once on Hill AFB internal roadways and travel routes are well established. The proposed action site can be accessed by existing paved roads.

The mileage of each transport route between Hill AFB and the three wings is shown below in Table 3-1.

Table 3-1. Mileage of Transport Routes

Route	Estimated Distance (miles
Minot AFB to Hill AFB	1142
Malmstrom AFB to Hill AFB	540
F.E. Warren AFB to Hill AFB	425

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The distance to SVIC from Hill AFB is approximately 19 miles. The typical travel route is north on Interstate 15 to 12th Street. The typical route travels west on 12th Street and becomes 9th Street to the entrance to SVIC.

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Distance to WSTF from Hill AFB is approximately 1,250 miles. The typical travel route is composed of interstate and state highways. The travel route from Hill AFB is Interstate 84 east to Interstate 80 until Cheyenne, Wyoming. At Cheyenne, the typical route turns south onto Interstate 25 and continues south through Colorado and New Mexico to El Paso, Texas. At El Paso, the typical travel route follows State Route 54 north to WSTF.

3.13 Socioeconomics

The following subsections describe the socioeconomics in the area of the proposed action.

3.13.1 Hill AFB

Hill AFB, located in both Davis and Weber Counties, employs approximately 15,000 people. In 2000, the combined population of Davis and Weber Counties was 435,527 (U.S. Census Bureau, 2000). These counties encountered a growth rate of approximately four percent between 1998 and 2000. Consequently, Hill AFB represents a major employer in this two-county area.

3.13.2 Freeport Center

The Freeport Center is situated in the middle of Wasatch Front, home for about 70% of Utah's population. Freeport Center, located in Clearfield City, was established in 1963 and provides typical manufacturing and distribution facilities for companies serving the Intermountain market and all major West Coast markets. There are more than 90 buildings on 735 acres with 80 acres dedicated for future development (Freeport Center Associates, 2002). Freeport Center is Utah's largest industrial park (Columbia Encyclopedia, 2001).

Nearby Clearfield City is adjacent to Hill AFB which is Utah state's largest employer (Columbia Encyclopedia, 2001). Many of Clearfield's residents are either present or past employees of Hill AFB (Global Security.Org, 2001). The population of Clearfield City was determined to be 25,974 in the 2000 Census (U.S. Census Bureau, 2000).

3.13.3 Transportation Routes

Three Wings

The typical transportation routes between Hill AFB and the three wings go through five states: northern Utah, eastern Idaho, southern Montana, western North Dakota, and southern Wyoming. Major cities in these five states along the three routes are Logan, Pocatello, Idaho Falls, Butte, Helena, Great Falls, Bozeman, Billings, Bismarck, Minot and Cheyenne, as seen on Figure 3-7. In the 2000 Census, the population of North Dakota was 642,200, the population of Montana was 902,195, the population of Idaho was 1,293,953 the population of Wyoming was 493,782, and the population of Utah was 2,233,169.

The state median annual incomes for the five states range from $50,800 to $68,900 per year as shown on Figure 3-8. Utah had the highest median income of $68,900, followed by Wyoming with a median income of $61,600. The states with the lowest median annual incomes were Idaho, Montana, and North Dakota, with incomes ranging from $58,200 to $50,800 per year.

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The typical transportation route from Hill AFB to SVIC is through Weber County. According to Census 2000, Weber County had a population of 196,533.

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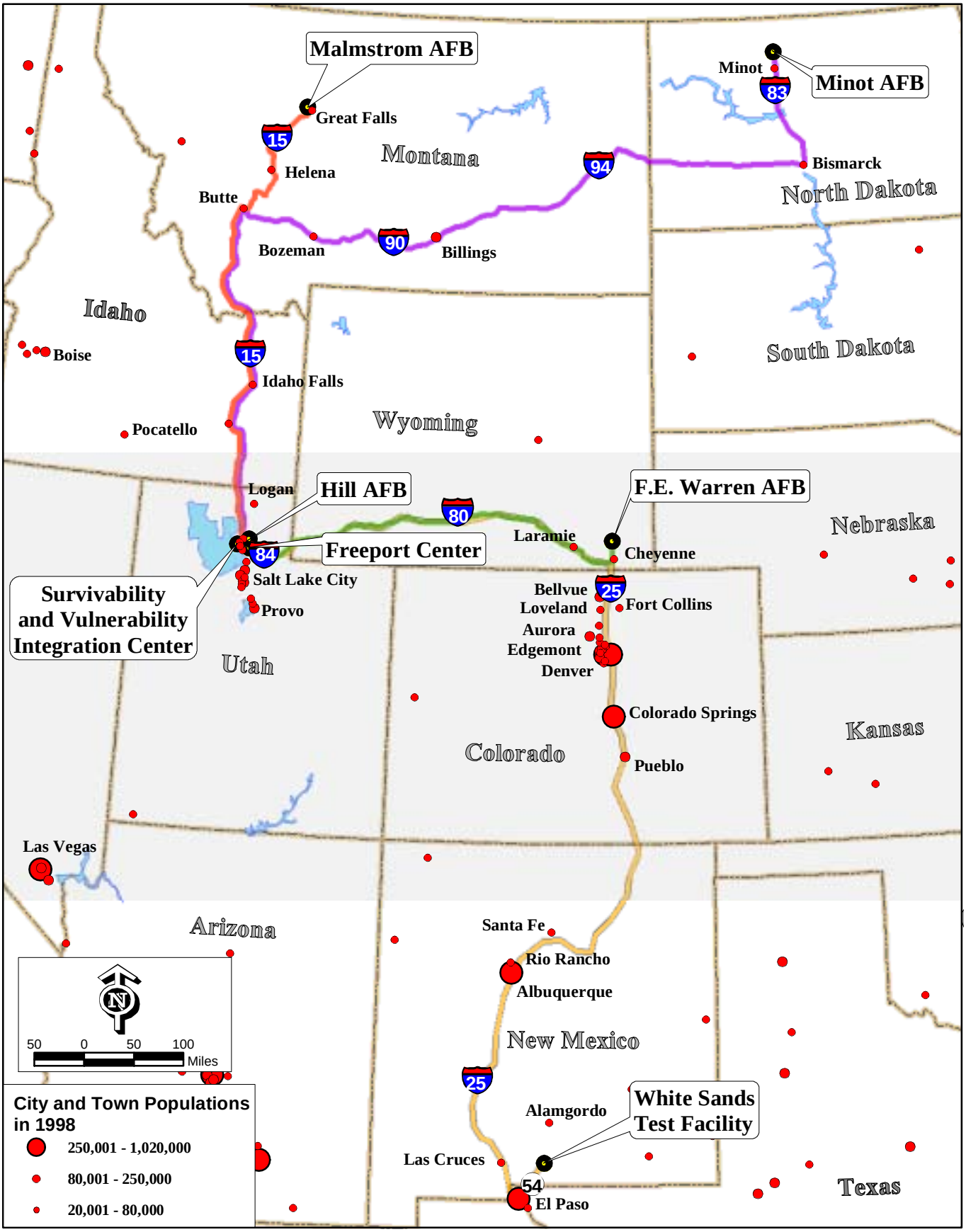
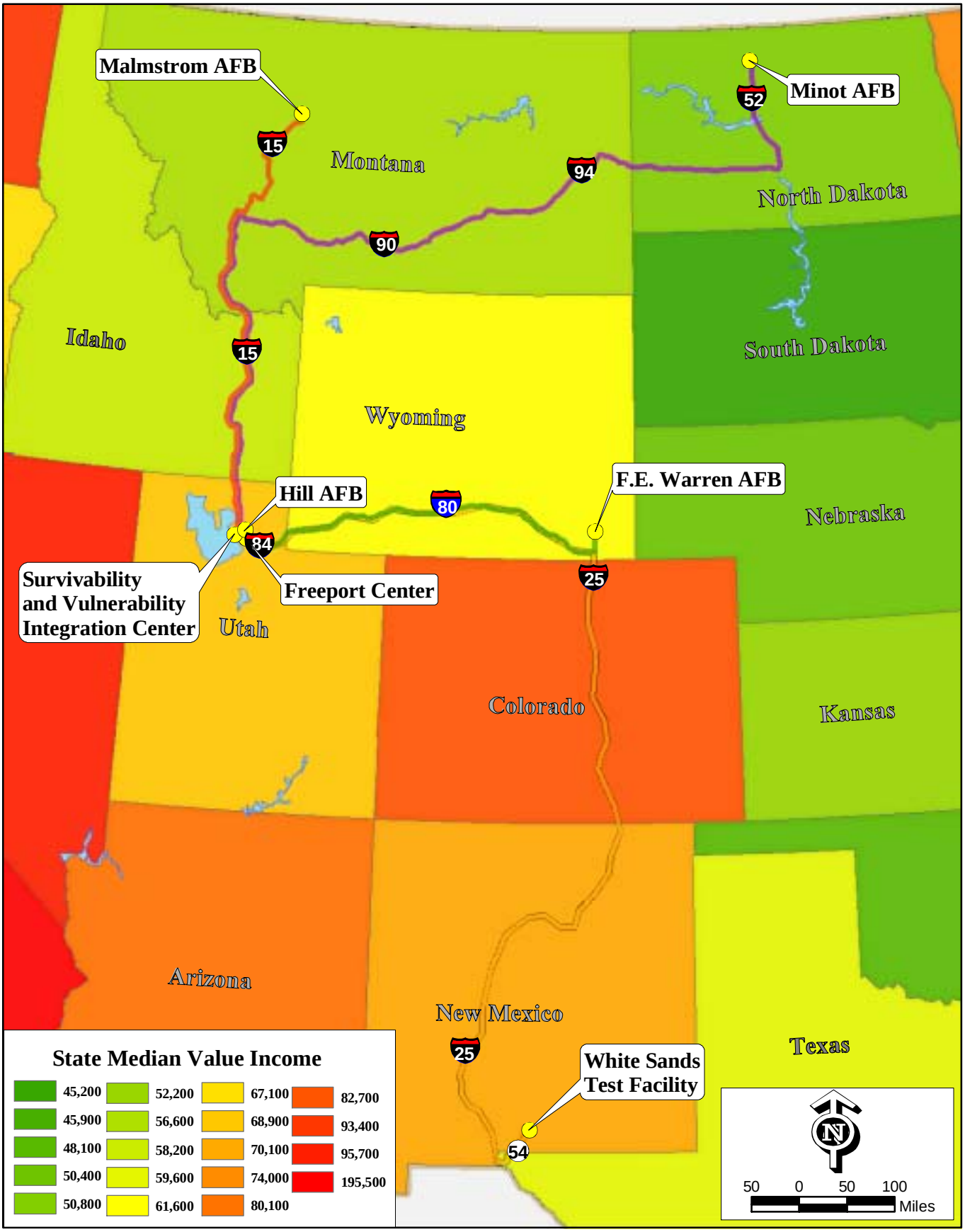
The typical transportation route from Hill AFB to WSTF goes through four states: northern Utah, southern Wyoming, eastern Colorado, and central New Mexico. The major cities along the route, as shown on Figure 3-7 are Cheyenne, Fort Collins, Denver and surrounding area, Aurora, Colorado Springs, Pueblo, Santa Fe, Rio Rancho, Albuquerque, and Las Cruces. From the 2000 Census, the population of Utah was 2,233,169, the population of Wyoming was 493,782, the population of Colorado was 4,301,261, the population of New Mexico was 1,819,046, and the population of Texas was 20,851,820.

The state annual median incomes ranged from $61,600 in Wyoming to $82,700 in Colorado. The median annual income of Utah was $68,900, the median annual income in Texas was $59,600, and the median annual income of New Mexico was $70,100, as shown on Figure 3-8.



Source: Environmental Research Institute, Inc., 1999 Data & Maps, United States Demographic Data (1999)

Figure 3-7. Cities and Towns



Source: Environmental Research Institute, Inc., 1999 Data & Maps, United States Demographic Data (1999)

Figure 3-8. Socioeconomics

Section 4
ENVIRONMENTAL CONSEQUENCES

This section describes the effects that the proposed action alternative and the no-action alternative would have on the existing conditions at Hill AFB, Freeport Center, and on the transportation corridors. The effects or impacts of the alternatives could be beneficial or adverse, and short-term or long-term, as discussed below.

4.1 Surface Water

No surface water bodies, wetlands, or surface water drainage patterns are expected to be impacted by the proposed action. There would be no ground disturbing activities at Hill AFB or Freeport Center and no surface water discharges. Additionally, the PSRE transport trucks would remain on interstate highways, state routes, and well traveled local roads while travelling on the transportation corridors, and both the PSRE and PSRE shipping container transport would remain on paved, local roadways while at Hill AFB. There would be no anticipated changes or impacts to surface water from either the proposed action or the no-action alternative.

4.2 Groundwater

No construction, ground-disturbing actions, or discharges to groundwater would be required for the proposed actions at Hill AFB, Freeport Center, or during transportation operations. Therefore, there would be no anticipated impacts to the groundwater from either the proposed action or the no-action alternative.

4.3 Geology and Soils

Transport vehicles would remain on paved, well-defined roadways while transporting the PSRE and PSRE shipping containers, and would not disturb local soils or geology. The refurbishment activities at Hill AFB and Freeport Center and the post-firing activities and component storage at Hill AFB would not disturb the local soils. Neither the proposed action or the no-action alternative would include any soil disturbing operations, therefore there would be no expected effects to either the geology or soils from either alternative.

4.4 Vegetation

Vegetation would not be disturbed by transport of the PSRE, transport of the PSRE shipping containers, the refurbishment actions at Hill AFB or Freeport Center, or the post-firing actions and component storage at Hill AFB. The proposed actions at Hill AFB and Freeport Center would remain within established buildings, and the transport trucks would remain on established, paved, well-defined roadways. Vegetation would not be disturbed or impacted under the proposed action or the no-action alternative. Therefore, there would be no anticipated impacts to vegetation from either alternative.

4.5 Wildlife

Under the proposed action and the no-action alternative, wildlife habitats, food sources and wildlife species would not be impacted. The transport trucks for the movement of the PSRE and the PSRE shipping containers would remain on well-traveled transport routes. Additionally, the proposed action at Hill AFB and Freeport Center would occur in established buildings and no wildlife or habitat disturbing activities would be required.

4.6 Air Quality

4.6.1 Hill AFB and Freeport Center

As a federal proposed action in a designated area of non-attainment for PM-10 and a maintenance area for ozone the proposed actions at Hill AFB and Freeport Center must undergo review in accordance with the Federal Conformity Rule (40 CFR 93.153). The proposed action would not increase PM-10 emissions at Hill AFB. There would be a slight increase in VOC emissions, but this would be well below the threshold levels and would be considered *de minimis*.

In the proposed facilities at Hill AFB and Freeport Center, ventilation systems are present. At Freeport Center, a clean room would be available with excellent ventilation and an air monitoring system with automatic air samples collected via automatic "sniffers". There would be no anticipated significant impact to air quality from the minor use of hazardous materials within the available facilities. Under the no-action alternative, the current status and activities at Hill AFB and Freeport Center would not change. Therefore, no significant adverse impact is anticipated to air quality from the proposed action at Hill AFB and at Freeport Center, and from the no-action alternative.

4.6.2 Transportation Routes

Emissions associated with the PSRE transportation routes would include the mobile emissions from the transport trucks. These mobile emissions from registered trucks should be accounted for in the Transportation Plans of the nonattainment and maintenance areas through which the PSRE transportation trucks pass. In addition, as specified in 40 CFR 93.153(c)(vii), the requirements of the Federal Conformity Rule do not apply to the routine, recurring transportation of materiel. As a result, there would be no significant air quality impacts from the transportation of the PSRE during the proposed action. The no-action alternative would not alter the current traffic load on the PRSE LEP typical transportation routes, and would have no impact on the air quality. Therefore, no impact is anticipated to the air quality from the proposed transportation operations and the no-action alternative.

4.7 Archaeological, Historical, and Cultural Resources

The proposed action would have no ground-disturbing activities because existing facilities would be used. Since the vehicles remain on established roads, there would be no effect to cultural resources. All areas and facilities remain the same under the no-action alternative. Therefore, no impact would occur to the archaeological, historical and cultural resources under either the proposed action or the no action alternative.

4.8 Land Use

Current land use would not be altered at Hill AFB, the Freeport Center, or on the transportation corridors by the transport of the PSRE, the transport of the PSRE shipping containers, the refurbishment actions at Hill AFB or Freeport Center, or the post-firing actions at Hill AFB. The proposed actions at Hill AFB and Freeport Center would remain within established buildings in accordance with current land use designations, and the transport trucks would remain on established, paved, well-defined roadways. Land use would not be impacted under the proposed action or the no-action alternative. Therefore, there would be no anticipated impacts to land use from either alternative.

4.9 Noise

4.9.1 Hill AFB

The proposed actions at Hill AFB for the PSRE LEP within the context of this EA include: shipping container transport, PSRE transport off and on the base, shipping container refurbishment and storage, PSRE post-firing activities and post-firing component storage. The mechanical equipment required for these operations is currently in regular usage; however, during the PSRE LEP, the usage of this equipment and thus noise levels could increase. The noise increase within the buildings is not expected to create an adverse impact due to noise protection equipment currently in place and used for these processes. A slight increase in personnel and materiel transport to and from the various proposed action areas could occur, but the noise levels of this traffic is expected to be negligible. The no-action alternative would not affect the current noise levels at Hill AFB. Therefore, there are no significant adverse impacts to noise at Hill AFB from the proposed action or the no-action alternatives.

4.9.2 Freeport Center

Current commercial and industrial activities are ongoing at Freeport Center. The proposed action alternative and the no-action alternative are not expected to significantly impact the current operational noise level of Freeport Center. Therefore, there are no significant adverse impacts to noise at Freeport Center from the proposed action or the no-action alternatives.

4.9.3 Transportation Routes

The noise impacts of the PSRE LEP transport trucks on the interstate highways, state routes, and local highways used for the typical transportation corridors would be negligible as these routes are well traveled. A slight increase in personnel transport to and from the various proposed action areas could occur, but the noise levels of this traffic would be negligible. The no-action alternative would not affect the noise levels on the typical transportation routes. Therefore, there are no significant adverse impacts to the noise levels of the typical transportation corridors under either the proposed action or the no action alternative

4.10 Health and Safety

4.10.1 Hill AFB

All processes involved with the PSRE LEP at Hill AFB are routine and have been previously examined for health and safety with concerns mitigated by Air Force personnel as seen in the Bioenvironemental Engineering Surveys located in Appendix D. Therefore, there is no significantly adverse impacts to health and safety at Hill AFB anticipated from the proposed action.

The no-action alternative could have a negative impact on the health and safety of the general population. Under the no-action alternative, age-out of the PSRE and thus MM III missile would occur and the missile would not be replaced. This would compromise national security and the homeland safety of the United States.

4.10.2 Freeport Center

The report completed by ICBM Prime Contract Integration Team (2001) identified PSRE LEP Environmental, Safety, and Occupational Health (ESOH) risks, specified the program strategy for integrating ESOH considerations into the systems engineering process, delineated ESOH responsibilities and identified how progress was tracked. This report determined that the PSRE LEP complied with all minimum ESOH requirements, procedures, and responsibilities. As part of the PSRE LEP ESOH

Compliance Program, Freeport Center production compliance issues were reviewed and it was determined that an Onsite Environmental Coordinator would maintain the environmental program at the Freeport Center facility. The proposed action at Freeport Center has been evaluated and risks have been minimized and potential concerns have been mitigated in the program planning. Therefore, there are no anticipated adverse impacts to health and safety from the actions at Freeport Center.

The no-action alternative could have a negative impact on the health and safety of the general population. Under the no-action alternative, age-out of the PSRE and thus MM III missile would occur and the missile would not be replaced. This would compromise national security and the homeland safety of the United States.

4.10.3 Transportation Routes

The Air Force has an excellent safety record for PSRE transport; strict procedures and guidelines are followed. Additionally, all components of the proposed action have explicit and safe policies and guidelines to ensure the health and safety of all involved as well as the health and safety of the general public. All regulations, policies, technical orders and operating instructions would be carefully followed and strictly enforced.

Risks of an incident during PSRE transport were analyzed in the 2000 ICBM Team report. The study suggested to reduce risks during transport, that multiple PSRE should be transported on one trailer, and that drivers should drive only during daytime hours. The study additionally suggested the use of Air Force drivers and the acquisition of special trailers for the PSRE to further reduce the risks (ICBM Prime Integration Contract Team, 2000). The PSRE LEP would acquire new PSRE transportation equipment (up to four commercial tractors and custom semi-trailers and up to two medium duty, air ride trucks) which would be driven by government drivers. The semi-trailers would be equipped with capability for MMH/NTO detection and environmental control systems for increased safety and protection. To further enhance safety during the PSRE LEP, drivers could be instructed to drive only during daytime hours. Regardless of how the PSRE are transported there would be risks in the movement of the PSRE. The use of government personnel drivers, dual drivers, specialized transport equipment, multiple PSRE per load, and transport during daytime hours are good management practices which reduce safety risks.

The no-action alternative could have a negative impact on the health and safety of the general population. Under the no-action alternative, age-out of the PSRE and thus MM III missile would occur and the missile would not be replaced. This would compromise national security and the homeland safety of the United States.

4.11 Hazardous Materials and Hazardous Wastes

4.11.1 Hill AFB

A hazardous materials list for the PSRE LEP is provided in Appendix E. As can be seen by Appendix E, very minor and negligible amounts of hazardous materials would be used at Hill AFB and Freeport Center during the PSRE refurbishment activities, and no hazardous materials or wastes are anticipated from the post-firing PSRE activities at Hill AFB. Small quantities of various materials would be required for shipping container refurbishment, including epoxy adhesives and isopropyl alcohol. During shipping container refurbishment a small increase in the amount of hazardous materials could occur. Hazardous materials used during the refurbishment process would be managed according to established Hill AFB and MAK Hazardous Material Management Plan and there are no anticipated hazardous materials or wastes from the post-fired PSRE actions or component storage. Therefore, there is

no significantly adverse impacts from hazardous materials and hazardous wastes from the proposed action at Hill AFB.

Under the no-action alternative, there would be no changes to the current usage of hazardous materials and wastes at Hill AFB, therefore, there are no impacts associated with the no-action alternative.

4.11.2 Freeport Center

The ICBM Prime Integration Contract Team report, 2001 reviewed the PSRE LEP for ESOH considerations. It was determined that the Air Force supply system would be used for hazardous materials and the Hill AFB hazardous waste infrastructure would be used for the PSRE LEP. With these actions, the Onsite Environmental Coordinator would maintain inventories of all chemicals stored, used, or handled in any manner at the facility. Additionally, during production, the Freeport facility would be a conditionally exempt small quantity generator of hazardous waste and would therefore be exempt under RCRA from contingency plan requirements. The proposed action at Freeport Center has been evaluated and risks have been minimized and potential concerns have been mitigated in the program planning. Therefore, there are no anticipated adverse impacts from hazardous materials and hazardous wastes from the proposed action at Freeport Center.

Under the no-action alternative, there would be no changes to the current usage of hazardous materials and wastes at the contractor facility at Freeport Center, therefore, there are no impacts associated with the no-action alternative.

4.11.3 Transportation Routes

The transportation of hazardous materials and hazardous waste are strictly governed by DOT and AF requirements. There are no anticipated adverse impacts from hazardous materials and wastes on the transportation routes.

In the unlikely event of a transportation accident, emergency guideline procedures are in place to ensure swift and safe resolution. Immediately after an accident, the driver that has the PSRE in his possession must contact the National Army Operations Center that is manned 24 hrs a day, 7 days a week. The National Army Operations Center will notify the base closest to the accident location. The notified base will activate their Disaster Control Group (DCG). When it is identified that a Logistical Missile (LM) asset is involved, the LM Alert Center (located at Hill AFB) will be contacted. Dedicated personnel are on call 24 hours a day to respond to an accident. It is estimated that within one and a half hours a First Responders Group of personnel from various functional groups such as LMES, Transportation, Civil Engineering, Explosives Ordinance Division, Fire Department, Judge Advocate General and Public Affairs can be assembled and in transit to the accident location. The local state authorities are in control of the accident scene until the First Responders Group arrives. When the First Responders Group arrives on the scene, the local authorities have the choice whether or not to allow the military to assist with the accident situation.

Under the no-action alternative, there would be no changes to the current usage of hazardous materials and wastes on the typical transportation corridors, therefore, there are no impacts associated with the no-action alternative.

4.12 Transportation

Traffic may increase slightly to and from Hill AFB, Freeport Center, and on the typical transportation corridors; however, all routes to be used are paved and well-used. The maximum number of PSRE expected to be refurbished in a month is eight, and PSRE shipping containers is six. The amount

of traffic from the PSRE LEP is not expected to be disruptive to traffic on the local, state, or national transportation routes.

Under the no-action alternative, there would be no effect to transport conditions on the typical transportation routes. No significant disturbance or impact is expected to occur to the transportation systems under the proposed action or the no-action alternative.

4.13 Socioeconomic Conditions

An increase in government personnel would be required for the PSRE LEP at Hill AFB. Up to nine new personnel would be required for the positions at Freeport Center, and additional personnel would be anticipated for transportation operations to successfully complete the program. Hill AFB employs over 20,000 people, therefore, the additional personnel due to the proposed action would have no significant impact on socioeconomic conditions.

Under the no-action alternative, the current staffing levels would be adequate to maintain current activities. The various MM III programs employ approximately 1,200 military, DoD, civilian, and contracting personnel from various military bases and civilian companies. The no-action alternative would have negative impacts to socioeconomic conditions. In time, the no-action alternative facilitates the degradation of the MM III missile and removes the requirement for the MM III programs and associated jobs.

4.14 Environmental Justice

Environmental justice analyses for NEPA documents attempt to determine whether a proposed action disproportionately impacts minority and poor populations. Since the PSRE LEP would not result in any significant impacts to the surrounding community, no such analysis was conducted.

4.15 Cumulative Impacts

There would be no anticipated adverse cumulative impacts expected from the actions required for the PSRE LEP. The proposed action would require negligible workforce growth to support the PSRE LEP The traffic created from the proposed action would not contribute significantly to congestion on base. Air emissions from incidental chemical usage would have a negligible impact on regional air quality and the National Ambient Air Quality Standards.

With the no-action alternative the MM III would degrade and become unusable, thus reducing homeland security for the United States. Additionally with the MM III no longer in operation, there would be a large negative impact to the work force that maintains the MM III programs. Therefore, indirect impacts of the no-action alternative are anticipated to create significant negative impacts to the nation.

4.16 Summary of Impacts

A summary of the impacts described in this section is provided in Table 4-1. It is not anticipated that the proposed action would have significant adverse environmental impacts, however, the no-action alternative would in time, compromise national defense and adversely affect the MM III program work force.

Table 4-1. Anticipated Environmental Consequences from the MM III PSRE LEP

Environmenta Issues	Proposed Action Alternative	No-Action Alternative
Surface Water	No impact.	No impact.
Groundwater	No impact.	No impact.
Geology and Soils	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Air Quality	No significant adverse impact. Negligible emissions from incidental chemical usage would be well ventilated.	No impact.
Cultural Resources	No impact.	No impact.
Land Use	No impact.	No impact.
Noise	No significant adverse impact. A slight increase in transport noise may occur, but interior noise would be mitigated with noise protection equipment, and increases in transportation noise levels would be negligible.	No impact.
Health and Safety	No anticipated adverse impact. Previous operations and program planning have mitigated and minimized proposed action risks and concerns. Regulations, policies, technical orders and operating instructions are in place for PSRE handling and transport. Transportation safety risks have been addressed.	National security may be compromised due to the non-replacement of aged-out MM III missiles.
Hazardous Materials and Hazardous Waste	No anticipated adverse impacts. Minor quantities of hazardous materials and hazardous wastes would be used and generated. Previous operations and program planning have mitigated and minimized proposed action risks and concerns.	No impact.
Transportation	No significant anticipated impacts. Traffic increase on the transportation corridors and to the proposed action areas would be minimal. All routes to be used are paved and well used.	No impact.
Socioeconomics	No adverse impact.	Negative adverse impacts to the workforce that operates the MM III programs with the degradation of the MM III missile.

Environmenta Issues	Proposed Action Alternative	No-Action Alternative
Environmental Justice	No impact.	No impact.

Section 5
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Section 7
REFERENCES

ARC, undated. *Emergency Response Quick Look Reference for Minuteman III PSRE. Atlantic Research Corporation.*

Code of Federal Register (CFR), Section 40, Part 93.153*, Determining Conformity of Federal Actions to State or Federal Implementation Plans.*

Columbia Encyclopedia, Sixth Edition, 2001. "Clearfield". http://www.bartleby.com/65/cl/Clearfie.html

Department of the Air Force, 75th Aerospace Medicine Squadron (AFMC) Hill Air Force Base Utah, 2001. "Summary of Bioenvironmental Engineering Survey, Generator Overhaul, Bldg 847". Memorandum. May 2001.

Department of the Air Force, 75th Aerospace Medicine Squadron (AFMC) Hill Air Force Base Utah, 2001."Summary of Bioenvironmental Engineering Survey, Winch Shop, Bldg 847". Memorandum. June 2001.

Department of the Air Force, 75th Aerospace Medicine Squadron (AFMC) Hill Air Force Base Utah, 2001. "Summary of Bioenvironmental Engineering Survey, Missile Ground Support Shop, Bldg 847". Memorandum. December 2001.

Department of the Air Force, 75th Aerospace Medicine Squadron (AFMC) Hill Air Force Base Utah, 2001. "Bioenvironmental Engineering Survey Summary, Missile Transportation Systems Sheetmetal Shop (MAKGBD), Bldg 847". Memorandum. August 2002.

Department of the Air Force, 75th Aerospace Medicine Squadron (AFMC) Hill Air Force Base Utah, 2001. "Summary of Bioenvironmental Engineering Survey, Corrosion Control Shop, Bldg 847". Memorandum. August 2002.

Department of the Air Force, 75th Aerospace Medicine Squadron (AFMC) Hill Air Force Base Utah, 2001. "Summary of Bioenvironmental Engineering Survey, Special Motor Build-up Shop, Bldgs. 2016, 2014, 2114, 2213, 2212, and 2211". Memorandum. September 2002.

Encyclopaedia Britannica, 1999-2001. "Alfisol". http://www.britannica.com/eb/article?idxref=469438, 1999-2001.

Encyclopaedia Britannica, 1999-2001. "Aridisol". http://www.britannica.com/eb/article?eu=9531&tocid=0&query=aridisol, 1999-2001

Encyclopaedia Britannica, 1999-2001. "Entisol".
http://www.britannica.com/eb/article?eu=33290&tocid=0&query=entisol, 1999-2001.

Encyclopaedia Britannica, 1999-2001. "Inceptisol".
http://www.britannica.com/eb/article?eu=43197&tocid=0&query=inceptisol, 1999-2001.

Encyclopaedia Britannica, 1999-2001. "Mollisol".
http://www.britannica.com/eb/article?eu=54593&tocid=0&query=mollisol, 1999-2001.

Encyclopaedia Britannica, 1999-2001. "Vertisols"
http://www.britannica.com/eb/article?eu=77136&tocid=0&query=vertisols, 1999-2001.

Environmental Alliance, Inc., 2000. "Preliminary Findings, Phase I Environmental Assessment, Building A-15 Freeport Center, Clearfield, Utah" (Letter to Mr. Mark Harlow of Atlantic Research Corporation). January 2000.

EPA, 2003. EPA Green Book Nonattainment Areas for Criteria Pollutants.
http://www.epa.gov/oar/oaqps/greenbk/

ERM, 1998. *Phase II Subsurface Investigation Buildings A15, E11, E12, and F9 Freeport Center, Clearfield, Utah*. November 1998.

Environmental Research Institute, Inc., 1999. "Data & Maps, United States Demographic Data". 1999.

Environmental Systems Research Institute, Inc., (ESRI) 1999. Geographic Data Technology. 1999.

Freeport Center Associates, 2002. www.freeportcenter.com
Geology.about.com, 2002. "Geologic Map of Colorado".
http://geology.about.com/library/bl/maps/blcoloradomap.htm

Geology.about.com, 2002. "Bedrock Geologic Map of Idaho".
http://geology.about.com/library/bl/maps/blidahomap.htm

Geology.about.com, 2002. "Geology of New Mexico".
http://geology.about.com/library/bl/maps/blnewmexicomap.htm

Geology.about.com, 2002. "Bedrock Geologic Map of North Dakota".
http://geology.about.com/library/bl/maps/blndakbdrckmap.htm

Geology.about.com, 2002. "Geological Map of Montana".
http://geology.about.com/library/bl/maps/blmontanamap.htm

Geology.about.com, 2002. "Geological Map of Utah".
http://geology.about.com/library/bl/maps/blutahmap.htm

Global Security.Org, 2001. "Clearfield Depot"
http://www.globalsecurity.org/military/facility/clearfield.htm

ICBM Prime Integration Contract Team, 2000. *Minuteman PSRE Transportation Study*. August 2000.

ICBM Prime Integration Contract Team, 2001. *Programmatic Environmental, Safety and Occupational Health Evaluation for the Minuteman III Intercontinental Ballistic Missile Propulsion System Rocket Engine Life Extension Program*. December 2001.

Montgomery Watson, 1998. *Hill Air Force Base, Utah, Environmental Restoration Management Action Plan,* May 1998.

OO-ALC/LM Guide 93-3. *Recovery Guide forLMG-30 Transportation and Missile Handling Equipment (T&MHE)*. July 1999

TRW, 1997. *Minuteman Propulsion System Handbook.* ICBM SE/TA Program, Strategic Systems Division, TRW Inc. September 1997.

University of Florida, 2002. "Vertisols".
http://grunwald.ifas.ufl.edu/Nat_resources/soil_orders/vertisols.htm

URS, 2001. *Final Environmental Assessment for the Minuteman III Propulsion Replacement Program Hill Air Force Base, Utah*. November 2001.

United States Air Force (USAF), 1989. *Hill Air Force Base Comprehensive Plan*, August 1989.

USAF. Air Force Instruction 32-7061. *The Environmental Impact Analysis Process*.1995.

U.S. Air Force, 2000. "Fact Sheet General Conformity Rule".
http://www.afcee.brooks.af.mil/pro-act/fact/july00.asp

U.S. Air Force, 2002. *RDT&E Budget Item Justification Sheet (R-2A Exhibit)*.
http://www.dtic.mil/descriptivesum/Y2003/AirForce/0604851F.pdf. February, 2002.

U.S. Census Bureau, 2000. "Quick Table, DP-1 Clearfield City, Utah".
http://factfinder.census.gov

U.S. Census Bureau, 2002. *Census 2000*.
http://factfinder.census.gov/servlet/GCTGeoSearchByListServlet?ds_name=PEP_2001_EST&_lang=en&_ts=50498505653. Each state within the typical transportation corridors was selected.

USDA Forest Service, 1995. "Ecoregion Provinces Map". August 1995. http://www.fs.fed.us/colorimagemap/ecoreg1_provinces.html

Following references are links from USDA Forest Service, 1995:

USDA Forest Service, undated. "M313 Arizona – New Mexico Mountains Semidesert – Open Woodland – Coniferous Forest – Alpine Meadow Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?827,76

USDA Forest Service, undated. "315 Southwest Plateau and Plains Dry Steppe and Shrub Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?824,551

USDA Forest Service, undated. "331 Great Plains-Palouse Dry Steppe Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?829,286

USDA Forest Service, undated. "332 Great Plains Steppe Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?827,255

USDA Forest Service, undated. "M331 Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?826,534

USDA Forest Service, undated. "341 Intermountain Semidesert and Desert Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?819,317

USDA Forest Service, undated. "342 Intermountain Semidesert Province". http://www.fs.fed.us/colormap/ecoreg1_provinces.conf?833,301

United States Department of Agriculture, Natural Resources Conservation Service, 1998. *Keys to Soil Taxonomy*, Eighth Edition, 1998. http://www.statlab.iastate.edu/soils/keytax/RevKeysSoilTax2_99.pdf

U.S. Department of the Interior, 2001. "The National Atlas of the United States of America". September, 2002. http://nationalatlas.gov/natlas/natlasstart.asp

U.S. Department of Transportation, undated. "Regulatory Guidance for the Federal Motor Carrier Safety Regulations (FMCSRs)". http://www.fmcsa.dot.gov/rulesregs/fmcsr/fmcsrguide.htm

U.S. Geological Survey, 1994. *Ground Water Atlas of the United States, Idaho, Oregon, Washington*. 1994. http://capp.water.usgs.gov/gwa/ch_h/index.html.

U.S. Geological Survey, 1995. *Ground Water Atlas of the United States, Arizona, Colorado, New Mexico, Utah*. 1995. http://capp.water.usgs.gov/gwa/ch_c/index.html.

U.S. Geological Survey, 1996. *Ground Water Atlas of the United States, Montana, North Dakota, South Dakota, Wyoming*. 1996. http://capp.water.usgs.gov/gwa/ch_i/index.html.

Utah Administrative Code (UAC) R307, Environmental Quality, Air Quality.

Utah Division of Wildlife Resources, 1998. *Utah Sensitive Species List*. February 1998.

Utah Governor's Office of Planning and Budget. "Table 2. Employment Projections by Major Industry 1980-2030". http://governor.utah.gov/projections/R0202B30.pdf

PROPOSED FINAL

ENVIRONMENTAL ASSESSMENT FOR THE MINUTEMAN III PROPULSION SYSTEM ROCKET ENGINE LIFE EXTENSION PROGRAM

May 2003

Prepared for:

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OO-ALC/EMR
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USAF Contract No.: F42650-98-D-0065
Task Order No.: 0023

Prepared by:

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Appendix A

PSRE LEP Programmatic Environmental, Safety and Occupational Health Evaluation Reference Documents

PSRE LEP
Programmatic Environmental, Safety & Occupational Health Evaluation
Reference Documents

No.	Doc. Number	Title
1	40 CFR 1500-1508	Code of Federal Regulations, National Environmental Policy Act
2	40 CFR 82.1-82.184	Code of Federal Regulations, Stratospheric Ozone Protection
3	42 USC 4321-4397	United States Code – National Environmental Policy Act
4	AFI 32-7061	Air Force Instruction, Environmental Impact Analysis Process
5	AFI 32-7086	Air Force Instruction, Hazardous Materials Management
6	ASHRAE Standard 34	American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard, Number Designation and Safety Classification of Refrigerants
7	DoD 5000.2-R	Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs
8	DoDI 6055.1	DoD Instruction, Protection of DOD Personnel from Exposure to Radio frequency Radiation and Military Exempt Lasers
9	EO 11514	Executive Order, Protection and Enhancement of Environmental Quality
10	EO 12114	Executive Order, Environmental Affects Abroad of Major Federal Actions
11	EO 12196	Occupational Safety and Health Programs for Federal Employees
12	EO 12843	Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances
13	EO 12873	Executive Order, Federal Acquisition, Recycling and Waste Prevention
14	FAR 11.301	Federal Acquisition Regulation, Commercial Item Acquisition
15	LM BP 91-03	ICBM SPO Business Practice, System Safety
16	LM BP 91-06	ICBM SPO Business Practice, Hazardous Materials Management Program
17	MIL-A-8625	Military Specification, Anodizing
18	MIL-STD-1472	Military Standard, Human Engineering Design Criteria for Military. Systems, Equipment and Facilities
19	MIL-STD-454	Military Standard, Standard General Requirements for Electronic Equipment
20	MIL-STD-882C	Military Standard, System Safety Program Requirements
21	NAS 411	National Aerospace Standard 41, Hazardous Materials Management Program
22	Public Law 102-484	Department of Defense Authorization Act for Fiscal year 1993
23	TR-PL-14421A	MM III PSRE LEP Safety Assessment Report

Source: TRW ICBM Systems, 2001.

No.	Doc. Number	Title
1a	32 CFR Part 989	Code of Federal Regulations, Environmental Impact Analysis Process
1b	40 CFR 1500-1508	Code of Federal Regulations, National Environmental Policy Act
2	40 CFR 82.1-82.184	Code of Federal Regulations, Stratospheric Ozone Protection
3	42 USC 4321-4397	United States Code – National Environmental Policy Act
4	AFI 32-7061	Air Force Instruction, Environmental Impact Analysis Process
5	AFI 32-7086	Air Force Instruction, Hazardous Materials Management
6	ASHRAE Standard 34	American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard, Number Designation and Safety Classification of Refrigerants
7	DoD 5000.2-R	Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs
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13	EO 12873	Executive Order, Federal Acquisition, Recycling and Waste Prevention
14	FAR 11.301	Federal Acquisition Regulation, Commercial Item Acquisition
15	LM BP 91-03	ICBM SPO Business Practice, System Safety
16	LM BP 91-06	ICBM SPO Business Practice, Hazardous Materials Management Program
17	MIL-A-8625	Military Specification, Anodizing
18	MIL-STD-1472	Military Standard, Human Engineering Design Criteria for Military. Systems, Equipment and Facilities
19	MIL-STD-454	Military Standard, Standard General Requirements for Electronic Equipment
20	MIL-STD-882C	Military Standard, System Safety Program Requirements
21	NAS 411	National Aerospace Standard 41, Hazardous Materials Management Program

No.	Doc. Number	Title
22	Public Law 102-484	Department of Defense Authorization Act for Fiscal year 1993
23	TR-PL-14421A	MM III PSRE LEP Safety Assessment Report

Appendix B

Separate Action
CATEXed AF Forms 813 and WSTF Form 423-A

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol
RCS:

INSTRUCTIONS: *Section I to be completed by Proponent, Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO
OO-ALC/EMP (Kay Winn)	OO-ALC/LMPS (Sherri Scott)	DSN 777-6443

3. TITLE OF PROPOSED ACTION
HAFB Building 2016 Facility Enhancement and PSRE Refurbishment for Minuteman PSRE Life Extension Program

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
See Attached

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
See Attached

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
Sherri Scott, GS-13, PSRE LEP Program Manager		26 Nov 01

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect, 0 = no effect, - = adverse effect, U = unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*				
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)*				
9. WATER RESOURCES *(Quality, quantity, source, etc.)*				
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)*				
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*				
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, flora, fauna, etc.)*				
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*				
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*				
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*				
16. OTHER *(Potential impacts not addressed above.)*				

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. [ ] PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR
[ ] PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED

18. REMARKS
D. Richard Clark, I-MES 26 Nov 01

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)*	19a. SIGNATURE	19b. DATE

Attachment to
HAFB Building 2016 Facility Enhancement and PSRE Refurbishment for Minuteman PSRE Life Extension Program

4. PURPOSE AND NEED FOR ACTION

4.1 Purpose. The purpose for this proposed action is to enhance existing facilities at the Minuteman III Propulsion System Rocket Engine (PSRE) Technical Repair Center (TRC) at Hill AFB Building 2016 and to execute PSRE refurbishment activities in the enhanced facility to support the PSRE Life Extension Program (LEP).

4.2 Need. The need for this action was identified in a December 1997 Life Extension Assessment Program which identified PSRE degradation trends. The PSRE LEP is planned to take place from 2004 through 2011. The existing Hill AFB 2016 facility is planned for critical LEP activities but has been determined to require some facility enhancements to meet program requirements.

4.3 Need Date. Approval to proceed with this activity is needed by November 2001 when some 2016 facility enhancements are scheduled to start.

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

5.1 Description of Proposed Action and Alternatives. A contractor will perform facility enhancements at Hill AFB Building 2016 to prepare the PSRE TRC for the PSRE LEP. Once Hill AFB Building 2016 enhancements are complete, final Engineering and Manufacturing Development activities will take place, Technical Order validation and verification will be conducted and process qualification will be conducted and completed. USAF personnel will then begin the PSRE refurbishment in this facility, which is similar to routine depot maintenance actions that have historically taken place in that facility. Building 2016 facility enhancement effort is scheduled to begin by November 2001 and the PSRE refurbishment is scheduled to take place from 2004 through 2011.

5.1.1 The building 2016 facility enhancements will primarily consist of the following:

a. Modify the Peacekeeper receiving bay to serve as a second PSRE receiving bay for receiving and shipping PSRE's. Install portable air lock between Peacekeeper receiving bay and main clean room. Allocate area for PSRE hold area.

b. Modify the system clean room, including installation of a facility crane, installation of conductive flooring and facility grounds.

c. Installation of an additional Minuteman PSRE Test Set (MPTS) and a larger Helium Pressure Intensification System. This involves removal of existing pressure intensification system, installation of a window and bulkheads between new MPTS control room and system clean

Attachment to
HAFB Building 2016 Facility Enhancement and PSRE Refurbishment for Minuteman PSRE Life Extension Program

room and development of a pad for helium tube trailer parking on the north side of Building 2016.

d. Modify the existing Room 118 Laboratory to become the Gas Storage Assembly Cleanroom (Room 119) and Air Lock (Room 118) by the addition of a removable partition. This includes installation of conductive flooring, new HVAC system, HEPA filters, cleanroom ceiling, new light fixtures, miscellaneous cabinets, relocation of an existing fume hood and sink, and facility grounding in addition to an upgrade of electrical fixtures.

e. The footprint of the facility will remain the same. The only modifications outside the building envelope are a parking pad on the north side of Building 2016 (including minor connecting surface repair), minor separation wall extension through the roof required by weapon system safety, and replacement of an exhaust fan on the roof.

5.1.2 Upon completion of required Building 2016 enhancements, the LEP will conduct/complete the activities referred to in paragraph 5.1 above and begin the refurbishment of PSRE's. This refurbishment effort begins in 2004 with Low-Rate Initial Production (LRIP) and the refurbishment rate ramps up to eight per month beginning in 2006 and continuing at this rate through 2011. At building 2016, each PSRE is to be received and have the energetics removed in accordance with established procedures. Each PSRE, minus the energetics, will then be shipped to a contractor location outside of HAFB for the remainder of the refurbishment/installation of various components. The inert PSRE will then be returned to Building 2016 for the balance of the refurbishment effort and the reinstallation of the energetics. Upon completion of refurbishment, final assembly and test of the refurbished PSRE will be accomplished at Building 2016 before final shipment.

5.2 Decision to be Made. The decision to be made is whether the proposed actions for Hill AFB Building 2016 are environmentally acceptable.

5.3 Anticipated Environmental Issues

5.3.1 Hazardous Waste

- During the facility enhancement activity, small quantities of hazardous waste may be generated during the facility enhancement activities. Hazardous waste may include fluorescent tubes from select electrical fixtures, which can be disposed of in accordance with normal procedures. Hazardous waste will be managed according to the HAFB Hazardous Waste Management Plan.
- Once the facility enhancements are complete and the facility becomes operational, a small increase in waste generation may be expected during

execution of the refurbishment contract through 2011 at which time waste generation will return to current levels.

5.3.2 Hazardous Materials

- Small quantities of various hazardous materials will be required in the facility enhancement. The contractor will provide his own materials to conduct the facility work. The contractor will abide by all local, state and federal hazardous materials requirements during the facility enhancement process. Hazardous materials will be managed in accordance with HAFB Hazardous Material Management Plan.
- During PSRE refurbishment, a small increase in the amount of hazardous materials will be likely. Hazardous materials used during the refurbishment process will be managed according to established HAFB and LM Hazardous Material Management Plans. Upon completion of the refurbishment activity in 2011, hazardous material usage should return to current levels or lower.

5.3.3 Air Quality

- Small quantities of air emissions may be generated during the facility enhancement activities. Any painting will utilize high-transfer efficiency equipment with low-volatile organic compound (low-VOC) paints or water based paints. An existing fume hood/fan will be relocated but there will be no net increase in air sources. There will be small amounts of air emissions due to construction equipment operation in addition to outdoor fugitive dust emissions during the Building 2016 facility enhancement activities.
- Once the facility enhancements are complete and the facility becomes operational, a small increase in emissions over current levels may be expected during execution of the refurbishment effort from 2004 through about 2011, at which time emissions will return to current levels.

5.3.4 Water Quality

- During the facility enhancement activities, the contractor will ensure that there is no dumping of materials into water. Fuel storage will be limited to 110 gallons (416 liters) and siting will be approved by HAFB Fire Department and the Environmental Management Office. Storage of oils, greases, chemicals, or other liquids will require containment for spill prevention and security. Spill response, containment and recovery will adhere to HAFB requirements. The contractor will ensure appropriate personnel protective equipment (PPE) is available to take care of spill cleanup and handling of residue. All tanks used for fuel storage must have spill containment for 110% of stored fuel. Any tanks needed for chemicals, oils, and other liquids must have spill containment for 110% of stored product.

Attachment to
HAFB Building 2016 Facility Enhancement and PSRE Refurbishment for Minuteman PSRE Life Extension Program

- During the refurbishment activity there will be no significant change in the amount or type of water effluents over current routine maintenance activities.

5.3.5 Solid Waste

- During the facility enhancement activities, small amounts of non-hazardous construction-related waste will be generated. Solid waste generated and disposed of by the contractor includes vinyl tile, linoleum, ceiling materials, steel pipe, electrical conduit and wire, HVAC grilles and an air handling unit, sheet metal ductwork, pieces of reinforced wall and asphalt/gravel roof materials. No asbestos is believed to be present in materials associated with the enhancement activity. Disposition of other solid waste consisting of asphalt, pavement, concrete, topsoil and overburden will be in accordance with HAFB requirements and guidelines.
- During the PSRE refurbishment activity, there will be no significant increase in the amount or type of solid waste generated over what is currently generated.

5.3.6 Cultural Resources. There are no known cultural resources at the proposed site. Neither the facility enhancement nor the PSRE refurbishment activities are anticipated to impact cultural resources.

5.3.7 Biological Resources. During the Building 2016 enhancement activities, a parking pad will be installed north of the facility. The enhancement activity will not impact any protected plant species, animal species or habitat.

5.3.8 Geology and Soils. The Building 2016 enhancement and operation is not anticipated to adversely impact the surrounding geology. Surface soils may be disturbed during the facility enhancement activity and efforts will be taken to minimize the potential effects of wind and water erosion on exposed soils during construction.

5.4 Design, Selection and Evaluation Criteria. Facilities must be capable of conducting PSRE energetics disassembly and assembly processes, have Class 100,000 clean rooms, overhead hoist, facility ground and energetics storage capacity, shop air/nitrogen/helium gas supply and room for various test stands.

5.5 Description of Alternatives.

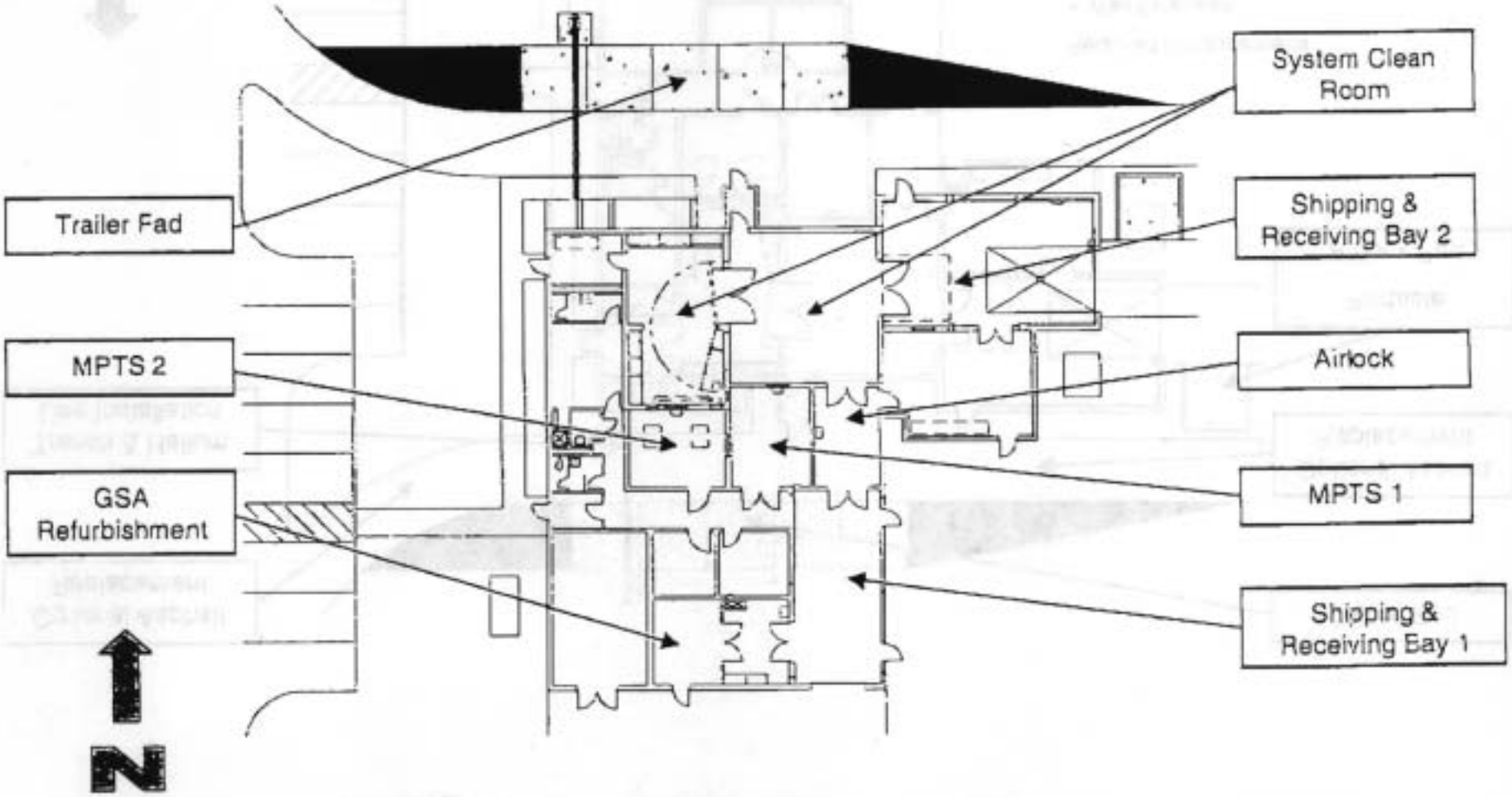
- No Action Alternative: Continue with aging PSRE's, which would ultimately degrade system reliability/availability and affect mission readiness.

Attachment to
HAFB Building 2016 Facility Enhancement and PSRE Refurbishment for Minuteman PSRE Life Extension Program

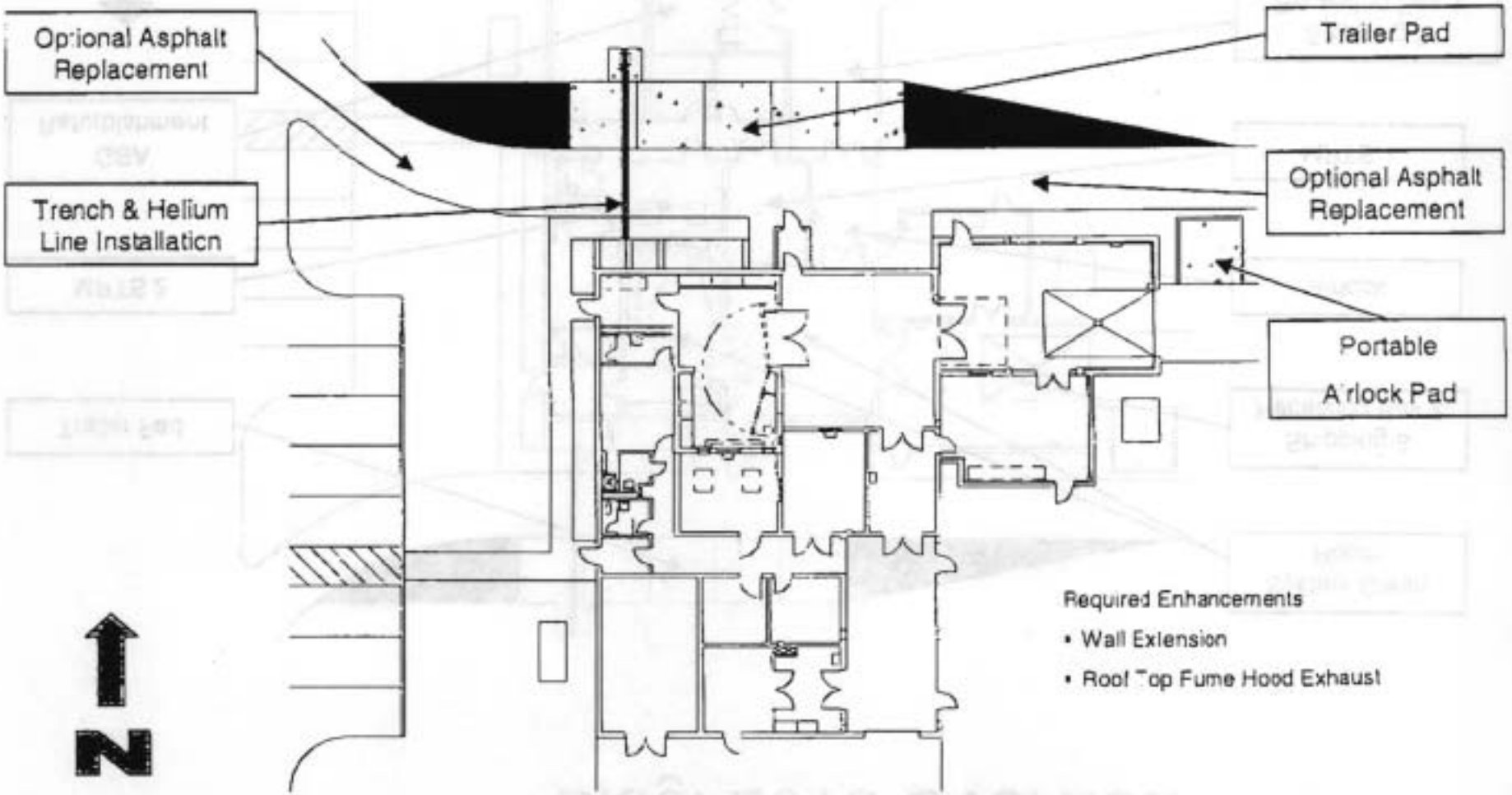
- Proposed Action: Implement Hill AFB Building 2016 facility enhancements to enable the execution of the PSRE Life Extension Program.
- Other alternatives: Other alternatives considered included PSRE refurbishment taking place at various mixes of contractor versus government facilities (i.e. all refurbishment at contractor facilities; contractor and government facilities split; all refurbishment at government facilities).

5.6 List of Required Permits, Licenses and Entitlements. Due to the small increase in air emissions, hazardous materials used and hazardous waste generated due to the proposed activities, it is anticipated that there may be a need to modify existing air permits, obtain hazardous materials licenses as necessary, and modify or establish hazardous waste streams as required.

Bldg. 2016 Overview



Bldg. 2016 Exterior Enhancements



Required Enhancements

- Wall Extension
- Roof Top Fume Hood Exhaust

ROEC No. RD011

RECORD OF ENVIRONMENTAL CONSIDERATION

Title: Peacekeeper Post-Boost Propulsion System (PBPS) and Minuteman III Propulsion System Rocket Engine (PSRE) Testing in Test Stand 401

Description of Proposed Action: Test articles will be hot fired and decontaminated in TS 401. The Peacekeeper PBPS test article contains approximately 543-lb MMH and 882-lb NTO. Hot fire testing will include mission duty cycle firings of the 2563 lbf axial engine and 8 each 70 lbf attitude control engines.

The Minuteman PSRE test article contains approximately 100 lbs MMH and 160 lbs NTO. Hot fire testing will include mission duty cycle firings of the 300 lbf axial engine and 10 each 23 lbf attitude control engines.

Anticipated Date and/or Duration of Proposed Action: (Month/year of expected action and duration action will be active) PBPS testing is anticipated to begin in February 2000. Preparation for, and actual hot fire testing is anticipated to take 2-3 weeks. Testing will be performed in 2000, 2003, 2006, and 2009.

PSRE testing is anticipated to begin in February 2001. Preparation for, and actual hot fire testing is anticipated to take 2-3 weeks. Testing will be performed in 2001 and every year from 2003 to 2014.

Note: a PBPS and PSRE are both scheduled to be hot fired in 2003, 2006, and 2009.

It has been determined that the action (complete one of the following):

1. Is adequately covered in the existing Environmental Resource Document (ERD) __X__ Environmental Assessment (EA) ____ Environmental Impact Statement (EIS) ____ entitled _____ and dated _____.

2. Qualifies for Categorical Exclusion _____, NASA Handbook 8800.11, Section 305.c., (Insert brief exclusion statement),

   _____ and no special circumstances require further documentation.

   _____ but special circumstances (described on back) require preparation of an EA _____ or an EIS _____.

3. Is exempt from National Environmental Policy Act requirements under the provisions of (cite superseding law).

Proponent Robert Howell Date 9-17-99
(Office responsible for proposed action)

Concurrence Harold Jansen Date 9/24/99
(Contractor environmental organization)

Approval David A. Quiroz Date 9/27/99
(NASA Environmental Program Manager)

ENVIRONMENTAL QUALITY CONSIDERATIONS

1. Does proposal conform with WSTF's Master Plan or ERD? Yes No
2. Would the proposed project alter land use on WSTF? Yes No
3. Describe project activities that could possibly affect the archaeological and/or cultural resources and the qualities of air, land, and water on WSTF (e.g., clearing, digging, etc.). These actions are to be coordinated with the site contractor environmental organization.
4. Prior use and condition of the property and/or equipment involved:
5. Proposed use of the property, equipment, and/or completed project:
6. Areas of potential environmental impact during implementation (e.g., construction phase, equipment placement phase, etc.) of proposed action. 1 = improvement, 2 = no change, 3 = minor adverse impact, 4 = moderate adverse impact, or 5 = major adverse impact

a.	Potential to cause air pollution.	1	2	3	4	5
b.	Potential to cause water pollution.	1	2	3	4	5
c.	Potential to impact on the quality or quantity of ground water.	1	2	3	4	5
d.	Potential for discharge or release of hazardous substance.	1	2	3	4	5
e.	Potential to cause soil contamination.	1	2	3	4	5
f.	Potential to violate a safety or health standard.	1	2	3	4	5
g.	Potential to impact on protected species or their habitat.	1	2	3	4	5
h.	Potential to affect cultural resources that are either on or eligible for the National Register, or unstudied.	1	2	3	4	5
i.	Potential effects upon labor force.	1	2	3	4	5
j.	Potential to impact upon recreational areas and/or prime farmland.	1	2	3	4	5
k.	Potential to affect energy demand.	1	2	3	4	5
l.	Potential environmental controversy involved with project:					
	(1) Local	Yes			No	
	(2) National	Yes			No	
m.	Potential to violate Federal, State, or local law/regulation designed to control air pollution.	Yes			No	
n.	Potential to violate Federal, State, or local law/regulation designed to control water pollution.	Yes			No	
o.	Potential involvement with contaminated areas and/or material.	Yes			No	

Areas of potential environmental impact during operational phase of proposed action.
1 = improvement, 2 = no change, 3 = minor adverse impact, 4 = moderate adverse impact, 5 = major adverse impact

a.	Potential to cause air pollution.	1	(2)	3	4	5
b.	Potential to cause water pollution.	1	(2)	3	4	5
c.	Potential to impact on the quality or quantity of ground water.	1	(2)	3	4	5
d.	Potential for discharge or release of hazardous substance.	1	(2)	3	4	5
e.	Potential to cause soil contamination.	1	(2)	3	4	5
f.	Potential to violate a safety or health standard.	1	(2)	3	4	5
g.	Potential to impact on protected species or their habitat.	1	(2)	3	4	5
h.	Potential to affect cultural resources that are either on or eligible for the National Register, or unstudied.	1	(2)	3	4	5
i.	Potential effects upon labor force.	1	(2)	3	4	5
j.	Potential to impact upon recreational areas and/or prime farmland.	1	(2)	3	4	5
k.	Potential to affect energy demand.	1	(2)	3	4	5
l.	Potential environmental controversy involved with project:					
	(1) Local	Yes			(No)	
	(2) National	Yes			(No)	
m.	Potential to violate Federal, State, or local law/regulation designed to control air pollution.	Yes			(No)	
n.	Potential to violate Federal, State, or local law/regulation designed to control water pollution.	Yes			(No)	
o.	Potential involvement with contaminated areas and/or material.	Yes			(No)	

8. Planned mitigation of adverse impact:

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS: OO-543

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO (Environmental Planning Function)	2. FROM (Proponent organization and functional address symbol)	2a. TELEPHONE NO.
EM	LM, LMETL	7-8248

3. TITLE OF PROPOSED ACTION
NEW PSRE CENTRIFUGE FACILITY AT LITTLE MOUNTAIN

4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date)
SEE ATTACHMENT

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.)
SEE ATTACHMENT

6. PROPONENT APPROVAL (Name and Grade)	6a. SIGNATURE	6b. DATE
KIM OWEN GS-12		05-15-00

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.) SHORT TERM NOISE INCREASE		X		
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.) FUGITIVE DUST EMISSIONS SHORT TERM		X		
9. WATER RESOURCES (Quality, quantity, source, etc.)		X		
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)	X			
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)	X			
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, flora, fauna, etc.)		X		
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)		X		
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)		X		
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)		X		
16. OTHER (Potential impacts not addressed above.)		X		

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ✓ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # A2.3.11 ; OR
☐ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX: FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED

18. REMARKS: Categorical Exclusion A2.3.11, "Actions similar to other actions which have been determined to have an insignificant impact in a similar setting as established in an EIS or an EA resulting in a FONSI." *EA for the Proposed Propellant Cutter and Shaker Facility.* Any mitigation's presented in the EA must be followed for the action to be valid. All hazardous waste generated must be disposed of in accordance with applicable law and regulations.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	19a. SIGNATURE	19b. DATE
KAY W. WINN, GS-12		14 Aug 00
E. ALLAN DALPIAS, GS-15		15 Aug 00

AF FORM 813, AUG 93 (EF-V1) (PerFORM PRO) THIS FORM CONSOLIDATES AF FORMS 813 AND 814. PREVIOUS EDITIONS OF BOTH FORMS ARE OBSOLETE. PAGE 1 OF 1 PAGE(S)

Attachment to AF Form 813 for PSRE centrifuge test facility

4.0 Purpose and Need

4.1 Purpose: The Minuteman III Propulsion System Rocket Engine (PSRE) proposes centrifugal testing of new and existing units for aging and surveillance. The test requires that a PSRE be bolted to a centrifuge and subjected to a specified acceleration over a given period of time. Prior testing of this sort has previously been performed at Arnold Test Laboratories. The testing is being transferred to Little Mountain for expediency and cost reduction as the PSRE program is situated at HAFB. A new 36' x 60' facility is required to perform the tests.

4.2 Need: The test is to ensure the stability and function of the rocket motor under design conditions and to test for deterioration of performance over time. The new facility is required to provide the ambient conditions that are required to conduct the test.

4.3 Decision to be made and due date: The decision that the Environmental Planning Function Manager must make is whether the proposed test and facility are environmentally acceptable. This decision needs to be made by Sept. 15,2000.

5.0 Description of Proposed Action and Alternatives

5.1 Potential Environmental Issues

5.1.1 Occupational Safety and Health
5.1.2 Hazardous Waste
5.1.3 Noise
5.1.4 Explosives

5.2 Selection Criteria

5.2.1 Mission Requirements: The PSRE test program is to conduct component and system level tests to provide hardware performance data for analysis of ageout trends and assessment of the PSRE service life. The plan is to test one inert unit, one engineering unit (baseline) and one live unit in the first year then two live units every three years for the duration of the program. Additional units and replacement units may be added to the schedule as required.

5.2.2 Environmental Requirements. The PSRE consists of a Gas storage Assembly (GSA), two (2) propellant Storage Assemblies (PSA), A gimble axial engine, ten (10) attitude control engines. The PSRE utilizes a hypergolic mixture of Nitrogen Tetroxide (N_2O_4) as the rocket oxidizer and Monomethylhydrazine as the rocket fuel. The test will be performed in accordance with the developed test directive. Video coverage will be provided during the test. A sniffer will be used to detect any toxic fumes after the test before personnel will be allowed to enter the facility. The facility is equiped with a deluge system in the event of an accidental spill. The facility has a drain to a 5000 gallon buried storage tank to capture any

hazardous waste that be produced in the event of a failure of the propellant system during testing. No such failures have occurred in previous tests. Therefore, testing must be performed in such a manner as to ensure:

a.) Personnel are adequately protected from possible exposure to explosion hazard and hazardous waste in the event of a failure.
b.) Any hazardous wastes generated are contained and properly Handled and disposed.
c.) Proper ear protection is provide and worn during equipment operation.
d.) Fugitive dust is controlled and kept to a minimum during construction.
e.) Proper storage and quantity distances are ensured for the test article.

5.3 Proposed Action and Alternatives.

5.3.1 Proposed Action: The test consists of receiving the PSRE from the Base, mounting the PSRE on one end of the boom of the centrifuge, operating the centrifuge from a remote location to a specified speed for a given duration of time. Data is taken during the test to ensure that the test article is subjected to the required levels of acceleration and that it is still functionally fit. Personnel then return to the facility and perform a sniffer test for toxic fumes before entering the facility. The test article is then taken off the centrifuge and placed in a clean room inside the facility for additional functional tests. The PSRE is then shipped back to the Base . The Little Mountain test facility (SVIC) was selected as the test location for the following reasons:

a.) HAFB is the depot that handles the Minuteman Missile.
b.) Little Mountain can conduct the tests remotely.
c.) Little Mountain is qualified to handle/store/test ordinance devices.
d.) Little Mountain is in close proximity to HAFB allowing program personnel to observe tests without extensive travel.
e.) Little Mountain is part of the ICBM organization.
f.) Little Mountain has test capabilities and equipment to perform the test.
g.) It is cost effective to build a new facility at Little Mountain verses doing the test at another location.

5.3.2 Past testing of explosives by Little Mountain personnel has demonstrated the capability to handle and test ordinance devices. Test directives will address the personnel safety issues.

5.3.2.1 Occupational Safety and Health. The test will be conducted remotely and in a secure area, thus personnel will not be exposed to a potential rupture during testing. A hazard analysis will be performed and

attached to the test directive. The facility will comply with the governing codes for class 1, division 2 explosives.

5.3.2.2 Hazard Waste. An existing underground waste collection tank will be utilizes to capture any hazardous waste that might be generated by the tests. Any hazardous waste in remaining in the facility will be washed into the holding tank or disposed of by wiping up with a rag, placed in a waste storage container and disposed of properly according to pertinent procedures.

5.3.2.3 Noise protection. Ear protective plugs are available at the site and signs will be posted requiring their use during any time the centrifuge is operated while personnel are in the building.

5.3.2.4 Contractor will be required to spray the area with water to keep down fugitive dust.

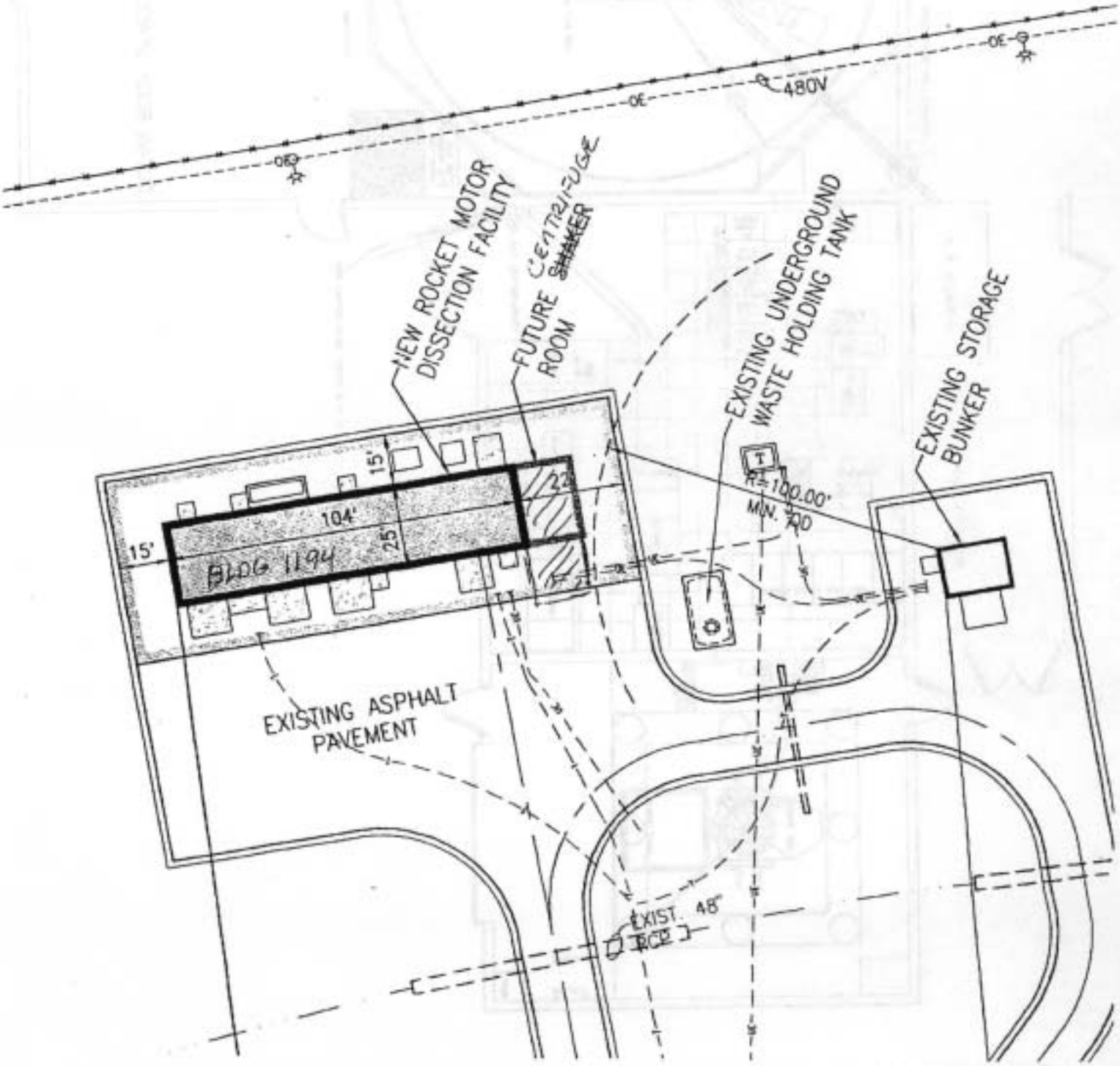
5.3.2.5 Design of the facility will be coordinated with SEG to ensure proper storage and QD are correct. An explosive site plan is required for the facility and will be approved prior to any testing.

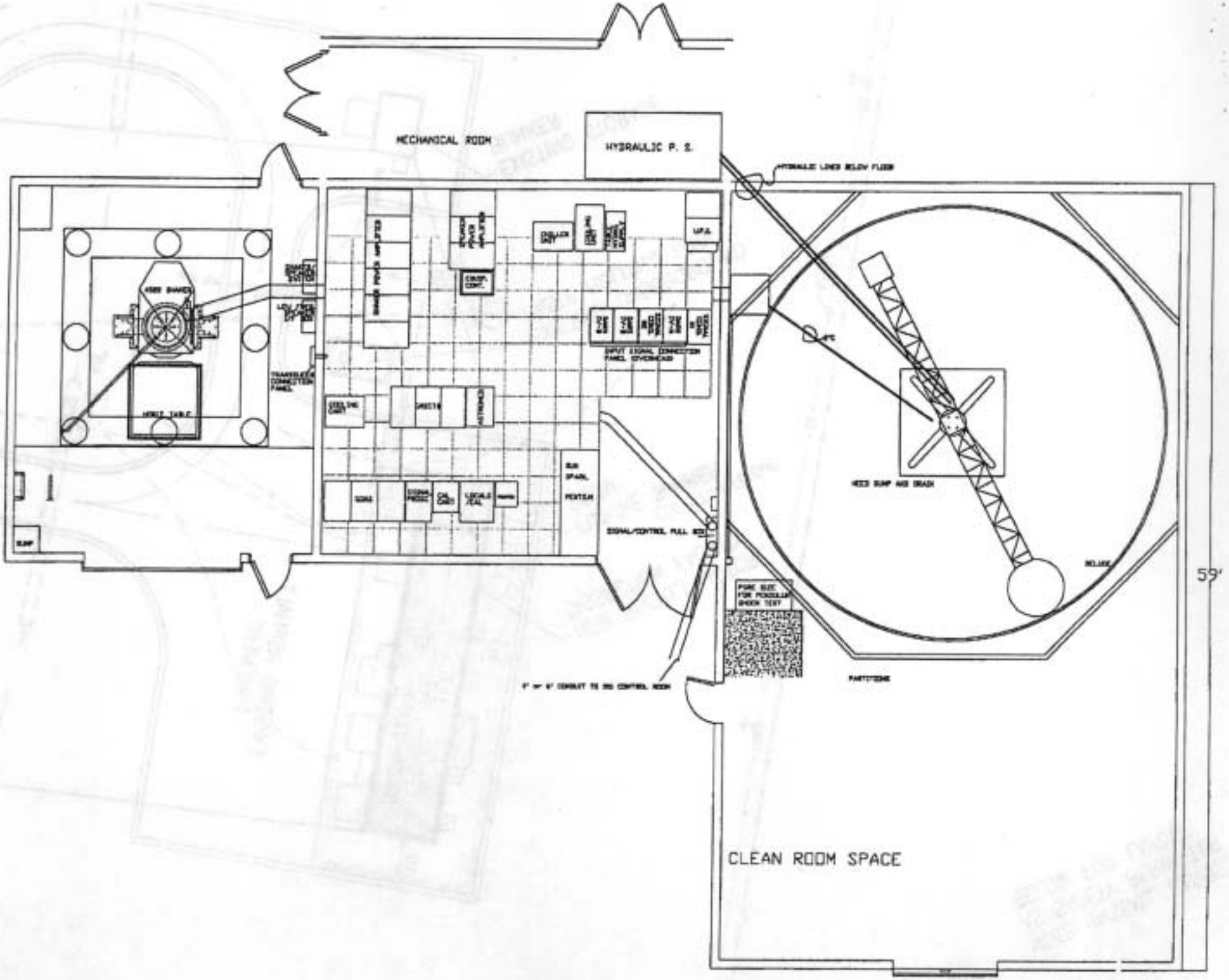
5.3.3 no action. Not performing the test would pose an unacceptable risk to the Minuteman Missile System. The technical risk of failure due to aging could not be determined without the tests.

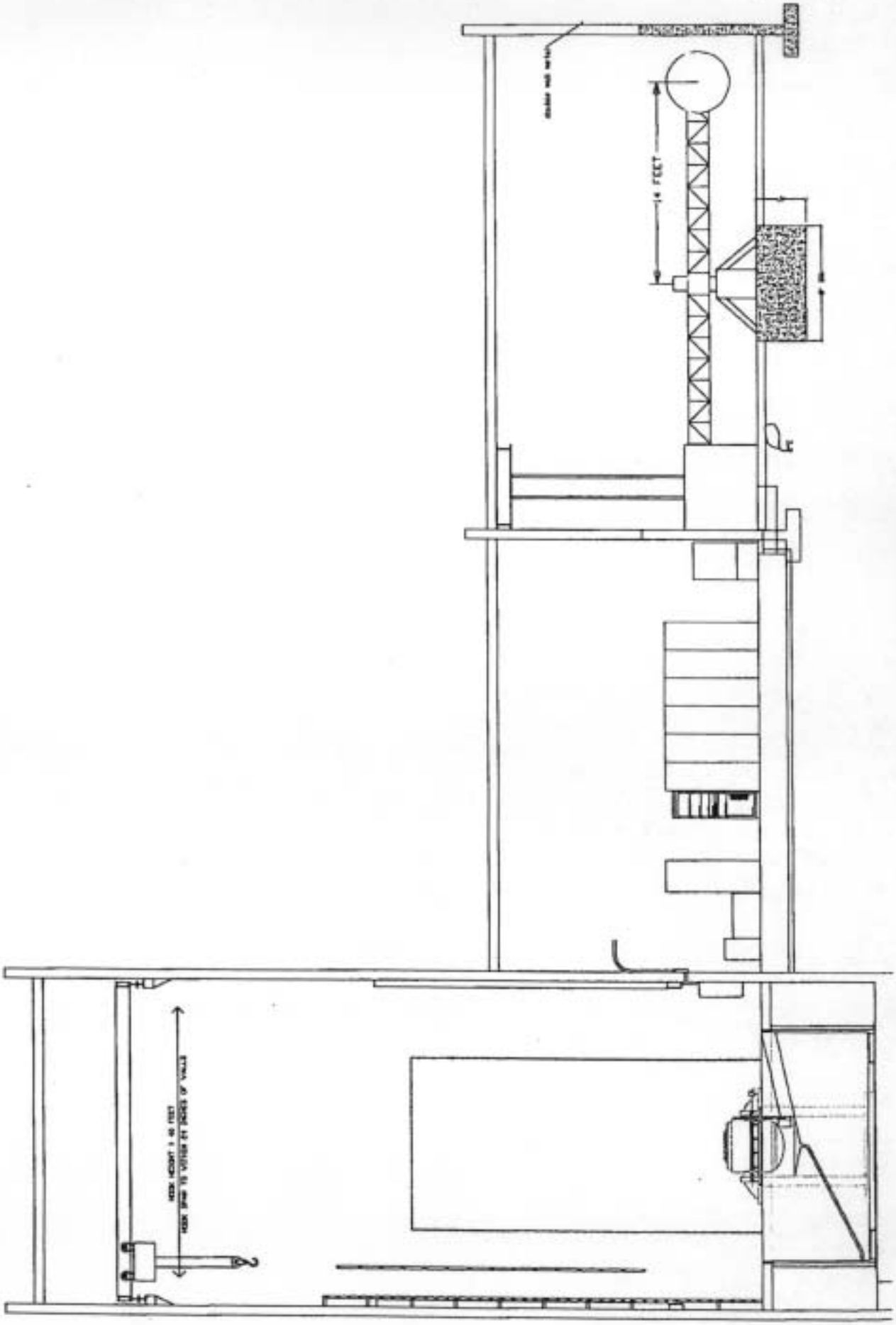
5.3.3 Provide test articles to another test facility for testing. This option would require addition contracting action and negotiation which would cause unacceptable schedule risk to the PSRE program.

5.4 No special permits or licensing is required to handle/transport test assets to and from HAFB/SVIC

NOTE: INSTALL BARBEL AS SAFETY PERIMETER. BELOW FOR LAYOUT.




MECHANICAL ROOM
HYDRAULIC P. S.
HYDRAULIC LINES BELOW FLOOR
UPS
INPUT SIGNAL CONNECTOR PANEL (OVERHEAD)
TRANSDUCER CONNECTOR PANEL
SIGNAL/CONTROL PULL BOX
SUMP
59'
CLEAN ROOM SPACE


14 FEET
MAX HEIGHT 1 10 FEET
TRAV OF BRIDGE 11 FEET

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS: 02-170

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
OO-ALC/EMP (Kay Winn)	OO-ALC/LMPS (Sherri Scott)	DSN 777-6443

3. TITLE OF PROPOSED ACTION
Supplemental 813: PSRE Mass Properties Test Equipment and PSRE Test Set at Centrifuge Facility/Little Mountain (Ref: 00-543)

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
See Attached

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
See Attached

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
Sherri Scott, GS-13, PSRE LEP Program Manager		06 Nov 01

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)*

	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*		X		
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)*		X		
9. WATER RESOURCES *(Quality, quantity, source, etc.)*		X		
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)*	X			
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*		X		
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, flora, fauna, etc.)*		X		
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*		X		
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*		X		
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*		X		
16. OTHER *(Potential impacts not addressed above.)*				

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. [✓] PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # A2.3.9/11 OR
[ ] PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS
CATEX A2.3.11 Actions similar to other actions which have been determined to have an insignificant impact in a similar setting as established in an EIS or an EA resulting in a FONSI. *EA for the Proposed Carter and Shaker Facility.* CATEX A2.3.9 Repairing and replacing real property installed equipment.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
KAY W. WINN, GS-12		14 June 02
WILLIAM R. JAMES, GS-14		18 Jun 02

4. PURPOSE AND NEED FOR ACTION.

4.1 Purpose. The Centrifuge Facility at Little Mountain Test Facility, Utah received a Categorical Exclusion (CATEX) from OO-ALC/EM against AF Form 813 #00-543, dated 15 August 2000. The purpose of this Supplemental AF Form 813 is to specify test equipment to be installed in the Centrifuge Facility to support the Minuteman III Propulsion System Rocket Engine (PSRE) Life Extension Program (LEP). The purpose of this action is to provide a means to test and assess critical mass properties of refurbished PSRE units. The Minuteman PSRE Test Set (MPTS) provides a means to perform functionality testing of PSRE units. The Mass Properties Test Equipment (MPTE) assesses critical mass properties (mass/weight and center of gravity) of the PSRE. The MPTS and the MPTE are proposed to be installed in the Centrifuge Facility at the Little Mountain Test Facility, Utah.

4.2 Need. There is a need for the PSRE Life Extension Program (LEP) to have functionality testing and mass and center of gravity determination for refurbished PSRE's. The mass and center of gravity (CG) properties are critical parameters for the accuracy of the Minuteman III missile system.

4.3 Approval to proceed with this action is needed by March 2002 when the equipment is to be installed.

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES.

5.1 Proposed Action and Alternatives. The proposed action is to construct, deliver, install and operate the MPTE and the MPTS in the Centrifuge Facility at the Little Mountain Test Facility, Utah. The Centrifuge Facility (reference AF Form 813 # 00-543) provides a central location for the receipt, partial disassembly, mass properties measurement, reassembly, testing, and shipping of the PSRE during the LEP. A diagram outlining the proposed location of the MPTS and the MPTE within the Centrifuge Facility is identified in the attached figure.

5.1.1 The PSRE MPTE shall record and report mass properties test data. The MPTE consists of two main parts: the test control console and the test stand. The test control console is rack mounted for operator interface, controls all mass property test functions, and is located in the control room. The test stand provides a PSRE mounting interface, measures weight and center of gravity moments, and is located in the centrifuge facility. Connection between the console and the stand will be through underground conduits. The test control console consists of a computer with display, keyboard and touch pad, a data acquisition system, an inclinometer power supply, intrinsic barriers, motor control relays, and motor control power supplies. The test stand consists of a "live" bed for PSRE interface, load cells, inclinometers, and DC motors. The

MPTE will interface with the vibration interface pad, will be rigidly mounted to the isolation pad and will interface with 90-120 psig at 1 scfm maximum facility compressed air supply and operate off 120 VAC. The data and control lines will connect the console and the stand through two separate two-inch diameter conduits underneath the floor. The MPTE will also provide support functions, including permanent storage of MPTE special tools/fixtures and hand tools.

5.1.2 The MPTS is a test set specifically designed to perform PSRE system operational testing and fault isolation. The MPTS is designed to fit into and operate in a minimum floor space of 13 feet deep by 16 feet wide by 8 feet high. The MPTS is comprised of electronic console and pneumatic console subsystems. It provides automated testing of selected components and end-to-end testing of the PSRE subsystem. The MPTS is proposed to be installed and operated in the Little Mountain Centrifuge Facility.

5.2 Decision to be Made and Due Date. The decision that the environmental planning function manager must make is whether the proposed MPTE and MPTS and site selection are environmentally acceptable. This decision is needed by March 2002 when the equipment is scheduled for installation.

5.3 Potential Environmental Issues.

5.3.1 Hazardous Waste. There are no additional hazardous waste impacts over and above the information contained in the referenced AF Form 813 (#00-543) for the Centrifuge Facility.

5.3.2 Hazardous Materials. There are no additional hazardous material impacts over and above the information contained in the referenced AF Form 813 (#00-543) for the Centrifuge Facility.

5.3.3 Air Quality. No air emissions are anticipated during the installation or operation of the MPTE or MPTS at Little Mountain Test Facility, Utah.

5.3.4 Water Resources. There are no additional water resource impacts over and above the information contained the referenced AF Form 813 (#00-543) for the Centrifuge Facility.

5.5 Selection Criteria. The facility to house the MPTE and MPTS must be designed to operate in a Class I, Division I hazardous environment in accordance with NFPA 70. This applies to equipment in the same area as the PSRE.

5.6 Proposed Action and Alternatives.

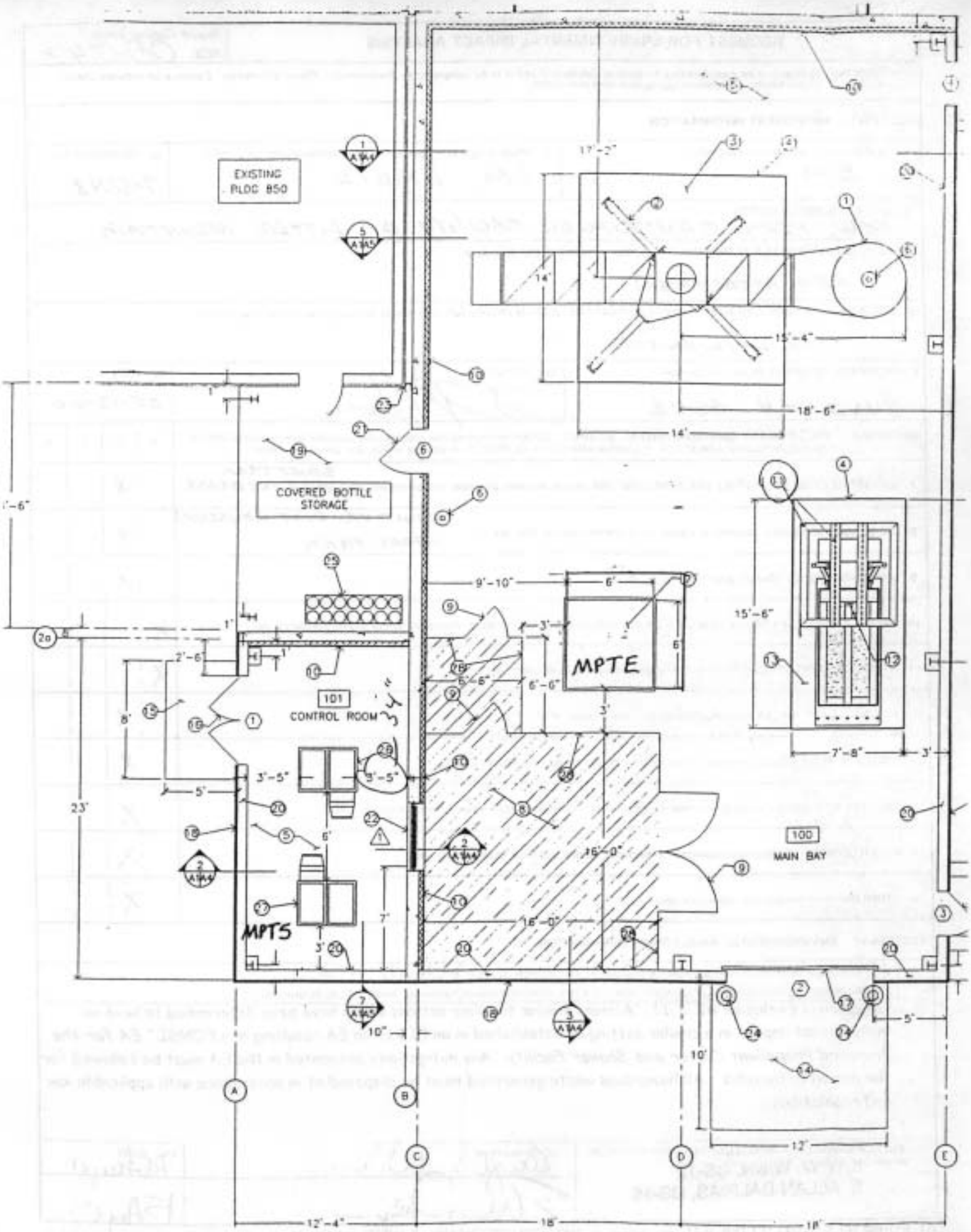
5.6.1 No Action Alternative. Without functionality testing and weight and center of gravity determination for the refurbished PSRE's, the accuracy of the Minuteman III fleet would be at risk of being degraded, jeopardizing the security of U.S. citizens.

5.6.2 Proposed Action. The proposed action is to install the MPTE and MPTS in the Centrifuge Facility at the Little Mountain Test Facility, Utah and conduct the testing at that location.

5.6.3 Alternatives. Hill AFB, Building 2016 and contractor facilities were considered but ruled out due to safety and economic factors.

5.7 List of Required Permits, Licenses and Entitlements. There are no known permits, licenses nor entitlements impacted by this activity.

5.8 Remarks. An existing Environmental Assessment (EA) & Finding of No Significant Impact, "EA for the Proposed Propellant Cutter and Shaker Facility" studied a similar action planned for the Little Mountain Test Facility and renders Categorical Exclusion A2.3.11 applicable to this activity. An existing AF Form 813, "New PSRE Centrifuge Facility at Little Mountain", CATEX'd 15 August 2000, contains the environmental analyses for other aspects of the facility and is attached.



1 PSRE CENTRIFUGE FACILITY FLOOR PI AN

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS: 00-543

INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).

SECTION I - PROPONENT INFORMATION

1. TO (Environmental Planning Function)	2. FROM (Proponent organization and functional address symbol)	2a. TELEPHONE NO.
EM	LM, LMETL	7-8248

3. TITLE OF PROPOSED ACTION
NEW PSRE CENTRIFUGE FACILITY AT LITTLE MOUNTAIN

4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date)
SEE ATTACHMENT

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.)
SEE ATTACHMENT

6. PROPONENT APPROVAL (Name and Grade)	6a. SIGNATURE	6b. DATE
KIM OWEN GS-12	[signature]	05-15-00

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY.

(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)

	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.) SHORT TERM NOISE INCREASE		X		
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.) FUGITIVE DUST EMISSIONS SHORT TERM		X		
9. WATER RESOURCES (Quality, quantity, source, etc.)		X		
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)	X			
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)	X			
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, flora, fauna, etc.)		X		
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)		X		
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)		X		
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)		X		
16. OTHER (Potential impacts not addressed above.)		X		

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. [✓] PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION CATEX # A2.3.11 OR
[ ] PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX. FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED

18. Categorical Exclusion A2.3.11, "Actions similar to other actions which have been determined to have an insignificant impact in a similar setting as established in an EIS or an EA resulting in a FONSI." *EA for the Proposed Propellant Cutter and Shaker Facility*. Any mitigation's presented in the EA must be followed for the action to be valid. All hazardous waste generated must be disposed of in accordance with applicable law and regulations.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	19a. SIGNATURE	19b. DATE
KAY W. WINN, GS-12	[signature]	16 May 00
E. ALLAN DALPIAS, GS-15	[signature]	15 May 00

Attachment to AF Form 813 for PSRE centrifuge test facility.

4.0 Purpose and Need.

4.1 Purpose: The Minuteman III Propulsion System Rocket Engine (PSRE) proposes centrifugal testing of new and existing units for aging and surveillance. The test requires that a PSRE be bolted to a centrifuge and subjected to a specified acceleration over a given period of time. Prior testing of this sort has previously been performed at Arnold Test Laboratories. The testing is being transferred to Little Mountain for expediency and cost reduction as the PSRE program is situated at HAFB. A new 36' x 60' facility is required to perform the tests.

4.2 Need: The test is to ensure the stability and function of the rocket motor under design conditions and to test for deterioration of performance over time. The new facility is required to provide the ambient conditions that are required to conduct the test.

4.3 Decision to be made and due date: The decision that the Environmental Planning Function Manager must make is whether the proposed test and facility are environmentally acceptable. This decision needs to be made by Sept. 15,2000.

5.0 Description of Proposed Action and Alternatives.

5.1 Potential Environmental Issues.

- 5.1.1 Occupational Safety and Health
- 5.1.2 Hazardous Waste
- 5.1.3 Noise
- 5.1.4 Explosives

5.2 Selection Criteria.

- 5.2.1 Mission Requirements: The PSRE test program is to conduct component and system level tests to provide hardware performance data for analysis of ageout trends and assessment of the PSRE service life. The plan is to test one inert unit, one engineering unit (baseline) and one live unit in the first year then two live units every three years for the duration of the program. Additional units and replacement units may be added to the schedule as required.
- 5.2.2 Environmental Requirements. The PSRE consists of a Gas storage Assembly (GSA), two (2) propellant Storage Assemblies (PSA), A gimble axial engine, ten (10) attitude control engines. The PSRE utilizes a hypergolic mixture of Nitrogen Tetroxide (N_2O_4) as the rocket oxidizer and Monomethylhydrazine as the rocket fuel. The test will be performed in accordance with the developed test directive. Video coverage will be provided during the test. A sniffer will be used to detect any toxic fumes after the test before personnel will be allowed to enter the facility. The facility is equiped with a deluge system in the event of an accidental spill. The facility has a drain to a 5000 gallon buried storage tank to capture any

hazardous waste that would be produced in the event of a failure of the propellant system during testing. No such failures have occurred in previous tests. Therefore, testing must be performed in such a manner as to ensure:

a.) Personnel are adequately protected from possible exposure to explosion hazard and hazardous waste in the event of a failure.

b.) Any hazardous wastes generated are contained and properly Handled and disposed.

c.) Proper ear protection is provided and worn during equipment operation.

d.) Fugitive dust is controlled and kept to a minimum during construction.

e.) Proper storage and quantity distances are ensured for the test article.

5.3 Proposed Action and Alternatives.

5.3.1 Proposed Action: The test consists of receiving the PSRE from the Base, mounting the PSRE on one end of the boom of the centrifuge, operating the centrifuge from a remote location to a specified speed for a given duration of time. Data is taken during the test to ensure that the test article is subjected to the required levels of acceleration and that it is still functionally fit. Personnel then return to the facility and perform a sniffer test for toxic fumes before entering the facility. The test article is then taken off the centrifuge and placed in a clean room inside the facility for additional functional tests. The PSRE is then shipped back to the Base . The Little Mountain test facility (SVIC) was selected as the test location for the following reasons:

a.) HAFB is the depot that handles the Minuteman Missile.

b.) Little Mountain can conduct the tests remotely.

c.) Little Mountain is qualified to handle/store/test ordinance devices.

d.) Little Mountain is in close proximity to HAFB allowing program personnel to observe tests without extensive travel.

e.) Little Mountain is part of the ICBM organization.

f.) Little Mountain has test capabilities and equipment to perform the test.

g.) It is cost effective to build a new facility at Little Mountain verses doing the test at another location.

5.3.2 Past testing of explosives by Little Mountain personnel has demonstrated the capability to handle and test ordinance devices. Test directives will address the personnel safety issues.

5.3.2.1 Occupational Safety and Health. The test will be conducted remotely and in a secure area, thus personnel will not be exposed to a potential rupture during testing. A hazard analysis will be performed and

attached to the test directive. The facility will comply with the governing codes for class 1, division 2 explosives.

5.3.2.2 Hazard Waste. An existing underground waste collection tank will be utilized to capture any hazardous waste that might be generated by the tests. Any hazardous waste ~~in~~ remaining in the facility will be washed into the holding tank or disposed of by wiping up with a rag, placed in a waste storage container and disposed of properly according to pertinent procedures.

5.3.2.3 Noise protection. Ear protective plugs are available at the site and signs will be posted requiring their use during any time the centrifuge is operated while personnel are in the building.

5.3.2.4 Contractor will be required to spray the area with water to keep down fugitive dust.

5.3.2.5 Design of the facility will be coordinated with SEG to ensure proper storage and QD are correct. An explosive site plan is required for the facility and will be approved prior to any testing.

5.3.3 No action. Not performing the test would pose an unacceptable risk to the Minuteman Missile System. The technical risk of failure due to aging could not be determined without the tests.

5.3.3 Provide test articles to another test facility for testing. This option would require additional contracting action and negotiation which would cause unacceptable schedule risk to the PSRE program.

5.4 No special permits or licensing is required to handle/transport test assets to and from HAFB/SVIC

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS: 02-172

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
OO-ALC/EMP (Kay Winn)	OO-ALC/LMPS (Sherri Scott)	777-6443

3. TITLE OF PROPOSED ACTION
Minuteman III Propulsion System Rocket Engine (PSRE) Life Extension Program (LEP)

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
See Attached

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
See Attached

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
Sherri Scott, GS-13, PSRE LEP Program Manager	Sherri L Scott	06 Nov 01

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)*

	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*		X		
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)*		X		
9. WATER RESOURCES *(Quality, quantity, source, etc.)*				X
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)*				X
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*				X
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, flora, fauna, etc.)*				X
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*		X		
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*				X
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*				X
16. OTHER *(Potential impacts not addressed above.)*				

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ☐ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR
☑ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS
J. Pendel Clark LMES 6 Nov 01
Proposed action does not qualify for a Categorical Exclusion (CATEX) under AFI 32-7061. An Environmental Assessment will be required and will be funded by the proponent and managed by EM.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
KAY W. WINN, GS-12	Kay W. Winn	17 June 02
WILLIAM R. JAMES, GS-14	WR James	18 Jun 02

4.0. PURPOSE AND NEED FOR ACTION

4.1. Purpose. The purpose for this action is to refurbish all MM III Propulsion System Rocket Engine (PSRE) systems and replace components as necessary to extend the service life of the PSRE to the year 2020.

4.2. Need. The need for this action was identified in a December 1997 Life Extension Assessment Program which identified five (5) component and two (2) electrical ordnance components for replacement.

4.3 Need Date. The proposed action is scheduled to begin in 2004 when Low-Rate Initial Production is scheduled and PSREs will be transported from operational missile wings at Malmstrom, Minot and Warren AFBs to Hill AFB for refurbishment. Hill AFB Building 2016 facility enhancements to support production are scheduled to start in November 2001.

5.0. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

5.1 Proposed Action and Alternatives. The proposed action is to refurbish 586 MM III Propulsion System Rocket Engines at the rate of eight units per month beginning in 2004 and concluding in 2011. Kits containing critical components necessary for the refurbishment activity will be provided to the Air Force through a contracting action. The Air Force will perform the actual PSRE refurbishment process utilizing the procured kits.

5.1.1 The proposed action includes transporting 586 units from MM III operational missile wings at Malmstrom, Minot and Warren AFBs to the HAFB Depot and a contractor facility at Freeport Center, Utah for disassembly, kit installation, and testing. Receiving, disassembly, kit installation, and final functional testing activities will be completed at Hill AFB, Building 2016 and at an ARC contractor facility at Freeport Center, Clearfield, Utah.

5.1.2 Part of the refurbishment process will be conducted at a contractor facility with government personnel. The remainder of the process, including handling of all energetics (ordnance, Monomethyl Hydrazine and Nitrogen Tetroxide) processes will be conducted at Hill AFB in existing facilities. Some facility enhancements will be required to handle the increased workload through the end of the PSRE LEP contract. Environmental analyses of the facility enhancements will be conducted separate from this analysis in accordance with the requirements of 32 CFR 989, which describes the Air Force Environmental Impact Analysis Process. Environmental Analyses associated with static testing

conducted at White Sands Missile Range, New Mexico, as discussed below will be coordinated with and performed by White Sands Missile Range.

5.1.3 Selected units will be transported to and from Little Mountain or White Sands Test Facility for testing as required. Testing activities associated with this program include: 1) Mass Properties, located at Little Mountain, 2) Dynamic Tests, located at Little Mountain and 3) Static Tests, located at White Sands Test Facility.

5.1.4 Receiving, disassembly, kit installation, and final functional testing activities will be completed at HAFB, Building 2016 and at a contractor facility at Freeport Center, Utah. Shipping container refurbishment is to be conducted at a HAFB location to be determined, likely building 843 or 847. Refurbished units will be returned to operational missile wings for reinstallation in launch facilities.

5.2 Decision to be Made. The decision to be made is what level of environmental analysis is required to enable the Air Force to select an alternative to accomplish PSRE life extension.

5.3 Anticipated Environmental Issues

5.3.1 Hazardous Waste. Small quantities of hazardous waste may be generated during the refurbishment process. All waste will be disposed of according to local, state and federal regulations. There may be a need to modify or establish hazardous waste streams as required and hazardous waste will be managed according to the HAFB Hazardous Waste Management Plan. A small increase in quantity may be expected during execution of the refurbishment contract through FY 11 at which time waste generation will return to current levels.

5.3.2 Hazardous Materials. Small quantities of various materials will be required in building the refurbishment kits and during the PSRE and shipping container refurbishment process. Hazardous materials used during the refurbishment process and installation of the refurbishment kits will be managed according to HAFB and LM Hazardous Material Management Plans.

5.3.3 Air Quality. A critical cleaning process has been identified that will use Freon TF (CFC-113), a Class I ODS for cleaning a very small orifice on the Attitude Control Engines (ACE). ACE flushing and flowing will be required only on an as needed basis. It is anticipated that approximately ten ACE engines would require flushing annually. This reflects a 1% demand rate (there are 10 ACE per PSRE, with a planned PSRE refurbishment of approximately 100 PSREs per year). This demand rate is based on process engineering estimates and the ACE empirical test data from the most recent PSRE programmed depot maintenance action. This requirement will double the amount estimated (from approximately 4200 pounds to 8400 pounds) when SAO approval was received

for the ICBM Prime Integration Contract in 1998. This cleaning process will be conducted at a contractor facility in a closed loop system (cleaning stand) to minimize emissions/losses. Small quantities of air emissions will occur as part of the shipping container refurbishment activity and will be conducted in accordance with HAFB Air Quality Management requirements.

5.4 Design, Selection and Evaluation Criteria. Facilities must be capable of conducting PSRE energetics disassembly process, have Class 100,000 clean rooms, overhead hoist, facility ground and energetics storage capacity, shop air/nitrogen/helium gas supply and room for various test stands.

5.5 Description of Alternatives

- No Action Alternative: Continue with aging PSREs, which would ultimately degrade system reliability/availability and affect mission readiness.
- Proposed Action: Conduct PSRE LEP refurbishment/replacement with contractor supplied refurbishment kits at contractor and Air Force facilities at Hill AFB and Freeport Center, Utah.

5.6 List of Required Permits, Licenses and Entitlements. Due to the small increase in air emissions, hazardous materials used and hazardous waste generated due to this program, it is anticipated that there may a need to modify existing air permits, obtain hazardous materials licenses as necessary, and modify or establish hazardous waste streams as required.

Appendix C

Photographs

Photo 1: Dismantled PSRE on Stand.

Photo 2: Survivability and Vulnerability Integration Center Shaker Building Equipment.

Photo 3: PSRE Shipping Container.

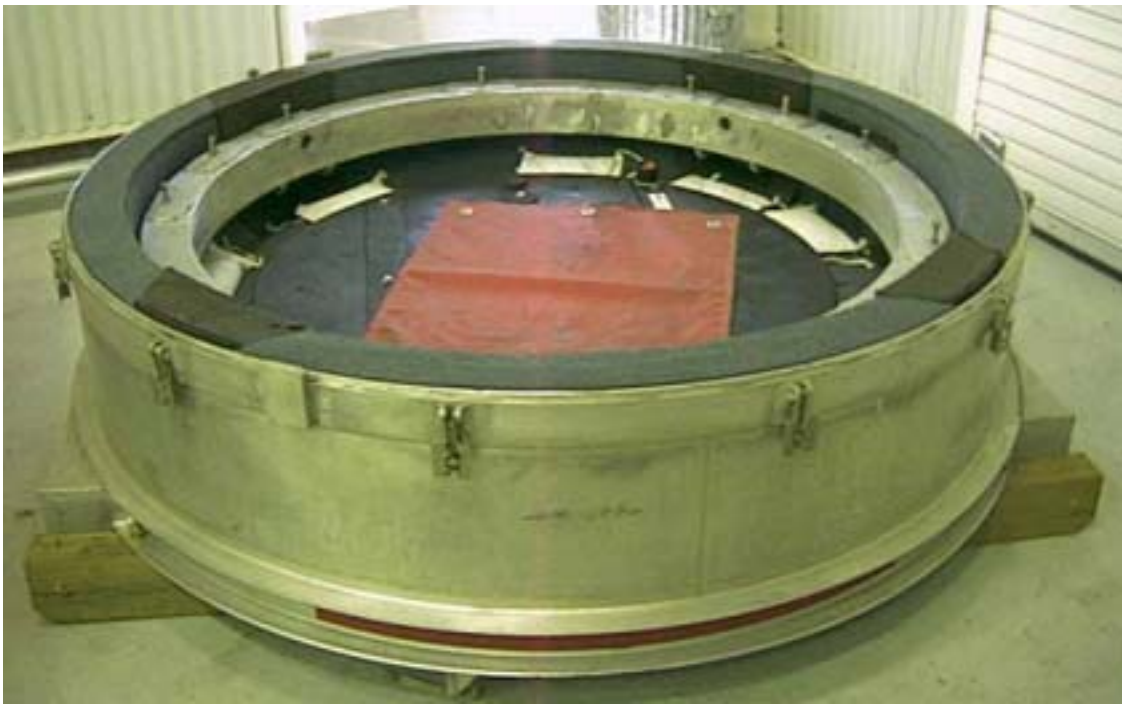


Photo 4: Interior of PSRE Shipping Container.

Photo 5: PSRE Shipping Container.

Photo 6: Safety Features of PSRE Shipping Container.

Photo 7: Contractor Facilities at Freeport Center.

Appendix D

Bioenvironmental Engineering Surveys

DEPARTMENT OF THE AIR FORCE
75TH AEROSPACE MEDICINE SQUADRON (AFMC)
HILL AIR FORCE BASE UTAH

9 September 2002

MEMORANDUM FOR MAKBC (Steve Kennedy)

FROM: 75 AMDS/SGPB

SUBJECT: Summary of Bioenvironmental Engineering Survey, Special Motor Build-up Shop, Bldgs. 2016, 2014, 2114, 2213, 2212, and 2211.

1. On 4 Sep 02, Mr. Bill Woods of Bioenvironmental Engineering Services (BES) completed a BES workplace assessment to review potentially hazardous processes and and discuss any employee concerns. Any deficiencies were briefed when they were found. The workplace information collected by BES will be reviewed by Public Health and Occupational Medicine, and you will shortly receive their evaluation including training and occupational physical requirements identified by them. Periodic surveys are mandated by AFI 48-101, *Aerospace Medical Operations,* and AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*.

2. No deficiencies were observed during this survey. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

WILLIAM W. WOODS
Industrial Hygienist

Attachments:

1. Bioenvironmental Engineering Assessment Report

cc:
AFGE 1592 w/o Atch
SEG w/1 Atch

5 September 2002

BIOENVIRONMENTAL SERVICES SHOP ASSESSMENT

A Bioenvironmental Engineering survey was conducted of the Special Motor Build-up Shop during the period 4 Sep – 5 Sep 02. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

1. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Personnel rosters for each PEG are attached. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. **PEG 2213A1:** This PEG performs repair and maintenance of missile safe, arm switches and other missile motor small components. These tasks include functional checks, evaluation, disassembling components, cleaning and lubricating parts, de-soldering, soldering wires and electronic pieces to subassemblies part, then reassembling the components. These tasks are mainly performed in Bldg 2014. They also disassemble and reassemble a variety of missile motors and subassemblies. The motors are cleaned as required using cleaning non-petroleum based solvents and compounds, inspect the parts, paint them as necessary, and reassemble them. In addition, they assemble the motors and prepare them for test firing. These tasks are done primarily in Bldgs. 2213 and 2114.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS
GENERAL TASKS Tasks include using hand tools, repetitive tasks, heavy lifting, awkward positions, and/or gripping.	Ergonomic risk factors include awkward work positions, gripping, repetition, vibration, and heavy lifting.	Ergonomic training, task rotation, tool wraps for tools without wide grips, proper lifting techniques, task rotation, limit lifting to 50 lbs. unassisted, and work breaks.
TAKE EXCISE SAMPLE (2nd stage only) Propellant	Inhalation and contact	Adequate Dilution ventilation.

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS Filtering face pieces (FFPD) may be worn for comfort purposes, apron, cotton gloves, and safety glasses.
MIX & APPLY 4-PART INHIBITOR (NSN-8030PSD955) Dibutyltin Dilaurate (Isocyanates)	Inhalation, ingestion, and contact.	Apron, butyl rubber gloves, and safety glasses, goggles, or faceshield. Lab hood ventilation system is also used while mixing four parts.
3rd STAGE MOTOR CUTTING (B & F MODELS ONLY) • Asbestos- contained in rubber lining of motor case	Inhalation, ingestion, and contact	Operation performed in an enclosed room, personnel outside of room during operation. Walls of the room are covered with plastic, and water is used to control air contaminants. PPE includes aprons, and butyl rubber gloves.
• Noise hazards when using circular saw	Hazardous noise	Ear plugs/muffs
REPAIR ELECTRICAL WIRES • Solder flux	Inhalation, contact, and ingestion.	Safety glasses, apron, and only low temperature solder irons are used.
BUILD UP • 2-butoxyethanol (1st stage only – NSN-6810PC686040040), alcohols, adhesives, Leak-Tec, RTV, and greases.	Inhalation and contact.	Safety glasses or goggles, and butyl rubber gloves.
LEAK TEST • Freon (NSN-6830001061659)	Inhalation, ingestion, and contact.	Butyl rubber gloves, apron, and safety glasses while pouring freon into test stand lines. It is an enclosed system, and excess freon is vented to the outside environment.

(2) **Evaluation of Chemical Exposure Hazards:** Our evaluation of current processes showed no need for air sampling.

(3) **Specific Hazards Requirements:** Exposure to certain chemicals at levels above the action level (AL), i.e., one-half the occupational exposure limit (OEL), requires specific actions. These are chemicals that are known human carcinogens as listed by the International Agency for Research on Cancer (IARC), or have specific programs prescribed by OSHA. Exposure to these materials should be kept as low as reasonably achievable. Use of these materials should not pose a health hazard when proper controls are used. OSHA requires specific actions upon exposure to certain chemicals, regardless of exposure level. These actions include worker notification, training, and medical surveillance. The following materials have been identified in your work area.

PROCESS	ITEM DESCRIPTION	CHEMICAL
3rd Stage Motor cutting	Lining of 3rd Stage (B & F Models)	Asbestos

(4) **Asbestos:** Asbestos exposures were analyzed in Mar 96 during the 3rd Stage Minuteman motor case dissection. Results verified that personnel have no asbestos exposures during this process. No further evaluation is needed at this time.

(5) **Evaluation of Specific Controls:**

(a) **Ventilation:** Local ventilation systems control airborne contaminants. This table gives the results of the airflow rates measured for each system. All systems meet their criteria.

SYSTEM	FLOW RATE	REQUIRED FLOW RATE
Lab Hood (SN# 5766)	100 fpm	100 fpm
Ultrasonic cleaner vent hood	80 fpm	75 fpm
Clean Room	N/A	N/A

(6) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Per a previous survey letter dated 16 Jun 99, it was stated that half face respirators are no longer recommended due to previous air sampling surveys of the below listed processes. Filtered Face Pieces may be worn for comfort purposes. FFP limitations are reviewed below.

(7) **Personal Protective Equipment (PPE)(29 CFR 1910.132-138, AFOSH Stds 91-31, 48-137):** We inspected the PPE listed in paragraph 2.a.(1) for proper use, condition and availability. All PPE meets the requirements of the standards and was readily available and properly maintained. Bill Woods certifies that the recommended PPE provided is adequate for the shop processes. We reviewed your AFF 55; all workers who use PPE have been trained and the training has been documented.

b. **PEG 2213A3:** The individual in this PEG performs the same work as those in PEG 2213A1 but has been give the additional responsibility to augment the LM Hydrazine Spill Team.

(1) **Summary of Hazards:** The following table describes hazards encountered by the worker, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES OR TASKS	HAZARD	CURRENT CONTROLS
HYDRAZINE RESPONSE TEAM (Augmentee) Hydrazine	Inhalation, injection, absorption, and contact	SCBA and fully encapsulating body suit.

(2) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Required respirators are specified in paragraph 2.b.(1) Respirator limitations are reviewed below. The worker has been fit-tested and is familiar with the use of the respirator.

(3) **Air Supplied Respirators/Self Contained Breathing Apparatus (SCBA):** The following breathing air systems are present in PEG 2213A3. Bill Woods inspected these systems and certifies that all components meet with all governing standards. Breathing air quality must be inspected and certified every 90 days to assure it meets Grade D specifications. This certification was available.

(4) Annual respiratory protection training was given to the supervisor during this survey. Training included proper wear, storage, inspection, cleaning, hazardous processes and the effects of overexposure to materials in the shop.

2. **Workplace hazards applicable to all PEGs:**

a. Eyewash/Shower Units (AFOSH Std 91-32): This shop has 4 portable eyewash units. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop do meet the requirements of the standard. **Note: Beginning in 2001, required frequency of operational checks has increased.**

b. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 161-2 for work areas and 161-3 through 161-6 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated. The following table provides a reference of hazardous noise sources and their required hearing protection:

HAZARDOUS NOISE SOURCE	MEASURED dBA LEVEL	85 dBA LINE	Hearing Protection	ADEQUATE?
3rd Stage Cutting Saw	97	9 ft	E.A.R plugs or Cabot Safety muffs (NNR – 22)	Yes
Pneumatic drill	90	3 ft	E.A.R plugs or Cabot Safety muffs (NNR – 22)	Yes

c. **Dosimetry:** Monitoring during a previous survey ranged from 68.8 – 78.3 dBA. However, our office needs current data due to the revision of AFOSH Std. 48-137 since the last noise dosimetry survey. A follow-up noise survey will be scheduled, and the results will be forwarded to your office upon completion in a separate letter.

d. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop. A review of the Accident/Injury Log data and other information for this shop does not show a repetitive motion injury trend. Workers have been trained and should continue to vary tasks as much as possible and take breaks when necessary. Our observation of the shop process and/or the ergonomic injury trend does not indicate further analysis is required.

ERGONOMIC RISK FACTOR	RECOMMENDED CONTROLS
Ergonomic risk factors include awkward work positions, gripping, repetition, vibration, and heavy lifting.	Ergonomic training, task rotation, tool wraps for tools without wide grips, proper lifting techniques, task rotation, limit lifting to 50 lbs. unassisted, and work breaks.

e. **Heat or Cold Stress (AFM 160-1):** Workers do perform tasks in conditions of extreme cold and/or heat while transporting equipment.

f. **Lighting (AFM 88-15):** A lighting survey was completed during a previous survey. Results indicated average light levels to be 87 foot-candles for the area. Workers did not express any health or safety concerns related to lighting.

3. **General Workplace Hygiene (AFOSH Std 91-68) and other considerations:**

a. Personnel should not eat or drink in the work area where hazardous materials are present.

b. **Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101):** Asbestos containing materials (ACM) were identified in this work area. Friable and/or non-friable asbestos is located in the Transite roofing material and other materials of buildings 2014, 2114, 2212, and 2211. ACM is in good condition. Materials that are in good condition are not a health hazard. EPA recommends leaving in place all ACM that is in good condition. Our office will evaluate abatement requirements and inform you of the action you

must take if the asbestos needs to be removed. Floor tile, ceiling tile and other building materials often contain asbestos. **Do not initiate self-help or any renovations or demolition work without thoroughly identifying to SGPB all materials that may be removed or disturbed.** The correct procedure is to route a work request form (AF Form 332 or AFMC Form 299) fully describing all intended self-help or contracted work through SGPB and Environmental Management.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did include a list of all non-routine tasks and a list of hazardous materials kept in the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training.

6. We inspected your workplace for the following specific potential hazards and did not find them:

Confined space	Methylene Chloride	Non-ionizing radiation
Organic vapors	Formaldehyde	Teratogens
Methylene dianiline	Ionizing radiation	Lead
Benzene	Cadmium	

7. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires any more information about this report, please contact Bill Woods at 7-9036, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

WILLIAM W. WOODS
Industrial Hygienist

DEPARTMENT OF THE AIR FORCE
75TH MEDICAL GROUP (AFMC)
HILL AIR FORCE BASE, UTAH

11 May 2001

MEMORANDUM FOR LMSTM

FROM: 75 AMDS/SGPB

SUBJECT: Summary of Bioenvironmental Engineering Survey, Generator Overhaul, Bldg 847

1. Bioenvironmental Engineering Flight (SGPB) is required by AFI 48-101, Aerospace Medical Operations, and AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*, to complete an annual survey/assessment of work areas and processes. William W. Woods, of Bioenvironmental Engineering Services, evaluated potentially hazardous work practices and processes in Generator Overhaul, Bldg 847.

2. No deficiencies were observed during this survey. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

MARK H. SMITH, Lt Col, USAF, BSC
Commander, Bioenvironmental Engineering Flight

Attachments:
1. Bioenvironmental Engineering Survey Report
2. Training Information

cc:

SEGO
AFGE
LMSO

BIOENVIRONMENTAL ENGINEERING SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted of the Generator Overhaul Shop, Bldg 847 during the period May 1, 2001 to May 9, 2001. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by the Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been divided into **PEG 847G1**. Personnel rosters were delivered during the survey. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. PEG 847G1: Overhaul generators and motors. Limited exposure to solvents, cleaners and hazardous noise.

(1) **Summary of Hazards for PEG 847G1** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PEG 847G1

HAZARDOUS PROCESSES OR TASKS	**HAZARD**	**CURRENT RECOMMENDED CONTROLS AND EVALUATION**
Prewash generator motors in Mart Tornado Washers Motors can weight up to 200 LBS	-Potential skin contact hazards -Potential steam contact hazard -Ergonomic Hazard	Enclosed system. Scoop dry detergent into dispenser, chemical resistant gloves, move motors on carts, hoists
Dry generator motors in Ovens	-Potential inhalation or skin contact hazard -Ergonomic Hazard	Enclosed system with that is vented. Move motors on carts
Clean parts of generator motors with 30% Isopropyl	-Potential inhalation or skin contact hazards	Adequate area ventilation, chemical resistant gloves.

Alcohol or WD 40.	-Ergonomic Hazard	Optimal height benches
Apply Glyptal red or Humiseal to parts of motors.	-Potential inhalation or skin contact hazards -Ergonomic Hazard	Adequate area ventilation, chemical resistant gloves. Optimal height benches
Silver, low lead brazing of motor parts	-Potential inhalation or skin contact hazards -Ergonomic Hazard	Localized ventilation and heat resistant gloves. Optimal height benches
Apply Moly-sulfide based and other type lubricants to parts of motor.	-Potential skin contact hazard	Chemical resistant gloves
Test rebuilt generator motors	-Noise hazard inside booth -Ergonomic Hazard	-Sound Proof test booths. Tasco Pionear Muffs. Optimal height benches, hoists

All controls listed above adequately control exposures to chemical and physical hazards in this shop.

(2) Potential Process Hazard Monitoring: Based on limited use and short duration of hazardous chemicals or materials, no further monitoring of current processes is necessary.

(3) **Evaluation of Specific Controls:**

(a) **Ventilation Controls (AFOSH Std 161-2):** This shop has local ventilation systems to control potential airborne contaminants for the silver lead free brazing process. The table below gives the results of the airflow rates measured for each system.

System	Flow Rate	Required Flow Rate
Brazing Station 1	1079 fpm	350 fpm
Brazing Station 2	1355 fpm	350 fpm

fpm = **feet per minute**

(b) **Personal Protective Equipment (PPE) (29 CFR 1910.132-138, AFOSH Stds** 91-31& 48-1): We inspected available PPE listed above for proper use, condition, and availability. Bill Woods of Bioenvironmental Engineering Services certifies that all recommended PPE meet the requirements of the standard and was readily available and properly maintained.

PROTECTIVE EQUIPMENT TYPE	EQUIPMENT LIMITATIONS
Butyl rubber gloves	Dexterity decreased; limited heat resistance; cannot use with acids.
Nitrile rubber gloves	Minimal heat and tear resistance.

PROTECTIVE EQUIPMENT TYPE	EQUIPMENT LIMITATIONS
Face shield	No respiratory protection from toxic or caustic vapors.
E.A.R Classic earplugs	Protect up to noise levels of 104 dBA
Tasco Pionear Muffs	Protect up to noise levels of 94 dBA

(c) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** Respiratory protection is not required for processes performed in this shop.

3. **Workplace evaluation applicable to all PEGs:**

a. **Eyewash/Shower Units (AFOSH Std 127-32):** This shop does have eyewash/ shower units. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected the eyewash/ shower units for cleanliness, location, operation, and operational checks. Units in this shop meet the requirements of the standard.

b. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated. The following table provides a reference of hazardous noise sources and their required hearing protection:

(1) **Equipment/Processes:** A number of processes in this shop involve potential exposure to hazardous levels of noise. Warning signs have been placed where hazardous noise may be present**.** Personnel working within the hazardous noise areas must wear hearing protection when that piece of equipment is being operated. Employees who may be exposed to noise levels above 85 dBA for a shift time weighted average are placed on a Hearing Conservation Program. Employees in PEG 847G1 are not currently on the Hearing Conservation Program. A summary of noise sources is as follows:

HAZARDOUS NOISE SOURCES e	MEASURED LEVELS IN dBA	Distance to 85 dBA Line	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTIO N IN dBA	ADEQUATE ?
Nederman Brazing ventilation system NW	81 dBA	N/A	None Required	**N/A**	**Not Hazardous**

Nederman Brazing ventilation system NW	81 dBA	N/A	None Required	**N/A**	**Not Hazardous**
Outside Test Cell	69 dBA	N/A	None Required	**N/A**	**Not Hazardous**
Test Cell A2	91 – 93 dBA	Inside booth	Howard Leight Max Plugs Tasco Pionear Muffs	**18 NRR** **13 NRR**	**YES** **YES**

(2) **Hearing Protection:** Hearing protectors are available in the shop, and are listed in the table above. Workers must wear Air Force approved ear plugs or muffs when noise levels are at or above 85 dBA. Workers must wear Air Force approved ear plugs in combination with muffs (double protection) when noise levels are at or above 103 dBA. The supervisor must encourage and enforce the use of hearing protection to prevent hearing loss in this shop.

(3) **Noise Dosimetry:** Monitoring was not required for processes in this shop. Exposure durations are very short duration and moderate intensity. The Air Force defines hazardous noise as levels at or above 85 dBA for a time weighted average. (TWA)

(4) **Hearing Losses:** No Employees had permanent hearing loss at the last hearing test. This indicates that personnel are using their hearing protection properly in hazardous noise areas.

c. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop. A review of the Accident/ Injury Log data and other information for this shop does not show a repetitive motion injury trend. Workers have been trained and should continue to vary tasks as much as possible and take breaks when necessary. Ergonomic risk factors are present in work processes in this shop as follows:

Ergonomic Risk Factor	**Recommended Controls**
Manual handling of generator motors that can weigh in excess of 150 pounds.	Ergonomic training and encourage workers to alter body posture when possible. Optimal height carts must be used to transport motors. Small overhead hoist used in several processes.

d. **Lighting (AFM 88-15):** A lighting survey was completed during this survey. Results indicated average light levels for the main area to be **71.4 foot-candles** for the area which is of optimal intensity for moderate to high detailed work which is performed in this shop. The IES recommends 75 to 150 footcandles for detailed work. Workers did not express any health or safety concerns related to lighting.

4. General Workplace Hygiene (AFOSH Std 91-68) and other considerations:

a. Personnel do not eat or drink in the work area where hazardous materials are present. Workplace and personal hygiene are necessary to reduce and possibly prevent ingesting hazardous materials and should be emphasized with everyone in the shop.

b. Filtering Face Piece Devices (FFPDs) are not used in this shop.

(1) **Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101):** Asbestos containing materials (ACM) were not identified in this work area.

(2) Floor tile, ceiling tile and other building materials often contain asbestos. **Do not initiate self-help or any renovations or demolition work without thoroughly identifying to SGPB all materials that may be removed or disturbed.** The correct procedure is to route a work request form (AF Form 332 or AFMC Form 299) fully describing all intended self-help or contracted work through SGPB and Environmental Management.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did include a list of all non-routine tasks and a list of hazardous materials kept in the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training.

6. Your workplace was free of the following potential hazards:

Confined space	Ionizing radiation	Lead
Asbestos-Containing Materials	Cadmium	Methylene dianiline
Hazardous Noise	Formaldehyde	
Methylene Chloride	Non-ionizing radiation	
Benzene	Carcinogens	
Heat or Cold stress	Teratogens	

7. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires further information regarding this report, please contact Bill Woods at 7-9036, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

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WILLIAM W. WOODS
Industrial Hygienist

TRAINING INFORMATION

Emergency Eyewash/Shower Units

Eyewash/Shower Units (AFOSH Std 91-32): The following information pertains to the installation, maintenance and testing requirements of emergency shower and eyewash units.

1. Emergency showers and eyewash units must be free of obstacles, within 100 feet of the operation, and require no more than ten seconds to reach. Try to locate the units as close to the hazard as possible without causing an additional hazard. The unit must be marked and easy to identify.

2. Perform and document service checks monthly on all permanently installed units to verify proper operation. The service check should verify adequate pressure, volume of water, and free flowing openings. Should fluid outlets become clogged, clean or replace them. Units in unoccupied or infrequently used areas are exempt from monthly checks; however, they must have service checks prior to the start-up of any operations that could expose personnel to hazardous materials. Documentation can be kept in a log, put in the computer or affixed to the equipment by tag or label. Include the name of the person doing the check and the date.

3. Document performance specification/installation checks every six months. These are performed in accordance with AFOSH Std 91-32, Emergency Shower and Eyewash Units, paragraph 3 and involve measuring the height of portions of the unit, actuating devices, actual spray patterns, etc. Refer to AFOSH Std 91-32, paragraph 3 for these inspection requirements.

4. Self-contained units may be used if approved by the base ground safety manager and Bioenvironmental Engineer under these conditions:

a. As an interim fix, prior to installing a permanent unit.

b. If the hazardous substance would not damage the eye.

c. In locations where permanent installation would not be feasible.

d. In field operations with no source of potable water.

e. These units shall be constructed of non-corrosive materials, shall provide a minimum of 15 minute continuous flow and the stored fluid shall be protected against contaminants and temperature extremes. These units may be filled with potable water or a solution approved by either the manufacturer or the installation medical services. Instructions and expiration dates shall be permanently affixed to the unit.

f. Units shall be tested, refilled and maintained according to manufacturer's instructions or at least quarterly. Check fluid level monthly. Attach tags or labels to the unit or adjacent to it showing fluid change schedule.

5. Eyewash bottles:

a. Eyewash bottles are not a substitute for other type units. They can be kept in the immediate vicinity where employees are working on extremely hazardous operations. They supply immediate flushing while proceeding to a permanently installed or self-contained unit.

b. Eyewash bottles are handy in remote areas where hazardous substances pose an irritant hazard, but can not cause permanent eye injury. Vehicles supporting such operations should be equipped with eyewash bottles or other means of flushing the eyes.

c. Eyewash bottles should be tested, refilled, maintained, and disposed of according to manufacturer's instructions. Watch for expiration dates.

Hazard Communication

1. Hazard Communication (AFOSH 161-21/OO-ALC-HAFBI 32-7001): While this section may duplicate some of the Administrative Controls Appendix, it specifically applies to the Hazard Communication Program and may be slightly different.

2. Written Program. Any workplace that works with hazardous materials must keep a written Hazard Communication Program. This program must include six things:

a. The base written Hazard Communication Program.

b. OO-ALC-HAFBI 32-7001 (the base written program is a separate document written by our office, current date is April 1993).

c. A copy of AFOSH Std 161-21 or reference to its location.

d. A list of the shop's hazardous materials and corresponding Material Safety Data Sheets for each item (or their location).

e. A list of non-routine tasks that your workers might do which involve hazardous materials.

f. Copies of all previous Bioenvironmental Engineering Survey Reports (annual or special evaluations).

3. Labeling. As a minimum, all containers of hazardous materials must be labeled with the base HMMS tracking label. If the manufacturer's label is present, it must be legible and not covered by other labels. Some materials are transferred to containers labeled only with an HMMS yellow or rainbow tracking label. The MSDS number on this label refers back to the MSDS from the manufacturer. If you put hazardous material into another container for use during your shift, label the container with the name of the material.

4. Training. Supervisors must ensure all workers attend the basic hazard communication training course. In addition, the supervisor must provide training in the following:

a. Hazards of all materials used in the PEG.

b. Hazards of all new materials introduced to the PEG.

c. Hazards of all materials needed to perform non-routine tasks.

d. The supervisor must document all Hazard Communication training on the worker's AF Form 55.

5. Availability. The shop supervisor must ensure this program is maintained and available to all workers. We suggest you keep all information about safety and health in one binder. The shop supervisor shall:

a. Ensure that a Hazard Communication/Workers Right to Know Program notebook is maintained and kept current.

b. Maintain all copies of Bioenvironmental Engineering surveys.

c. Inform their employees and TDY personnel of the information contained in Bioenvironmental Engineering surveys (PPE, ventilation systems, radiation hazards, etc.).

6. Responsibilities. The shop supervisor will be responsible for:

a. Adherence to all procedures outlined in the Confined Space Program.

b. Notification of the Base Radiation Safety Officer (RSO) of any changes to and additional sources of non-ionizing and ionizing radiation within the shop.

c. Enforcement of general workplace hygiene standards.

d. Notifying Bioenvironmental Engineering of personnel changes, reassignment of personnel for overtime purposes, and of changes in work processes and chemicals used.

Hazardous Noise

Hazardous Noise (AFOSH Std 48-19): Hazardous noise is common in most industrial shops. Workers who don't wear required hearing protection may succumb to occupational noise induced hearing loss, an

irreversible occupational illness (once your hearing deteriorates, it's not going to get better with time). Bioenvironmental Engineering evaluates hazardous noise during our surveys and will perform initial surveys to identify hazardous noise sources and, if needed, noise dosimetry to identify workers who are potentially overexposed to hazardous noise. Those workers found to be occupationally exposed to hazardous noise will be monitored on the Hearing Conservation Program; provided annual audiometric evaluations as part of their occupational physicals. Shop supervisors must:

1. Post identified hazardous noise areas or specific hazardous noise sources. You may use Air Force Visual Aids (AFVA) 48-101, 48-103 and 48-105 for these signs. (AFVA 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment).

2. Make ear plugs <u>and/or</u> muffs available when needed.

3. Assure only Air Force approved hearing protection is provided.

4. Enforce the use of hearing protection when working with identified hazardous noise sources or within posted hazardous noise areas. Different hazardous noise levels warrant more stringent hearing protection. Ensure workers wear prescribed hearing protection (plugs or muffs, plugs and muffs, or plugs and muffs with a time limit).

5. Identify any new hazardous noise sources or possible hazardous noise operations to Bioenvironmental Engineering for further evaluation.

DEPARTMENT OF THE AIR FORCE
75TH MEDICAL GROUP (AFMC)
HILL AIR FORCE BASE, UTAH

14 June 2001

MEMORANDUM FOR LMSF/MKPSB

FROM: 75 AMDS/SGPB

SUBJECT: Summary of Bioenvironmental Engineering Survey, Winch Shop, Bldg 847

1. Bioenvironmental Engineering Flight (SGPB) is required by AFI 48-101, Aerospace Medical Operations, and AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*, to complete an annual survey/assessment of work areas and processes. William W. Woods, of Bioenvironmental Engineering Services, evaluated potentially hazardous work practices and processes in Winch Shop, Bldg 847.

2. No deficiencies were observed during this survey. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

MARK H. SMITH, Lt Col, USAF, BSC
Commander, Bioenvironmental Engineering Flight

Attachments:
1. Bioenvironmental Engineering Survey Report
2. Training Information

cc:

LMSM (Craig Nielsen)
LMSO
AFGE 1592
SEGO W/O Atch

BIOENVIRONMENTAL ENGINEERING SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted during the period May 17, 2001 to June 12, 2001. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by the Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. **Potential Exposure Groups (PEGs):** Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to **PEG 847H1**. A personnel roster was updated during the survey. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. Personnel perform a depot level maintenance and modification of missile support mechanical systems such as winches and hoists. Employees use hand tools and powered hand tools such as small drills. Shop uses solvents and greases. No sustainable sources of hazardous noise. Separated from 847E2 in 1999.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PEG: 847H1

AREAS REVIEWED	POTENTIAL HAZARDS	CURRENT CONTROLS
Expansion Oven heat treat of winch parts	Inhalation of smoke from burnt greases	Low temperature of 259 degrees. Clean grease of before treatment.
Application of solvents, adhesives and greases	Inhalation of vapors or skin contact hazard	Perform in well ventilated area and chemical resistant gloves. May use face shield with Stoddard solvent tank.
Testing and mechanical repair of parts	Hazardous Noise	ear plugs or muffs

All controls listed above adequately control exposures to chemical and physical hazards in this shop.

(2) Potential Process Hazard Monitoring: Based on limited use and short duration of hazardous chemicals or materials, no further monitoring of current processes is necessary.

(3) **Evaluation of Specific Controls:**

(a) **Ventilation Controls (AFOSH Std 161-2):** This shop does not have local ventilation systems.

(b) **Personal Protective Equipment (PPE) (29 CFR 1910.132-138, AFOSH Stds** 91-31& 48-1): We inspected available PPE listed above for proper use, condition, and availability. Bill Woods of Bioenvironmental Engineering Services certifies that all recommended PPE meet the requirements of the standard and was readily available and properly maintained.

PROTECTIVE EQUIPMENT TYPE	**EQUIPMENT LIMITATIONS**
Butyl rubber or Nitrile gloves	Minimal heat and tear resistance
Face shield	No respiratory protection from toxic or caustic vapors
HL Max earplugs	Protect up to noise levels of 102 dBA
Safety Direct Muffs	Protect up to noise levels of 97 dBA

(c) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** Respiratory protection is not required for processes performed in this shop.

3. **Workplace evaluation applicable to this shop:**

a. **Eyewash/ Shower Unit (AFOSH Std 91-32):** This shop does have a eyewash/ shower units. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop do meet the requirements of the standard. Refer to Attached training information for further guidance on eyewash/shower unit.

b. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated.

(1) **Equipment/Processes:** Noise Measurements were taken during this survey. Several processes in this shop involve potential exposure to hazardous levels of noise. Warning signs have been placed where applicable**.** Personnel working within the hazardous noise areas must wear hearing protection when that piece of equipment is being operated. Employees who may be exposed to noise levels above 85 dBA for a shift time weighted average are placed on a Hearing Conservation Program. Employees in PEG 847H1 are not currently on the Hearing Conservation Program. A summary of noise sources is as follows:

HAZARDOUS NOISE SOURCES e	MEASURED LEVELS IN dBA	Distance to 85 dBA Line	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION IN dBA	ADEQUATE?
Testing Winch Motors	98 dBA at operation	15 feet	Howard Leight Max Ear Plugs or Safety Direct RBW-71 Muffs	**18 NRR** **13 NRR**	**YES** **YES**
Hammering on Parts (impact noise)	95 dBA	10 feet	Howard Leight Max Ear Plugs or Safety Direct RBW-71 Muffs	**18 NRR** **13 NRR**	**YES** **YES**
C5 Winch Tester	84 dBA	N/A	N/A	N/A	N/A

(2) **Hearing Protection:** Hearing protectors are available in the shop, and are listed in the table above. Workers must wear Air Force approved ear plugs or muffs when noise levels are at or above 85 dBA. Workers must wear Air Force approved ear plugs in combination with muffs (double protection) when noise levels are at or above 103 dBA. The supervisor must encourage and enforce the use of hearing protection to prevent hearing loss in this shop.

(3) **Noise Dosimetry:** Estimated noise doses are as follows:

Process:	**Daily Duration/ Limiting DD:**	**Estimated Noise Dose: (100% is hazardous)**
Testing Winch Motors	15 mins / 24 mins	63%

Estimated noise exposures are well below the maximum time weighted average dose of 100 percent. Noise levels are estimated to be well below the 85 dBA for a time weighted average exposure. A noise dosimetery was not necessary due to the infrequent exposure to hazardous noise and estimated noise exposures.

c. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop. A review of the Accident/ Injury Log data and other information for this shop do show a repetitive motion injury trend related to lifting heavy parts. Workers have been trained and should continue to vary tasks as much as possible and take breaks when necessary. Ergonomic risk factors are present in work processes in this shop as follows:

Ergonomic Risk Factor	**Recommended Controls**
Lifting and handling heavy parts.	Overhead hoists available. Effective ergonomic training designed for each specific task.

d. **Lighting (AFM 88-15):** A lighting survey was completed during a previous survey. Average light intensity for general illumination was **79.5 foot-candles** which meets the standard. Workers did not express any health or safety concerns related to lighting.

4. **General Workplace Hygiene (AFOSH Std 91-68) and other considerations:**

a. Personnel do not eat or drink in the work area where hazardous materials are present. Workplace and personal hygiene are necessary to reduce and possibly prevent ingesting hazardous materials and should be emphasized with everyone in the shop.

b. Filtering Face Piece Devices (FFPDs) are not used in this shop.

(1) **Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101):** Asbestos containing materials (ACM) were not identified during this survey.

(2) Floor tile, ceiling tile and other building materials often contain asbestos. **Do not initiate self-help or any renovations or demolition work without thoroughly identifying to SGPB all materials that may be removed or disturbed.** The correct procedure is to route a work request form (AF Form 332 or AFMC Form 299) fully describing all intended self-help or contracted work through SGPB and Environmental Management.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did include a list of all non-routine tasks and a list of hazardous materials kept in the shop. Containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training.

6. Your workplace was free of the following potential hazards:

Asbestos-Containing Materials	Carcinogens	Confined spaces
Methylene Chloride	Teratogens	
Benzene	Lead	
Ionizing radiation	Methylene dianiline	
Non Ionizing radiation	Cadmium	
Formaldehyde	Heat and cold stress	

7. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires further information regarding this report, please contact Bill Woods at 7-9036, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

WILLIAM W. WOODS
Industrial Hygienist

TRAINING INFORMATION

Hazard Communication

1. Hazard Communication (AFOSH 161-21/OO-ALC-HAFBI 32-7001): While this section may duplicate some of the Administrative Controls Appendix, it specifically applies to the Hazard Communication Program and may be slightly different.

2. Written Program. Any workplace that works with hazardous materials must keep a written Hazard Communication Program. This program must include six things:

a. The base written Hazard Communication Program.

b. OO-ALC-HAFBI 32-7001 (the base written program is a separate document written by our office, current date is April 1993).

c. A copy of AFOSH Std 161-21 or reference to its location.

d. A list of the shop's hazardous materials and corresponding Material Safety Data Sheets for each item (or their location).

e. A list of non-routine tasks that your workers might do which involve hazardous materials.

f. Copies of all previous Bioenvironmental Engineering Survey Reports (annual or special evaluations).

3. Labeling. As a minimum, all containers of hazardous materials must be labeled with the base HMMS tracking label. If the manufacturer’s label is present, it must be legible and not covered by other labels. Some materials are transferred to containers labeled only with an HMMS yellow or rainbow tracking label. The MSDS number on this label refers back to the MSDS from the manufacturer. If you put hazardous material into another container for use during your shift, label the container with the name of the material.

4. Training. Supervisors must ensure all workers attend the basic hazard communication training course. In addition, the supervisor must provide training in the following:

a. Hazards of all materials used in the PEG.

b. Hazards of all new materials introduced to the PEG.

c. Hazards of all materials needed to perform non-routine tasks.

d. The supervisor must document all Hazard Communication training on the worker's AF Form 55.

5. Availability. The shop supervisor must ensure this program is maintained and available to all workers. We suggest you keep all information about safety and health in one binder. The shop supervisor shall:

a. Ensure that a Hazard Communication/Workers Right to Know Program notebook is maintained and kept current.

b. Maintain all copies of Bioenvironmental Engineering surveys.

c. Inform their employees and TDY personnel of the information contained in Bioenvironmental Engineering surveys (PPE, ventilation systems, radiation hazards, etc.).

6. Responsibilities. The shop supervisor will be responsible for:

a. Adherence to all procedures outlined in the Confined Space Program.

b. Notification of the Base Radiation Safety Officer (RSO) of any changes to and additional sources of non-ionizing and ionizing radiation within the shop.

c. Enforcement of general workplace hygiene standards.

d. Notifying Bioenvironmental Engineering of personnel changes, reassignment of personnel for overtime purposes, and of changes in work processes and chemicals used.

Hazardous Noise

Hazardous Noise (AFOSH Std 48-19): Hazardous noise is common in most industrial shops. Workers who don't wear required hearing protection may succumb to occupational noise induced hearing loss, an irreversible occupational illness (once your hearing deteriorates, it's not going to get better with time). Bioenvironmental Engineering evaluates hazardous noise during our surveys and will perform initial surveys to identify hazardous noise sources and, if needed, noise dosimetry to identify workers who are potentially overexposed to hazardous noise. Those workers found to be occupationally exposed to hazardous noise will be monitored on the Hearing Conservation Program; provided annual audiometric evaluations as part of their occupational physicals. Shop supervisors must:

1. Post identified hazardous noise areas or specific hazardous noise sources. You may use Air Force Visual Aids (AFVA) 48-101, 48-103 and 48-105 for these signs. (AFVA 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment).

2. Make ear plugs <u>and/or</u> muffs available when needed.

3. Assure only Air Force approved hearing protection is provided.

4. Enforce the use of hearing protection when working with identified hazardous noise sources or within posted hazardous noise areas. Different hazardous noise levels warrant more stringent hearing protection. Ensure workers wear prescribed hearing protection (plugs or muffs, plugs and muffs, or plugs and muffs with a time limit).

5. Identify any new hazardous noise sources or possible hazardous noise operations to Bioenvironmental Engineering for further evaluation.

DEPARTMENT OF THE AIR FORCE
75TH MEDICAL GROUP (AFMC)
HILL AIR FORCE BASE UTAH

21 August 2002

MEMORANDUM FOR OO-ALC/MAKGBD

FROM: 75 AMDS/SGPB

SUBJECT: Bioenvironmental Engineering Survey Summary, Missile Transportation Systems Sheetmetal Shop (MAKGBD), Bldg 847

1. Bioenvironmental Engineering Flight (SGPB) is required by AFI 48-101, Aerospace Medical Operations, and AFI 91-301, *Air Force Occupational and Environmental Safety Fire Protection and Health (AFOSH) Program*, to complete an annual survey/assessment of work areas and processes. William W. Woods, of Bioenvironmental Engineering Services, evaluated potentially hazardous work practices and processes in Missile Transportation Systems Sheetmetal Shop, Bldg 847

2. The deficiency that involved manual pan brakes has been resolved by replacing the facilities in question with more ergonomically designed brakes.

3. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

WILLIAM W. WOODS
Industrial Hygienist,
Bioenvironmental Engineering Services

Attachments:
1. Survey Discussion
cc:
MAPE (Mike Hall)
SEGO
AFGE

19 August 2002

DETAILED REPORT, BIOENVIRONMENTAL ENGINEERING SURVEY
Missile Transportation Sheet Metal Shop, Building 847

1. A Bioenvironmental Engineering survey was conducted on 19 August, 2002. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by the Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. **Potential Exposure Groups (PEGs):** Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to **PEG Z30**. A personnel roster was updated during the survey. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. Z30: Personnel perform various sheetmetal tasks in maintenance of the missile ground support systems and transportation vehicles. Workers perform sanding, grinding, cutting, riveting, drilling and metal bending. Steel and aluminum are the most common materials that are worked on. Potential chemical exposures include metal dusts. Other tasks that are occasionally performed include foam insulation injection, fiberglass lay up and minor painting.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PEG: Z30

Process	Hazard	Control
Metal Cutting (Power Shears & Grinder)	Inhalation, ingestion, and contact hazard from metal dust.	Adequate dilution ventilation, nitrile gloves and personal hygiene
	Exposure to hazardous noise	E-A-R plugs or ear muffs
	Mechanical hazard to eye	Safety goggles or face shield
	Ergonomic risk factors (awkward body position	Ergonomic training, task/job redesign or employee rotation, work breaks,

	repetitive motions, vibration, impact and force)	ergonomically designed tools and work gloves, proper lifting techniques, and foam/ support pads for sitting and kneeling on hard work surfaces.
Riveting (Hand or Pneumatic)	Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	E-A-R plugs or ear muffs Safety goggles or face shield Ergonomic training and, task/ job redesign
Metal Sanding (Pneumatic)	Inhalation, ingestion, and contact hazard from metal dust. Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors (awkward body position repetitive motions, vibration, impact and force)	Adequate dilution ventilation, nitrile gloves and personal hygiene E-A-R plugs or ear muffs Safety goggles or face shield Ergonomic training, task/job redesign, employee rotation, ergonomically designed tools and work gloves, proper lifting techniques, and foam/ support pads for sitting and kneeling on hard work surfaces.
Riveting (Hand or Pneumatic)	Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	E-A-R plugs or ear muffs Safety goggles or face shield Ergonomic training and task/ job redesign
Metal Drilling (Hand Drill, Drill Press, Power Punch & Hand Punch)	Inhalation, ingestion, and contact hazard from metal dust. Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	Adequate dilution ventilation, nitrile gloves and personal hygiene E-A-R plugs or ear muffs Safety goggles or face shield Ergonomic training and, task/job redesign.
Metal Bending (Power Brake & Hand Brake)	Exposure to hazardous noise High Ergonomic risk factors	E-A-R plugs or ear muffs Replacement of manual equipment Ergonomic training and, task/job redesign.
Foam Insulation injection	Inhalation, ingestion, and contact hazard from expanding liquid foam Exposure to hazardous noise	Adequate dilution ventilation, Nitrile gloves and proper personal hygiene E-A-R plugs or ear muffs

	Chemical hazard to eye Ergonomic risk factors	Safety goggles or face shield Ergonomic training and, task/job redesign.
Foam Insulation Sanding	Inhalation, ingestion, and contact hazard from epoxy resins Exposure to hazardous noise Chemical hazard to eye Ergonomic risk factors	Adequate dilution ventilation, nitrile gloves and personal hygiene E-A-R plugs or ear muffs Safety goggles or face shield Ergonomic training, task/job
Fiber Glass Sanding	Inhalation, ingestion, and contact hazard from dusts Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	Adequate dilution ventilation, nitrile gloves and personal hygiene E-A-R plugs or ear muffs Safety goggles or face shield Ergonomic training, task/job redesign.

(2) **Potential Process Hazard Monitoring**: Based on limited use and short duration of hazardous chemicals or materials, no further monitoring of current processes is necessary.

(3) **Carcinogens**: Cadmium and lead are suspected carcinogens. These substances may be present on the objects being worked. These materials do not pose a health hazard as long as personnel continue to follow the work practices identified in para 2a (1).

(4) **Evaluation of Specific Controls:**

(a) **Ventilation Controls** (AFOSH Std 161-2): This shop does not need local ventilation systems to control airborne contaminants from existing work processes.

(b) **Personal Protective Equipment (PPE) (29 CFR 1910.132-138, AFOSH Stds** 91-31& 48-1): We inspected available PPE listed above for proper use, condition, and availability. Bill Woods of Bioenvironmental Engineering Services certifies that all recommended PPE meet the requirements of the standard and was readily available and properly maintained.

(b) **Respiratory Protection** (29 CFR 1910.134, AFOSH Std 48-1): This shop does not have a need for respiratory protection.

3. **Workplace evaluation applicable to this shop:**

a. **Eyewash Unit (AFOSH Std 91-32):** This shop does have several eyewash/ shower units unit. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop do meet the requirements of the standard. **Note: Beginning in 2001, required frequency of operational checks has increased.** This shop also has a portable eyewash unit which is limited to being used as a interim unit only until the employee can be moved to a fixed unit.

b. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated. The following table provides a reference of hazardous noise sources and their required hearing protection:

(1) **Equipment/Processes:** Noise Measurements were taken during a previous survey. Some processes in this shop involve potential exposure to hazardous levels of noise. Warning signs have been placed where hazardous noise may be present**.** Personnel working within the hazardous noise areas must wear hearing protection when that piece of equipment is being operated. Employees who may be exposed to noise levels above 85 dBA for a shift time weighted average are placed on a Hearing Conservation Program. Employees in PEG Z30 are currently on the Hearing Conservation Program. A summary of noise sources is as follows:

HAZARDOUS NOISE SOURCES	MEASURED LEVELS IN dBA	Distance to 85 dBA Line	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION IN dBA	ADEQUATE?
Sears Bandsaw	103	13 ft	EAR Foam Ear Plugs and Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
10 in Disc Sander	102	12 ft	EAR Foam Ear Plugs Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
3x Rivet Gun	99	9 ft	EAR Foam Ear Plugs Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
National Power Brake	97	7 ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
Wissota Grinder/Buffer	95	6 ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**

Doall Bandsaw	92	ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
Wysong Miles Power Shear	89	ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
High Speed Grinder	89	ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
Verson Allsteel Press	87	ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
Peck, Stow Cut-Off Shear	86	ft	EAR Foam Ear Plugs or Tasco Pionear muffs	**22 NRR** **13 NRR**	**YES** **YES**
Drill Motor	81	N/A	N/A	N/A	N/A
General Drill Press	78	N/A	N/A	N/A	N/A

(2) **Hearing Protection:** Hearing protectors are available in the shop, and are listed in the table above. Workers must wear Air Force approved ear plugs or muffs when noise levels are at or above 85 dBA. Workers must wear Air Force approved ear plugs in combination with muffs (double protection) when noise levels are at or above 103 dBA. The supervisor must encourage and enforce the use of hearing protection to prevent hearing loss in this shop.

(3) **Dosimetry**: Noise dosimetry was completed during a previous survey revealed Average TWA of 90.4 dBA. The Air Force defines hazardous noise as noise levels more than 85 dBA averaged over an eight-hour period.

(4) **Hearing Losses:** There have been cases of hearing loss in this shop in past years. This may indicate that personnel are not using their hearing protection properly in hazardous noise areas. The supervisor must encourage and enforce the use of hearing protection to prevent additional hearing shifts in this shop. Please refer to Appendix C for further guidance.

c. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop.

ERGONOMIC RISK FACTOR	RECOMMENDED CONTROLS
High Ergonomic risk factors when operating the Pan Breaks to bend 1/6th grade steel and aluminum. Several employees have experienced cumulative trauma disorders as a result of	Manual Pan Brakes have been replaced with more ergonomically designed brakes. RAC KRMS20010322013E issued on 3/22/2001 pertains to this problem has

operating the brakes.	been resolved and will be closed.
Ergonomic risk factor (awkward body positions, hand and pneumatic tools, repetitive motions, vibration, impact and force) are present when cutting, sanding, grinding, drilling, bending and riveting metal.	Ergonomic training, task/job rotation, work breaks, ergonomically designed tools and work gloves, proper lifting techniques, and foam/support pads for sitting and kneeling on hard work surfaces.

Conclusion: The sheetmetal workers are at risk for developing cumulative trauma disorders. Work-related injuries are commonly associated with these risk factors. Administrative controls, (training, breaks, etc.) proper use of equipment and replacement of some equipment can help reduce ergonomic stresses and prevent injuries. Personnel should continue to follow the controls identified in this letter to prevent any possible injuries in the future.

d. **Heat or Cold Stress** (AFM 160-1): Workers do not perform tasks in conditions of extreme heat or cold.

e. **Lighting** (AFM 88-15): General illumination and task levels in this shop have met or exceeded the required Air Force standards

4. **General Workplace Hygiene (AFOSH Std 91-68) and other considerations:**

a. Personnel do not eat or drink in the work area where hazardous materials are present. Workplace and personal hygiene are necessary to reduce and possibly prevent ingesting hazardous materials and should be emphasized with everyone in the shop.

b. Filtering Face Piece Devices (FFPDs) may occasionally be used in this shop for comfort purposes only.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did include non-routine tasks and a list of hazardous materials is kept in the shop. All containers of hazardous materials are stored in another shop. A review of the Air Force Forms 55 shows workers have received HAZCOM training. Refer to appendix B for further guidance.

6. Your workplace was free of the following potential hazards:

Asbestos-Containing Materials	Carcinogens	Lead
Methylene Chloride	Teratogens	Chromates
Benzene	Methylene dianiline	
Non ionizing radiation	Cadmium	
Ionizing radiation	Formaldehyde	

7. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires further information regarding this report, please contact Bill Woods at 7-9036, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation

_____

WILLIAM W. WOODS
Industrial Hygienist

DEPARTMENT OF THE AIR FORCE
75TH AEROSPACE MEDICINE SQUADRON (AFMC)
HILL AIR FORCE BASE UTAH

29 Aug 02

MEMORANDUM FOR MAKGAC

FROM: 75 AMDS/SGPB

SUBJECT: Summary of Bioenvironmental Engineering Survey, Corrosion Control Shop, Bldg 847

1. Bioenvironmental Engineering Flight (SGPB) is required by AFI 48-101, Aerospace Medical Operations, and AFI 91-301, *Air Force Occupational and Environmental Safety Fire Protection and Health (AFOSH) Program*, to complete an annual survey/assessment of work areas and processes. William W. Woods, of Bioenvironmental Engineering Services, evaluated potentially hazardous work practices and processes in Missile Transportation Corrosion Control Shop, Bldg 847.

2. No deficiencies were observed during the survey. Please contact Bioenvironmental Engineering Services at 7-4551, if you have any questions.

WILLIAM W. WOODS
Industrial Hygienist,
Bioenvironmental Engineering Services

Attachments:
1. Bioenvironmental Engineering Survey Report

cc:
MAK/CC w/o Atch
AFGE 1592 w/o Atch
SEG w/1 Atch

28 Aug 02

BIOENVIRONMENTAL ENGINEERING SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted for the Corrosion Control Shop during the period of 22 - 28 Aug 02. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by the Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to one PEG. Personnel rosters for this PEG are attached. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. **PEG 847B1:** Workers in this PEG perform media blast and protective coating applications (painting) on all of the SICBM missile transportation, ground support equipment, and aircraft generator depot maintenance. Workers also perform paint stripping, steam cleaning, and other associated prep-cleanup work.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES	HAZARD	CURRENT CONTROLS
Media Blasting	Inhalation of heavy metal dust (cadmium, chromium, inorganic lead, etc…)	Air supplied helmet, coveralls, leather gloves, steel toe boots, showers and annual physicals.
	Hazardous noise area	Howard Lite Max earplugs (NRR 18) Sound Guard ear plugs (NRR 33) Pionear 2500 ear muffs (NRR 25)*
Stripping/Painting	Inhalation of toxic vapors from cleaning solvent and paint.	Air purifying half -face respirators with organic vapor (OV)/P100 cartridges or air supplied hood, nitrile gloves, Tyvex coveralls, goggles or faceshield.
	Hazardous noise area	Howard Lite Max earplugs (NRR 18) Sound Guard ear plugs (NRR 29) Pionear 2500 ear muffs (NRR 25)*
Steam Cleaning Trailers & Parts	Heat Stress	Tyvek protective suit, face shield/goggles, rubber (yellow) gloves and limit exposure time to the hot environment.
General Tasks: Ergonomics	Moderate ergonomic risk factors for repetitive motion injury to wrists, arms, shoulders, and back.	Ergonomics awareness training, use lifting equipment, worker take appropriate breaks.

All the controls listed above adequately control exposures to chemical and physical hazards in this shop, unless marked with an asterisk. The controls marked with an asterisk are not adequate and require corrective action as recommended below.

b. **Evaluation of Chemical Exposure Hazards:** Our evaluation of exposure to hazardous chemicals during the media blasting process shows concentrations below the allowed limit. However, OSHA requires that at least 2 consectutive samples (at least 7 days apart) show concentrations below the action level (half of the occupational exposure level). **More air sampling will be accomplished during the second week of Sept 2002, IAW with the OSHA specific standard for cadmium.** For a detailed

list of the past results, see letters dated 4 April 02 and 26 Oct 01, which are located in your HazCom Binder. Results shown from prior years are still valid since process parameters are unchanged.

c. **Specific Hazards Requirements:** Exposure to certain chemicals at levels above the action level (AL), i.e., one-half the occupational exposure limit (OEL), requires specific actions. These are chemicals that are known human carcinogens as listed by the International Agency for Research on Cancer (IARC), or have specific programs prescribed by OSHA. Exposure to these materials should be kept as low as reasonably achievable. Use of these materials should not pose a health hazard when proper controls are used. OSHA requires specific actions upon exposure to certain chemicals, regardless of exposure level. These actions include worker notification, training, and medical surveillance. The following materials have been identified in your work area.

PROCESS	ITEM DESCRIPTION	CHEMICAL
Media Blasting	Metal dust	Cadmium

d. **Evaluation of Specific Controls:**

(a) **Ventilation:** Local ventilation systems control airborne contaminants. All ventilation units are operation, but will not be running for the next week or so. This table gives the results of airflow rates measured for each system.

SYSTEM	FLOW RATE	IAW/ ACGIH RECOMMENDED FLOW RATES
Small Paint Booth AQUIS # 3247	178 fpm	100 fpm
Large Drive in Paint booth AQUIS # 3248	226 fpm	60 fpm
Large Drive-thru Paint Booth AQUIS # 3156	75 fpm	60 fpm
Media Blast Booth (Supply)	419 fpm	350 fpm
Media Blast Booth (Exhaust)	446 fpm	350 fpm

(b) **Respiratory Protection (29 CFR 1910.134, AFOSH Std 48-137):** We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Required respirators are specified in paragraph 2.b.(1). Respirator limitations are reviewed below. Workers have been fit-tested and are familiar with the use of respirators. Respirators are adequately stored and maintained.

PROCESS NAME	SPECIFIC RESP PROTECTION	RESPIRATOR LIMITATIONS
Media Blast	3M Air Supplied Helmet	Cannot be used in IDLH conditions without a designated escape bottle and limited hose length
Painting	Hood or 3M Full Face Air supplied	Same as above.
Sanding and Painting w/ enamels	3M Half Face w/ OV/P100	Cartridge specific protection; not oxygen-supplying; therefore, cannot be used in oxygen deficient atmospheres

1 **Cartridge Change-Out Schedule:** The OV/P100 cartridges are used in your shop for vapors, mists, and particulates. These must be changed out within 8 hours of use or shorter durations especially when workers begin to notice a taste or smell from the product they are using, or when breathing becomes restricted.

2 **Air Supplied Respirators:** The following breathing air systems are present in PEG 847B1. Bill Woods inspected these systems and certifies that all components meet with all governing standards. Breathing air quality must be inspected and certified every 90 days to assure it meets Grade D specifications. This certification was available and is located in the HazCom binder.

BREATHING AIR SYSTEM	LOCATION	QUICK CONNECT INCOMPATIBLE?	MASK/HOSE MFG SAME?
Ingersoll-Rand Air Compressor	In center of Bldg 847.	Yes	Yes
Del-mox Air Purifying Breathing Air System	In center of Bldg 847.	Yes	Yes

3 Annual respiratory protection training will be given to the supervisor and wearers at a latter date. Training included proper wear, storage, inspection, cleaning, hazardous processes and the effects of overexposure to materials in the shop.

e. **Personal Protective Equipment (PPE)(29 CFR 1910.132-138, AFOSH Stds 91-31, 48-137):** I inspected the PPE listed in paragraph 2.b.(1) for proper use, condition and availability. All PPE meets the requirements of the standards and was readily available and properly maintained. William Woods certifies that the recommended PPE is adequate for the shop processes. We reviewed your AFF 55; all workers who use PPE have been trained and the training has been documented.

f. **Eyewash/Shower Units (AFOSH Std 91-32):** This shop has 4 portable eyewash units. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop do meet the requirements of the standard. **Note: Beginning in 2001, required frequency of operational checks has increased.** Refer to Attachment 2 for further eyewash/shower unit

g. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated. See below for recommended hearing protection.

HAZARDOUS NOISE SOURCE	MEASURED dBA LEVEL	85 dBA LINE	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION	ADEQUATE?
Media Blast Booth South End (5ft away)	86	≈1ft	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes Yes
Media Blast Booth NE door	83	N/A	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes Yes
Media Blast Booth SE door by collector	92	Entire area	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes Yes
Inside Media Blast Booth	91	Entire area	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes Yes
Small Paint Booth at Face	99	Entire area	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes **Yes, but for no longer than 381 mins.**
Small Paint Booth at overhead door	92	Entire area	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes Yes
Glove box	99	Entire area	Sound Guard Max plugs(18) Tasco Pionear 2500 muffs(13)	18 13	Yes **Yes, but for no longer than 381 mins.**

(1) **Dosimetry:** Monitoring during 14 & 17 Nov 00 ranged from 81.9 – 95.3 dBA for painters and media blasters. The Air Force defines hazardous noise as exposure to noise levels more than 85 dBA averaged over an eight-hour period.

(2) **Hearing Losses:** Individuals in your shop have had a permanent hearing threshold shift at previous hearing test. This indicates that personnel may not be using their hearing protection in hazardous noise areas. The supervisor must encourage and enforce the use of hearing protection to prevent additional hearing shifts in this shop.

h. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop. A review of the Accident/Injury Log data and other information for this shop does not show a repetitive motion injury trend. Workers have been trained and should continue to vary tasks as much as possible and take breaks when necessary. Our observation of the shop process does not indicate further analysis is required.

i. **Lighting (AFM 88-15):** Workers did not express any health or safety concerns related to lighting.

3. **General Workplace Hygiene (AFOSH Std 91-68) and Other Considerations:**

a. Personnel do not eat or drink in the work area where hazardous materials are present. Workplace and personal hygiene are necessary to reduce and possibly prevent ingesting hazardous materials and should be emphasized with everyone in the shop.

b. **Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101):** Asbestos containing materials (ACM) were not identified in this work area. ACM's that are in good condition are not a health hazard.

4. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did not include a list of all non-routine tasks, but did contain a list of hazardous materials kept in the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. A review of the Air Force Forms 55 shows workers have received HAZCOM training.

5. Your workplace was free of the following potential hazards:

Confined space	Heat or Cold stress	Non-ionizing radiation
Asbestos-Containing Materials	Methylene Chloride	Methylene dianiline
Benzene	Ionizing radiation	Teratogens
Formaldehyde	Lead	

6. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires further information regarding this report, please contact Mr. Bill Woods at 777-9036, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

WILLIAM W. WOODS
Industrial Hygienist

DEPARTMENT OF THE AIR FORCE
75TH MEDICAL GROUP (AFMC)
HILL AIR FORCE BASE UTAH

15 Oct 2001

MEMORANDUM FOR OO-ALC/LMSTB

FROM: 75 AMDS/SGPB

SUBJECT: Bioenvironmental Engineering Survey Summary, Missile Transportation Systems Welding Shop, Bldg 847

1. Bioenvironmental Engineering Flight (SGPB) is required by AFI 48-101, Aerospace Medical Operations, and AFI 91-301, *Air Force Occupational and Environmental Safety Fire Protection and Health (AFOSH) Program*, to complete an annual survey/assessment of work areas and processes. William W. Woods, of Bioenvironmental Engineering Services, evaluated potentially hazardous work practices and processes in Missile Transportation Systems Welding Shop, Bldg 847.

2. The following deficiencies were observed during the survey. Please provide a plan of action for correcting these deficiencies within 15 working days.

DEFICIENCY	CORRECTIVE ACTION REQUIRED
Nederman Local Exhaust system located on south wall has been non operational for two years.	Repair, remove or replace unit

3. Please contact Bioenvironmental Engineering Services at 7-4551 if you have any questions.

MARK H. SMITH, Lt Col, USAF, BSC
Commander, Bioenvironmental Engineering Flight

Attachments:
1. Survey Discussion
2. Training Information

cc:

LMSO (Mike Hall)
LMSMT (Jay Raymond)
LMSMT (Gary Petersen)
SEGO
AFGE

11 Oct 2001

DETAILED REPORT, BIOENVIRONMENTAL ENGINEERING SURVEY
LM Missile Transportation Welding Shop, Building 847

1. A Bioenvironmental Engineering survey was conducted on October 11, 2001. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by the Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. **Potential Exposure Groups (PEGs):** Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been assigned to **PEG Z36**. A personnel roster was updated during the survey. Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. **Z36:** Personnel perform various types of welding (stick, MIG, TIG) cutting and brazing (oxygen-acetylene, plasma arc), and soldering in maintenance of the missile ground support systems and transportation vehicles. Workers may also do some sanding and grinding. Steel and aluminum are the most common materials that are worked on. Potential chemical exposures include metal fumes and dusts. (include nickel and zinc) Potential physical exposures include hazardous noise, ultraviolet radiation, and ergonomic risk factors (awkward body positions, vibration, and force).

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PEG: Z30 - Missile Trailer Repair

Process	Hazard	Control
Welding (MIG, TIG, and stick) –	Inhalation, ingestion, and contact hazards from metal fumes (nickel and zinc) Thermal skin and eye exposure to ultraviolet radiation Ergonomic risk factor (Heavy lifting and awkward body positions)	Local exhaust ventilation and coveralls For hard to reach areas use respiratory protection. Welders helmet and leather gloves Ergonomic training, work breaks,task rotation and mechanical lifting assistance
Cutting and Brazing (Plasma Arc and Oxygen Acetylene) –	Inhalation, ingestion, and contact hazards from heavy metal fumes (nickel and zinc) Thermal skin and eye exposure to ultraviolet Radiation Exposure to hazardous noise (plasma arc cutting only) Ergonomic risk factor (Heavy lifting and awkward body positions)	Local exhaust ventilation and coveralls * For hard to reach areas use respiratory protection. Welders helmet and leather gloves Ear plugs or muffs Ergonomic training, work breaks, and task rotation
Soldering –	Inhalation, ingestion, and contact hazards from heavy metal fumes Ergonomic risk factor (awkward body positions)	Local exhaust ventilation and coveralls * Ergonomic training, work breaks, and task rotation
Riveting (Hand or Pneumatic)	Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	Ear plugs or muffs Safety goggles or face shield Ergonomic training and, task/ job redesign
Metal Sanding (Pneumatic)	Inhalation, ingestion, and contact hazard from heavy metal dust Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors (awkward body position repetitive motions, vibration,	Adequate dilution ventilation, nitrile gloves and personal hygiene Ear plugs or muffs Safety goggles or face shield Ergonomic training, task/job redesign, employee rotation, ergonomically designed tools and work gloves, proper

	impact and force)	lifting techniques, and foam/ support pads for sitting and kneeling on hard work surfaces.
Riveting (Hand or Pneumatic)	Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	Ear plugs muffs Safety goggles or face shield Ergonomic training and task/ job redesign
Metal Sanding (Pneumatic)	Inhalation, ingestion, and Contact hazard from dust Mechanical hazard to eye Exposure to hazardous noise Ergonomic risk factors	Adequate dilution ventilation, nitrile gloves and personal hygiene Safety goggles or face shield Ear plugs or muffs Ergonomic training and, task/ job redesign
Metal Grinding and Sanding	Inhalation, ingestion, and Contact hazard from dust Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	Adequate dilution ventilation, nitrile, gloves and personal hygiene Ear plugs or muffs Safety goggles or face shield Ergonomic training and, task/job redesign.
Metal Drilling (Hand Drill, Drill Press, Power Punch & Hand Punch)	Inhalation, ingestion, and contact hazard from dust Exposure to hazardous noise Mechanical hazard to eye Ergonomic risk factors	Adequate dilution ventilation, nitrile gloves and personal hygiene Ear plugs or muffs Safety goggles or face shield Ergonomic training and, task/job redesign.

* Minimal respiratory protection of a half-face respirator with P-100 (HEPA) cartridges is required if ventilation systems are not available or if the materials being worked on are cadmium plated.

All controls listed above adequately control exposures to chemical and physical hazards in this shop

(2) **Potential Process Hazard Monitoring**: Based on limited use and short duration of hazardous chemicals or materials, no further monitoring of current processes is necessary.

(3) **Carcinogens**: Cadmium and lead are suspected carcinogens. These substances may be present on the objects being worked. These materials should not pose a health hazard

as long as personnel continue to follow the work practices identified in para 2a.(1). Also the following materials in your inventory contain carcinogens:

NSN/CAGE	ITEM DESCRIPTION	CONSTITUENT
3439005119704/24559	Stainless Steel Bare Wire, AWS 308L	Nickel
3439P25507181/6S493	SMAW Electrode, Type Code Arc 9018M; Welding Rod	Nickel
3439P308LP/ORJ41	Electrodes for flux cored arc welding	Nickel

(4) **Specific Hazardous Material Programs**: No longer perform processes that may have involved potential exposure to cadmium and lead.

(5) **Evaluation of Specific Controls:**

(a) **Ventilation Controls** (AFOSH Std 161-2): This shop has local ventilation systems to control airborne contaminants from existing work processes. This table gives the results of the air flow rates measured for each system.

SYSTEM	FLOW RATE	REQUIRED FLOW RAT
Nederman, portable, SN# 92450-00	102 fpm @ 7" from hood	100 fpm capture velocity
Nederman, fixed, west wall (north unit)	150 fpm @ 7" from hood	100 fpm capture velocity
Nederman, fixed, west wall (south unit)	142 fpm @ 7" from hood	100 fpm capture velocity
Nederman, fixed, east wall (south unit)	120 fpm @ 7" from hood	100 fpm capture velocity
Nederman, fixed, east wall (north unit)	2100 fpm at duct	1000 fpm capture velocity
*Nederman, fixed, south wall	Inoperable	100 fpm capture velocity

* Nederman on south wall has been inoperable for the past two years and is listed as a deficiency. All other units meet requirements.

(b) **Personal Protective Equipment (PPE) (29 CFR 1910.132-138, AFOSH Stds** 91-31& 48-1): We inspected available PPE listed above for proper use, condition, and availability. Bill Woods of Bioenvironmental Engineering Services certifies that all recommended PPE meet the requirements of the standard and was readily available and properly maintained.

PROTECTIVE EQUIPMENT TYPE	EQUIPMENT LIMITATIONS
Hornell or 3M Power air supplied (PAPR) welding helmet	Protect against inhalation of dust and fumes up to 25 times the Occupational Exposure limit. Not to be used in oxygen deficient or

PROTECTIVE EQUIPMENT TYPE	EQUIPMENT LIMITATIONS
respirators with P-100 cartridges	IDLH atmospheres.
Nitrile rubber gloves	Minimal heat and tear resistance.
Face shield	No respiratory protection from toxic or caustic vapors.
Sound Guard earplugs	Protect up to noise levels of 103 dBA
Tasco Pionear Ear Muffs	Protect up to noise levels of 97 dBA

(c) **Respiratory Protection** (29 CFR 1910.134, AFOSH Std 48-1): We reviewed the Respirator Operating Instruction and the training requirements with the shop supervisor. Workers have been fit-tested and are familiar with the use of respirators. Respirators are adequately stored and maintained. However, one worker did not have access to the respirator for which he was fit tested. This discrepancy must immediately be corrected. A respirator that does not fit properly will not provide adequate protection in a hazardous environment.

i. PEG Z36 must use respiratory protection for these processes.

PROCESS NAME	SPECIFIC RESPIRATORY PROTECTION
Welding in positions that can not be reached by local exhaust ventilation.	Hornell or 3M Power air supplied (PAPR) welding helmet respirators with P-100 cartridges

ii. Supervisor annual training was given during this survey. Training included proper use, storage, inspection, cleaning, hazardous processes, and the effects of overexposure to materials in the shop.

3. **Workplace evaluation applicable to this shop:**

a. **Eyewash Unit (AFOSH Std 91-32):** This shop does have a portable eyewash unit, but is not a requirement. This shop does not use chemicals that are a serious eye hazard. Portable eyewash units are only suitable to for as a interim unit only until the employee can be moved to a fixed unit. **Note: Beginning in 2001, required frequency of operational checks has increased.** Refer to Appendix A for further eyewash/shower unit guidance.

b. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated.

(1) **Equipment/Processes:** Noise Measurements were taken during a previous survey. Some processes in this shop involve potential exposure to hazardous levels of noise. Warning signs have been placed where hazardous noise may be present**.** Personnel working within the hazardous noise areas must wear hearing protection when that piece of equipment is being operated. Employees who may be exposed to noise levels above 85

dBA for a shift time weighted average are placed on a Hearing Conservation Program. Employees in PEG Z36 are currently on the Hearing Conservation Program. A summary of noise sources is as follows:

HAZARDOUS NOISE SOURCES	MEASURED LEVELS IN dBA	Distance to 85 dBA Line	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION IN dBA	ADEQUATE?
90 Degree Hand Grinder	104	13 ft	Sound Guard Plugs **and** Tasco Pionear muffs	**18 NRR** **13 NRR**	**YES** **YES**
Bench Disc Sander	92	12 ft	Sound Guard Plugs or Tasco Pionear muffs	**18 NRR** **13 NRR**	**YES** **YES**
Pedestal Grinder/Buffer	90	6 ft	Sound Guard Plugs or Tasco Pionear muffs	**18 NRR** **13 NRR**	**YES** **YES**
Black and Decker Angle Sander	88	2 ft	Sound Guard Plugs or Tasco Pionear muffs	**18 NRR** **13 NRR**	**YES** **YES**
Delta Bench Grinder	88	2 ft	Sound Guard Plugs or Tasco Pionear muffs	**18 NRR** **13 NRR**	**YES** **YES**
Plasma Arc Cutting Table	85	1 ft	Sound Guard Plugs or Tasco Pionear muffs	**18 NRR** **13 NRR**	**YES** **YES**

(2) **Hearing Protection:** Hearing protectors are available in the shop, and are listed in the table above. Workers must wear Air Force approved ear plugs or muffs when noise levels are at or above 85 dBA. Workers must wear Air Force approved ear plugs in combination with muffs (double protection) when noise levels are at or above 103 dBA. The supervisor must encourage and enforce the use of hearing protection to prevent hearing loss in this shop.

(3) **Dosimetry**: Noise dosimetry was completed during a previous survey revealed 72.9 – 86.6 dBA and averaged 82.6 dBA. The Air Force defines hazardous noise as noise levels more than 85 dBA averaged over an eight-hour period.

(4) **Hearing Losses:** No employees had permanent hearing loss at the last hearing test. This may indicate that personnel are using their hearing protection properly in hazardous noise areas. The supervisor must encourage and enforce the use of hearing protection to prevent additional hearing shifts in this shop. Please refer to Appendix C for further guidance.

c. **Radiation** (10 CFR Series, AFI 40-201, AFOSH Stds 48-9 and 161-10): This shop does not have any sources of ionizing radiation. However, welding operations produce non-

ionizing ultraviolet radiation, which is harmful to the skin and eyes. Controls that are in place to adequately control radiation from these sources.

d. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop.

ERGONOMIC RISK FACTOR	RECOMMENDED CONTROLS
Lifting of material of excessive weight	Implement mechanical lifting equipment for each area of shop
Awkward body positions when welding	Ergonomic training, task rotation, and work breaks
Vibration and force when sanding and grinding	Ergonomic training, task rotation, and work breaks

Conclusion: The welders are not at high risk for developing cumulative trauma disorders, however, ergonomic risk factors (mentioned above) are still present in the shop. Work-related injuries are commonly associated with these risk factors. Administrative controls (training, breaks, etc.) and proper use of equipment can help reduce ergonomic stresses and prevent injuries. Personnel should continue to follow the controls identified in this letter to prevent any possible injuries in the future.

e. **Heat or Cold Stress** (AFM 160-1): Workers perform tasks in conditions of extreme heat. In extreme heat, encourage workers to drink more fluids. See Appendix D for additional guidelines to follow to reduce stress from temperature extremes.

f. **Lighting** (AFM 88-15): General illumination and task levels in this shop have met or exceeded the required Air Force standards

4. **General Workplace Hygiene (AFOSH Std 91-68) and other considerations:**

a. Personnel do not eat or drink in the work area where hazardous materials are present. Workplace and personal hygiene are necessary to reduce and possibly prevent ingesting hazardous materials and should be emphasized with everyone in the shop.

b. Asbestos Inspection at Baseline Survey (AFI 32-1052 para 2.1 and 2.3): Asbestos containing materials (ACM) were identified in this work area. Asbestos is located in the pipe fittings in the west equipment room. Also, some floor tiles or mastic may contain asbestos.

(1) ACM is in good condition except. Materials that are in good condition are not a health hazard. EPA recommends leaving in place all ACM that is in good condition. Our office will evaluate abatement requirements and inform you of the action you must take.

(2) Floor tile, ceiling tile, and other building materials often contain asbestos. Do not initiate self-help, or any renovation or demolition work without thoroughly identifying to SGPB all materials that may be removed or disturbed. The correct procedure is to route a work request form (AF332 or AFLC 299) fully describing all intended self-help work through SGPB and Environmental Management.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did include non-routine tasks and a list of hazardous materials is kept in the shop. All containers of hazardous materials are stored in another shop. A review of the Air Force Forms 55 shows workers have received HAZCOM training. Refer to appendix B for further guidance.

6. Your workplace was free of the following potential hazards:

Asbestos-Containing Materials	Methylene dianiline
Methylene Chloride	Formaldehyde
Benzene	
Ionizing radiation	
Teratogens	

7. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires further information regarding this report, please contact Bill Woods at 7-9036, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation

WILLIAM W. WOODS
Industrial Hygienist

TRAINING INFORMATION

Emergency Eyewash/Shower Units

Eyewash/Shower Units (AFOSH Std 91-32, American National Standard Z358-1): The following information pertains to the installation, maintenance and testing requirements of emergency shower and eyewash units. **Boldface information below is new in 2001.**

1. Emergency showers and eyewash units must be free of obstacles, within 100 feet of the operation, and require no more than ten seconds to reach. Try to locate the units as close to the hazard as possible without causing an additional hazard. The unit must be marked and easy to identify.

2. Perform and document service checks **weekly** [formerly monthly] on all permanently installed units to verify proper operation. The service check should verify adequate pressure, volume of water, and free flowing openings. Should fluid outlets become clogged, clean or replace them. Units in unoccupied or infrequently used areas are exempt from monthly checks; however, they must have service checks prior to the start-up of any operations that could expose personnel to hazardous materials. Documentation can be kept in a log, put in the computer or affixed to the equipment by tag or label. Include the name of the person doing the check and the date.

3. **Document performance specification/installation checks are to be performed weekly [formerly monthly]** These are performed in accordance with AFOSH Std 91-32, Emergency Shower and Eyewash Units, paragraph 3 and involve measuring the height of portions of the unit, actuating devices, actual spray patterns, etc. Refer to AFOSH Std 91-32, paragraph 3 for these inspection requirements.

4. Self-contained units may be used if approved by the base ground safety manager and Bioenvironmental Engineer under these conditions:

a. As an interim fix, prior to installing a permanent unit.

b. If the hazardous substance would not damage the eye.

c. In locations where permanent installation would not be feasible.

d. In field operations with no source of potable water.

e. These units shall be constructed of non-corrosive materials, shall provide a minimum of 15 minute continuous flow and the stored fluid shall be protected against contaminants and temperature extremes. These units may be filled with potable water or a solution approved by either the manufacturer or the installation medical services. Instructions and expiration dates shall be permanently affixed to the unit.

f. Units shall be **tested and inspected at the same frequency as permanently installed units. Where tap water is used, units will be refilled at least monthly. Less frequent intervals of fluid change, as recommended by the manufacturer, are acceptable where a solution or water additive is used.** [formerly: tested, refilled and maintained according to manufacturer's instructions or at least quarterly. Check fluid level monthly.] Attach tags or labels to the unit or adjacent to it showing fluid change schedule.

5. Eyewash bottles:

a. Eyewash bottles are not a substitute for other type units. They can be kept in the immediate vicinity where employees are working on extremely hazardous operations. They supply immediate flushing while proceeding to a permanently installed or self-contained unit.

b. Eyewash bottles are handy in remote areas where hazardous substances pose an irritant hazard, but can not cause permanent eye injury. Vehicles supporting such operations should be equipped with eyewash bottles or other means of flushing the eyes.

c. Eyewash bottles should be tested, refilled, maintained, and disposed of according to manufacturer's instructions. Watch for expiration dates.

Appendix A

Hazard Communication

1. Hazard Communication (AFOSH 161-21/OO-ALC-HAFBI 32-7001): While this section may duplicate some of the Administrative Controls Appendix, it specifically applies to the Hazard Communication Program and may be slightly different.

2. Written Program. Any workplace that works with hazardous materials must keep a written Hazard Communication Program. This program must include six things:

   a. The base written Hazard Communication Program.

   b. OO-ALC-HAFBI 32-7001 (the base written program is a separate document written by our office, current date is April 1993).

   c. A copy of AFOSH Std 161-21 or reference to its location.

   d. A list of the shop's hazardous materials and corresponding Material Safety Data Sheets for each item (or their location).

   e. A list of non-routine tasks that your workers might do which involve hazardous materials.

   f. Copies of all previous Bioenvironmental Engineering Survey Reports (annual or special evaluations).

3. Labeling. As a minimum, all containers of hazardous materials must be labeled with the base HMMS tracking label. If the manufacturer’s label is present, it must be legible and not covered by other labels. Some materials are transferred to containers labeled only with an HMMS yellow or rainbow tracking label. The MSDS number on this label refers back to the MSDS from the manufacturer. If you put hazardous material into another container for use during your shift, label the container with the name of the material.

4. Training. Supervisors must ensure all workers attend the basic hazard communication training course. In addition, the supervisor must provide training in the following:

   a. Hazards of all materials used in the PEG.

   b. Hazards of all new materials introduced to the PEG.

   c. Hazards of all materials needed to perform non-routine tasks.

   d. The supervisor must document all Hazard Communication training on the worker's AF Form 55.

5. Availability. The shop supervisor must ensure this program is maintained and available to all workers. We suggest you keep all information about safety and health in one binder. The shop supervisor shall:

   a. Ensure that a Hazard Communication/Workers Right to Know Program notebook is maintained and kept current.

b. Maintain all copies of Bioenvironmental Engineering surveys.

c. Inform their employees and TDY personnel of the information contained in Bioenvironmental Engineering surveys (PPE, ventilation systems, radiation hazards, etc.).

6. Responsibilities. The shop supervisor will be responsible for:

a. Adherence to all procedures outlined in the Confined Space Program.

b. Notification of the Base Radiation Safety Officer (RSO) of any changes to and additional sources of non-ionizing and ionizing radiation within the shop.

c. Enforcement of general workplace hygiene standards.

d. Notifying Bioenvironmental Engineering of personnel changes, reassignment of personnel for overtime purposes, and of changes in work processes and chemicals used.

Appendix B

Hazardous Noise

Hazardous Noise (AFOSH Std 48-19): Hazardous noise is common in most industrial shops. Workers who don't wear required hearing protection may succumb to occupational noise induced hearing loss, an irreversible occupational illness (once your hearing deteriorates, it's not going to get better with time). Bioenvironmental Engineering evaluates hazardous noise during our surveys and will perform initial surveys to identify hazardous noise sources and, if needed, noise dosimetry to identify workers who are potentially overexposed to hazardous noise. Those workers found to be occupationally exposed to hazardous noise will be monitored on the Hearing Conservation Program; provided annual audiometric evaluations as part of their occupational physicals. Shop supervisors must:

1. Post identified hazardous noise areas or specific hazardous noise sources. You may use Air Force Visual Aids (AFVA) 48-101, 48-103 and 48-105 for these signs. (AFVA 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment).

2. Make ear plugs and/or muffs available when needed.

3. Assure only Air Force approved hearing protection is provided.

4. Enforce the use of hearing protection when working with identified hazardous noise sources or within posted hazardous noise areas. Different hazardous noise levels warrant more stringent hearing protection. Ensure workers wear prescribed hearing protection (plugs or muffs, plugs and muffs, or plugs and muffs with a time limit).

5. Identify any new hazardous noise sources or possible hazardous noise operations to Bioenvironmental Engineering for further evaluation.

Appendix C

Thermal Stress

1. The following are some guidelines to avoid potential health effects of hot or cold exposure.

2. Hot Environments:

a. Allow your body to adjust to the heat gradually. Most people get used to warmer temperatures in four to seven days. When you've been away from a hot environment for a week or more you have to start the process again.

b. Drink cool water every 15 to 20 minutes to make up for loss of fluids whether you feel thirsty or not. The body can lose up to three gallons of fluid a day. Thirst is not a reliable guide to the body's need for water in extreme heat. Add salt normally to your food, but avoid salt tablets unless your doctor recommends them.

c. Allow employees to pace themselves and take rest breaks. Relief workers should be available to keep close watch on fellow workers and take over for those who require a break.

3. Work in cold environments:

a. Be aware of the dangers of frostbite and hypothermia and know the symptoms.

b. Exposed skin cools more rapidly as the wind velocity increases. Wind can cause unprotected skin to become frostbitten at relatively mild temperatures. Refer to OO-ALC-HAFBR15-102 for wind chill charts and time limits for working in low temperature ranges.

c. Hypothermia can be fatal if not detected and treated early. Symptoms may include:

(1) Slurred speech

(2) Stumbling

(3) Confused thinking

(4) Shivering

(5) Weakness and/or fatigue

(6) Drowsiness

(7) Shallow breathing

d. If you observe someone with signs of hypothermia, get emergency medical help.

e. Body temperature is maintained better by wearing many layers of relatively light clothing. Wear an outer shell of windproof material instead of a single heavy outer garment and make sure clothing allows some venting of perspiration because wet skin will freeze more rapidly than dry skin.

DEPARTMENT OF THE AIR FORCE
75TH AEROSPACE MEDICINE SQUADRON (AFMC)
HILL AIR FORCE BASE UTAH

10 Dec 01

MEMORANDUM FOR LMSMT

FROM: 75 AMDS/SGPB

SUBJECT: Summary of Bioenvironmental Engineering Survey, Missile Ground Support Shop, Bldg 847

1. On 6 Nov 01, SSgt Christine L. West of Bioenvironmental Engineering Services (BES) held an opening conference with Mr. Calvin Tanner, shop supervisor, to plan the shop survey strategy and discuss any employee concerns. SSgt West completed the survey on 30 Nov 01. Deficiencies were briefed as they were found; however, a closing conference will be held to further discuss findings and recommendations. The workplace information collected by BES will be reviewed by Public Health and Occupational Medicine, and you will shortly receive their evaluation including training and occupational physical requirements identified by them. Periodic surveys are mandated by AFI 48-101, *Aerospace Medical Operations,* and AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*.

2. No deficiencies were observed during this survey. Please contact Bioenvironmental Engineering Services at 7-4551, if you have any questions.

MARK H. SMITH, Lt Col, USAF, BSC
Bioenvironmental Engineering Flight Commander

Attachments:
1. Bioenvironmental Engineering Survey Report
2. Training Information

cc:
LM/CC w/o Atch
AFGE 1592 w/o Atch
SEG w/1 Atch
LMSM (Craig Nielsen) w/1 Atch

10 Dec 01

BIOENVIRONMENTAL ENGINEERING SURVEY REPORT

1. A Bioenvironmental Engineering survey was conducted for the Missile Ground Support Shop during the period of 6 Nov 01 to 30 Nov 01. A Bioenvironmental Engineering survey examines tasks, materials, processes and procedures that may expose personnel to potential health hazards. The survey also addresses environmental and safety concerns as they are encountered. The results of the survey will be reviewed by the Public Health Flight for training and physical examination requirements. This report summarizes the information obtained or reviewed during the survey, and includes hazard assessments and recommendations for protection of workers. AFI 91-301 requires that this report be maintained in the work area (preferably in the Hazard Communication binder) for a minimum of 10 years. In addition, a copy of this survey report must be posted on the work place bulletin board for a period of 10 days after receipt, to allow workers free access to the findings.

2. Potential Exposure Groups (PEGs): Workers are divided into PEGs based upon the similarity of their work tasks and workplace environment. Workers in the same PEG will have similar exposure to chemical or physical hazards, and will get the same occupational physicals. Your workers have been divided into two PEGs (847A2 & 847A3). Report any changes of personnel assigned to an exposure group, in writing (electronic or paper), to Julie Mikesell, (75 AMDS/SGPB, fax 7-1050, julie.mikesell@hill.af.mil).

a. PEG 847A2: Workers in this PEG are administrative personnel and supervisors. Exposure to chemicals and noise are incidental and not directly related to work being performed.

b. PEG 847A3: Workers in this PEG perform all general heavy mobile equipment maintenance and component related repairs on the Peacekeeper and Minuteman Trailer/Trucks. In addition, this PEG also conducts Preventive Depot Maintenance (PDM). Personnel have a potential exposure to chemicals and hazardous noise.

(1) **Summary of Hazards:** The following table describes hazards encountered by the workers, and current methods of reducing or eliminating the risk of occupational illness.

PROCESSES/TASKS	HAZARD	CURRENT CONTROLS
Peacekeeper/Minuteman Truck/Engine PDM	-Inhalation of exhaust fumes from truck and auxiliary power unit (APU) run-ups -Contact to fuel, oils, greases, antifreeze, adhesives, RTV, and cleaning solvents (PD-680 Type III). -Hazardous noise from pneumatic tools and while grinding -Ergonomic risk factors (repetitive motion) from hand tools	-Local exhaust ventilation -Nitrile disposable rubber gloves and Butyl rubber gloves for solvent tank -Classic E.A.R. plugs or Tasco Pionear earmuffs -Safety glasses/faceshield -Education
Peacekeeper/Minuteman Trailer PDM	-Inhalation and contact hazard from oils, greases, adhesives, sealants, and cleaning solvents (PD-680 Type III) -Hazardous noise from pneumatic tools and while grinding -Ergonomic risk factors (repetitive motion) from hand tools	-Nitrile disposable rubber gloves and Butyl rubber gloves for solvent tank -Classic E.A.R. plugs or Tasco Pionear earmuffs -Education

PROCESSES/TASKS	HAZARD	CURRENT CONTROLS
Missile Ground Support Equipment Maintenance/ Repair		
-General Repair	-Inhalation and contact to cleaning solvents, oils, lubricants, greases, penetrating oil, RTV, adhesives and exhaust fumes	-Nitrile rubber gloves well ventilated area, and local ventilation systems for exhaust fumes
-Soldering	-Inhalation of metal fumes and isopropyl alcohol	-Well ventilated area and safety glasses
-Refrigeration Systems	-Inhalation and contact to refrigerants	-Leather gloves, safety glasses/faceshield
-Diesel Generator Maint.	-Inhalation of exhaust fumes	-Ventilation system

All the controls listed above adequately control exposures to chemical and physical hazards in this shop, unless marked with an asterisk. The controls marked with an asterisk are not adequate and require corrective action as recommended below.

(2) **Evaluation of Chemical Exposure Hazards:** Our evaluation of current processes shows no need for air sampling at this time. Hazardous materials within this PEG do not represent a significant hazard due to the relatively small quantities being used.

(3) **Evaluation of Specific Controls:**

(a) **Ventilation:** Local ventilation systems control airborne contaminants. ***A follow-up survey will be accomplished during December 2001.***

(b) **Personal Protective Equipment (PPE)(29 CFR 1910.132-138, AFOSH Stds 91-31, 48-137):** We inspected the PPE listed in paragraph 2.b. (1), for proper use, condition and availability. All PPE meets the requirements of the standards and was readily available and properly maintained. William Woods certifies that the PPE provided is adequate for specific shop processes. All applicable workers have been trained on proper use and maintenance of their PPE. Documentation of all training on the AF Form 55 is up to date and current.

PROTECTIVE EQUIPMENT TYPE	EQUIPMENT LIMITATIONS
E.A.R. Classic earplugs	Not sufficient for flightline noise worn alone. To be used in conjunction with muffs.
Tasco Pionear ear muffs	Not sufficient for flightline noise worn alone. To be used in conjunction with E.A.R. plugs.
Safety glasses/faceshield	No respiratory protection (from caustic/poisonous gases/vapors).
Nitrile disposable rubber gloves	Minimal tear resistance and varying breakthrough times (chemical dependent).
Leather Work Gloves	Minimal chemical protection (may absorb and hold chemicals)

3. **Workplace Evaluation Applicable to all PEGs:**

a. **Eyewash/Shower Units (AFOSH Std 91-32):** This shop has six portable eyewash units and one shower/eyewash unit. Eye wash units are required to be on hand to provide immediate first aid to flush chemicals and foreign objects from the eye. Shower units are required to be on hand to provide immediate first aid to flush chemicals off the body and clothes. We inspected these units for cleanliness, location, operation and documentation of operational checks. Units in the shop do meet the

requirements of the standard. **Note: Beginning in 2001, required frequency of operational checks has increased.** Refer to Appendix 1 for further eyewash/shower unit guidance.

b. **Hazardous Noise (AFOSH Std 48-19):** The equipment listed in the table below generates hazardous noise. Equipment producing hazardous noise was properly labeled with warning signs. Area and equipment noise hazard signs are Air Force Visual Aids (AFVA) 48-101 for work areas and 48-103 and 48-105 for different sizes of equipment. Personnel working within the 85 dBA line must wear Air Force approved hearing protection when that piece of equipment is being operated. The following table provides a reference of hazardous noise sources and their required hearing protection:

HAZARDOUS NOISE SOURCE	MEASURED dBA LEVEL	85 dBA LINE	MFG/MODEL AVAIL PROTECTION	NOISE REDUCTION IN dBA	ADEQUATE ?
14" Cutting Saw	94	5 ft	EAR Classic Earplugs Tasco Pioneer 2500 muff	27 13	Yes Yes
Bench Grinder	90	N/A	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes Yes
Pneumatic Drill	86	1 ft	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes Yes
Pneumatic Grinder	91	3 ft	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes Yes
Air Gun	95	N/A	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes Yes
ECU for Trailers	96	N/A	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes Yes
Hammering (impact)	99	N/A	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes No
Nut Runner	93	N/A	EAR Classic Earplugs Tasco Pionear 2500 muff	27 13	Yes Yes

(1) **Dosimetry:** Monitoring conducted on the 28th and 29th of November ranged from 75 – 87 dBA. The Air Force defines hazardous noise as exposure to noise levels more than 85 dBA averaged over an eight-hour period.

PEG	DATE	LAST 4 SSN	8 HR TWA
847A3	28 Nov 01	8919	75.9 dBA
	28 Nov 01	7465	78.8 dBA
	29 Nov 01	8732	**86.6** dBA
	29 Nov 01	9962	83.0 dBA
	29 Nov 01	8919	81.6 dBA
	29 Nov 01	7465	83.0 dBA

(2) **Hearing Losses:** Seven employees had permanent hearing threshold shifts during their last hearing test. This indicates that personnel may not be using their hearing protection in hazardous noise areas. The supervisor must encourage and enforce the use of hearing protection to prevent additional hearing shifts in this shop.

c. **Radiation (10 CFR Series, AFI 40-201 and 48-125, AFOSH Stds 48-9 and 48-139):** This shop does not have sources of ionizing or non-ionizing radiation.

d. **Ergonomics:** Ergonomic risk factors are present in work processes in this shop. A review of the Accident/Injury Log data and other information for this shop does not show a repetitive motion injury trend. Workers have been trained and should continue to vary tasks as much as possible and take breaks when necessary. See Appendix 2 for risk factors and recommended guidelines to reduce

ergonomic injury. Our observation of the shop process and the ergonomic injury trend does not indicate further analysis is required.

e. **Heat or Cold Stress (AFM 160-1):** Workers do not perform tasks in conditions of extreme cold or heat. See Appendix 3 for additional guidelines to follow to reduce stress from temperature extremes.

f. **Confined Space (29 CFR 1910.146 and AFOSH Std 91-25):** Shop personnel do not enter confined spaces.

g. **Lighting (AFM 88-15):** Workers did not express any health or safety concerns related to lighting.

4. **General Workplace Hygiene (AFOSH Std 91-68) and Other Considerations:**

a. Personnel should not eat or drink in the work area where hazardous materials are present. Workplace and personal hygiene are necessary to reduce and possibly prevent ingesting hazardous materials and should be emphasized with everyone in the shop.

b. **Asbestos Containing Building Materials (AFI 32-1052, para 2.1 and 2.3 and 29 CFR 1926.1101):** Asbestos containing materials (ACM) were identified in this building. Friable and non-friable asbestos is located in all hard steam line insulation and in floor tiles/associated adhesives. These materials are located throughout the building and are currently in good condition.

(1) Materials that are in good condition are not a health hazard. The EPA recommends leaving in place all ACM that is in good condition. Our office will evaluate abatement requirements and inform you of the action you must take if the asbestos needs to be removed.

(2) Floor tile, ceiling tile and other building materials often contain asbestos. **Do not initiate self-help or any renovations or demolition work without thoroughly identifying to SGPB all materials that may be removed or disturbed.** The correct procedure is to route a work request form (AF Form 332 or AFMC Form 299) fully describing all intended self-help or contracted work through SGPB and Environmental Management.

5. **Hazard Communication/Worker's Right-to-Know Programs (AFOSH Std 161-21, OO-ALC-HAFBI 32-7001):** We reviewed designated portions of your Right-to-Know book and HAZCOM program to determine compliance with the regulations. Workers had access to AFOSH Std 161-21 and the Hill AFB HAZCOM program. The written compliance program did not include a list of all non-routine tasks kept in the shop; however, a list of hazardous materials was located within the shop. All containers of hazardous materials were adequately labeled with manufacturer and tracking labels. Reviews of the Air Force Form 55's indicate workers have received HAZCOM training.

6. Your workplace was free of the following potential hazards:

Organic vapors	Ergonomics	Formaldehyde
Cadmium	Methylene dianiline	Carcinogens
Methylene Chloride	Ionizing radiation	Teratogens
Benzene	Non-ionizing radiation	Lead

7. **Conclusion:** This report must be posted on the workplace bulletin board for a period of 10 days after receipt to allow workers free access to the findings. It must be maintained in the workplace for at least 10 years. If anyone desires further information regarding this report, please contact SSgt West at 777-1047, or come to building 249. If there are any specific occupational health concerns not addressed here or if you would like help regarding these issues during health or safety training, please call—we would be happy to help. Thank you for your cooperation.

ERIC J. CAMERON, 1Lt, USAF, BSC
Bioenvironmental Engineer

TRAINING INFORMATION

Ergonomics

Performing certain operations in an environment not designed for production work, administrative work areas not designed for comfortable working, working with tools that are hard to handle or produce high vibration, lifting heavy weights, or performing certain tasks often enough can lead to ergonomic disorders. Some of the more common disorders include; back strains, carpal tunnel syndrome, rotator cuff injury, and other repetitive motion disorders. A properly designed work area with ergonomically designed tools is ideal and will effectively reduce body stresses. Also, using two man lifts and proper lifting techniques (lift with your legs, not your back), will reduce stress on the back. It should be noted that weight belts may serve to keep your back in a good posture when lifting, but are not considered a control and will not protect the backs of your workers.

Thermal Stress

1. The following are some guidelines to avoid potential health effects of hot or cold exposure.

2. Hot Environments:

a. Allow your body to adjust to the heat gradually. Most people get used to warmer temperatures in four to seven days. When you've been away from a hot environment for a week or more you have to start the process again.

b. Drink cool water every 15 to 20 minutes to make up for loss of fluids whether you feel thirsty or not. The body can lose up to three gallons of fluid a day. Thirst is not a reliable guide to the body's need for water in extreme heat. Add salt normally to your food, but avoid salt tablets unless your doctor recommends them.

c. Allow employees to pace themselves and take rest breaks. Relief workers should be available to keep close watch on fellow workers and take over for those who require a break.

3. Work in cold environments:

a. Be aware of the dangers of frostbite and hypothermia and know the symptoms.

b. Exposed skin cools more rapidly as the wind velocity increases. Wind can cause unprotected skin to become frostbitten at relatively mild temperatures. Refer to OO-ALC-HAFBR15-102 for wind chill charts and time limits for working in low temperature ranges.

c. Hypothermia can be fatal if not detected and treated early. Symptoms may include:

(1) Slurred speech

(2) Stumbling

(3) Confused thinking

(4) Shivering

(5) Weakness and/or fatigue

(6) Drowsiness

(7) Shallow breathing

d. If you observe someone with signs of hypothermia, get emergency medical help.

e. Body temperature is maintained better by wearing many layers of relatively light clothing. Wear an outer shell of windproof material instead of a single heavy outer garment and make sure clothing allows some venting of perspiration because wet skin will freeze more rapidly than dry skin.

Emergency Eyewash/Shower Units

Eyewash/Shower Units (AFOSH Std 91-32, American National Standard Z358-1): The following information pertains to the installation, maintenance and testing requirements of emergency shower and eyewash units. **Boldface information is new in 2001.**

1. Emergency showers and eyewash units must be free of obstacles, within 100 feet of the operation, and require no more than ten seconds to reach. Try to locate the units as close to the hazard as possible without causing an additional hazard. The unit must be marked and easy to identify.

2. Perform and document service checks **weekly** [formerly monthly] on all permanently installed units to verify proper operation. The service check should verify adequate pressure, volume of water, and free flowing openings. Should fluid outlets become clogged, clean or replace them. Units in unoccupied or infrequently used areas are exempt from monthly checks; however, they must have service checks prior to the start-up of any operations that could expose personnel to hazardous materials. Documentation can be kept in a log, put in the computer or affixed to the equipment by tag or label. Include the name of the person doing the check and the date.

3. Document performance specification/installation checks **monthly** [formerly semiannually] These are performed in accordance with AFOSH Std 91-32, Emergency Shower and Eyewash Units, paragraph 3 and involve measuring the height of portions of the unit, actuating devices, actual spray patterns, etc. Refer to AFOSH Std 91-32, paragraph 3 for these inspection requirements.

4. Self-contained units may be used if approved by the base ground safety manager and Bioenvironmental Engineer under these conditions:

a. As an interim fix, prior to installing a permanent unit.

b. If the hazardous substance would not damage the eye.

c. In locations where permanent installation would not be feasible.

d. In field operations with no source of potable water.

e. These units shall be constructed of non-corrosive materials, shall provide a minimum of 15-minute continuous flow and the stored fluid shall be protected against contaminants and temperature extremes. These units may be filled with potable water or a solution approved by either the manufacturer or the installation medical services. Instructions and expiration dates shall be permanently affixed to the unit.

f. Units shall be **tested and inspected at the same frequency as permanently installed units. Where tap water is used, units will be refilled at least monthly. Less frequent intervals of fluid change, as recommended by the manufacturer, are acceptable where a solution or water additive is used.** [Formerly: tested, refilled and maintained according to manufacturer's instructions or at least quarterly. Check fluid level monthly.] Attach tags or labels to the unit or adjacent to it showing fluid change schedule.

5. Eyewash bottles:

a. Eyewash bottles are not a substitute for other type units. They can be kept in the immediate vicinity where employees are working on extremely hazardous operations. They supply immediate flushing while proceeding to a permanently installed or self-contained unit.

b. Eyewash bottles are handy in remote areas where hazardous substances pose an irritant hazard, but cannot cause permanent eye injury. Vehicles supporting such operations should be equipped with eyewash bottles or other means of flushing the eyes.

c. Eyewash bottles should be tested, refilled, maintained, and disposed of according to manufacturer's instructions. Watch for expiration dates.

Appendix E

PSRE LEP Programmatic Environmental, Safety and Occupational Health Evaluation PSRE Refurbishment Hazardous Materials List

Programmatic Environmental, Safety and Occupational Health Evaluation
PSRE Refurbishment Hazardous Materials List

	HAZARDOUS MATERIAL	PRODUCT DESCRIPTION	BLDG/2016 (per unit)	KITTING (per unit)	COMMENT
1	Acetone	Wipe cleaning	1 oz.	1 oz.	
2	Adhesive	ATV-108	1 oz.	1 oz.	in a spray can
3	Aliphatic naptha	TT-N-95	1/2oz.	1/2oz.	
4	Alkaline cleaner	Dyclene-EW			change every 6 mo. (1 gal.)
5	Alodine 1200	Chromic acid	1/8oz	1/8oz	
6	Alodine 600	Chromic acid			
7	Anodizing solution	Chromic acid	1/8oz	1/8oz	
8	Brulin 815GD	Ultrasonic cleaner	1/8oz	1/8oz	
9	Cork adhesive	K-1170/E18	0	0	Rarely use
10	Trowelable cork	K5NA	1oz	1oz	3 part mix
11	Detergent	Joy	3oz	3oz	same as spray & wash
12	DS-108	wipe cleaning	1/8oz	1/8oz	center mech.
13	Duco Cement		1/4oz	1/4oz	
14	Electrical separation ordnance	disposal required			Explosives (not at Freeport Facility)
15	Mechanical separation ordnance	disposal required			Explosives (not at Freeport Facility)
16	Epoxy Polyamide Primer	MIL -P -23377	1/4oz	1/4oz	
17	Grease		1/8oz	1/8oz	used on can
18	Grommet adhesive	MMM-A-1617	0	0	
19	Hypalon Coating	EC-2241	1oz	1oz	
20	Isopropyl Alcohol	Wipe cleaning	1oz	1oz	
21	Krytox 241AC	O Rings	1/4oz	1/4oz	BraCote

Source: TRW ICBM Systems, 2001.

Programmatic Environmental, Safety and Occupational Health Evaluation
PSRE Refurbishment Hazardous Materials List

	HAZARDOUS MATERIAL	PRODUCT DESCRIPTION	BLDG 2016 (per unit)	KITTING (per unit)	COMMENT
22	leak test compound	spray & wipe	2oz	2oz	MIL-L-25567
23	Methyl ethyl ketone		1/8oz	1/8oz	
24	Monomethyl Hydrazine	Test to verify no leak			Fuel don't use at Freeport Facility
25	Nitric acid				don't use at Freeport Facility
26	Nitrogen Tetroxide	Test to verify no leak			Oxidizer don't use at Freeport Facility
27	Oakite 157				don't use at Freeport Facility
28	Oil		1/8oz	1/8oz	used on actuator
29	Prepsolv	Wipe cleaning	2oz	2oz	MIL-6085
30	Primer	DC1200	1/8oz	1/8oz	
31	Retaining compound		1/8oz	1/8oz	Lock-tite
32	Solvent, rust	Solox No. 33	1oz	1oz	used on shipping container
33	Thinner for primer	MIL-T-81772 type II	1/8oz	1/8oz	
34	Torque stripe paint		1/8oz	1/8oz	
35	Vertrel XF	Wipe cleaning	1oz	1oz	MS-782
36	Wax solution	MIL-W-3688	1/8oz	1/8oz	Pin Wax