FINAL
ENVIRONMENTAL ASSESSMENT FOR
CONSTRUCT PHYSICAL FITNESS CENTER
MALMSTROM AIR FORCE BASE, MONTANA

Prepared by:

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This document was prepared by the 341st Civil Engineer Squadron, Environmental Flight, Malmstrom AFB, Montana. This draft report is intended to permit Malmstrom AFB to make a fully informed decision and provide public notice for the proposed project to satisfy requirements set forth in the National Environmental Policy Act. Comments based on this draft Environmental Assessment shall be consolidated and used to develop a final Environmental Assessment which will determine whether this activity represents a significant impact to the human environment, and require the preparation of an Environmental Impact Statement.

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ENVIRONMENTAL ASSESSMENT

CONSTRUCT FITNESS CENTER

MALMSTROM AIR FORCE BASE; GREAT FALLS, MONTANA

1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION

1.1 Executive Summary/Abstract

This Environmental Assessment was developed for the Construct Physical Fitness Center project at Malmstrom AFB. A properly sized and configured fitness center is vital at this northern tier installation for the health, morale and welfare of our members, as well as, to maintain a fitness level necessary for optimal performance of our military missions. Daily exercise/physical training meets the demands of today's expeditionary Air Force requirements for 4,600+ military personnel and civilians. Training sessions require aerobic and strength training to comply with AFI 10-248. Temperature and weather cannot be limiting factors. Functional layout, appearance and adequate space to accommodate fitness activities and equipment are essential for a quality fitness center.

The expansive clay soils in this area require special foundation design consideration to prevent premature failure. The Health and Wellness Center (HAWC), currently located in a separate facility, Building 1145, should be incorporated inside the fitness center to allow for full service fitness assessment, awareness and physical therapy. An indoor running track is required at this northern tier base to allow for adequate running conditions during the cold months of the year. Additionally, the physical limitations of some personnel and dependents (i.e. arthritis, joint injuries) require an indoor lap pool to serve as a physical conditioning alternative.

The existing fitness center, Building 1010, constructed in 1957, does not adequately satisfy personnel or infrastructure demands. The HAWC, Building 1145, crowds into an inadequate space ergonometric testing, physical therapy and nutrition classes. Outdoor aerobic conditioning activities, such as running, are not practical from October through March, due to the cold Montana temperatures. Individuals desiring to run must find other activities in the already overcrowded existing fitness center or seek off-base, expensive, health club memberships to avoid a 6-month break from their fitness objectives. An indoor lap pool would provide individuals with an alternative for sustaining cardio-vascular fitness during the Montana winter months. Current facilities have insufficient space for group exercise during much of the year. The military places unit strength and cohesiveness among the core values of readiness building blocks. Group fitness training strengthens a unit's readiness through team building.

This Environmental Assessment discusses in detail the potential effects, if any, the Proposed Action will have on air, water, geological, biological, cultural, noise, health, land, and socioeconomic resources. The Proposed Action would occur in Cascade County, Montana, where the air quality is designated as in attainment and better than the national standards for

several air pollutants. Due to the nature of construction activities and the phasing of the Proposed Action, the impact to air resources is likely to be short-term and not significant.

Groundwater resources consist of deep, confined aquifers that range from 100 feet to 200 feet below land surface on base. Surface water drains in ephemeral streams and coulees to the Missouri River about one mile north of the base. The Proposed Action would not significantly impact groundwater resources. Short-term impacts to surface water could potentially occur during construction, but long-term impacts to surface water resources would not occur.

The Proposed Action would occur within Seismic Zone 1 but it is recommended that the buildings be designed for Seismic Zone 2B because Great Falls is situated near the seismic zone boundary. The modern soils of Malmstrom AFB have developed directly on Quaternary glacial deposits and consist of sandy lean clay, clayey sand, silty sand, fat clay, and high-plasticity, lean clay. The Proposed Action further develops the site of the existing fitness center, thus no significant long-term impacts to site soils are expected.

There are no federally listed threatened or endangered species that occur on Malmstrom AFB, and no delineated jurisdictional wetlands currently identified within the site. Consistent with the lack of impact to the site soils, the Proposed Action would have an insignificant impact on biological resources, wetland areas, habitat areas, or threatened or endangered species.

Cultural resources of concern located near the proposed area of impact include a railroad segment that may be eligible for the National Register of Historic Places. The proposed site of this action is currently used for fitness activities, thus impacts to traditional resources are not expected under the Proposed Action.

Existing noise levels are documented as falling within the “Urban Residential” noise level, consisting of a typical range of 58 to 62 dB. The Proposed Action would increase existing noise levels as construction commences and continues, but this noise will be intermittent and occur at times when most residents are not in the area surrounding the construction site.

Land use at Malmstrom AFB consists primarily of airfield, administrative, industrial and housing facilities. Private vehicles dominate traffic at Malmstrom with no public transit available. The presence of construction vehicles would increase traffic levels in the north-west section of the Base, but increases in traffic volumes associated with construction activity would be temporary. No long-term impacts to on-base transportation systems would result from the Proposed Action.

The operation of Malmstrom AFB makes an important contribution to the economy of the region through both direct employment and purchases from local businesses. The presence of the base provides economic stability to the city and the region. No long-term changes in base employment or expenditures are anticipated as a result of the Proposed Action. No permanent or long-lasting socioeconomic impacts are anticipated as a result of the Proposed Action.

Construction impacts on air quality will be short-term and limited to localized areas. Significant permanent changes to soil structure and stability would not occur from disrupting and reworking site soils. Noise from construction activities is an unavoidable short-term impact. Although Malmstrom AFB has elected to break the Proposed Action into multiple phases, given the size and scope of the project, the construction traffic should not deteriorate or impact on-base roads to

a significant degree. In light of past, present, and the future actions evaluated in this Environmental Assessment, Malmstrom AFB expects no significant cumulative impacts as a result of the Proposed Action.

1.2 Introduction

The United States Air Force (USAF), as the 341 Civil Engineer Squadron (341 CES), proposes to demolish the existing fitness center and construct a new fitness center on the existing site at Malmstrom AFB.

This Environmental Assessment (EA) was prepared to analyze potential environmental consequences, if any, associated with three alternatives: 1) the Proposed Action; 2) Remodeling and Constructing an Addition to the Existing Facility; and 3) No Action. This EA utilizes the requirements of the National Environmental Policy Act (NEPA) and the implementing regulations.

Section 1.3 provides background information on Malmstrom Air Force Base (AFB). The purpose of and need for the Proposed Action are discussed in Section 1.4. Detailed descriptions of the Proposed Action, the Remodel/Addition Alternative and the No Action Alternative are provided in Chapter 2. Chapter 3 describes the existing conditions of various environmental resources that could be affected by the Proposed Action, the Remodel/Addition Alternative or the No Action Alternative. Chapter 4 describes how those resources would be affected by implementation of the Proposed Action, the Remodel/Addition Alternative or the No Action Alternative. Chapter 5 evaluates the cumulative effects of the Proposed Action. Chapter 6 is a bibliography of resources cited in the preparation of this EA.

1.3 Background

Malmstrom AFB encompasses over 3,600 acres of land in Cascade County in west central Montana (Figure 1). The base lies approximately 0.3 miles east of the City of Great Falls city limit at its closest point and is 5 miles from the central business district of the City. Interstate Highway 15 passes along the western boundary of Great Falls. Access to the base main gate is off US Highway 87/89, east of Interstate Highway 15, via 2nd Avenue North.

The Proposed Action consists of demolishing the existing fitness center and constructing a larger more comprehensive fitness and health facility at the same site, located approximately 1 mile east of the main gate to Malmstrom AFB along Goddard Drive. The project will be constructed in phases with demolition of the existing fitness center following the construction of the first phase and prior to the construction of the second phase of the Proposed Action.

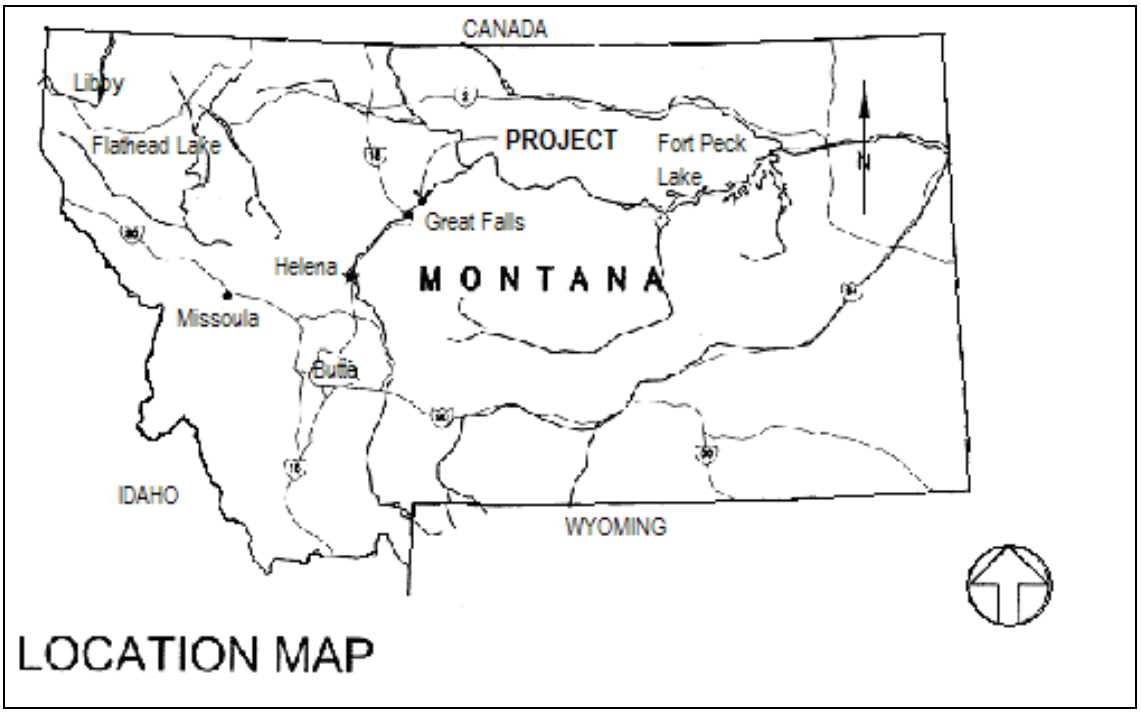

Figure 1: Vicinity Map of Malmstrom AFB

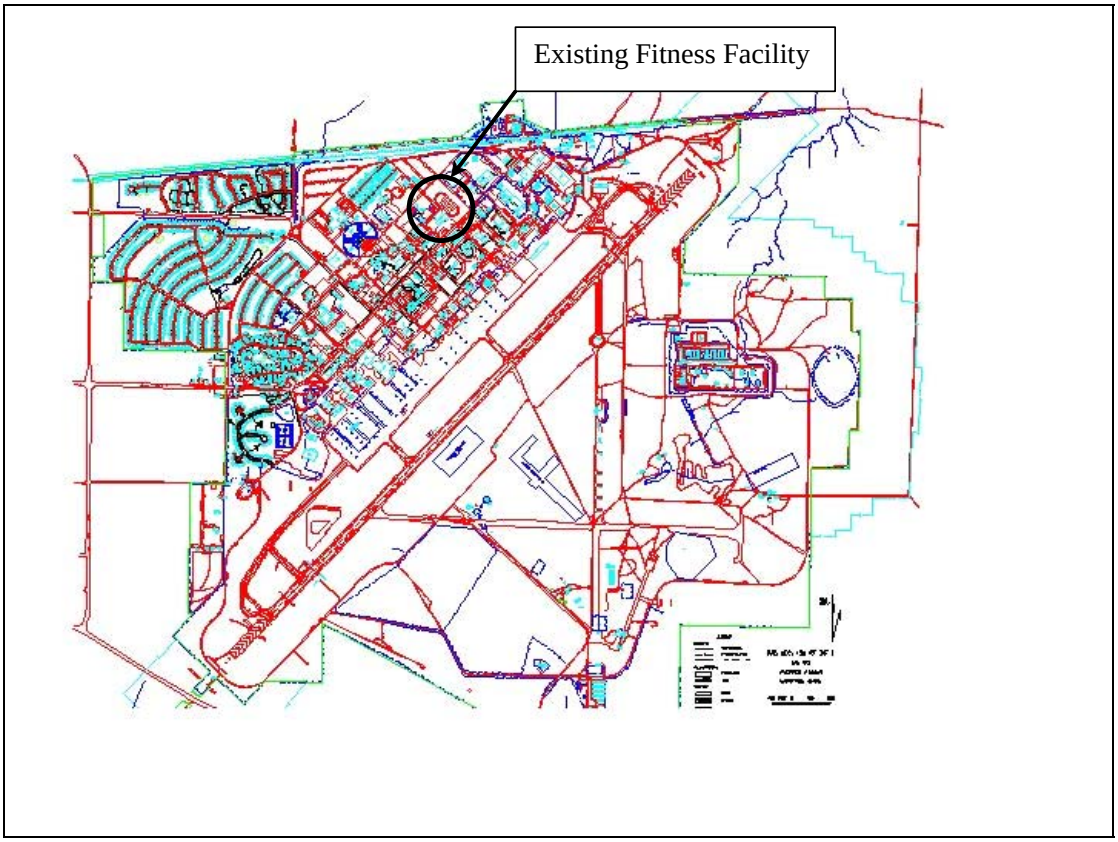

Figure 2: Map of Malmstrom Air Force Base, Great Falls Montana.

An Air Force physical fitness facility promotes a broad spectrum of positive opportunities, both mission and quality of life based. Physical Fitness reduces stress, on the job injuries, health care costs, lost work and a myriad of other well studied and documented impacts. Integrating these positive attributes into one comprehensive facility saves valuable government dollars and helps maintain a fit and ready military force. A comprehensive fitness center also contributes to the Air Force goal of family support design to develop and sustain an installation environment that provides a quality life for the Air Force families and the Malmstrom AFB community.

1.4 Project Need and Purpose

Recent inspections of the fitness center reveal that:

- The existing facility does not meet current building codes, including electrical, fire and seismic requirements.
- Plumbing systems have deteriorated over time exhibiting the effects of hard water and corrosion, including constriction and pipe leakage, and plumbing fixture wear and discoloration.
- The Base uses this facility as a contingency personnel shelter and the existing facility does not comply with new requirements for Antiterrorism and Force Protection.
- Upgrading and adding onto the existing facility exceeds 70 percent of the estimate cost of constructing a new facility. Air Force regulations mandate new construction when renovation costs exceed 70 percent of new construction.

The Proposed Action replaces the existing substandard fitness center and Health and Wellness Center with a consolidated conforming Fitness Center. The existing substandard fitness center was first constructed in 1957. Typically 30 to 40 year old structures no longer meet current Air Force standards or comply with current building codes and force protection requirements.

This document addresses the impacts related to the construction of the Proposed Action. Construction contract award for the initial phase is proposed for late Fiscal Year (FY) 2006 or early 2007. The second phase of the project is not yet funded. After the construction of Phase 1 and prior to construction of Phase 2, Malmstrom plans to demolish the existing fitness facility.

Table 1 lists gross floor area of the existing Malmstrom AFB facilities and outlines the Air Force requirements for satisfying mission requirements, as allocated by Air Force fitness center design and sizing guidelines. The Deficiency demonstrates the existing facility is substantially smaller than the Air Force design guidelines.

Table 1: Fitness Center Existing and Proposed Space Allocation

Core Space Description (Units = Square Feet)	USAF Guidelines	Existing	Deficiency	Proposed
Visitor and Spectator Support	2,675	905	(1,770)	2,675
Administration	1,430	542	(888)	1,430
Support	3,557	620	(2,937)	3,557
Locker Rooms	7,530	3,851	(3,679)	7,530
Gymnasium	22,150	19,463	(2,687)	22,150
Group Exercise	8,925	2,064	(6,861)	8,925
Fitness Equipment Spaces	9,310	7,296	(2,014)	9,310
Racquetball Courts	3,360	4,200	840	3,360
Indoor Track	4,144	0	(4,144)	4,144
Health and Wellness Center	4,345	5,442	1,097	4,345
Enhanced Areas	13,054	1,328	(11,726)	12,134
Add 35% circulation, RR, and Mechanical	28,168	15,796	(12,372)	27,846
Building Gross	108,648	61,507	(47,141)	107,406

1.5 Scope of the Environmental Review

Malmstrom AFB prepared this Environmental Assessment in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations (§40 CFR 1500-1508), and 32 CFR 989. As allowed by §40 CFR 1500.4 and 1508.9 and 32 CFR 989, this EA focuses on specific issues and concerns affecting Malmstrom AFB.

1.6 Other Applicable Regulatory Requirements

Each environmental resource is regulated and/or protected by Federal and State of Montana regulations. In establishing the background conditions and assessing the potential environmental consequences of the Proposed Action, the following regulations were considered.

1.6.1 Air Quality

The Montana Clean Air Act (Montana Code Annotated [MCA], Title 75, Chapter 2) implements the federal Clean Air Act. The Montana Clean Air Act, implemented by the MCA and Administrative Rules of Montana (ARM), establishes ambient air quality standards and permitting and monitoring procedures. Montana law and regulations implement and in many cases adopt by reference the federal Clean Air Act Amendments (CAAA) of 1990, the current federal legislation regulating the prevention and control of air pollution. The CAAA establishes seven major titles that address various aspects of the national air pollution control program:

1. Title I describes air pollution control requirements for geographic areas in the United States with respect to the National Ambient Air Quality Standards (NAAQS). This section also sets forth a list of hazardous air pollutants, which prompted EPA to establish the National Emissions Standards for Hazardous Air Pollutants (NESHAP).

2. Title II deals mostly with revised tailpipe emission standards for motor vehicles. These requirements compel automobile manufacturers to improve design standards to limit Carbon Monoxide (CO), hydrocarbon, and Nitrogen Oxide ($NO_{x)}$ emissions. Oxygenated gasoline will be required in cities with the worst ozone and CO nonattainment. Reformulated gasoline and gasoline with reduced Reid vapor pressure is used in ozone nonattainment areas.
3. Title III sets forth emergency powers, civil administrative and legal process, and other miscellaneous requirements. Title III also addresses hazardous air pollutants through control of routine emissions, and contingency planning for accidental releases.
4. Title IV addresses acid deposition control and applies only to commercial utilities that produce electricity for sale.
5. Title V outlines the requirement of having states issue federally enforceable operating permits to major stationary sources. The permits are designed to enhance the ability of the U.S. Environmental Protection Agency (USEPA), state regulatory agencies, and private citizens to enforce the requirements of the CAAA. Permits will also be used to specify operation and control requirements for stationary sources.
6. Title VI limits the emissions of chlorofluorocarbons (CFC), halons, and other halogenated chemicals that contribute to the destruction of stratospheric ozone. These requirements closely follow the control strategies recommended in June 1990 by the second meeting or parties to the Montreal Protocol. Also, procurement of ozone depleting substances is restricted by Federal agency acquisition policies.
7. Title VII describes civil and criminal penalties that may be imposed for violation of new and existing air pollution control requirements. This title also gives authority to the USEPA to issue field citations for many types of violations.

1.6.2 Water Quality

The Water Pollution Control Law (MCA Title 75 Chapter 5) sets forth water conservation, water quality protection, and pollution prevention and abatement measures. Implementing regulations include the Water Pollution Administrative Regulations (ARM, Title 17, Chapter 30). The Montana Pollutant Discharge Elimination System (MPDES) Rules (ARM 17.30.12-13) establish effluent limitations, treatment standards, and other requirements for point source discharge of waste into State waters, including storm water runoff. The Groundwater Pollution Control Regulations (ARM 17.30.10) establish groundwater classification, and set forth protection and permitting requirements, while the Surface Water Quality Standards (ARM 17.30.06) establish surface water quality criteria to ensure public health and safety and provide for water conservation.

The Montana Department of Environmental Quality issued Malmstrom AFB a General Permit for Storm Water Discharges Associated with Industrial Activity. This Permit became effective on October 1, 2001. The Permit expires on September 30, 2006. The permit authorizes Malmstrom AFB to discharge storm water in accordance with the parameters set forth in the Permit. The permit effluent limitations include no discharge of process wastewater pollutants to surface waters, storm water discharge may only be generated through rainfall precipitation and snowmelt, no discharge associated with industrial activity may violate water quality standards and new or increased storm water discharges associated with industrial activity shall not cause

degradation as described under ARM 17.30.715(3) and MCA 75-5-301(5)(c). The Permit requires Malmstrom to implement and maintain a Storm Water Pollution Prevention Plan. The Permit requires Malmstrom AFB to sample, twice per year, to assess compliance with the Monitoring Parameter Benchmarks set forth the Permit.

1.6.3 Public Health and Safety/Hazardous Waste

The Solid Waste and Litter Control Act (MCA Title 75, Chapter 10) provides for State solid waste management and a resource recovery plan. All solid waste disposal must comply with this Act and 40 CFR §§ 240-259. Municipal solid waste landfills must comply with 40 CFR 258, Criteria for Municipal Sold Waste Landfills. Air Force installations must use permitted, secure, municipal or regional facilities for solid waste disposal, when feasible. In addition Malmstrom AFB must comply with the requirements of DoD directive 4165.60 when disposing of solid waste.

The Montana Integrated Waste Management Act (MCA Title 75, Chapter10. Part 8) provides for waste reduction and recycling programs. The Air Force prefers recycling and diversion to ultimate disposal. AFI 32-7080 Pollution Prevention Program sets forth policy encouraging these alternatives. Contract specifications for the Proposed Action would require consideration of recycled materials and encourage the diversion and reuse of construction debris.

The Montana Hazardous Waste Act (MCA Title 75, Chapter10, Part 4), and the Hazardous Waste Management Regulations (ARM Title 16, Chapter 44) control the generation, storage, transportation, treatment, and disposal of hazardous wastes; the Act also authorizes the State to implement a program pursuant to the federal Resource Conservation and Recovery Act (RCRA).

The Refuse Disposal Regulations (ARM 16.14.05) implement the Hazardous Waste Act and Regulations. These regulations provide uniform standards for the storage, treatment, recycling, recovery, and disposal of solid waste, including hazardous waste, and the transportation of hazardous waste.

1.6.4 Biological Resources

The Endangered Species Act (§16 United States Code (USC) 1531-1544) requires Federal agencies to avoid jeopardizing the continued existence of endangered or threatened species or destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on endangered or threatened species of fish, wildlife, and plants and their critical habitats and take steps to conserve and protect these species. The Act requires the avoidance or mitigation of all potentially adverse impacts to endangered and threatened species.

Executive Order (EO) 11990, Protection of Wetlands, requires Federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect construction in wetlands if a feasible alternative is available. All Federal and federally supported activities and projects must comply with EO 11990. In addition, activities occurring in jurisdictional wetlands and other Waters of the U.S. require compliance with Section 404 of the Clean Water Act administered by the U.S. Army Corps of Engineers and

Section 401 of Clean Water Act administered by the Environmental Protection Agency (EPA) for on-Base lands and the Montana Department of Environmental Quality for off-Base lands.

1.6.5 Cultural, Paleontological, and Archaeological Resources

The primary goal of the National Historic Preservation Act (NHPA) of 1966 (16 USC 470 et seq., as amended); is to ensure adequate consideration of the value of historic properties in carrying out Federal activities, seeking to identify and mitigate impacts to significant historic properties. The NHPA is the principal authority used to protect historic properties. Federal agencies must determine the effect of their actions on cultural resources and take steps to ensure they locate, identify, evaluate, and protect all resources. 36 CFR 800 defines the responsibilities of the State, the Federal Government, and the Advisory Council on Historic Preservation (ACHP) in protecting historic properties identified in a project area. Section 106 of the NHPA and its implementing regulations mandate identification of cultural resources which would be potentially affected by project activities and that the Air Force address the effects of the undertaking on such resources. 36 CFR 60 establishes the National Register of Historic Places (NRHP) and defines the criteria for evaluating eligibility of cultural resources to the NRHP.

The Archaeological Resources Protection Act of 1979 (16 USC 470aa-470mm, as amended) protects archaeological resources on Federal lands. If an agency discovers archaeological resources during site activities, the act requires permits for excavating and removal of any archaeological resources.

2.0 ALTERNATIVE ANALYSIS

This Section describes the elements of the Proposed Action, the Remodel/Addition Alternative and the No Action Alternative.

2.1 No Action Alternative

The No Action Alternative would result in no construction or renovation of the existing fitness center. The existing fitness center, constructed in 1957, does not adequately satisfy personnel, Air Force or infrastructure demands. The HAWC in an inefficiently formatted space provides customers ergonometric testing, physical therapy and nutrition classes.

Air Force fitness policy, implemented through AFI 10-248, sets the goal of having 100 percent of the 3409 Malmstrom AFB active duty Air Force personnel to engage in a combination of aerobic, muscular and flexibility fitness training three (3) to five (5) days per week. Running outdoors from October through March is frequently not practical due to cold Montana temperatures. The individuals desiring to run must find other activities to do in an already overcrowded environment or seek expensive, off-base memberships to avoid taking a 4 to 6-month break from their fitness objectives.

Current facilities have insufficient space for group exercise. Among the core values and readiness building blocks, the military places unit strength and cohesiveness at its foundation. Group fitness training strengthens a unit's readiness through team building. As described, the No Action Alternative would result in a decrease in readiness, morale and base unity.

2.2 Remodel/Addition Alternative

The Air Force analyzed the option of renovating the existing structures. Air Force guidance mandates replacement, if the cost of renovation exceeds 70 percent of the replacement cost (USAF 1995a). The renovation option was discarded because the estimated project cost of the renovation/addition package exceeding the 70 percent threshold, due to multiple Building Code deficiencies, including safety, electrical, fire and seismic, the presence of multiple sources of potential hazardous contamination (lead-based paint, asbestos, PCB containing light ballasts, etc),. The existing site, as configured, does not contain sufficient unutilized area to make the remodel/addition alternative readily feasible. In addition, under even a comprehensive existing facility renovation, a portion of the renovated structure would still not comply with Building Code seismic design criteria. Based upon this analysis, the Remodel/Addition Alternative is eliminated as not reasonably feasible. This alternative will not be analyzed in the remainder of this Environmental Assessment.

2.3 Proposed Action

The Proposed Action consists of demolishing the existing fitness center and constructing a larger more comprehensive fitness and health facility at the same site, located approximately 1 mile east of the main gate to Malmstrom AFB along Goddard Drive. The project will be constructed in two phases with demolition of the existing fitness center following the construction of the first phase and prior to the construction of the second phase of the Proposed Action.

The Proposed Action involves the construction of the new Fitness Center in two phases and demolishing the existing fitness facility before the start of the second phase. The project schedule proposes Phase 1 ready to advertise (RTA) during summer 2006. Demolition of the existing fitness center as part of the construction of Phase 2 will follow Phase 1, but Phase 2 is currently unfunded.

2.3.1 Demolition

In order to accommodate ongoing physical fitness requirements, and to prevent adverse impacts to the Malmstrom AFB community, Malmstrom proposes to demolish the existing fitness center, when all activities have moved into the new Fitness Center after the completion of construction of Phase 1 and before commencing Phase 2. Figure 6 presents a conceptual floor plan for the new Fitness Center. The final floor plan may differ somewhat from this demonstrative plan. The Air Force seeks to minimize or eliminate interruption to personnel use of fitness facilities. All existing utilities are underground, including electrical; fire protection; natural gas; heating, ventilation, and air conditioning (HVAC); water; sewer; telephone; and cable television.

Telephone and electrical services, originally installed above ground, were buried during one of many interim renovations of the utility systems on the Base. Depending upon the HVAC system selected, a building connection to the high temperature hot water system may be required.

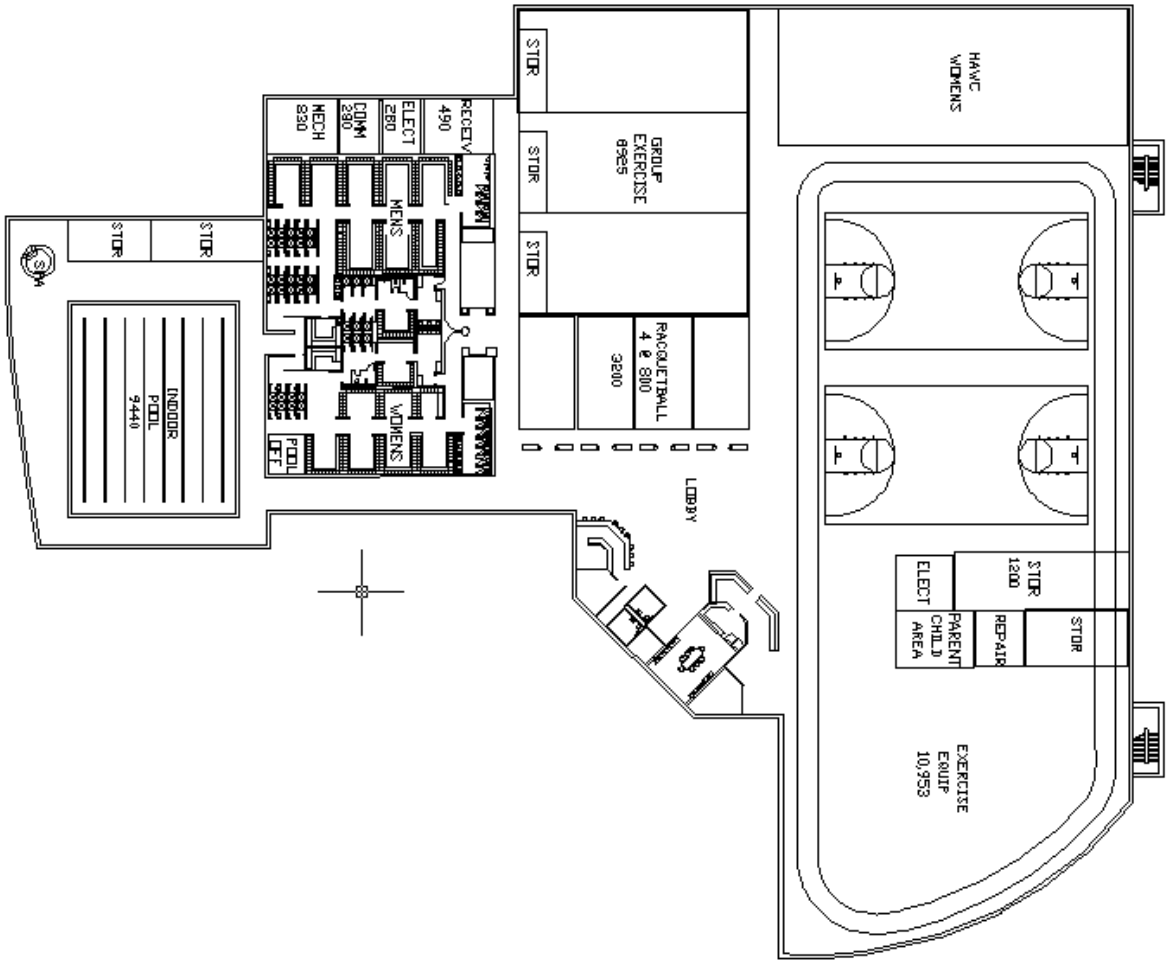

Figure 3: Proposed Action Conceptual Floor Plan, Fitness Center Malmstrom AFB, Great Falls Montana.

2.3.2 New Construction

Construction of the proposed Fitness Center will comply with current building codes. Specific replacement and upgrades to the utilities include:

- Due to EPA requirements for off-site storm water runoff, current and future development a proponent must evaluate the Proposed Action with respect to its effect on storm water runoff. Existing storm sewer lines may require rerouting during construction. New curbs and storm sewer inlets will be constructed, as necessary. The amount of pervious and impervious surface in the area will not change significantly as a result of this construction (See Sections 3.2 and 4.2).

- New natural gas valves will be installed where necessary to tie the existing gas main to the new construction.

- Sanitary sewer and drinking water lines will remain to provide service to the existing fitness center during construction. Damaged or degraded sections of piping will be replaced as needed during construction. New electrical circuits and supporting infrastructure will be provided as needed to tie in the Proposed Action without disrupting services to the existing facilities.

2.4 Comparison of Alternatives

Table 2 summarizes the potential environmental impacts of the Proposed Action and alternatives, based on the impact analyses presented in Chapter 4.0. Potential environmental consequences are not significant with the implementation of the Proposed Action, remodel/addition or no action alternatives.

Table 2: Summary of Potential Environmental Impacts.

Resource	Proposed Action	Remodel/Addition Alternative	No Action Alternative
Air Resources	0	0	0
Water Resources	0	0	0
Geological Resources	0	0	0
Biological Resources	0	0	0
Cultural Resources	0	0	0
Noise (Construction)	-	-	0
Health, Safety and Waste Management	+	+	-
Land Use (Transportation)	0	0	0
Socioeconomics and Environmental Justice	+	+	0
- = Adverse, but not significant short-term or long term impact + = Positive/beneficial short-term or long-term impact 0 = No change short-term or long-term.			

3.0 AFFECTED ENVIRONMENT

This chapter describes the affected environment at Malmstrom AFB. The existing environmental conditions within the expected geographic extent of potential impacts, known as the Region of Influence (ROI), are addressed for each environmental resource in this chapter.

3.1 Air Resources

This section describes the existing concentrations of various pollutants and the climatic and meteorological conditions that influence the quality of the air. Precipitation, wind direction and speed, and atmospheric stability conditions determine the extent of pollutant dispersion. The type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences determine air quality. Comparing these values to federal and/or state ambient air quality standards determines the significance of a pollutant concentration in a region or geographical area. Under the Clean Air Act (CAA), the United States Environmental Protection Agency (USEPA) has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety.

The National Ambient Air Quality Standards (NAAQS) represent the maximum allowable atmospheric concentrations for six "criteria" pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 micrometers in diameter (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). Based on measured ambient criteria pollutant data, the USEPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Nonattainment areas that achieve attainment are subsequently redesignated as maintenance areas for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when insufficient ambient air quality data exists for EPA to form a basis of attainment status. When applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

In 1997, the USEPA promulgated two new standards: an 8-hour O_3 standard (to eventually replace the existing 1-hour O_3 standard) and a new standard for particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), which are fine particulates that have not been previously regulated. In addition, the USEPA revised the existing PM_{10} standard. The two new standards are scheduled for implementation over the next few years, as monitoring data becomes available to determine the attainment status of areas in the United States. Meanwhile, the USEPA will enforce the existing 1-hour O_3 standard for areas that are still in nonattainment of the standard.

Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. For selected criteria pollutants, the State of Montana has established its state AAQS, some of which are more stringent than the federal standards. Montana AAQS are more restrictive than federal standards for CO, NO_2, O_3, and SO_2. Montana does not have state standards for $PM_{2.5}$. In addition, Montana regulates emissions of settleable particulates, visibility, fluoride in foliage, and hydrogen sulfide (H_2S), for each of which no federal standards exist. A summary of the federal and Montana AAQS that apply to the proposed project area is presented in Table 3.

Table 3: Montana and Federal Ambient Air Quality Standards.

Air Pollutant	Averaging Time	Montana AAQS	Federal (NAAQS)	
			Primary	Secondary
Carbon Monoxide (CO)	8-hour 1-hour	9 ppm 23 ppm	9 ppm 35 ppm	--- ---
Nitrogen Dioxide (NO_2)	AAM 1-hour	0.05 ppm 0.30 ppm	0.053 ppm ---	0.053 ppm ---
Sulfur Dioxide (SO_2)	AAM 24-hour 3-hour 1-hour	0.02 ppm 0.10 ppm --- 0.50 ppm	0.030 ppm 0.14 ppm --- ---	--- --- 0.50 ppm ---
Particulate Matter (PM_{10})	AAM 24-hr	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$
Particulate Matter ($PM_{2.5}$) (a)	AAM 24-hour	--- ---	15 $\mu g/m^3$ 65 $\mu g/m^3$	15 $\mu g/m^3$ 65 $\mu g/m^3$
Ozone (O_3) (b)	1-hour 8-hour	0.10 ppm ---	0.12 ppm 0.08 ppm	0.12 ppm 0.08 ppm
Lead (Pb) and Lead Compounds	Calendar Quarter 90-days	--- 1.5 $\mu g/m^3$	1.5 $\mu g/m^3$ ---	1.5 $\mu g/m^3$ ---
Settleable Particulates (TSP)	30-day	10 g/m^2	---	---
Hydrogen sulfide (H_2S)	1-hr(d) ½-hr(e) ½-hr(f)	0.010 ppm 0.100 ppm 0.030 ppm	--- --- ---	--- --- ---
Fluoride in foliage	1-month grazing season	50 $\mu g/g$ 35 $\mu g/g$	--- ---	--- ---
Visibility	AAM	3 x 10^{-5}/m	---	---

Notes: AAM = Annual Arithmetic Mean; AGM = Annual Geometric Mean.
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.

(a) The $PM_{2.5}$ standard (particulate matter with a 2.5-micron diameter) was promulgated in 1997, and will be implemented over an extended time frame.

(b) The 8-hour Ozone standard was promulgated in 1997, and will eventually replace the 1-hour standard. The USEPA plans to implement this standard beginning in 2004. During the interim, the 1-hour ozone standard will continue to apply to nonattainment areas for Ozone.

Sources: §40 CFR 50; USFS (2000)

For non-attainment regions, the states must develop a State Implementation Plan (SIP) designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring State air quality conditions into (and maintain) compliance with the NAAQS.

CAA Section 162 further established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are those areas where any appreciable

degradation in air quality or associated visibility impairment is considered significant. Under the Prevention of Significant Deterioration (PSD) program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. Class II areas allow moderate, well-controlled growth. Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have yet been so designated in the United States. The PSD requirements affect construction of new major stationary sources in the PSD Class I, II, and III areas and are a pre-construction permitting system.

CAA Section 169A established the additional goal of preventing further visibility impairment in the PSD Class I areas. Visibility impairment is defined as a reduction in visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area typically evaluates stationary source contributions. The USEPA is implementing a Regional Haze rule for PSD Class I areas that will also address contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to qualitatively assess potential impairment to visibility in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of PM_{10} and SO_2 in the lower atmosphere.

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with each state's SIP for attainment of the NAAQS. Federal activities must not:

- cause or contribute to any new violation;
- increase the frequency or severity of any existing violation; or
- delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS.

General conformity applies only to nonattainment and maintenance areas. If emissions from a federal action proposed in a nonattainment area exceed annual thresholds specified in the rule, a conformity determination is required of that action. Malmstrom AFB is classified as attainment and therefore a conformity determination is not required for actions on the base.

3.1.1 Climatology and Meteorology

Malmstrom AFB, located in north central Montana, is on the dry eastern side of the Rocky Mountains and has a modified semiarid continental type climate. Summertime is generally pleasant, with cool nights, moderately warm and sunny days, and very little hot, humid weather. Winters are milder than would be expected of a continental location at this latitude because of the frequent occurrence of warm down slope winds (Chinooks) that produce temperature changes of 40° F or greater in 24 hours (USAF 1998). July is generally the warmest month, with a mean daily high temperature of 83.6° F. January is usually the coldest month, with a mean daily low temperature of 12.5° F. The growing season averages 135 days per year (USAF 1999).

Humidity and precipitation are usually low, despite large fluctuations in daily and seasonal temperatures. Average annual precipitation is 15 inches, occurring mostly during the late fall, winter, and early spring as snow. Chinook winds typically prevent large accumulations of snow

(USAF 1998). Average annual snowfall is 43.6 inches (USAF 2000). Prevailing winds from the southwest year round are generally moderate with speeds exceeding 25 mph only two percent of the time (USAF 1999). Based on the average annual precipitation, the area would normally be classified as semi-arid, but about 70 percent of the annual rainfall typically occurs during the April to September growing season, so the climate is favorable for dry land farming (USAF 1998). Table 4 presents average monthly temperatures, precipitation, humidity, and wind speed data from the nearest National Weather Service station in Great Falls, Montana (USAF 1999).

Table 4: Climate Data For Great Falls, MT.

Month	Temperature		Precipitation		Wind		Relative Humidity [1]
	Mean Daily Max °C (°F)	Mean Daily Min °C (°F)	Mean Total cm (in)	Mean Snow cm (in)	Prevailing Direction	Mean Speed m/s (mph)	Mean % [2]
January	-0.5 (31.1)	-10.8 (12.5)	2.06 (0.81)	25.1 (9.9)	SW	6.8 (15.3)	62
February	2.3 (36.2)	-8.7 (16.3)	1.70 (0.67)	21.6 (8.5)	SW	6.4 (14.3)	59
March	5.8 (42.5)	-5.5 (22.1)	2.56 (1.01)	26.4 (10.4)	SW	5.8 (13.0)	55
April	12.9 (55.2)	0.2 (32.4)	3.15 (1.24)	18.5 (7.3)	SW	5.1 (12.9)	47
May	18.4 (65.1)	5.3 (41.4)	6.25 (2.46)	4.6 (1.8)	SW	5.0 (11.4)	46
June	22.9 (73.3)	9.5 (49.1)	6.75 (2.66)	0.8 (0.3)	SW	4.5 (11.2)	44
July	28.7 (83.6)	12.7 (54.9)	3.23 (1.27)	Trace	SW	4.6 (10.1)	37
August	27.6 (81.6)	11.9 (53.4)	3.40 (1.34)	Trace	SW	5.1 (10.2)	39
September	21 (69.8)	7.1 (44.7)	3.15 (1.24)	4.1 (1.6)	SW	5.9 (11.3)	46
October	15.1 (59.2)	2.6 (36.7)	1.96 (0.77)	7.9 (3.1)	SW	6.5 (13.2)	46
November	6.4 (43.6)	-3.7 (25.3)	1.82 (0.72)	19.1 (7.5)	SW	7.0 (14.6)	54
December	1.7 (35.0)	-8.2 (17.3)	1.85 (0.73)	22.6 (8.9)	SW	7.4 (15.6)	60
Annual	13.6 (56.4)	0.99 (33.8)	37.90 (14.9)	150.6 (59.3)	SW	5.7 (12.8)	50

1 Relative humidity measured at 11:00 a.m.
2 Wind speed based on 1941-90 period; prevailing direction through 1963.

Source: Bair (1992).

3.1.2 Air Quality

The Proposed Action would occur within Cascade County, Montana. According to federally published attainment status for Montana in §40 CFR 81, Cascade County is designated as in attainment, better than the national standards, or unclassified for CO, NO_2, SO_2, PM_{10}, O_3, 8-hour ozone and $PM_{2.5}$ NAAQS.

The City of Great Falls had a small area located along 10th Avenue South, previously classified as nonattainment or unclassifiable for carbon monoxide (CO). This area was redesignated as attainment on 8 July 2002, and is now considered to be a maintenance area for CO. With the redesignation, the area is subject to a limited maintenance plan until 2012, after which it must submit a revised maintenance plan to last another 10 years. If no exceedances of the ozone standard occur within the next 20 years, the area may apply for full attainment status.

Malmstrom AFB is located in Montana Air Quality Control Region (AQCR) 141, which covers north central Montana. Mandatory PSD Class I areas for the state of Montana are listed under 40 CFR 81. Lewis and Clark National Forest, Scapegoat Wilderness, Helena National Forest, and Gates of the Mountain Wilderness are Class I areas not within 50 miles of the project area and Malmstrom AFB. The Flathead Indian Reservation, 150 miles west of Great Falls, is a non-mandatory Tribal Class I area, which requires similar protection as mandatory Class I areas.

Emissions at military installations generally include CO, volatile organic compounds (VOCs), nitrogen oxides (NOx, commonly measured as nitrogen dioxide), sulfur oxides (SOx, commonly measured as sulfur dioxide), and PM_{10}. Although O_3 is considered a criteria pollutant and is measurable in the atmosphere, it is not often considered a pollutant when reporting emissions from specific sources. O_3 is not typically emitted directly from most emissions sources; it is formed in the atmosphere from its precursors (NOx and VOCs), which are directly emitted from various sources. Thus, NOx and VOCs are commonly reported instead of O_3. Sources of pollutants include stationary sources (fossil fuel combustion and fuel or solvent evaporation), construction activities, and mobile sources.

Title 1 of the federal Clean Air Act Amendments (CAAA) of 1990, prompted EPA to establish the National Emissions Standards for Hazardous Air Pollutants (NESHAP). The Montana Clean Air Act (Montana Code Annotated [MCA], Title 75, Chapter 2) implements the federal Clean Air Act. The Montana Clean Air Act, implemented by the MCA and Administrative Rules of Montana (ARM), establishes ambient air quality standards and permitting and monitoring procedures. The NESHAP for asbestos abatement sets forth ambient air quality standards and permitting and monitoring procedures for asbestos abatement. Prior to demolition of the existing fitness center, Malmstrom AFB must comply with all NESHAP requirements for any asbestos containing material encountered in the existing fitness center.

3.2 Water Resources

Water resources consist of groundwater and surface water. The ROI for water resources is considered to be within the limits of Malmstrom AFB. Located on a plateau with drainage northward toward the Missouri River, drainage features in the study area are primarily ephemeral streams and coulees. Potable groundwater is present at depths greater than 100 feet below ground surface. All water used at Malmstrom AFB is supplied by the City of Great Falls and is treated surface water from the Missouri River.

3.2.1 Groundwater

Groundwater resources exist in the project area and occur primarily in deep, confined aquifers (e.g., the Madison-Swift aquifer). The depth to these deep aquifers ranges between about 100 feet and 200 feet below land surface at the base. Shallow groundwater (less than about 25 to 40 ft below land surface) occurs locally as noncontiguous, unconfined, perched zones. The deep confined aquifers in the area tend to flow northward; flow in the shallow, unconfined aquifers typically follows topographic gradients.

The deep Madison-Swift aquifer has the greatest potential for future groundwater development. Because of the limited supply of water and discontinuous nature of the shallow perched zones, they are unlikely to be used as a water source in the future. Due to the ample surface water supply and the depth of most of the aquifers, groundwater resources have not been developed on the base.

3.2.2 Surface Water

The base lies on a plateau roughly 10 square miles in extent that drains northward toward the Missouri River. The Missouri River is located about one mile north of the base and serves as the principal source of potable water for Malmstrom AFB and the city of Great Falls. There are no perennial streams present on the base.

Surface water drainage at the site occurs primarily through open storm ditches and in ephemeral streams and coulees (Figure 7). Storm water drainage at the site occurs primarily through open storm ditches, swales and underground pipes and discharge outfalls. Storm water discharge is regulated by a Montana Pollution Discharge Elimination System (MPDES) Industrial Activity Discharge Permit to the Base from the Montana Department of Environmental Quality.

Malmstrom AFB has an estimated 662 acres of impervious area out of a total of 3,260 acres. Storm water is comprised of nine (9) drainage areas combining to exit Malmstrom AFB at six (6) discharge points (outfalls) (Malmstrom, 2005). Only Drainage Areas 1 through 6, drain northerly and exit the Base at five outfalls, flowing into the west, center and east branches of Whitmore Ravine, eventually discharging into the Missouri River (Figure 4). The remaining Drainage Areas 7 through 9 flow south. The Proposed Action lies in Drainage Area 2.

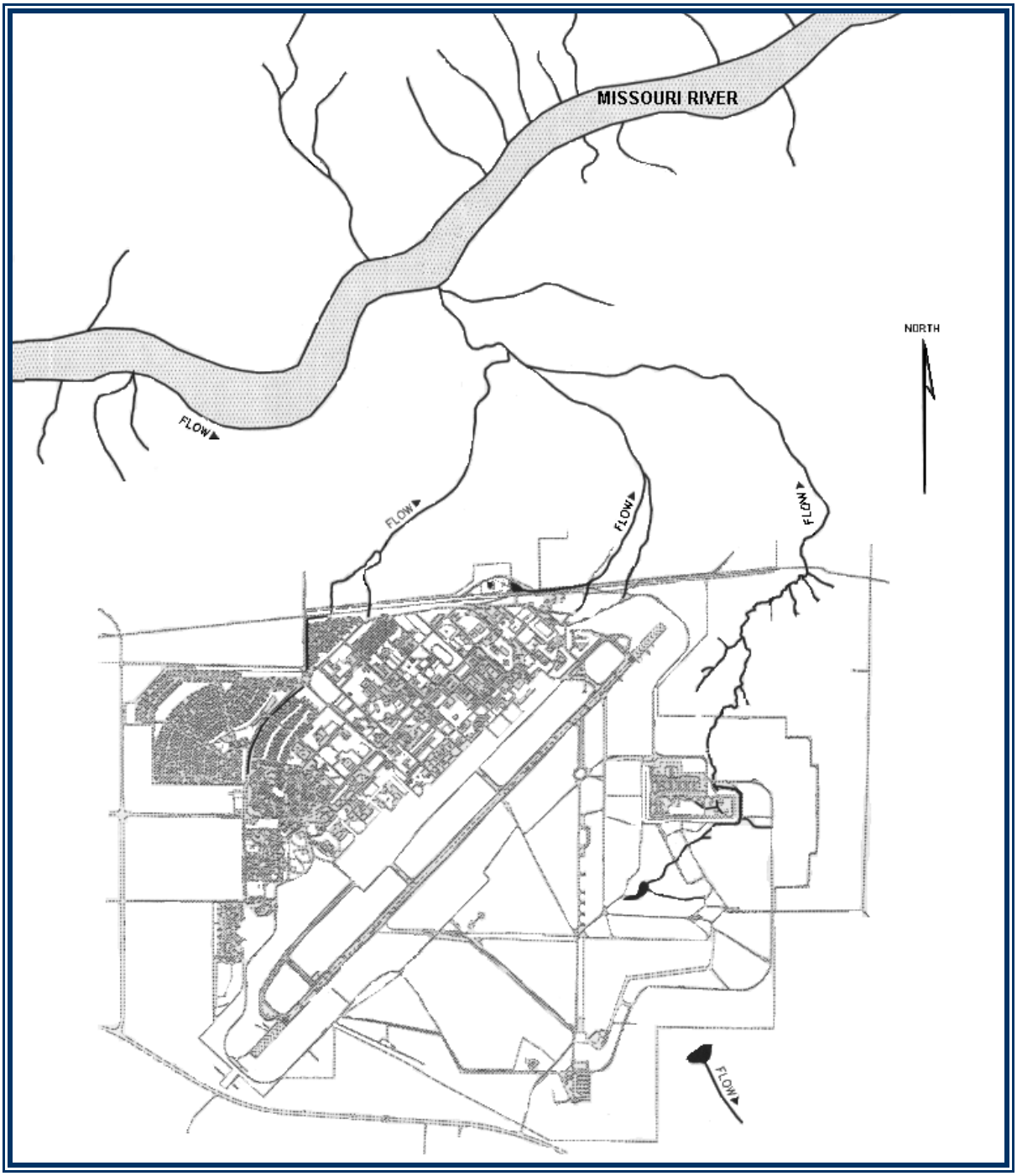

Figure 4: Surface Water Drainage Patterns at Malmstrom AFB

Drainage Area 1 collects runoff from the southwest end of the runway, the south end of the aircraft-parking apron, most of the old aircraft maintenance shops and hangars, the south end of the petroleum storage and pumping facility, the truck and tractor maintenance garage, and the

majority of the underground ramp hydrant refueling system. Drainage Area 1 has a steady flow due to foundation drains, sumps and perched water tables in existing areas. The basin drains through a combination of underground concrete pipes, primarily in the former aircraft operations and maintenance and the family housing areas, curb gutters in streets and roadways, and grass covered ditches adjacent to streets. The entire basin drains through a concrete lined ditch (approximately 1,000 LF) and an intermittent grass covered ditch from the end of the lined ditch into the western branch of Whitmore Ravine to the Missouri River approximately one mile north of the base boundary. The measured peak discharge at the outfall for a 0.25-inch in 2.5 hours rain event was 49.6 cubic feet per second (cfs).

Drainage Area 2 is bounded by 72nd St. North, Goddard Drive and Perimeter Road. The drainage area collects storm water runoff from the north central portion of the base. The drainage flows north until it discharges off base into center Whitmore Ravine near Walnut St. The basin drains by a combination of underground concrete pipes, grass-lined ditches and curb and gutters in streets and roadways. Above ground curb and gutter, and ditch flow comprise over 70% of the flow pathway. The underground flow is confined to the vehicle maintenance and storage facility area located in the northeast corner of the drainage. The outfall collection channel near Walnut St. is an unlined ditch that passes under a railroad track via two 36-inch concrete pipes and under the north boundary road via one 48 inch corrugated metal pipe. Drainage Area 2 combines with the flow from Drainage Area 1 in the west branch of Whitmore Ravine then flows north to the Missouri River. The measured peak discharge at the Walnut St. outfall (just below the 48 inch Corrugated Metal Pipe, CMP) for a 0.25-inch in 2.5 hours rain event was 10.2 cfs.

Drainage Area 3 is bounded on the east by the east edge of the runway, on the north by the base boundary extending from the pole yard storage area to the coal fired heating plant, on the west by drainage basins Nos. 1 and 2, and on the south by drainage basin No. 1. This basin collects and discharges storm water from the majority of the old aircraft operations pavements, the primary petroleum operations, storage and supply systems, several industrial facilities, and light commercial and residential (dormitory) areas. Two sub-drains are included in this drainage. These sub-drains collect and discharge shallow ground water in the area. The eastern most sub-drain collects runoff from the runway, taxiways, and aircraft parking ramps. The western most sub-drain drains the fuel facilities and cantonment area. These drainages intersect near the southeast corner of the base supply building (building 400) and form the outfall channel that flows through an oil/water separator before flowing into the center branch of Whitmore Ravine. There is a combination of storm water drainage facilities, including an extensive underground storm drain system of open ditches (concrete and grass lined), and curb and gutter at roads and streets. The peak discharge measured at the outfall for a 0.25-inch in 2.5 hours rain event was 42.4 cfs.

Drainage Area 4 includes a vacant helicopter maintenance hangar (building 1700) and associated parking apron, and runoff from a small portion of the runway. The area drains primarily by overland sheet flow. There are roadway ditches, mostly grass lined, and a small inlet and underground pipe system that collects runoff from the runway and the aircraft parking area. Runoff is carried in the underground system or flows over a grass surface. Runoff flows north through a culvert under Perimeter Road and through a set of culverts running under a gravel road leading off base in the northeast corner of the base, and under the railroad into the center branch

of Whitmore Ravine, which drains into the Missouri River. The outfall is a 36-inch corrugated metal pipe (CMP) that passes under a railroad right-of-way. The peak discharge measured during a 0.25-inch rain over a 2.5-hour storm was 2.9 cfs.

Drainage Area 5 includes runoff from the weapons storage area (WSA) and an inactive landfill, including approximately 1,000 feet of underground storm drain (concrete pipe and field catch basin) that daylights to overland sheet flow. The ditches adjacent to the roads in this area are grass lined. Most storm water in this area either infiltrates into the ground or exits this drainage basin in sheet flow; a small portion of this drainage area exits the drainage area in a broad, shallow, heavily vegetated ditch north of WSA. Flow is only observed in this drainage area if the area received a heavy rainfall because of the shape, vegetative cover, and size of the ditch exiting the base. Runoff from this area flows into the east branch of Whitmore Ravine, which drains into the Missouri River.

Drainage Area 6 includes runoff from the missile handling facility, combat arms firing range, an inactive landfill, Pow-Wow Pond, a new fire training area, and a small missile maintenance facility. Most storm water in this area either infiltrates into the ground, collects in natural and man-made retention areas (i.e. road ditches) within the drainage, or exits this drainage basin in a well defined grassed coulee north of the WSA. Runoff from this area flows into the east branch of Whitmore Ravine, which drains into the Missouri River. Actual flow measurements recorded during storm water sampling (0.1 cfs during a 0.25 inch in 2.5 hours rain event) indicate that the runoff coefficient calculated below is extremely conservative (Table 6).

Table 5. Runoff Coefficients for Malmstrom AFB Drainage Areas.

Drainage Area	Total Area	Impervious Surface	Pervious Surface	Runoff Coefficient
One	655.5	249.1	406.4	0.61
Two	213.6	76.6	137	0.60
Three	391.7	179.2	212.5	0.65
Four	74.5	13.1	61.4	0.50
Five	275.7	28.7	247.	0.46
Six	851.5	77.4	774.1	0.50
Seven	598.4	42.5	555.9	0.46
Eight	40	5.3	34.7	0.47
Nine	144.1	22.2	121.9	.048

The runoff coefficient provides an indicator for predicting storm water discharge rates. The runoff coefficient assists in providing a starting point for evaluating the amount of rainfall a drainage will infiltrate versus the amount of rainfall a drainage will discharge. Many other factors affect infiltration versus discharge, such as the duration and intensity of the rain event, the slope of the drainage, the soil type, the type of vegetation ground cover, evaporation rates, and pre-rain event moisture content of the soil. Given the number of natural variables involved, storm water analysis involves quantified prediction, based upon time proven methods, rather than equations that calculate discharges with pinpoint accuracy.

The Malmstrom AFB coefficients fall within the range of average values for typical multi-family detached residential development and for light industrial development. However the coefficients must be combined with the best professional judgment of competent storm water professionals and empirical observations to effectively predict existing conditions and evaluate change to existing conditions. The coefficients cited above were derived to assist in conservatively predicting peak discharge rates. Evaluating change in the runoff coefficient assists the engineer in quantifying and conservatively predicting change to the pervious and impervious surface within a drainage and how this change may affect existing storm water base flow conditions or the potential change in storm water peak events.

3.3 Geological Resources

Geological resources include geology, seismicity and soils. The ROI for geological resources is within Malmstrom AFB boundaries.

Malmstrom AFB is located in a glaciated portion of the Glaciated Missouri Plateau which in the northern part of the Great Plains Province. When continental ice sheets spread southward into northern Montana and the Dakotas, a few isolated areas of Montana stood above the surrounding plain. These areas were uplifted by the intrusion of igneous bodies long before the streams began downcutting and carving the land. The northernmost of these isolated mountains, the Sweetgrass Hills, were surrounded by ice and became nunatuks, or islands of land, in the sea of advancing ice, which pushed southward up against the Highwood Mountains, near Great Falls, the Bearpaws (also known as the Bear's Paw) south of Havre, and the Little Rockies to the east.

Much of the northern part of Montana is a plain of little relief that is the surface of a nearly continuous cover of glacial deposits, generally less than 50 feet thick. The advancing ice front blocked one after another the northward-flowing streams of the region, diverting them eastward flow along the ice front. Shonkin Sag, north of the Highwood Mountains near Great Falls is an abandoned diversion channel of the Missouri River, occupied when the ice front stood close to the north slopes of the Highwoods. Most of the present course of the Missouri River in the Great Falls area was established as an ice-marginal channel along the boundary of the ice front. These valleys were cut during the last 2 million years. (Trimble 1980)

The proposed site is underlain by the Sweetgrass Arch, a bedrock structural feature extending northwest between the Little Belt Mountains, 24 miles to the south, past the Base on the southwestern side and into Alberta, Canada. Stratigraphic units, important to the framework of the region surrounding Malmstrom, range in age from the Madison Limestone of the Mississippian era (360 million years) to the Eolian Sand of the Holocene (10,000 years). These units include sedimentary bedrock formations, unconsolidated glacial deposits, and windblown deposits. The occurrence of geologic hazards in the study area is low. Widely scattered, low-level seismicity characterizes the area. No active faults are near the project area or Malmstrom AFB and the proposed construction sites do not include significant areas of steep slopes.

In the vicinity of Malmstrom AFB, Quaternary glacial deposits overlie Early Cretaceous shale and sandstone formations. The modern soils of Malmstrom AFB have developed directly on these Quaternary deposits and consist primarily of Lawther silty clay (associated with the Pleistocene till) and Dooley sandy loam (associated with the Holocene eolian sand) (SCS 1982).

These two series encompass approximately 75 percent of the base. Other soils on base include sandy loams, loamy sands, and alluvial silty clay loams. Most of the soils on Malmstrom AFB are not highly subject to wind or water erosion. According to the March 2004 Geotechnical report from Thomas, Dean & Hoskins, Inc., "In general, the subsurface soil conditions encountered within the soil borings consist of sandy, lean clay and/or sandy soils near the surface underlain by fat clay and high-plasticity, lean clay. These heavy clay soils extend down to a depth of at least 26.5 feet, which was the maximum depth investigated." The following soils were documented in the Thomas, Dean & Hoskins, Inc. report (March 2004):

- Sandy, lean clay was encountered directly below the topsoil and organics or at the surface in eight of the eleven soil borings. The sandy, lean clay may represent site grading fill or a disturbed layer associated with the former housing development. The thickness of sandy, lean clay averaged nearly 2.5 feet. The natural moisture content measured an average of 11 percent.

- Clayey sand or silty sand was observed in five of the borings. Three occurrences were directly below the topsoil layer or surficial sandy, lean clay while two were observed interbeds within the fat clay and high-plasticity, lean clay soils.

- Fat clay and/or high-plasticity, lean clay was encountered in each boring generally below the surficial sandy, lean clay (in eight borings), the silty/clayey sands (in two borings) or directly at the surface (in Boring B-11). This material is slightly to moderately compressible as indicated by the consolidation test results. These figures also show that the samples exhibit slight to moderate expansion upon inundation at a surcharge pressure of 1000 psf.

3.4 Biological Resources

Biological resources of the region provide economic, social, cultural, and environmental value. The plants, animals, and land in the vicinity of Malmstrom AFB are important for biological productivity and landscape continuity.

3.4.1 Vegetation, Wetlands, and Floodplains

Malmstrom AFB is located on a high plateau approximately one mile south of the Missouri River and is approximately 100 feet above the 100-year floodplain of the river (USAF 1998). The base is located on flat to gently rolling terrain in the Shortgrass Prairie region of the United States. Most indigenous vegetation within the boundaries of the base and in the general vicinity has been replaced with exotic and weedy species over the past 60 years of site development. Some noxious weed populations of spotted knapweed, Canada thistle, and field bindweed are known to occur on the Base (USAF 2001b). Currently, the site is mainly turf grasses with shrubs and trees dispersed around the site. Malmstrom AFB is bordered on the north, east, and south sides by agricultural and pasture lands, with mixed commercial, industrial, residential, and open land uses to the west and northwest (USAF 2001b).

The existing site vegetation is a mix of introduced grass species with a low percentage of native grasses of a mixed-grass steppe community. Approximately 36 acres of wet areas and moist seeps were identified on Malmstrom AFB and range from retained storm water (Pow Wow Pond) to streambeds that flow only after heavy precipitation (USAF 2001b); there are no wetlands within the Proposed Action area (Figure 5). Wet areas and moist seeps encountered throughout the Base generally arise from human-induced, site-specific conditions. In general, woody vegetation is sparsely distributed throughout the project area, consisting primarily of trees, and recruited species.

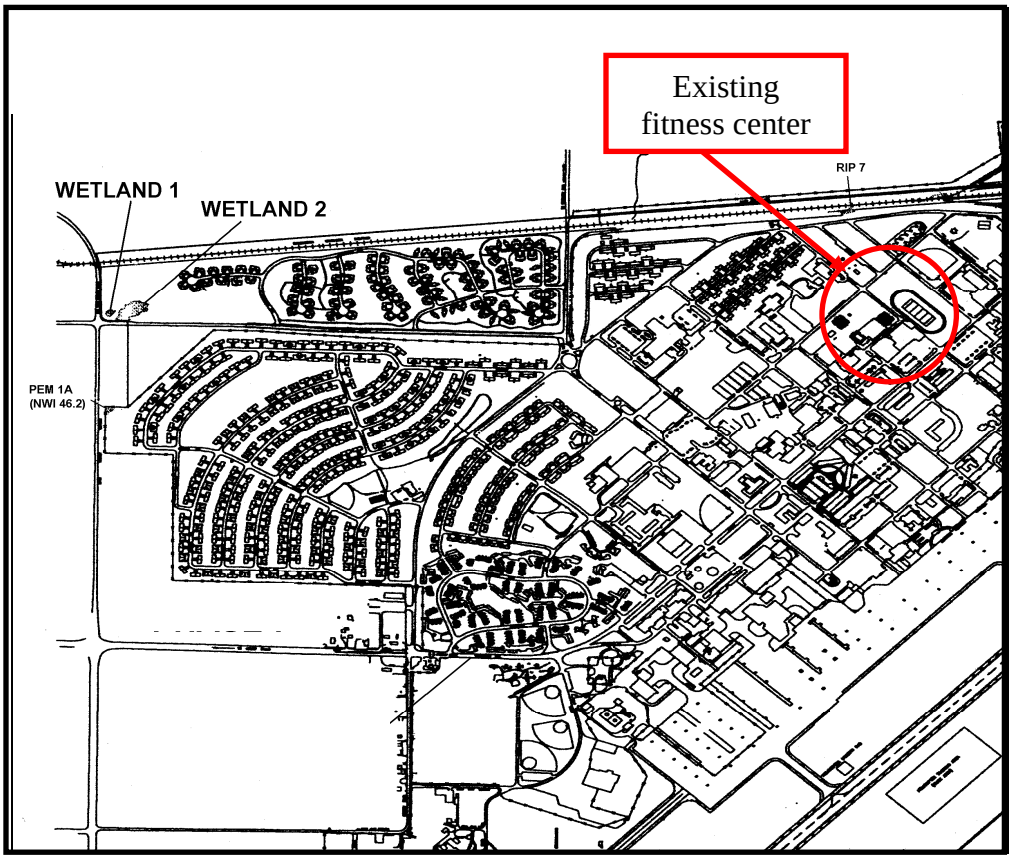

Figure 5 Wetland locations at Malmstrom AFB in relation to the proposed project area.

No threatened or endangered plant species have been identified in the study area (USAF 1994b, Montana Natural Heritage Program [NHP] 2003).

3.4.2 Wildlife

Effective wildlife habitat is limited in the study area by the relatively large portion of land used for buildings, runways, and other base facilities (USAF 2001b). Bird species of greatest abundance include a variety of songbirds, shorebirds, raptors, and waterfowl. Common mammals include the white-tailed jackrabbit, badger, skunk, ground squirrels, and field mice. There may be transient use of the area by coyotes. There are no native fish on base; Pow Wow Pond contains stocked rainbow trout (USAF 2001b).

No federally listed threatened or endangered species occur on Malmstrom AFB (Montana NHP 2003). Two federal-candidate bird species (ferruginous hawk and Swainson's hawk) and one state-recognized species (the upland sandpiper) may be migrants to the study area. Although no specific protective measures are required, consideration should be given to minimize disruption of their habitat. Threatened or endangered wildlife species do not impose a constraint to development on Malmstrom AFB (USAF 1998).

3.5 Cultural Resources

Cultural resources are prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activities considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources are typically divided into three major categories: archaeological resources, architectural / engineering resources, and traditional resources.

Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Architectural /engineering resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. They generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP). Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. They may include archaeological resources, locations of historic events, sacred areas, sources of raw materials, topographic features, traditional hunting or gathering areas, and native plants or animals. Significant cultural resources are evaluated for adverse impacts from a federal undertaking. Significant cultural resources are generally those that are eligible or potentially eligible for inclusion in the NRHP. Native American or other ethnic groups also may identify traditional resources as significant. The Region of Influence (ROI) for cultural resources consists of Malmstrom AFB. The Area of Potential Effect (APE) consists of the proposed action, the Fitness Center, and the haul route.

3.5.1 Historical Setting

Cultural frameworks for the region have been developed by Mulloy, Wedel, Frison and others (USAF 1995b), defining three major periods of human culture prior to contact with Euro-Americans. The people from the earliest period, from as long ago as 12,000 years to about 7,000 years ago, lived by hunting large game such as the now-extinct mammoth, and later deer, bison and smaller mammals. They used distinctive lanceolate spear points known as Clovis, Folsom and Plainview (USAF 1995b). Archaeological evidence from this period in the vicinity of Malmstrom AFB is usually in the form of surface sites or isolated finds, and there is little evidence for other aspects of their culture.

During the middle period, from about 7,000 to 1,500 years ago, there is evidence that bison were an important part of the economy, as well as remains of activities other than hunting, including plant collection, cooking, and food storage. Archaeological sites include a variety of projectile points, ground stone tools, and in the latter part of this period, ceramics (USAF 1995b). In the

vicinity of Malmstrom AFB archaeological sites are found both on the surface and buried. However, the deposition on base precludes material being deeply buried.

In the most recent period prior to contact with Euro-Americans, from about 1500 to 300 years ago (about A.D. 1700) the variety of projectile points increases and pottery is more evident. Bison were still an important component on the economy, and stone circles are a distinctive type of site associated with this period. During the 18th century, prior to face-to-face contact, horses and trade goods such as beads and metal points made their way to this region through trade (USAF 1995b). Archaeological sites are found both on the surface and buried. When Euro-Americans contacted the Native Americans of this region, they identified Blackfoot, Crow, Plains Cree, Gros Ventre, Teton Dakota and Assiniboine living a highly mobile life centered around bison hunting during the warm part of the year and village dwelling in sheltered areas such as river valleys during the cold seasons (USAF 1995b). Use of tipis and horses helped make this possible.

French and British fur traders had come through the upper Missouri River area prior to Lewis and Clark's Voyage of Discovery, but in 1805 this expedition's portage around the Great Falls probably took them across what is now Malmstrom AFB. Their route went between Belt Creek and a point upstream of the City of Great Falls. This exploration presaged later settlements, including Fort Benton to the northeast of the base during the first half of the 19th century (USAF 1995b). Forts and trading posts were followed by gold prospectors in the 1850s and 1860s, and then cattle ranching in the period between 1860 and 1880. The severe winter of 1886-1887 set the stage for sheep ranching to follow cattle ranching as the dominant industry, capped by the Great Northern Railroad reaching Great Falls in 1893. Between 1890 and 1910 homesteading increased, with the accompanying grain production contributing to the economy (USAF 1995b). The Chicago, Milwaukee, St. Paul and Pacific Railroad ("Milwaukee Road") came to Montana, passing through Great Falls in 1909 (Montana Historical Society 2003); a remnant of this route now forms part of the northern boundary of Malmstrom AFB.

The City of Great Falls continued to grow, and in 1941 the Army Air Corps developed Great Falls Municipal Airport for use by the U.S.S.R. as part of the Lend-Lease program (USAF 1995b). Construction of the base began in 1942. Initially known as East Base, it was renamed Great Falls Air Force Base in 1947, and in 1956 was again renamed, this time for vice commander Col. Einar Malmstrom following his death in a plane crash (USAF 1995b). In March 1961 construction began on the first launch facility at Malmstrom. The base was an important player during the Cuban Missile Crisis. Missiles formed an important part of the Malmstrom AFB mission, but over the years other aspects have been added. The 301st Air Refueling Wing was activated at Malmstrom AFB in 1988. HQ USAF redesignated the 341st Strategic Missile Wing as the 341st Missile Wing in September 1991. In July 1994, USAF Space Command took over as the Major Command replacing Air Mobility Command.

Malmstrom AFB now hosts the 819th RED HORSE squadron. RED HORSE, acronym for Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer, is the first Active Duty and Air National Guard associate unit in the Air Force. The 341st Missile Wing was redesignated the 341st Space Wing in 1997 .

Identified Cultural Resources

A search of the National Register Information System database shows that no National Register-eligible resources are located on Malmstrom AFB, although the City of Great Falls is home to a number of National Register-listed historic buildings.

Three archaeological and historic resource surveys have been conducted on Malmstrom AFB proper (USAF 2001b). In 1988 Historical Research Associates conducted a survey that found a segment of the Chicago, Milwaukee, St. Paul, and Pacific Railroad (now Burlington Northern Santa Fe) that traverses the northern border of the base (site 24CA 264). The railroad segment may be eligible for the National Register of Historic Places based on its role in the Euro-American settlement of the region (USAF 1995b), but it is outside the APE. An archaeological site in the southern part of the base is considered to be not eligible for the National Register. With the exception of isolated finds, no other cultural resources were identified within Malmstrom AFB.

Malmstrom AFB conducted an architectural inventory in 1996 to identify Cold War resources. The inventory also identified a number of buildings that are eligible, potentially eligible or potentially eligible pending additional background research (USAF 2001b). None of these facilities are within the APE of the Proposed Action.

Significant paleontological resources do occur in Montana, mostly in surface to near-surface bedrock. However, the project area and Malmstrom AFB are underlain by 30 to 100 feet of glacial sediments, which do not tend to produce paleontological finds, and none have been found on the Base (USAF 2001b). Upland areas, on which the project area and Base are located, also have a lower potential for cultural and historic sites than riparian areas.

Previous contacts with the Montana Historic Preservation Office confirmed the presence of only one known National Register-eligible cultural resource (historic railroad tract segment) adjacent to, but not within the proposed project area (USAF 2001b).

3.6 Noise

Noise may be defined as unwanted or physically harmful sound. Noise is usually objectionable because it is disturbing, annoying or can cause physical injury. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. Pitch is the quality of a tone or sound, depending on the speed (frequency) of the vibrations (longitudinal wave) by which it is produced, the shorter the wavelength the higher the pitch/frequency, the longer the wavelength the lower the pitch/frequency. Higher pitched signals of the same *loudness* sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the force of an ocean wave hitting the shore, in that, intensity is a measure of the amplitude of the sound wave from the point of view of the listener.

In addition to the concepts of pitch and loudness, there are several noise measurement scales that are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement that

indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

There are several methods of characterizing sound. The most commonly used is the *A-weighted sound level* or *dBA.* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night—because excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Day/Night Average Sound Level, or* L_{dn}, is a measure of the cumulative noise exposure in a community, with a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. Table 7 categorizes the typical range of L_{dn} levels for various functional areas encountered on Malmstrom AFB. In general 30-50 dB represents a quiet classification, 65-70 dB represents a moderately noisy classification, and 70-75 dB represents a noisy classification. *Yerges.*

Table 6: Typical Day-Night Levels in Urban Areas in the United States.

Description	Typical Range of L_{dn}, dB	Average L_{dn}, dB
Quiet suburban residential	48-52	50
Normal suburban residential	53-57	55
Urban residential	58-62	60
Noisy urban residential	63-67	65
Very noisy urban residential	68-72	70

Source: U.S. Environmental Protection Agency 1974.

3.6.1 Existing Noise Setting

This analysis assesses noise levels in the area of the Proposed Action. The most recent Air Installation Compatible Use Zone (AICUZ) analysis was completed in 1994 (USAF 1994a), when the 341st ARG was still assigned to Malmstrom AFB. The base does not currently host an active air wing, thus the runway is currently inactive, with the exception of Huey helicopters, a squadron of the 341st Space Wing Operations Group. The 1994 AICUZ analysis shows the proposed action area outside of the 65 dB contour.

3.6.1.1 Residential Areas

Vehicular traffic is the primary source of noise near Base residential areas. Single family and duplex homes line the streets adjacent to the vehicle route from the site to the commercial gate and a medical clinic is currently operating at the intersection of Perimeter Road and Clinic Court. Perimeter Road bisects two residential areas near the Proposed Action and is a primary arterial for on-base travel. However, Perimeter Road is blocked from further travel at Plum Street, so it is not a through street to the Main Gate. Noise from vehicular traffic would emanate from the site of the Proposed Action and along the vehicle route from the site to the commercial gate. Any potential increase in noise from construction activities will primarily occur during day-time business hours and should not adversely affect local buildings or neighborhoods, to the point of becoming problematic.

The noise experienced by residential and other noise-sensitive receptors varies according to their distance from the site of the Proposed Action and travel route and the number of intervening facilities. (Noise typically is attenuated, or reduced, 6 dB for every doubling of distance from the source. In addition, one intervening row of structures reduces noise about 5 dB; additional rows reduce noise by about 10 dB.)

Ambient noise levels at the areas closest to Perimeter Road are expected to be comparable to those described in Table 6 as “urban residential.” Those residences farthest from Perimeter Road will likely experience noise that is comparable to that described under “normal suburban residential.”

3.7 Health, Safety, and Waste Management

This section describes programs and activities currently in place at Malmstrom AFB including general public health and safety responsibilities, worker health and safety protection, solid and hazardous waste management, sewage and storm water management, environmental remediation activities, pesticide application, and harmful substances in the ROI.

3.7.1 Public Health Management

The USAF and agencies of the City of Great Falls, Cascade County, the State of Montana, and the federal government protect public health and safety at Malmstrom AFB. The city and county provide police protection and emergency services; the Cascade County Health Department is

responsible for monitoring public health and safety issues such as drinking water quality and disease control. The Montana Department of Environmental Quality regulates waste management, toxic substance reporting, and investigation and cleanup of contaminated sites. The State of Montana also provides technical and financial assistance for occupational health concerns such as asbestos control, radon emissions, and drinking water. The 341 CES/CEV provides assistance and guidance to Malmstrom AFB personnel regarding regulatory requirements for safe use, storage, and disposal of hazardous and toxic substances and has a pollution prevention program that includes minimization of hazardous wastes and recycling. The Environmental Office of the Montana Department of Military Affairs provides the same oversight and guidance for state-operated National Guard facilities.

3.7.2 Worker Safety and Health

Construction activities on-base are governed by the rules and regulations of the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) as codified in §40 CFR 1910 Occupational Safety and Health Standards.

3.7.3 Solid and Hazardous Waste Management

Solid and hazardous waste programs provide for the collection, handling, and disposal of waste materials, response operations to spills of hazardous materials or waste, and management of the Installation Restoration Program (IRP). In Montana, hazardous and solid waste issues are regulated by the Montana Department of Environmental Quality.

At Malmstrom AFB, the solid and hazardous waste programs are managed by the Environmental Flight (341 CES/CEV). The responsibility to develop Spill Prevention Control and Countermeasures (SPCC) providing procedures for spill reporting, containment, cleanup, and disposal, resides with the Environmental Flight. The fire department requests support, as needed, from local volunteer departments in the event of a spill (USAF 1998).

Hazardous waste management consists of the collection, storage and transportation of hazardous wastes as defined by RCRA. A release of certain materials, such as JP-8 fuel, could result in the generation of hazardous wastes. Hazardous wastes are recorded and processed through the Environmental Flight and Defense Reutilization and Marketing Office (DRMO) (USAF 1998).

Solid waste collection and disposal services are provided to the base by civilian contractors and the City of Great Falls. Material is taken off base to a private landfill.

3.7.4 Sewage and Storm Water Management

Sewage wastewater from the base is discharged to the City of Great Falls which then manages waste under a service contract with a private sewage treatment management firm. Storm water is considered a wastewater discharge by the Clean Water Act. Storm water is discharged from the base in accordance with a Montana Pollution Discharge Elimination System (MPDES) General Discharge Permit for Storm Water Associated with Industrial Activity issued by the Montana DEQ. Precipitation that falls or melts in the study area is managed in accordance with the Malmstrom AFB Storm Water Pollution Prevention Plan (SWPPP; Malmstrom AFB 1998). The

SWPPP also mandates that construction discharges and industrial discharges be managed through Best management Practices, as appropriate.

3.7.5 Environmental Remediation Activities

The USAF is undergoing clean up of contaminated sites created by past activities under the Installation Restoration Program (IRP). Seven IRP sites at Malmstrom AFB are either under investigation or undergoing cleanup activities at Malmstrom AFB (USAF 1998). There are no active IRP sites within a mile of the site of the Proposed Action or any area impacted by the Proposed Action.

3.7.6 Pesticides

Herbicide spraying has occurred throughout the Base and herbicides may have been sprayed on the Proposed Action site. Because herbicides used for base wide spraying were biodegradable and would have dissipated from the soil in less than a year, any herbicides applied by Malmstrom in the past would likely not be present at this time (USAF 1999).

3.7.7 Harmful Substances

A radon survey of the base was performed by the Bioenvironmental Engineering office in September of 1988. The results of that survey indicated that Malmstrom AFB was categorized as Low Probability. This signifies that all structures sampled had less than four Pico curies of radon concentration. At this level of concentration, no further action is required (USAF 1999).

The existing fitness center has been part of previous base wide surveys for lead-based paint and asbestos. The existing fitness center lead-based paint sample analysis confirms lead-based paint or lead-containing paint on a majority of the interior and exterior surfaces, including interior and exterior walls and many other painted surfaces. The asbestos surveys for the existing fitness center identifies asbestos containing materials in the boiler insulation and some of the pipe insulation, fitting insulation, and expansion joints. Standard Air Force contacting practice calls for the proper containment and disposal in an approved landfill of these known substances.

3.8 Land Use

This section describes land use, transportation, and visual resources on Malmstrom AFB. Land use focuses on general land use patterns, as well as management plans, policies, ordinances, and regulations. These provisions determine the type of uses that are allowable and identify appropriate design and development standards to address special use or environmentally sensitive areas. Transportation addresses roads and circulation in the project area. Aesthetic qualities in the ROI are also described.

3.8.1 Land Use

Land use on Malmstrom AFB includes developed areas in the northwestern portion of the installation and open space and weapons storage in the eastern portion (refer to Figure 2). The airfield, located in the southeastern portion of the installation, is the dominant land use on the

installation. Light industrial and aircraft operations and maintenance are adjacent to the airfield. Other land uses in the cantonment area are generally located to the west of the airfield.

Housing is primarily located in the northwestern portion of the installation. Recreation facilities are scattered throughout the base in areas adjacent to the family housing area. Pow Wow Park is located in the east portion of the installation and includes a manmade pond for fishing. The park also includes playground equipment and a picnic area.

Adopted plans and programs guide land use planning on Malmstrom AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development. The *Malmstrom AFB General Plan* (Malmstrom AFB 2005) provides an overall summary of strategic planning initiatives. The plan includes six components (Composite Constraints and Opportunities, Infrastructure, Land Use, Capital Improvements Program, Facilities Excellence Plan, and Five-Year Plan), which represents a summary of current base plans. The base's *Integrated Natural Resource Management Plan,* (USAF 2001b) is used to coordinate natural resource management.

The *AICUZ Study, A Citizen's Brochure* (USAF 1994a) provides a summary of the AICUZ program. The Malmstrom AFB AICUZ study includes an analysis of the effects of noise, aircraft accident potential, and land use and development on Malmstrom AFB and its neighbors.

3.8.2 Transportation

Access to Malmstrom AFB is provided from US Highway 87/89, east of Interstate 15 (refer to Figure 1). The Main Gate located on 2nd Avenue North and the Commercial Gate (North Gate) on 10th Avenue North provides access to the base. Second Avenue North becomes Goddard Avenue on Base, which serves as the main thoroughfare. Tenth Avenue becomes 72nd Street North and intersects Goddard Avenue. Both entrance routes connect to 57th Street North (Northeast Bypass - Montana Department of Transportation [MDT] Route 5205).

Seventy five percent of base traffic enters the base through the Main Gate and the remaining 25 percent enter through the North Gate (USAF 2001a). Peak traffic hours are between 6:45 am to 8:00 am and 4:30 pm to 5:30 pm. The majority of traffic is vehicular in nature, although there are school buses that provide transportation service to children on the base.

3.8.3 Visual Resources

Malmstrom AFB is located to the east of the City of Great Falls in rolling plains about 75 miles east of the Rocky Mountains. Malmstrom AFB lies at an elevation of 3,525 feet above sea level on a plateau (Malmstrom AFB 2002). The topography is characterized by broad, gently sloping plains that have been moderately dissected by numerous streams.

The base occupies 3,600 acres. The airfield runway occupies the largest portion of the installation. The base maintains a consistent design standard that has resulted in a uniformity of architectural design. The residential area specifically reflects modern colonial or ranch style one and two story homes with overlapping plank siding (or aluminum, if upgrades have occurred) and symmetrical window and door placement.

Little native vegetation currently exists in the housing areas of Malmstrom AFB. Native vegetation has been altered or modified by developmental activities and the introduction of exotic grasses (Malmstrom AFB 2002).

3.9 Socioeconomics and Environmental Justice

3.9.1 Definition of the Resource

Socioeconomic resources for this analysis are characterized in terms of population and employment, with a particular emphasis on minority, low-income and youth populations. For the purposes of this analysis, the ROI is Malmstrom AFB, with some information provided for Cascade County.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to address environmental and human health conditions in minority and low-income communities. An analysis of environmental justice helps determine if actions of federal agencies disproportionately and adversely impact the human health and environmental conditions in minority populations and low-income populations or Native Americans. The approach applied in this section is in accordance with the *Interim Guide for Environmental Justice within the Environmental Impact Analysis Process* (USAF 1997).

In addition to environmental justice issues are concerns pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

3.9.2 Population and Employment

There are 3,409 active duty military personnel assigned to Malmstrom AFB, of this number 1,749 (52 percent) reside on base, while the remainder live off the installation. Family members and dependents of these personnel amount to 4,544 persons (U.S. Census 2000, Tract 12). In addition, Malmstrom AFB employs 435 appropriated fund civilian employees and 728 non-appropriated fund civilians, contractors and private-business employees. The base population, including military personnel, civilian workers and dependents, totals 9,072 persons (Malmstrom AFB 2002).

The City of Great Falls is the seat of Cascade County and the second largest city in Montana with a 2000 population of 56,690 persons, accounting for 70 percent of the county population of 80,357 persons (U.S. Census 2000). Cascade County is home to 32,547 households with an average household size of 2.41 persons. In the predominantly rural area, Great Falls is largely dependent upon the fluctuations of the agricultural industry. Due to the area's natural terrain, Great Falls residents enjoy a high quality of life attributable to the numerous recreational opportunities and natural wildlife habitat in the area.

The operation of the base makes an important contribution to the economy of the region through both direct employment and purchases from local businesses. The presence of the base provides economic stability to the city and the region. Malmstrom's annual payroll obligates $151.6 million to military and civilian employees, and the Air Force contributes an estimated $97.9 million in construction and service contracts and other purchases from local businesses. Malmstrom AFB has a total annual economic impact of over $282 million on a 50-mile radius that includes the counties of Cascade, Judith Basin, Lewis and Clark, Teton, Pondera, and Choteau (Malmstrom AFB 2002).

3.9.3 Environmental Justice and Protection of Children

Disadvantaged groups within the ROI, including low-income and minority communities, are specifically considered in order to assess the potential for disproportionate occurrence of impacts. For the purposes of this analysis, disadvantaged groups are defined as follows:

- *Minority Population*: Persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders.
- *Low-Income Population*: Persons living below the poverty level, according to income data collected in U.S. Census 2000.
- *Youth Population*: Children under the age of 18 years.

Based on 2000 Census data, the incidence of persons in Cascade County with incomes below the poverty level was comparable to state levels accounting for 13.5 percent and 14.6 percent of the population, respectively (U.S. Census 2000). Nationally, 12.4 percent of the population lives below the poverty level.

Total population of the United States is 281,421,906 (U.S. Census 2000). Minorities represent 28.02 percent of the National population. The United States population is composed of 12.3 percent Black, 0.9 percent Native American, 3.6 percent Asian, and 12.5 percent identifying a cultural heritage of Hispanic. Persons under the age of 18 comprise 25.6 percent of the United States Population.

Minority persons represent 10.5 percent of both the Cascade County and Montana populations. Native American and Aleut persons are the most predominant minority group in the county, representing 40 percent of the minority population, followed by persons of Hispanic descent who account for 23 percent of minorities. At the state level, Native Americans and Aleuts represent 60 percent of the minority population and Hispanic persons represent 19 percent of minorities (U.S. Census 2000). The youth population, which includes children under the age of 18, accounts for 26.0 percent of Cascade County's population, compared to 25.5 percent at the state level.

The U.S. Census Bureau, Census 2000, data for Cascade County, Great Falls, Montana, Tract 12 specifically addresses Malmstrom Air Force Base. The areas outside the Malmstrom AFB boundaries included in Tract 12 historically are not populated and are used for farming and ranching operations. Although Tract 12 incorporates a small amount of area outside of the Malmstrom AFB boundaries, this fact should not significantly change the Census 2000 data, if at

all. The incidence of persons living below the poverty level at Malmstrom AFB is 6.2 percent, far below the national average.

As typically observed at rural military installations, the demographic makeup of the Malmstrom AFB population differs significantly from the demographic makeup of the local area. Minority persons represent 21.8 percent of the Malmstrom AFB population. In contrast to the racial and cultural demographic described for the county and state populations in the preceding paragraph, the Malmstrom AFB population is composed of 31.8 percent Black, 3.2 percent Native American, 12 percent Asian, 3.6 percent Pacific Islander, 16.8 other, and 32.3 percent of persons identifying themselves as "Two or More Races." However, the Census 2000 data for Tract 12 reveals a white only, not Hispanic or Latino population of 3554 or 78.2 percent. The youth population, which includes children under the age of 18, accounts for 36.2 percent of Malmstrom AFB's population, compared to 25.5 percent at the State level.

4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4.0 presents the environmental consequences of the Proposed Action for each of the resource areas discussed in Chapter 3.0. To define potential direct and indirect impacts, this chapter evaluates the project elements described in Chapter 2.0 against the affected environments provided in Chapter 3.0. Specifically, each resource analysis considers the effects of the Proposed Action in the existing area. Cumulative effects of the Proposed Action with other foreseeable future actions, as well as past and present activities, are presented in Chapter 5.0.

4.1 Air Resources

The significance of impacts to air quality is based on federal, state, and local pollution regulations or standards. Air quality impacts from a proposed activity or action would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- Impair visibility within any federally mandated federal Class I area.

According to EPA's General Conformity Rule in §40 CFR 51, Subpart W, any proposed federal action that has the potential to cause violations, as described above, in a nonattainment or maintenance area must undergo a conformity analysis. A Conformity Analysis is not required since Malmstrom is an attainment area for all NAAQS.

Section 169A of the CAA established the Prevention of Significant Deterioration (PSD) regulations to protect the air quality in regions that already meet the NAAQS. Certain national parks, monuments, and wilderness areas have been designated as PSD Class I areas, where appreciable deterioration in air quality is considered significant. The nearest PSD Class I area is more than 50 miles from the region potentially affected by the Proposed Action. Therefore, the

Proposed Action would not potentially have a significant impact on the PSD Class I areas identified in Section 3.1.2.

4.1.1 Potential Impact from Proposed Action

A military installation can constitute a major source of CO, VOCs, SOx, NOx, and PM_{10} pollution. Sources of these pollutants include stationary sources (fossil fuel combustion and fuel or solvent evaporation), construction activities, and mobile sources. The Proposed Action, however, is a fitness center construction project not unique to a military installation.

Construction activities produce short-term combustion emissions (vehicle exhaust emissions) and fugitive dust emissions (PM_{10}), which would cease once construction is completed. Potential effects created from construction activities include road dust entrainment from vehicles and dust from temporary storage piles. Impacts can also result from increased vehicular emissions from construction vehicles, material hauling, and labor force transportation.

However, emissions generated by construction projects are short-term and temporary in nature. Fugitive dust emissions will be minimized and controlled by implementation of dust control measures in accordance with standard construction practices. For instance, frequent spraying of water on exposed soil during construction, proper soil stockpiling methods, and prompt replacement of ground cover or pavement are standard procedures that will be used to minimize the amount of dust generated during construction. Using efficient grading practices and avoiding long periods where engines are running at idle will reduce combustion emissions from construction equipment. Vehicular combustion emissions from construction worker commuting may be reduced by carpooling.

The Proposed Action will increase the number of stationary sources at the Base, but would not result in a net permanent increase in either stationary sources or vehicular traffic. The stationary source increase will arise from the use of a clean-burning, natural-gas, water heater for summer time use, when the coal-fired heat plant is shut down. The water heater would not significantly impact the air quality at Malmstrom AFB or the region, as any increase will be offset by demolition of the existing fitness center. Therefore, the overall impact to air resources from the Proposed Action would be short-term and not significant.

4.1.2 Potential Impact from the No Action Alternative

No impacts to air quality would result from the no-action alternative, since no proposed construction would occur.

4.2 Water Resources

Water resources are surface and subsurface resources that are finite but renewable. Construction activities may affect water resources by physical disturbances and material releases (e.g., sediment, chemical contaminants, etc.) into surface and groundwater. An impact to water resources at Malmstrom AFB that arises from any constellation of parameters could be considered significant if an aquifer, groundwater table, or surface water body is altered or degraded resulting in a measurable and persistent change in groundwater recharge, water quantity or water quality. An impact would also be considered significant if surface or

groundwater quality were degraded such that severe or long-term violations of federal or state water quality criteria resulted.

Construction of facilities changes a watershed's response to precipitation. The most common effects are reduced infiltration and decreased travel time, which increase peak discharges and runoff. Runoff is determined primarily by the amount of precipitation and by infiltration characteristics related by soil type, soil moisture, antecedent rainfall, cover type, impervious surfaces and surface retention. Travel time is determined primarily by slope, length of flow path, depth of flow, and roughness of flow surfaces. Peak discharges are based on the relationship of these parameters and on the drainage area of the watershed, the location of the proposed development, the effect of any storage and other natural or manmade active or passive control works, and the time distribution of rainfall during a given storm event (USDA Technical Release 55). Incremental increases of impervious surface may combine to significantly alter peak events or baseline flow in a watershed. Increased recharge or improved water quality are examples of beneficial impacts.

4.2.1 Potential Impact from Proposed Action

The Proposed Action would not be expected to significantly impact the pre-existing status of groundwater resources at Malmstrom AFB. Excavations at the Proposed Action site would be shallow and would not intersect groundwater (except, possibly minor perched zones). Short-term impacts due to leaks or spills of contaminants during construction (e.g., fuels, lubricants) could possibly impact shallow perched zones; however, they would not be expected to enter the deeper confined aquifers and can be readily mitigated through implementation of appropriate construction/maintenance practices.

Short-term impacts to surface water could potentially occur during construction. These potential impacts could include increased turbidity in surface waters that are adjacent to construction activities and potential contamination due to leaks and spills of fuels and lubricants from construction equipment. Use of Best Management Practices (BMP's) and engineering controls as prescribed in the required Stormwater Pollution Prevention Plan (SWPPP), and compliance with the protective provisions of the mandatory State of Montana, Storm Water Permit for the Proposed Action would significantly reduce the potential for construction related impacts to surface water resources. Under Montana law the Proposed Action requires a Montana Construction Storm Water Permit because this construction activity would disturb more then one (1) acre.

The Proposed Action would not result in a significant net increase in impervious surface in Drainage Area 2. The increase arises from a net increase in the surface area of the proposed facility. The Air Force would demolish the existing fitness center but would not demolish the HAWC. These facilities all fall within Drainage Area 2.

The design of the Proposed Action is not completed. However the Air Force proposes to construct the Proposed Action in two phases with the first phase awarded prior to the end of FY 2006. A slight increase in impervious surfaces would likely occur as set forth in Table 7, based upon size of the proposed facility and demolition of the existing facility. The Proposed Action

would add 1.2 acres of impervious surface area to Drainage Area 2, less than a 1% reduction in pervious surface in Drainage Area 2.

Table 7: Changes in Impervious Surface Area for Drainage Area 2 for Proposed Action.

Existing Total Drainage Area [Acres unless otherwise specified]	Existing Impervious Drainage Area	Existing Pervious Drainage Area	Net Increase in impervious surface (Sq.Ft.)	Runoff Coefficient including Proposed Actions
213.6	76.6	137	1.2 (53,246)	0.61

This increase in impervious surface triggers evaluating the significance of changing the runoff coefficient from 0.60 (See Table 5) to 0.61. As discussed in §3.2, the runoff coefficient provides an indicator for predicting storm water discharge rates. The 0.61 coefficient falls within the accepted range of average values for typical multi-family detached residential development and for light industrial development. However the coefficients must be combined with the best professional judgment of competent storm water professionals to effectively predict existing conditions and evaluate change to existing conditions.

Although storm water discharge analysis tends to be empirical in nature, evaluating change in the runoff coefficient assists the engineer in quantifying and conservatively predicting how changes to pervious and impervious surface within a drainage may affect existing storm water base flow or potentially change storm water peak events.

Low Impact Design (LID). Traditional methods of storm water management have generally relied on flood control schemes. These traditional methods of management fail to consider the overall natural resources management, hydrological objectives and stewardship responsibilities. LID concepts use hydrology as the integrating framework of design and protect the overall ecology of the watershed.

LID maintains the site's natural and existing hydrological function. This goal is accomplished with five concepts: The site hydrology integrates the framework for the design, distributes controls through micromanagement, controls storm water at the source, incorporates non-structural systems and creates multi-functional landscapes, buildings and infrastructure.

The effectiveness of LID is determined by comparing the curve number (CN) calculations for the existing site to the post-development CN. MAFB proposes to develop the CN using the SCS methodology as cited in the United States Department of Agriculture Natural Resources Conservation Service, Technical Release 55 (TR-55, June 1986). The benefit of using this method is that the CN can easily be modified to represent urban conditions, i.e. hydrological soil group, cover type, treatment, hydrological conditions and antecedent runoff conditions. The percentage of impervious area and the means of conveying runoff from the impervious area to the drainage system are used in the computing of the CN.

The CN represents the pre and post development conditions of the drainage area. MAFB drainage area specific numbers would be developed for evaluating the Proposed Action. In this way the assumptions in the model would account for the pervious and impervious areas in the drainage area, i.e. the CN is weighted based upon the pervious and impervious conditions at the site.

The Proposed Action. The comparison of the Proposed Action versus the existing facility begins with § 1.4 and Table 1 above. The existing fitness center and HAWC would provide 61,507 sf of usable space. The USAF Guidelines authorize a facility of 108,648 sf. Malmstrom AFB proposes to construct a facility roughly 107, 406 sf in size. Malmstrom AFB proposes to demolish the existing 54,160 sf, fitness center but not the existing HAWC, which occupies roughly 5442 sf in Building 1145. The HAWC space left in Building 1145 would be converted to another use. The Proposed Action would demolish the parking lot and tennis courts to the northwest of the existing facility and an, as yet, undetermined amount of the paved streets on the northwest side of the existing facility. After demolition of the existing fitness center, the existing parking lot would be expanded, but this expansion would not exceed the surface area of the pavement demolished. The functions and associated space allocated to those functions are set forth in Table 1.

The runoff coefficient is derived for use in storm water calculation methods commonly accepted in the engineering field, such as the Rational Method, Q=CiA, a storm water calculation method. Where Q= peak discharge (cfs), C = runoff coefficient (ASCE Manual of Practice), i = rainfall intensity (in/hr) and A = watershed area (acres). The runoff coefficient was calculated considering the following past actions:

Drainage Area I	
Matador Manor (PH I,II, & III)	1,556,912 sf
Phases I, II & III demolition	(235,889 sf)
Phases IV,V,VI & VII roughly net zero	0 sf
Net increase in impervious surface	1,321,023 sf = 30.53 acres

Drainage Area 1 Total Surface Area = 655.5 acres

Drainage Area 2	
Phase V	669,700 sf
Demolish relocatables	(573,177 sf)
New Fitness Center	107,406 sf = 1.2 acres
Demolish existing fitness center	(54,160 sf)
Net increase in impervious surface	149,769 sf = 3.44 acres

Drainage Area 2 Total Surface Area = 213.6

By using the surface areas described we can calculate an effective runoff coefficient for the combination of the various surfaces and slopes found in the drainage area. In effect since we are not altering the rainfall intensity or the boundaries of the watershed area, the only environmental

change that may significantly affect peak discharge is the change in impervious surface area, as that change causes us to select a different runoff coefficient for the new type of surface from the ASCE Practice Manual. The runoff coefficient provides one of several factors in the Rational Method that assists the engineer in evaluating runoff versus infiltration. The adjusted runoff coefficients are evaluated in Sections 4.2. and 5.1.3.

The storm water calculations using appropriate Runoff Coefficients and the Rational Method demonstrate the Proposed Action would impart a maximum 0.5 % change in the existing discharge to Drainage Area 2 and the Cumulative Effect of the actions identified and further evaluated in §5.1 would impart a maximum 1.7% increase to the discharge from Drainage Area 2, during a 5 year – 2 hour storm event, and a maximum 1.6% increase to the discharge from Drainage Area 2, during a 10 year – 2 hour storm event. Increases at the identified levels would not impart a significant change to Drainage Area 2 and when factored into the gross Base discharge into Whitmore Ravine the increase becomes even less significant. Malmstrom AFB would reduce this insignificant change by utilizing the LID considerations and Best Management Practices discussed above.

The Proposed Action would not have a significant effect on ground water or surface water conditions at Malmstrom AFB.

4.2.2 Potential Impact from No Action Alternative

Under the no action alternative, the proposed construction would not occur. Therefore, no significant impacts to water resources are anticipated.

4.3 Geological Resources

4.3.1 Potential Impacts from Proposed Action

Slopes within the project area are generally gentle. However, water and wind erosion could occur during construction activities. Engineering controls described in Chapter 2.0 will reduce these impacts.

Many of the soils at the site are moisture sensitive, and have high clay content. These soils are expansive and have caused foundation related problems. Thomas, Dean & Hoskins, Inc (March, 2004) developed a Geotechnical Investigation report for use on recent housing projects, which includes Malmstrom specific engineering considerations and controls, that would assist the design engineer in mitigating any negative impacts of the soil conditions for the Proposed Action. The soil type at the site of the Proposed Action should not differ significantly from those evaluated in the March 2004 study.

No significant long term impacts to site soils are expected.

4.3.2 Potential Impact from No Action Alternative

No impacts to geology or soils are expected under the no action alternative.

4.3.3.1 Storm Water - Erosion and Sedimentation: Impacts of the Proposed Action

Storm water effects related to erosion and sedimentation from construction are negligible. Only, short-term impacts to surface water could potentially occur during construction. These potential impacts could include increased turbidity in surface waters that are adjacent to construction activities and potential contamination due to leaks and spills of fuels and lubricants from construction equipment. Use of Best Management Practices (BMP's) and engineering controls as prescribed in the required Storm Water Pollution Prevention Plan (SWPPP), and compliance with the protective provisions of the required Erosion Control Plan for the Proposed Action would significantly reduce the potential for construction-related impacts to surface water resources. Cumulative effects are also considered negligible (see Section 5.0). As noted above, the Proposed Action results in a slight increase to impervious area, but given the size of Drainage Area 2 and the distance from the site of the Proposed Action to Outfall Number 2, the Proposed Action will have an insignificant effect on Storm Water.

Malmstrom AFB studied storm water outflows from housing areas under the proposed action (and previous actions; NZAS 93-0012B, June 2004). The June 2004 study determined that for a ten-year discharge event, the combined outflow for Basins 1-4 (which includes the housing replacement areas for Phase 6 and 7) has a combined maximum discharge of 480 cfs. The report recommended a combined detention pond (now completed), regrading of the storm channel redesign, which if implemented would reduce total discharge by 25% to 355 cfs, which is nearer to the capacity of Outfall Number 1 at 300cfs. The Proposed Action would have no significant effect on discharge at Outfall Number 1 or Outfall Number 2, as discussed, and therefore no significant change to the existing condition of the West Branch of Whitmore Ravine.

4.3.3.2 Storm Water - Erosion and Sedimentation: Impacts of the No-Action Alternative

With no construction under the no action alternative, there would be no change in storm water related erosion and runoff.

4.4 Biological Resources

Direct disturbances include excavation and removal of existing habitat. Impacts to biological resources could also result from noise and dust generation during the construction of the site.

4.4.1 Potential Impacts from Proposed Action

The proposed site is within a light industrial/administrative complex area that consists of buildings, recreation facilities, paved roads, parking areas, and open space planted with trees, shrubs, turf grasses and other landscaping.

Surface disturbance associated with the Proposed Action can result in an increased risk of invasion by noxious weeds. Prompt re-vegetation of all disturbed areas adjacent should be considered. Because of the limited amount of biological resources of the project area, the Proposed Action would have an insignificant impact on biological resources. In addition, no

significant impacts to wetland areas, significant habitat areas, or threatened or endangered species are expected.

4.4.2 Potential Impact from No Action Alternative

Under this alternative, the construction would not occur. Therefore, the limited biological resources within the ROI would not be impacted by the no-action alternative.

4.5 Cultural Resources

A number of federal regulations and guidelines mandate the management of cultural resources. Section 106 of the National Historic Preservation Act (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are cultural resources listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Eligibility evaluation is the process by which resources are assessed under NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have been identified as important to Native Americans as outlined in the American Indian Religious Freedom Act (AIRFRA) and EO 13007 Indian Sacred Sites. Department of Defense (DoD) *American Indian and Alaska Native Policy* (1999) provides guidance for interacting and working with federally-recognized American Indian governments. DoD policy requires that installations provide timely notice to, and consult with, tribal governments prior to taking any actions that may have the potential to significantly affect protected tribal resources, tribal rights, or American Indian lands.

Analysis of potential impacts to cultural resources considers direct impacts that may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that alter the character of the property or its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources potentially affected. Indirect impacts generally result from increased use of an area.

4.5.1 Potential Impact from Proposed Action

All undisturbed areas at Malmstrom AFB were surveyed and no National Register-eligible or archaeological resources were identified (USAF 1995a). The original existing fitness center was constructed in 1957 with several additions thereafter. The existing flat-roofed, concrete block masonry facility does not encompass any significant historical or architectural attributes. The depositional environment is such that there is little potential for deeply buried archaeological remains (Malmstrom AFB 2002). It is extremely unlikely that the construction effort will affect archaeological resources because buried cultural material is unlikely to occur in the site specific depositional environment.

Use of existing roads along the route proposed for hauling material to the construction site will not affect archaeological or architectural resources. Should improvements to existing roads be

part of the Proposed Action, this also should have no effect on archaeological resources. However, construction of additional roads or widening the existing right-of-way would be considered a separate undertaking. It would be necessary to comply with Section 106 of the NHPA, including identification and NRHP evaluation of any affected resources. The portion of the Chicago, Milwaukee, St. Paul and Pacific Railroad (site 24CA 264) that borders the northern boundary of the base will not be affected by the haul route.

In the unlikely event that archaeological resources are encountered in the course of any aspect of the Proposed Action, compliance with Section 106 of the NHPA, including NRHP evaluation of all identified resources, would be necessary prior to completing the Proposed Action. Malmstrom will send a copy of this document to the Montana State Historic Preservation Office regarding this Proposed Action for review during the public comment period. Impacts to traditional resources are not expected under the Proposed Action. No traditional resources have been identified to date within Malmstrom AFB.

4.5.2 Potential Impact from No Action Alternative

Under the No Action Alternative, there would be no construction of new housing units. Thus, there would be no effects to cultural resources.

4.6 Noise Resources

4.6.1 Potential Impact from Proposed Action

The residential areas currently under construction in MFH Phase V will experience construction-related noise impacts. Occupants probably will not take possession of this new housing until well into the construction of the Proposed Action. The FamCamp nearby will experience construction related noise impacts, as well as users of the nearby dormitories, athletic fields, tennis courts, skate park and the outdoor swimming pool. Table 9 lists typical construction-related noise levels. Typical noise sources include diesel engines on construction equipment (e.g., backhoes, front-end loaders, dump trucks), air compressors and jackhammers to demolish concrete structures, back-up horns on construction equipment, and movement of construction materials. Noise levels should be similar to those listed for Office Building below.

Table 8: Noise Levels for Construction Phases.

Phase	Typical Ranges of Energy Equivalent Noise Levels at Construction Sites (L_{eq} in dBA)							
	Domestic Housing		***Office Building, Hotel, Hospital, School, Public Works***		***Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station***		***Public Works Roads & Highways, Sewers, and Trenches***	
	I	**II**	**I**	**II**	**I**	**II**	**I**	**II**
Ground Clearing	83	83	84	84	84	83	84	84
Excavation/Demolition	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	74	89	74	84	84

I = All pertinent equipment present at site.

II = Minimum required equipment present at site.

Source: USEPA, Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

The construction of the Proposed Action would take roughly 18 months. The noise impacts will vary depending on the construction phase. Construction should minimally impact residents in the housing areas, given the distance from the site to Base housing. The FamCamp area, across Fourth Avenue North near the intersection of Perimeter Road will experience increased noise attributable to construction activities.

Based on Table 8, Finishing and Excavation/Demolition would create the single loudest phase of construction. Assuming this activity generates a maximum L_{eq} of 89 dBA, noise would exceed 60 dBA (the point at which construction noise could affect activity or speech communication outdoors and sleep indoors) at residential or other noise-sensitive receptors with a direct line-of-sight of the activity for a distance of 1,300 feet. Given the cleared nature of the site in the project area, noise wouldn't be attenuated by intervening structures at many locations for FamCamp tenants and users of the nearby athletic and recreation facilities. Thus, adjacent facility users may at times perceive noise as very loud while construction occurs in the same neighborhood.

Noise associated with the construction of the Proposed Action would come from the operation of heavy equipment on-site and delivery trucks such as lowboys and refuse hauling trucks. Assuming that all trucks used a Perimeter Road route, the vehicles would generate approximately 62 dBA. This noise would not be distinguishable from the overall noise in areas where construction activities were underway. Noise would be more perceptible along the local streets that serve as primary access routes for larger areas (e.g., Perimeter Road, Goddard Avenue and 4th Avenue North). Impacts along these routes would not be significant given the limited amount of time noise exposure would occur (the area should not experience increased equipment and

vehicle noise for more than one construction season) and the fact that construction activities should only be used during the daytime on weekdays.

One of the most essential elements in ensuring that noise impacts do not reach a level of significance is requiring that construction occurs during daytime hours and on weekdays. All internal combustion engine-driven equipment should be equipped with mufflers that are in good condition. Although the construction traffic will have increased noise levels, they are not unlike the current intermittent industrial activity in the vicinity.

4.6.2 Potential Impact from No Action Alternative

No impacts associated with noise are expected under the No Action Alternative, as no construction would occur.

4.7 Health, Safety, and Waste Management

4.7.1 Potential Impact from Proposed Action

Worker safety is the primary health and safety concern during construction activities. There are inherent risks associated with construction operations. The contractor selected to implement the Proposed Action will be subject to rigorous safety management requirements as part of the contract with the Corps of Engineers. These requirements are primarily associated with OSHA workplace safety practices. If the required safety precautions are enforced, no significant safety impacts are anticipated.

The Proposed Action would not generate an amount of debris large enough to significantly impact local permitted solid waste facilities. Contract specifications for the Proposed Action would require consideration of recycled materials and encourage the diversion and reuse of construction debris. Hazardous and toxic wastes are regulated by state and federal cleanup standards. A review of 341 CES/CEVC records reveals the existing facility contains examples of regulated materials (asbestos, lead) as well as hazardous materials such as cleaning solvents, batteries and fluorescent light bulbs. To the degree that the existing information provides evidence that materials require remediation, the Contractors shall comply with all state and federal regulations with respect to management, abatement and disposal of hazardous waste, hazardous materials and toxics. Plans for the management of such materials already exist for actions taken at Malmstrom AFB.

4.7.2 Potential Impact from No Action Alternative

This alternative presents no health, safety or waste management impacts since construction activity associated with this phase of the housing development would not occur.

4.8 Land Use

The impact analysis for land use focuses on general land use patterns and land management practices. The methodology to assess impacts on individual land uses requires identification of those uses and determination of the degree to which those areas would be affected. Impacts to

transportation are assessed with respect to the potential for disruption or improvement of current transportation patterns and systems; deterioration or improvement of existing levels of service, and changes in existing levels of safety.

Determination of the significance of the impact on visual resources is, in part, a subjective and, in part, an objective decision process based on the level of visual sensitivity in the area, when considered in conjunction with the aesthetic attributes of the area.

4.8.1 Potential Impact from Proposed Action

The proposed construction would occur in an area that currently supports fitness activities, and would be consistent with surrounding land uses. The Proposed Action would meet current Air Force community standards and would be visually consistent with the Base Master Plan.

In accordance with that Plan, new development would be designed and constructed to be architecturally consistent and compatible with existing facilities and structures. Landscaping for the Proposed Action would be provided using standards identified in the Base Master Plan.

Construction traffic associated with the implementation of the Proposed Action would comprise only a small portion of the total existing on base traffic. Increases in traffic volumes associated with construction activity would be temporary and are not unlike volumes experienced during typical US Army Corps of Engineers managed construction project. Upon completion of construction, no long-term impacts to on-base transportation systems would result.

4.8.2 Potential Impact from No Action Alternative

Under the No Action Alternative, the existing conditions would remain unchanged and impacts associated with land use, transportation, and visual resources would not occur.

4.9 Socioeconomic and Environmental Justice Impacts

This Environmental Assessment section considers the potential socioeconomic and environmental justice impacts of the Proposed Action. Employment, race, ethnicity, poverty status and age characteristics of populations in Cascade County were analyzed by evaluating the data presented in Section 3.9. With regard to environmental justice and protection of children, Malmstrom and County figures were compared to regional, state and national demographics to evaluate whether or not proportional differences exist. Should the data analysis reveal areas containing relatively high environmental justice-related populations, the evaluator should give special consideration regarding potential impacts in order to address the potential of disproportionately high or adverse human health or environmental effects on these communities.

Comparison of the data set forth in Section 3.9 does not highlight any areas of concern with respect to minority populations, low-income populations or youth populations. Malmstrom AFB has a higher concentration of the highlighted populations than Cascade County or the State of Montana. The Proposed Action at issue will enhance the quality of life for person residing on Base. The effects and impact of the demolition of the existing fitness facility and construction of the new facility is short term and would not expose the on or off base populations to disproportionately high or adverse human health or environmental effects.

No long-term change in base employment or expenditures is anticipated as a result of the Proposed Action. All construction activity, including demolition, material hauling and recycling, is anticipated to occur within the boundaries of the base therefore negligible off-base socioeconomic or environmental justice impacts would be expected.

Construction-related noise impacts will occur in the affected residential areas surrounding the new housing sites. Noise impacts will be limited, as much as practicable, by restricting construction activity to daytime hours on weekdays. Appropriate construction measures will be taken to ensure that the generation of dust during construction and hauling of materials does not create any significant health or safety risks to children and other nearby residents.

4.9.1 Potential Impact from Proposed Action

Construction activities associated with the Proposed Action could take place beginning in FY2006 and may involve expenditures for both phases of approximately $25.5 million. Phase 1, consisting of the gymnasium, cardio, interior running track, four racquetball courts, administration area, lobby, juice bar, retail, storage, men and women's locker rooms, showers and saunas with associated mechanical and electrical rooms required, is estimated at $13.5 million. Phase 2 would include an indoor lap pool, additional gymnasium, running track with new athletic field and other enhancements, plus demolition of the existing fitness center. The proposed construction activity would generate construction jobs and income and induce regional purchases and expenditures. These potential impacts would be temporary, however, only occurring for the duration of the construction period. No permanent or long-lasting socioeconomic impacts are anticipated as a result of implementation of the Proposed Action.

4.9.2 Potential Impact From No Action Alternative

Under the No Action alternative, Malmstrom AFB would maintain its existing fitness center and not undertake the proposed improvements to the quality of life and mission readiness of the military personnel and the Base populace. Failure to implement the proposed improvements would not generate any of the construction-related employment or earnings impacts associated with the Proposed Action. Implementation of the No Action alternative could result in significant adverse socioeconomic or environmental justice impacts to Air Force personnel. Given the current state of the existing facility and its life expectancy, the Air Force must construct a new facility or repair/alter the existing facility to meet mission requirements.

5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 Cumulative Effects

This section provides (1) a definition of cumulative effects, (2) a description of past, present, and reasonably foreseeable actions relevant to cumulative effects, and (3) an evaluation of cumulative effects potentially resulting from these interactions.

5.1.1 Definition of Cumulative Effects

Council on Environmental Quality (CEQ) regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (§40 CFR 1508.7). Recent CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the Proposed Action. The scope must consider geographic and temporal overlaps among the Proposed Action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with, or in close proximity to, the Proposed Action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, this EA addresses three questions:

(1) Does a relationship exist such that elements of the Proposed Action might interact with elements of past, present, or reasonably foreseeable actions?

(2) If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?

(3) If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

In this EA, an effort has been made to identify all related actions under consideration or in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action in this EA, these actions are included in this cumulative analysis. This combined approach enables stakeholders to have the most current information available so that environmental consequences of the Proposed Action can be evaluated.

5.1.2 Past, Present, and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide stakeholders with not only the cumulative effects of the Proposed Action, but also the incremental contribution of past, present, and reasonably foreseeable actions.

5.1.2.1 Past and Present Actions Relevant to the Proposed Action

Malmstrom AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the United States defense

policy that the Air Force must be ready to respond to threats to American interests throughout the world. The most recent mission change at Malmstrom was in 1997 when the 819th RED HORSE squadron was assigned to Malmstrom.

The Department of Defense released a Base Realignment and Closure (BRAC) list on 16 May 2005. The BRAC process has slated Malmstrom AFB to gain a US Army Reserve Center with a proposed 9 acre site on the southeast side of the Base near the horse stables. However this action is still in the concept phase and we do not have sufficient information to add assessment of that future action into this cumulative effects analysis. Such a realignment action will require the completion of a separate EA in the future when appropriate.

The Proposed Action will demolish the existing fitness center and construct a new and expanded fitness center. The base, in order to maintain functional capacity, like any other major institution, requires new construction, facility improvements, and infrastructure upgrades. Phases 4 and 5 of the housing upgrade project have a current EA and FONSI signed (August 2004). The recent Heat Plant Upgrade has been categorically excluded from requiring an EA because the purpose of the project is maintenance. The Installation Commander signed a FONSI for the Corrosion Control Facility upgrade which was recently completed. The Base recently constructed a storm water detention basin near Outfall 1, specifically designed to reduce the impact of peak flow events discharging from Drainage Basin 1 into Whitmore Ravine.

The Air Force anticipates a continuing mission for Malmstrom AFB, but the specific nature of that mission and the military units stationed at Malmstrom to undertake that mission are subject to change within the discretion of Congress and the Executive Branch.

5.1.3 Analysis of Cumulative Impacts

As stated above, the Proposed Action will upgrade and impact the existing Malmstrom AFB fitness complex and community, as described. The itemized past actions were either recently constructed or are under construction and coordinated through the itemized, phase-specific NEPA documents. The following analysis examines how any impacts resulting from the Proposed Action at Malmstrom AFB might affect the impacts of these other actions and whether a potential symbiotic or synergistic relationship could create significant impacts not identified when considering the Proposed Action alone. Potential cumulative impacts have been identified for the following environmental resources:

- **Air Resources:** Because of the nature of the development activities required, it is expected that construction impacts on air quality will be short-term and limited to localized areas. Prolonged construction activity, such as the current Malmstrom AFB housing replacement program could conceivably impact regional air quality attainment status given the substantial scope and intensity. However, construction of the Proposed Action combined with the entire base housing plan, other itemized actions and nearby (off-installation) developments; it is unlikely that the actions individually or cumulatively will result in lowered air attenuation standards or long term air quality degradation. Physical plant infrastructure required to support the proposed plan appears generally adequate. As such, significant additional energy or related support systems should not be required as a result of this Proposed Action. The Proposed Action will not result in a significant cumulative effect on Air Resources.

- **Geological Resources:** Permanent changes to soil structure and stability could occur by disrupting and reworking certain soils. However, none of the projects geologically overlap. The limited scope of these cumulative actions in a finite area does not combine to create significant geological environmental impact when considered individually or cumulatively.

- **Noise Resources:** Noise from construction activities would represent an unavoidable impact. This short-term impact will be evident over the 18-month construction schedule, lessening as the Proposed Action progresses (as workers complete finish work indoors). Cumulative impacts to noise resources from the Proposed Action when combined with the entire housing program may impact Base occupants along 4th Ave. N. and Perimeter Road along the travel routes to the Commercial Gate. None of the noise levels identified should create the potential for health concerns, given the anticipated sound pressure levels, the distance to the sound perception and duration of the associated construction activities. The noise may for short times rise to a level of interrupting conversation, the nearer one gets to the construction activity. Malmstrom AFB elected to phase the military housing construction to minimize cumulative impacts of the housing construction, which includes reducing peak noise levels and duration. Post construction noise impacts from the Proposed Action will remain similar to the existing facility and will be consistent with other nearby and established uses. The Proposed Action should not create significant cumulative impacts to noise resources.

- **Transportation:** Taken individually none of the past or future actions identified any short or long term transportation impact. However, as multiple construction projects occur, and particularly with soil backfilling as a component of Phase VI and VII of the housing construction projects, on-base roads will eventually begin to deteriorate. Any increase in traffic by heavy equipment or heavily loaded vehicles could shorten to some extent the life expectancy of existing pavements along the travel route both on and off Base. However, given the scope of these projects, this impact should not rise to a point of significance. One would define significance in this situation as acute wear and tear as opposed to normal for similar vehicles using the on-Base or off-Base public thoroughfares. The combined actions should not create significant traffic congestion on or off Base. When considering the itemized cumulative actions as a whole, road and other infrastructure around and outside the installation remain suitable for the volume of traffic anticipated by the current active construction projects when combined with the Proposed Action. Overall vehicle traffic when compared to existing uses and possible future development will not result in significant cumulative impacts.

- **Water Resources:** Potential exists for short term increases in sediment discharge within existing base storm water facilities during soil-disturbing construction activity. Best management practices, would be implemented to control erosion required under MPDES Construction Storm Water Discharge Permits obtained by project contractors. The permits establish appropriate storm water control measures that would be designed to prevent any significant short term impacts.

  The long term quantity and quality of storm water discharged from the base would not be affected by the Proposed Action. In addition to a review of the Proposed Action and discussion contained in §4.2, Malmstrom AFB conducted a programmatic review of the overall Malmstrom AFB housing replacement program and the program's potential cumulative effects in the EA for Military Family Housing (MFH) Phase 6 and 7 (FONSI signed December 2005). As evaluated in the MFH Phase 6 and 7 EA, Housing Phases 1, 2, 3 and 4 created a maximum storm water increase of 3.5 percent in the west branch of Whitmore Ravine during peak flow events. Phase 6 housing replacement will result in a small (1.44 acres) net decrease in impervious surface within Storm Water Drainage Area 1. Phase 7 housing replacement will increase impervious surface in Storm Water Drainage Area 1 a similar amount resulting in a zero net change to Outfall 1 for Phase 6 and 7.

  Outfall 1 and Outfall 2 both discharge into the west branch of Whitmore Ravine (See Figure 4). The Proposed Action would discharge to Outfall 2. The Proposed Action would add 1.2 acres of impervious surface area, which would be a less than 1% reduction in pervious surface to Drainage Area 2. Given the small change in impervious surface area, the distance from the site of the Proposed Action to Outfall 2, the topography, soil type and site conditions, the Proposed Action would not induce a significant change to existing storm water quality or quantity. The Air Force notes the comments received from the Cascade County Conservation District. After considering the comments, the LID proposed would not result in any significant impact to the environment.

  The combined past actions of Phase 5 housing replacement, demolishing the relocatable housing from the Phase 5 sites, constructing the Proposed Action and demolishing the

existing fitness center would increase the impervious surface in Storm Water Drainage Area 2 by 3.44 Acres. The Phase 6 and 7 EA identified a slight potential for insignificant rise of storm water flows in the west branch of Whitmore Ravine, but concluded the cumulative total peak event flow through Whitmore Ravine and other drainages would not change significantly, when considering the actions evaluated.

The cumulative effect of the combined actions would not result in a significant increase of impervious surface at Malmstrom AFB. No cumulative impacts to groundwater recharge or surface water resources would result. The combined actions would not significantly alter the current condition of the channel of Drainage Area 2 or Outfall 2. The combined actions would not significantly alter any existing condition of sheet or channel flow currently existing in Drainage Area 2. No significant changes in cumulative environmental impacts to surface water are expected from the implementation of the evaluated actions. In addition, the Base designed appropriate detention and storm drain outfall systems to address surface water runoff issues during peak flow events of Drainage Area 1, using both the Rational Method and the SCS Method.

As an additional measure to decrease the impacts of development on storm water, Malmstrom AFB would implement Low Impact Development (LID) into the design of the Proposed Action. LID is a management strategy that maintains or restores the natural hydrological conditions at a development site. LID uses natural and constructed features that reduce rate, quality and quantity of runoff from the small frequent storms.

Malmstrom AFB will implement LID measures into the design with goal of achieving a post development Curve Number (CN) as close to the pre-development CN for the Fitness Center site as reasonably possible. LID measures would control 85 percent of any identified storm water increase from the Proposed Action.

The implementation of LID and the small change in impervious area that would result from the proposed developments lead to a determination of no significant change to the preexisting surface water conditions at Malmstrom AFB.

In light of past, present, and the evaluated future actions, USAF expects no significant cumulative impacts to ground or surface water as a result of the Proposed Action or the cumulative effects of past actions and future actions evaluated. In conclusion, the cumulative effects of the itemized actions at Malmstrom, combined with the detention pond at Drainage Area 1, should not significantly affect the pre-existing quality or quantity of the water resources at Malmstrom AFB.

5.2 Irreversible and Irretrievable Commitment of Resources

NEPA recommends that environmental analysis include identification of " . . . any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame.

Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the demolition of a historic building).

For the Proposed Action, most resource commitments are neither irreversible nor irretrievable. When evaluating a non-industrial endeavor such as the Proposed Action in the context of development in an urban setting, most environmental consequences are short-term and temporary (such as air emissions and noise from construction activities) or longer lasting but negligible.

The design team will specify, as required by the Air Force Green Procurement Regulations, that sustainable materials be used throughout the construction of the Proposed Action. For example, the existing pavements and facility concrete shall be recovered, crushed and reused as appropriate on future projects.

Those limited resources that may involve a possible irreversible or irretrievable commitment under the Proposed Action include consumption of limited amounts of materials typically associated with facility construction (e.g., concrete, finish materials, doors, windows wiring, plumbing, insulation, and HVAC). The Proposed Action does not impact any natural resources considered unique or exceptional. The amount of these materials used is not expected to significantly decrease the availability of the consumed resources in the local area, Montana, America or the world.

5.3 CONCLUSIONS

Based on the forgoing analysis of the Proposed Action, the Air Force concludes that the Construct Physical Fitness Center Project is not an activity with a significant impact to the human environment, and therefore the preparation of an Environmental Impact Statement is not required. Rather, the Installation Commander, as the decision maker, is encouraged to sign a Finding of No Significant Impact.

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Appendix A

Public Comments Received

file 33B

FINDING OF NO SIGNIFICANT IMPACT

NAME OF THE PROPOSED ACTION

Construct Physical Fitness Center at Malmstrom Air Force Base, Montana.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Malmstrom Air Force Base proposes to construct a 107,406 square foot Physical Fitness Center and demolish the existing fitness center.

Under the Add/Alter Alternative the Air Force analyzed the option of renovating the existing structures. The renovation option was eliminated because to the estimated project cost of the renovation/addition package is comparable to the cost of new construction, due to multiple Building Code deficiencies, including safety, electrical, fire and seismic, the presence of multiple sources of potential hazardous contamination (lead-based paint, asbestos, PCB containing light ballasts, etc), site orientation and the size of the existing facility.

Under the No Action Alternative, neither the Proposed Action nor Add/Alter Alternative would not occur.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This Environmental Assessment (EA) provides an analysis of the potential environmental consequences associated with the Proposed Action and the No Action Alternative. Nine resource categories received thorough evaluation to identify potential environmental consequences. As indicated in Chapter 4.0, the Proposed Action would not result in significant impacts to any resource area. The No Action Alternative would result in no impacts (positive or negative); however, the No Action Alternative would not accomplish the physical fitness center upgrade objective.

Air quality impacts, while not significant, will occur due to exhaust emissions from construction equipment and from fugitive dust created during the construction process. Current air quality in the region of influence is excellent.

Implementation of the Proposed Action will have temporary increases in localized noise levels in the project area during construction. Noise will be typical construction noise, lasting for the duration of the specific construction activities. However, noise will be mitigated by the use of equipment sound mufflers and restricting construction activity to normal working hours. Although noise disruptions would be temporary and would be limited to daytime hours, these disruptions will be very noticeable.

Under the Proposed Action, the overall ecological effect would be insignificant. There would be no impacts to wetlands and the Proposed Action would not conflict with the wetlands management program at Malmstrom AFB. No special species or sensitive habitats are expected to be impacted. Standard construction best management practices would be applied to control sedimentation and erosion during construction, thereby avoiding secondary effects to any wetlands or freshwater aquatic communities. The Proposed Action would increase the amount of

impervious surface within the project area, but would not significantly impact storm water discharge. Cumulative impacts to Drainage Area 2 are insignificant.

CONCLUSION

In accordance with the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), as amended, and the Air Force Environmental Impact Analysis Process regulations contained in 32 Code of Federal Regulations (CFR) 989, an assessment of the environmental effects has been completed for the construct Physical Fitness Center at Malmstrom AFB. I have determined that the Proposed Action will not have a significant adverse impact on the environment or the quality of the human environment. Therefore, an Environmental Impact Statement is not required.

19 JUL 2006

GEOFREY A. FRAZIER, Colonel, USAF
Malmstrom AFB ESOH Council Chairman

Date