3.0
AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

This section describes the environmental characteristics that may be affected by the Proposed Action. The information provided serves as a baseline from which to identify and evaluate environmental changes resulting from the construction and operation of the components of the proposed GBI VOC test site. To provide a baseline point of reference for understanding any potential impacts, the affected environment is briefly described; any components of greater concern are described in greater detail.

Proposed BMC2 activities at Peterson AFB, Shriever AFB, and Cheyenne Mountain Complex, and the Boeing facilities would consist of placing computer and communication equipment within an existing room, which may require minor interior modifications only and for that reason no affected environment is presented. Appropriate health and safety and hazardous materials and waste management regulations would be followed during any modifications; therefore, no impacts are anticipated.

Available reference materials, including EAs, EISs, and base master plans, were acquired to assist in the description of the affected environment. To fill data gaps (questions that could not be answered from the literature) and to verify and update available information, installation and facility personnel; Federal, state, and local regulatory agencies; and private individuals were contacted.

Environmental Resources

Thirteen broad areas of environmental consideration were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and waste, health and safety, infrastructure, land use, noise, socioeconomics, water resources, and environmental justice. The areas were analyzed as applicable for each proposed location or activity.

The following sections summarize applicable data from the NMD Deployment EIS. Information from any other source is specifically referenced.

3.1 FORT GREELY, ALASKA

Fort Greely is located approximately 172 kilometers (107 miles) southeast of Fairbanks and just south of the community of Delta Junction in an unincorporated borough. Fort Greely originally contained 267,519 hectares (661,051 acres), most of which was withdrawn from the Bureau of Land Management. Fort Greely consists of the Main Post, two large training areas—Fort Greely West Training Area and Fort Greely East Training Area—and three outlying sites in the area.

Approximately 722 hectares (1,785 acres) of Fort Greely was surplused in July 2001. This area contained most of the buildings on the base. (Moniz, 2001) However, Section 1207 of Public Law 107-20 authorized the Secretary of Defense to retain all or a portion of Fort Greely to meet military, operational, logistics, and personnel support requirements for missile defense. The Secretary of Defense delegated this authority to the Director of MDA, who requested retention of the property to meet support requirements for missile defense. The U.S. Army amended the previously approved Determination of Surplus as a result of the realignment of Fort Greely on 8 November 2001. MDA has assumed all operational costs associated with the requested property. Use of the property must be coordinated and agreed to by the U.S. Army Pacific Command.

Initial analysis indicated that the activities proposed for Fort Greely would not result in short- or long-term impacts to airspace. No new special use airspace, or any modification to existing special use airspace, would be required to support any of the proposed activities.

3.1.1 AIR QUALITY

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere, expressed in units of parts per million (ppm) or micrograms per cubic meter. Pollutant concentrations are determined by the type and amount of pollutants emitted into the atmosphere; the physical characteristics, including size and topography of the air basin; and meteorological conditions related to prevailing climate. The significance of a pollutant concentration is determined by comparison with National Ambient Air Quality Standards (NAAQS) and state ambient air standards that establish limits on the maximum allowable concentrations of seven pollutants (carbon monoxide, lead, oxides of nitrogen, ozone, particulate matter with a diameter less than or equal to 10 micrometers [PM-10], particulate matter with a diameter less than or equal to 2.5 micrometers, and sulfur dioxide) to protect public health and welfare.

Alaska has established State Ambient Air Quality Standards. Emissions of air pollutants from operations in Alaska are limited to the more restrictive standard (Federal or state).

Region of Influence

Identifying the region of influence (ROI) for air quality assessment requires knowledge of the pollutant types, source emissions rates and release parameters, proximity relationships of project emission sources to other emission sources, and local and regional meteorological conditions. For inert pollutants (all pollutants other than ozone and its precursors, nitrogen oxide and reactive organic compounds), the ROI is generally limited to an area extending no more than a few tens of miles downwind from the source. Wind speeds average approximately 18 kilometers (11 miles) per hour and are generally southerly along the Delta River in the summer.

Affected Environment

Interior Alaska has a continental or subarctic climate characterized by long, cold winters; short, mild summers; and significant changes in the daily pattern throughout the year.

Regional Air Quality

Air quality in Alaska is generally very good; however, two carbon monoxide nonattainment areas are located in and around urban areas of Anchorage and Fairbanks. Since Fort Greely is approximately 172 kilometers (107 miles) southeast of Fairbanks it is removed from many of the sources that disrupt air quality in the Fairbanks region. Principal sources of air pollution in the Fort Greely area are from limited vehicle traffic and fuels burned for heat and/or power. The overall air quality is good, and the area is in attainment for all NAAQS and state standards.

Although the base itself is located in an attainment area, the Fairbanks North Star Borough is in nonattainment for carbon monoxide. During episodes of cold winter weather, atmospheric inversions may trap contaminants and cause exceedances of the NAAQS or state standards. According to Fairbanks North Star Borough studies, approximately 90 percent of all carbon monoxide produced within the borough is from vehicles.

Pollutants from mobile sources would include hydrocarbons, carbon monoxide, nitrogen oxides, and particle emissions. The primary pollutant of concern from mobile sources in Alaska is carbon monoxide. As such, this is the only pollutant from mobile sources analyzed in the NMD Deployment EIS and this study. Up to 80 percent of carbon monoxide emissions contributing to exceedances of the NAAQS in Fairbanks have been attributed to mobile sources. Cold starts during moderately cold weather, prolonged idling periods, and low-level temperature inversions all contribute to pronounced air quality impacts from motor vehicle emissions in cold climates.

Existing Emissions Sources

Fort Greely has major emissions sources from boilers, generators, storage tanks, prescribed burning/firefighter training and has submitted an application for a Title V Air Permit to the ADEC (Spiers, 2001a). Annual emissions (1997) included the following: carbon monoxide—3,327 metric tons (3,668 tons); oxides of nitrogen—124 metric tons (136 tons); and volatile organic compounds—37 metric tons (41 tons). Fort Greely also emitted 0.27 metric tons (0.30 tons) of hazardous air pollutants. As such, Fort Greely is not a major source of hazardous air pollutants.

3.1.2 BIOLOGICAL RESOURCES

Native or naturalized vegetation, wildlife, and the habitats in which they occur are collectively referred to as biological resources. Existing information on plant and animal species and habitat types in the vicinity of the proposed sites was reviewed, with special emphasis on the presence of any species listed as threatened or endangered by Federal or state agencies, to assess their sensitivity to the effects of the Proposed Action. For the

purpose of discussion, biological resources have been divided into the areas of vegetation, wildlife, threatened and endangered species, and environmentally sensitive habitat.

Region of Influence

The ROI for biological resources includes the area within and adjacent to the sites on Fort Greely that could potentially be affected by construction or operation of the proposed activities.

Affected Environment

Vegetation

In June 1999, a wildfire burned through the area, and as a result, much of the vegetation within the base was burned. Approximately 54 hectares (134 acres) of the area proposed for use underwent initial site preparation activities in late 2001 including vegetation removal and initial earthwork related to site and road grading.

The predominant vegetation (figure 3-1) at the proposed sites is low growing spruce forest, which is common throughout Interior Alaska. At Fort Greely, approximately one-third of the base is lowland black spruce interspersed with about 40 percent heath bog communities. Dominant tree species are black spruce and balsam poplar. The understory and groundcover consist of *Vaccinium* spp., marsh labrador tea, crowberry, and a variety of mosses and lichens.

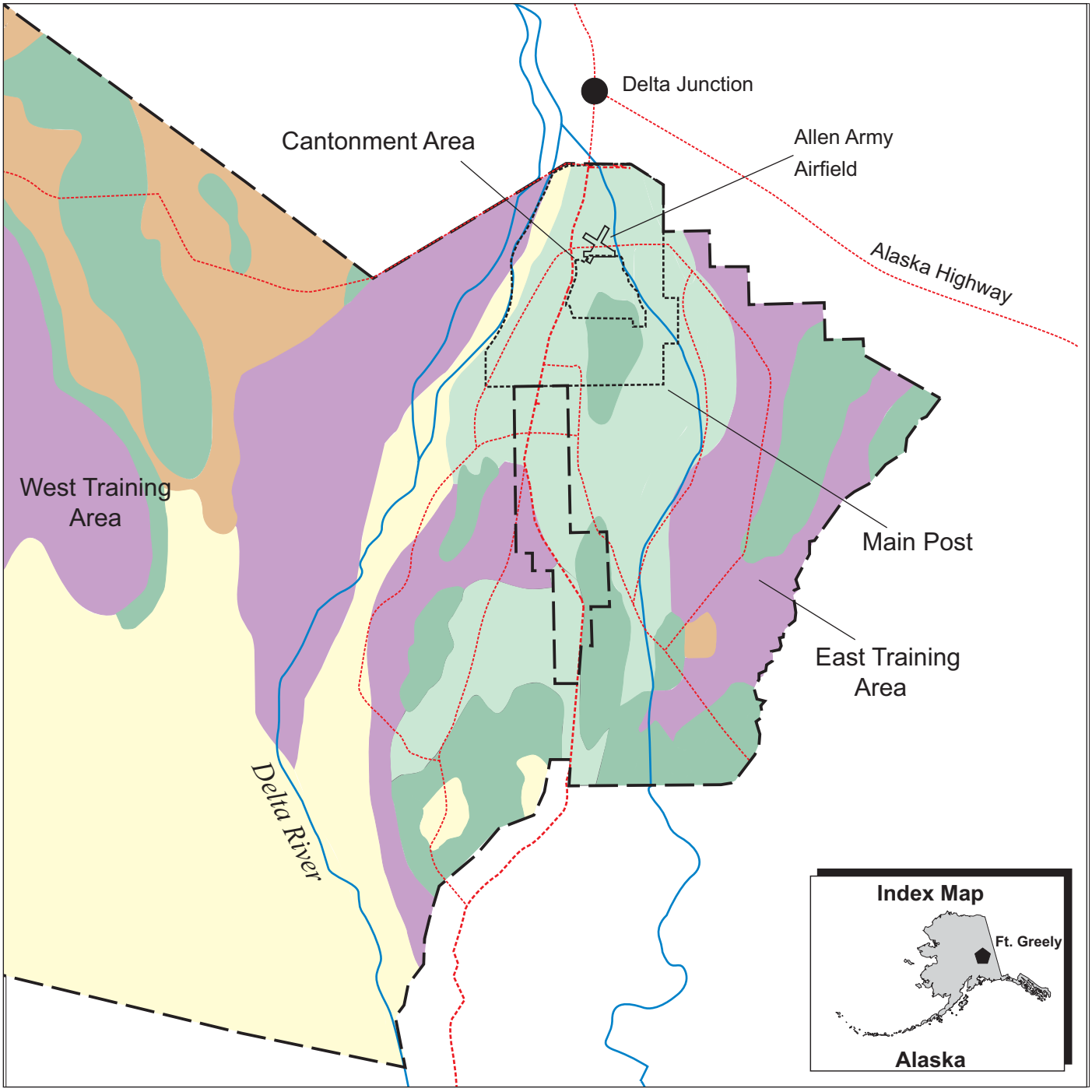
Native vegetation was removed from most of the cantonment area during the 1950s. The area has been landscaped and is maintained by mowing. A few isolated pockets of forest do remain, particularly north of the airfield.

Wildlife

Numerous lakes and ponds and four glacially fed major streams are located on Fort Greely. The major streams flow north to the Tanana River, but are silt laden and do not provide quality habitat for fish although Arctic grayling migrate through them. No important spawning (anadromous) streams are located on the installation.

Fort Greely supports the largest number of game species found at any military installation within the United States. The most common big game species include moose, bison, and barren ground caribou.

Commonly occurring predators in the project area include grizzly bear, black bear, gray wolf, red fox, marten, coyote, and wolverine. Additional species trapped for fur at Fort Greely are mink, muskrat, snowshoe hare, beaver, and red squirrel. The cantonment area at Fort Greely does not provide quality wildlife habitat compared to the surrounding undeveloped areas. Resident wildlife is limited to small rodents and bats. Avian species occurring within the project areas include the common raven, willow ptarmigan, rock ptarmigan, spruce grouse, ruffed grouse, owls, and a variety of songbirds.



EXPLANATION

- Roads and Major Trails
- Rivers
- Installation Boundary
- Trans-Alaska Pipeline
- Cantonment Area
- Main Post Boundary

- Mixed Forest
- Tundra/Barren
- Coniferous
- Deciduous/High Brush
- Muskeg
- City

Scale 1:500,000

0 4 7.9 miles

0 6.4 12.7 kilometers

NORTH

02-09-02 Ft Greely Veg 3-1

Vegetation

Fort Greely, Alaska

Figure 3-1

Threatened and Endangered Species

No federally listed threatened, endangered, or candidate species of vegetation are found in Interior Alaska.

No known threatened or endangered wildlife species occur on Fort Greely. Although the recently delisted American peregrine falcon and arctic peregrine falcon migrate through the area during the spring and fall migration periods, there have been no confirmed sightings of either species within 16 kilometers (10 miles) of Fort Greely.

Environmentally Sensitive Habitat

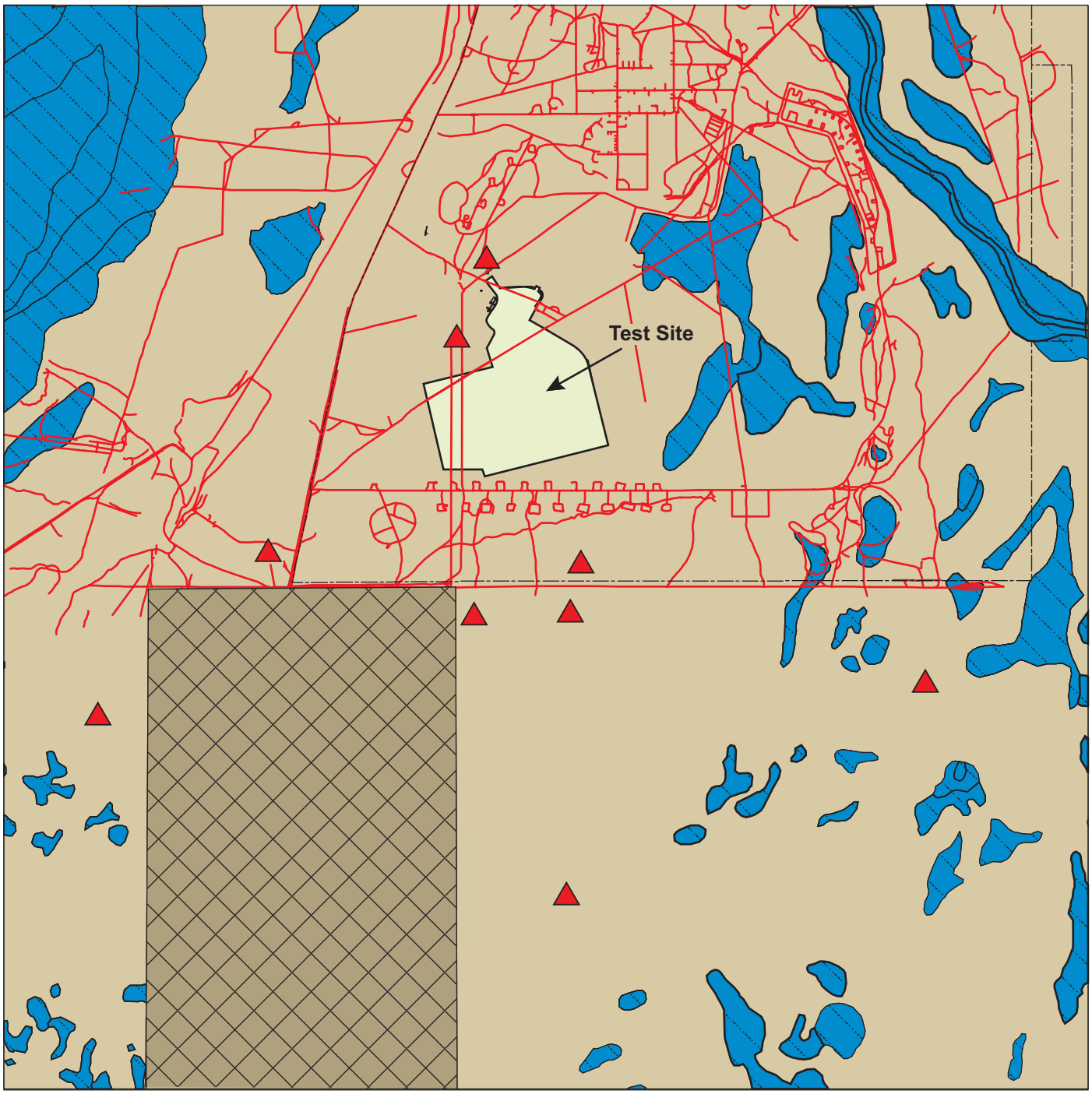
No federally designated critical habitat has been identified on Fort Greely.

Wetlands in Alaska are defined by the U.S. Army Corps of Engineers as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." The U.S. Army Corps of Engineers Alaska District and EPA regulate wetlands through the Clean Water Act Section 404 Permitting Program. There are no wetlands within the areas proposed for ground disturbance. The nearest wetland as shown in figure 3-2 is a palustrine, scrub-shrub, needle-leaved evergreen, saturated wetland approximately 457 meters (1,500 feet) east of the proposed GBI VOC site. (National Wetlands Inventory, 2001)

3.1.3 CULTURAL RESOURCES

Cultural resources include prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. For ease of discussion, cultural resources have been divided into archaeological resources (prehistoric and historic), historic buildings and structures, native populations/ traditional resources (e.g., Native American sacred or ceremonial sites), and paleontological resources.

Numerous laws and regulations require that possible effects to cultural resources be considered during the planning and execution of Federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the Federal agency proposing the action, and prescribe the relationship among other involved agencies (e.g., State Historic Preservation Officer [SHPO], the Advisory Council on Historic Preservation). In addition to NEPA, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act (especially Sections 106 and 11O), the Archaeological Resources Protection Act, the Antiquities Act of 1906, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act.



EXPLANATION

- Uplands
- Wetlands
- Private Property
- Roads
- Fort Greely Boundary
- IDT Sites

NORTH

Scale
0 571.5 1,143 meters
0 1,875 3,750 feet

03-03-02 Ft Greely Wetlands GBI 3-2

Wetlands, Potential GBI VOC Site

Fort Greely, Alaska

Figure 3-2

Region of Influence

The term ROI is synonymous with the "area of potential effect" as defined under cultural resources regulations, 36 Code of Federal Regulations (CFR) 15 Part 800.16(d). In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. The currently defined ROI for Fort Greely includes construction sites and any other areas where ground disturbance could occur (e.g., utility corridors, roads, or runway modifications).

Affected Environment

Prehistoric and Historic Archaeological Resources

Archaeological evidence indicates that the Fort Greely area has been occupied for 10,000 to 12,000 years. Eighty-four prehistoric archaeological sites have been identified on Fort Greely. Sites are found in every vegetative community and predominantly west of the Delta River out of the ROI. Most of the sites are surface flake scatters, isolated artifacts, or are found in a disturbed context and contain insufficient information to determine site function, affiliation, or age.

In 1997, the Bureau of Land Management and the U.S. Army Corps of Engineers, Alaska District conducted a survey of the Base Realignment and Closure cantonment area (including the runway area). Due to a lack of subsurface artifacts, the area is considered clear of cultural resources concerns. However, there could be additional archaeological resources in the Fire Tower Hill area of the cantonment.

There are no recorded sites within the proposed GBI area (figure 2-9); and due to the degree of disturbance to the area and the physiographic setting within which the GBI area occurs, the potential for archaeological materials is considered low. An archaeological survey of the Fort Greely ROI performed in August 1999 confirmed this assumption. Recent use sites (i.e., less than 50 years in age) are associated with contemporary hunters, trappers, and the military. None of these display sufficient significance or integrity to be considered eligible for listing in the National Register. SHPO concurrence is pending.

Historic Buildings and Structures

Fort Greely originated as Station 17, Alaskan Wing, Air Transport Command in 1942. During World War II, the installation served as a rest and refueling stop for American pilots. In 1949, the installation became the site of the Arctic Training Center, due to extreme winter conditions and varied terrain. Construction began on permanent buildings to support cold weather testing and training (in the area now known as the Main Post) in 1953, and the installation had been renamed Fort Greely by 1955.

As a result of archaeological investigations, three historic sites and a historic trail have been identified at Fort Greely—all are west of the Delta River outside the ROI.

Review of the World War II and Cold War inventory of Fort Greely by the Alaska SHPO and subsequent consultation between the U.S. Army and the SHPO indicates that there are 26 buildings and structures eligible for listing in the National Register. A Memorandum of Agreement between the U.S. Army and the Alaska SHPO regarding these buildings has been completed. The Memorandum of Agreement stipulated that all of the buildings within the district "may be altered, demolished, leased with no restrictions, or transferred out of federal ownership with no restrictions" following completion of Historic American Buildings Survey (HABS) Level 1 recordation. All HABS information has been delivered and the Memorandum of Agreement between SHPO and the U.S. Army has been signed. (Spiers, 2001a)

Native Populations/Traditional Resources

Fort Greely encompasses lands historically and prehistorically occupied by the Tanana Indians. Salcha Natives used the Delta River and Delta Creek for subsistence hunting in historic times; however, this generally ceased by the 1920s. By 1962 there were no native settlements in the Tanana Valley between Healy Lake and Nenana.

No Alaska Native traditional cultural properties have been formally identified within the ROI. In addition, no Alaska Native reservations or villages are in the immediate vicinity of Fort Greely. Tanana is the closest Alaska Native village, approximately 130 kilometers (80 miles) east of Fort Greely.

Paleontological Resources

The ROI at Fort Greely is situated within an alluvial fan, characterized by glacial till; portions of the ROI are also underlain by permafrost. Although the bones of Ice Age mammals have been found elsewhere on the installation, no paleontological remains have been encountered within the ROI.

3.1.4 GEOLOGY AND SOILS

Geology and soils include those aspects of the natural environment related to the earth, which may affect or be affected by the Proposed Action. These features include physiography, geologic units and their structure, the presence/availability of mineral resources, soil condition and capabilities, and the potential for natural hazards.

Region of Influence

The ROI for geology and soils includes that area that could potentially be disturbed by construction and operation activities associated with the GBI field, BMC3, related facilities, and connecting roads and infrastructure.

Affected Environment

Physiography

The Fort Greely cantonment area encompasses a portion of Tanana–Kuskokwim Lowlands physiographic province. Streams flowing through the foothills generally originate in the

Alaska Range and flow north in rugged V-shaped canyons and across broad terraced valleys. Fort Greely is situated between two significant drainages originating in the foothills—the Delta River to the west and Jarvis Creek to the east. The terrain at the site is mildly undulating with elevations ranging from approximately 411 to 442 meters (1,350 to 1,450 feet). The site vicinity has a northeast surface gradient of about 18 meters (60 feet) per mile.

Geology

The proposed GBI VOC site, like the cantonment area, is located on a low alluvial terrace that has a gently undulating surface. The terrace is composed of glacial outwash deposits that are underlain by till, which is in turn underlain by stratified gravel. Moraine features to the east and south of the cantonment are composed of coarse, unstratified, unsorted till ranging from silty gravel with sand to sandy silt with gravel.

Wind blown loess of glacial origin forms a mantle over much of the Fort Greely area, ranging from several centimeters thick to greater than 1.5 meters (5 feet) thick. Discontinuous permafrost occurs throughout the region. The permafrost ranges from the surface to as much as 66 meters (217 feet) below ground surface.

Soils

No detailed soil surveys have been completed for the site area. Shallow, well-drained silt loams with sandy to gravelly underlying material occupy most of the rolling uplands on the surface of the glacial moraines and alluvium east of the Delta River. The exact thickness and areal extent of these soils at the site are unknown.

Mineral Resources

The U.S. Department of the Interior and DoD considered Fort Greely to have low to moderate potential for leasable minerals. Eight mineral material sites, all of which are now closed or inactive, have been located at Fort Greely. Other gravel pits are located near Fort Greely along the Richardson Highway and the Trans-Alaska Pipeline System.

Geologic Hazards

Fort Greely lies in seismic Zone 3, where major earthquake damage has a 10 percent probability of occurring at least once in 50 years. Earthquake epicenters are scattered throughout Fort Greely and surrounding areas. From past studies there appears to be no concentration of seismic events in the area, and serious damage has not been reported.

Permafrost was not encountered within test borings conducted at the proposed GBI site in 1999, nor did ground penetrating radar indicate any ice lenses or other permafrost features.

3.1.5 HAZARDOUS MATERIALS AND WASTE

The relevant aspects of hazardous materials/waste management include the applicable regulatory procedures for hazardous materials usage and hazardous waste generation, and management programs for existing hazardous waste-contaminated sites within areas potentially affected by the Proposed Action.

Hazardous materials and hazardous waste management activities are governed by specific environmental regulations. Any hazardous materials and waste management plans applicable to the proposed activities that have lapsed since realignment would be updated and reinstated. For the purposes of the following analysis, the terms hazardous materials or hazardous waste will mean those substances defined by both Federal and state regulations. In general, this includes substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment when released into the environment. Hazardous waste is further defined as any solid waste that possesses any of the hazard characteristics of toxicity, ignitibility, corrosivity, or reactivity.

Region of Influence

The ROI for hazardous materials and hazardous waste management includes the Fort Greely infrastructure and existing facilities within the main base cantonment. Additional facilities associated with the Proposed Action could be constructed within the base cantonment area.

Affected Environment

Hazardous Materials Management

A Hazardous Waste and Hazardous Materials Standard Operating Procedure Manual created for Fort Greely in September of 1995, complies with all applicable state and Federal regulations. The Plan established standard operating procedures for the correct management and storage of hazardous materials. Hazardous material inventories are reviewed and updated twice a year if necessary.

Hazardous materials previously stored within the cantonment area include fuels, pesticides, and materials used in vehicle, boat, and aviation repair; power and heat generation; wastewater treatment; photo processing; and building maintenance.

Currently, Fort Greely has 49 ASTs with capacities ranging from 946 to 2,384,809 liters (250 to 630,000 gallons). Four ASTs located within the cantonment area were emptied, purged of fumes, and secured before realignment (Spiers, 2001a). The tanks and their supports are periodically inspected using visual inspection, hydrostatic inspection, or a system of nondestructive shell thickness testing. There are 23 underground storage tanks (USTs) at Fort Greely, 9 in the cantonment area, with capacities ranging from 1,136 to 189,270 liters (300 to 50,000 gallons). USTs located within the cantonment area that meet state regulations would be removed unless identified to support specific reuse

activities. USTs that do not meet current regulations will be deactivated and removed before disposal by deed.

Fort Greely administers an Oil Discharge Prevention and Contingency Plan, which leads personnel through procedures necessary to safely detect, contain, and clean up all oil spill discharges on post. Also, a Storm Water Pollution Prevention Plan (SWPPP) for Fort Greely was completed in May 1996. The plan includes site-specific good housekeeping practices, facility surveys, satellite accumulation area inspections, employee training, record keeping and internal reporting, comprehensive site compliance evaluation, and sediment and erosion control. The base also complies with applicable reporting requirements by submitting annual emergency response and extremely hazardous substances updates to the local emergency management officials.

Hazardous Waste Management

Fort Greely is registered by the EPA as a small quantity generator. Hazardous wastes generated at the installation are associated with equipment maintenance. Other wastes generated by the facility include paint, pesticides, aerosol canisters, batteries, used acetone and paint thinner, and sewage sludge. The wastes are accumulated in 208-liter (55-gallon) drums at satellite accumulation points before disposal. Currently, a temporary unnumbered building near T100 serves as the centralized hazardous waste collection site (Spiers, 2001a). Hazardous waste management is performed in accordance with a Hazardous Waste and Hazardous Materials Standard Operating Procedures Manual.

Pollution Prevention

Fort Greely has developed and implemented a Pollution Prevention Plan. This plan aids in the elimination or reduction of hazardous substances, pollutants, and contaminants. Recycling activities at Fort Greely include fuels, batteries, and brass shell casings.

Installation Restoration Program

No Installation Restoration Program (IRP) sites on Fort Greely have been listed on the Comprehensive Environmental Response, Compensation, and Liability Act National Priorities List. In addition, there are no leaking UST sites on the installation.

Three buildings within the cantonment area are on the State Priorities List. These include Building 612, where waste drains to the sanitary sewer; Building 601, where transformers, solvents, and herbicides have been stored in the Resource and Utilities yard north of the building; and Building 605, which includes a maintenance shop, paint bay, and battery storage facility. All three of these buildings are potential GMD VOC support facilities.

Environmental cleanup at Fort Greely has been addressed under both the IRP and the Base Realignment and Closure Environmental Cleanup Program. Numerous sites have been investigated and remediated under these programs. Investigations are now complete at all known sites. Cleanup of the nuclear waste line from the past activities of the SM-1A nuclear reactor has been completed, and other cleanup actions at Building 110 and the old firefighter training pits are currently underway. Building 101 and several other sites are

being characterized for the extent of contamination and scheduled for cleanup. (Spiers, 2001b)

Asbestos

Most of the family housing unit basements surveyed in 1998 were found to contain asbestos in pipe fittings and pipe insulation. The main post Fire Station, Building 504, was also tested in 1988 and found to contain asbestos in the pipe insulation. Buildings constructed before 1985, which have not been surveyed, have been identified as at risk for the presence of asbestos-containing material.

Polychlorinated Biphenyls

All polychlorinated biphenyl (PCB)-containing transformers were removed from the installation in 1994.

Lead-based Paint

All family housing, medical center, and transient quarters buildings surveyed in 1997 were found to contain lead-based paint. Buildings not surveyed but constructed before 1978 are believed to be at risk for the presence of lead-based paint.

Radon

Radon surveys were conducted in various buildings within the cantonment area from 1990 through 1993. Buildings within the cantonment area have been evaluated for the presence of radon based on the results of those surveys. Some buildings were found to have radon concentrations equal to or greater than the current U.S. EPA guidelines of 4 picocuries per liter. Family housing units with radon levels greater than or equal to 4 picocuries per liter have been mitigated. All buildings not surveyed were designated as potentially containing radon, and buildings found to contain radon concentrations below 4 picocuries per liter were not given a radon designation.

Pesticides

Fort Greely has completed and implemented an Integrated Pest Management Plan to minimize the adverse environmental impact of pesticide use while achieving an acceptable level of control and cost-effectiveness. All chemicals used on Fort Greely are EPA approved and are applied by DoD management certified personnel.

3.1.6 HEALTH AND SAFETY

Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following:

The well-being, safety, or health of workers—Workers are considered to be persons directly involved with the operation producing the effect or who are physically present at the operational site.

The well-being, safety, or health of members of the public—Members of the public are considered to be persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-base population. Also included within this category are hazards to equipment, structures, flora, and fauna.

Region of Influence

The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action facilities. The ROI for public safety includes properties immediately adjacent to the base and the transportation network for hazardous materials.

Affected Environment

The Fort Greely cantonment area has been given over for MDA use; therefore, most of the operations in this area have ceased. However, the base still maintains maintenance personnel and firefighting support for the cantonment area. The Fort Greely fire department maintains four crash/pumper trucks, three brush trucks, one small pumper truck, and a command vehicle. The base fire department is authorized for one chief, two captains, and nine firefighters. To assist in emergency response, Fort Greely maintains cooperative agreements with most of the small communities within a 161-kilometer (100-mile) radius of the base. The Bureau of Land Management has the primary responsibility of fighting fires in the forested area of Fort Greely with assistance from the post fire department (Spiers, 2001a).

Fort Greely has an airfield; however, this field is only minimally used for training. The Clear Zones for the airfield are contained within the base boundaries.

Health and safety issues at Fort Greely are associated with both U.S. Army and U.S. Air Force activities and range fires. The U.S. Army trains at Fort Greely throughout the year with exercises including the deployment of troops, weapons firing, and infantry tactical maneuvers. Weapons such as rockets, mortars, small arms, and artillery are fired from the east side of the Delta River westward towards weapon impact areas. Access to the weapon impact areas on Fort Greely is restricted because of the potential of unexploded ordnance. The Fort Greely East Training Area is used primarily as a nonfiring maneuver area. The Cold Regions Test Center utilizes this same area for experimental airdrops, airborne training, and testing of clothing, vehicles, and equipment.

The U.S. Air Force uses the airspace above Fort Greely and the weapons impact areas for training activities such as close air support, aerial gunnery, rockets, bombing, training flights, and test flights. These activities are conducted within the restricted airspace or along military training routes above Fort Greely in accordance with U.S. Air Force safety procedures.

Under a Memorandum of Understanding, the Bureau of Land Management Alaska Fire Service is responsible for fire detection and suppression on withdrawn lands. The Alaska

Fire Service has a reciprocal Fire Protection Agreement with the State of Alaska, Department of Natural Resources, Division of Forestry. Nineteen fires of 40 hectares (100 acres) or more occurred on Fort Greely from 1954 to 1997. The U.S. Army Alaska requires a 15-meter (50-foot) firebreak around all facilities.

3.1.7 INFRASTRUCTURE

Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste.

Region of Influence

The utility systems that could potentially be affected by the Proposed Action include potable water pumping, treatment, storage, and distribution; wastewater collection and treatment; solid waste collection and disposal, and energy generation and distribution, including the provision of electricity and natural gas.

Affected Environment

Water

The potable water supply at Fort Greely is currently managed from Building 606, the power plant. Two groundwater wells are utilized to supply all of the existing building facilities and fire hydrants within the main cantonment. These two wells have a combined capacity of 4.2 million liters per day (1.1 million gallons per day). A 712-thousand-liter (188-thousand-gallon) storage tank is located in Building 606 and feeds two 76-thousand-liter (20-thousand-gallon) pressure tanks that pump into a piped water system. The only water treatment performed is the addition of chlorine and fluorine. The existing base water system, when all buildings were in use, consumed roughly 1 million liters per day (0.3 million gallons per day). Two new 1,893-liter- (500-gallon-) per-minute wells were developed during initial site preparation activities.

Wastewater

The sewage system at Fort Greely conveys wastewater to an Imhoff (septic) tank inside Building 633. Sludge from the bottom of this tank is pumped to sludge drying beds. Once the sludge is dried, it is hauled to the landfill. Effluent from the Imhoff tank is conveyed to the sewage lagoon. The lagoon is aerated for further treatment. Effluent leaving the sewage lagoon is chlorinated and discharged to Jarvis Creek.

This system has a capacity of 1.7 million liters per day (0.46 million gallons per day). Wastewater usage, when all buildings were in use, was less than 1.2 million liters per day (0.32 million gallons per day). Wastewater from buildings in the Old Post and Mid Post area is discharged to either a septic tank or a leach field.

Solid Waste

The base landfill is a Class II facility that is currently permitted to receive both sewage sludge and asbestos materials. An Alaska Class II Municipal Solid Waste Landfill is a landfill that accepts, for disposal, less than 20.3 metric tons (20 tons) daily of municipal

solid waste based on an annual average; is located on a site where there is no evidence of groundwater pollution caused or contributed to by the landfill; is not connected by road to a Class I facility or, if connected by road, is located more than 80 kilometers (50 miles) from a Class I facility; and serves a community that experiences, for at least 3 months each year, an interruption in access to surface transportation, preventing access to a Class I landfill; or with no practicable waste management alternative, with a landfill located in an area that annually receives 64 centimeters (25 inches) or less of precipitation.

The current facility is not lined, but does have groundwater monitoring tubes. Cells at this facility are about 18 meters (60 feet) by 61 meters (200 feet) by 6 meters (20 feet) deep and generally last 1.5 years under current conditions. Current solid waste management operations consist of solid waste collection, volume reduction by open pit burning, and final disposal (including ash) in the landfill. Open burning is conducted about once a week in a burn facility located away from the working face and not inside the landfill boundary. Gravel is utilized for daily cover at the working face of the landfill.

The Fort Greely per capita solid waste generation rate in 1995 was estimated to be about 1.8 kilograms (4 pounds) per person per day. In 1999, approximately 13,494 cubic meters (17,649 cubic yards) of solid waste were generated at Fort Greely. Open burning operations are conducted at Fort Greely, authorized under the current permit. Burning is conducted in a burn facility located away from the working face and not inside the landfill boundary, and is limited to wood, paper, and cardboard which do not create black smoke or smoldering of waste.

Electricity and Steam

Electrical power requirements at Fort Greely are currently met through a combination of power supplied from Fort Wainwright and on-post generators run by Fort Greely personnel. The electrical power from Fort Wainwright is "wheeled" over the commercial electrical grid that exists between the two bases and is eventually supplied to Fort Greely through an existing 2.9-MW substation. The U.S. Army Alaska pays Golden Valley Electric Association for the use of its grid. The average electrical power demand at Fort Greely was approximately 1.8 MW when all buildings were in use. However, peak demands of up to 3.3 MW sometimes occurred during the winter. When the demand at Fort Greely exceeded the capacity of the substation, the additional power requirements were met by the three on-post diesel-powered generators, which together can generate up to 0.95 MW.

The Jarvis Creek substation is approximately 9 kilometers (5.5 miles) north of where the new transmission line would terminate on Fort Greely. An existing 25-kV distribution line also originates at the Jarvis Creek substation and parallels the eastern side of the Richardson Highway, except where it crosses the highway near the western end of the East-West runway at Allen Army Airfield. The crossing was made to avoid height restrictions for aircraft. After passing south of the runway area, it re-crosses the Richardson Highway and continues south. This line services Fort Greely and other communities south of Jarvis Creek.

3.1.8 LAND USE

Land use can be defined as the human use of land resources for various purposes including economic production, natural resources protection, or institutional uses. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive uses. Potential issues typically stem from encroachment of one land use or activity on another, or an incompatibility between adjacent land uses that leads to encroachment.

Region of Influence

The ROI for land uses includes all lands on and adjacent to Fort Greely that could be potentially affected by the Proposed Action.

Affected Environment

The post is not located in a municipality or a borough and there are no local zoning or land use policies. There are also no state plans or guidelines for the area. Therefore, existing land uses do not conflict with any Federal, state, or local land use plans or policies. The land around Fort Greely is primarily agricultural, undeveloped open space, forests, tundra, or wetlands and is sparsely populated, with the closest inhabited structure being in Delta Junction. Most development occurs on the Richardson Highway north towards Fairbanks, and some small settlements are found along the highways at Big Delta, Richardson, Alrich, and Birch Lake. The Trans-Alaska Oil Pipeline bisects Fort Greely, with a pumping station located 4 kilometers (2.5 miles) southwest of the cantonment area.

The area to the south and east of the potential sites is known as the Fort Greely East Training Area. This area of Fort Greely consists of 20,943 hectares (51,750 acres). This land was withdrawn from the public domain by Public Law 99-606. This area is primarily used as a non-firing maneuver area. Other than the vehicle test loops used to test vehicles in extreme weather conditions and varying snow depths, there are very few man-made structures. When portions of the range are not in use for the testing of materials, infantry, artillery, and engineer units use the area for non-firing marches, troop maneuvers, artillery unit training, and small arms training (with blank ammunition).

The military and the public use Fort Greely for a wide range of recreation activities. Portions of the base may be closed at times for military missions, and impact areas are always closed for safety considerations. Otherwise, most of the remainder of the base can be used for recreation after obtaining permission from Fort Greely. The most common recreation activities on the base are hunting, fishing, and trapping. Other activities include off-road vehicle use, hiking, backpacking, camping, boating, bicycling, wildlife watching, and skiing. The use of Fort Greely for subsistence is minimal.

3.1.9 NOISE

Noise is usually described as unwanted sound. Characteristics of sound include amplitude, frequency, and duration. Sound can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for the measure of the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude. Sound pressure levels are easily measured, but the variability is subjective, and physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness."

Sound also varies with frequency or pitch. When describing sound and its effect on a human population, A-weighted sound levels, measured in A-weighted decibels (dBA), are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. The American National Standards Institute established this filtering network. The A-weighted noise level has been found to correlate well with people's judgments of noisiness of different sounds and has been used for many years as a measure of community noise.

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time; therefore, to compare levels over different time periods, several descriptors have been developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various effects of noise on humans and animals, including land-use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects.

The primary environmental noise descriptor used in environmental noise assessments is the A-weighted Day-Night Equivalent Sound Level (which is abbreviated DNL and symbolized as L_{dn}). The DNL was developed to evaluate the total daily community noise environment. The DNL is the average A-weighted acoustical energy during a 24-hour period, with 10 dBA added to all signals recorded within the hours of 10:00 p.m. and 7:00 a.m. This 10 dBA is a penalty that accounts for the extra sensitivity people have to noise during typical sleeping hours.

Almost all Federal agencies having non-occupational noise regulations use DNL as their principal noise descriptor for community assessments.

Region of Influence

The ROI for noise includes those areas potentially affected by proposed activities that could experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways

potentially affected by proposed activities that might experience a Continuous Equivalent Sound Level ($L_{eq(1\ hour)}$) greater than or equal to 67 dBA.

Affected Environment

The area surrounding Fort Greely is sparsely populated, and thus, would be expected to have a background noise level of DNL less than or equal to 55 dBA. However, under certain conditions, a low-level droning noise from a nearby Alaska pipeline pumping station can be heard. This noise comes from the pumping stations' jet turbine engines and was estimated to be approximately 55 dBA.

The principal sources of noise at Fort Greely are vehicular traffic and military activities, including aircraft overflight and firing of large and small caliber weapons. Frequency and duration of noise from military activities varies as a factor of the irregular training schedules.

Noise from military activity at Fort Greely, while intermittent, can be fairly loud. Some representative examples include weapons testing, helicopters, and maintenance equipment. Noise from weapons testing typically ranges from 112 to 190 dBA. The noise levels on the ground from a helicopter at 460 meters (1,500 feet) and 76 meters (250 feet) of altitude are 79 dBA and 95 dBA, respectively. Maintenance equipment, such as the tracked vehicles used for trail maintenance, can generate noise levels up to 105 dBA.

The main highways in the vicinity of Fort Greely are the Richardson Highway and the Alaska Highway. No noise sensitive receptors (churches, schools, communities) are known to exist in the vicinity of Fort Greely.

3.1.10 SOCIOECONOMICS

Socioeconomics describes a community by examining its social and economic characteristics. Several demographic variables are analyzed in order to characterize the community, including population size, the means and amount of employment, and income creation. In addition, socioeconomics analyzes the fiscal condition of local government and the allocation of the assets of the community, such as its schools, housing, public services, and healthcare facilities.

Region of Influence

The ROI is assumed to include Fort Greely, Delta Junction, and Big Delta.

Affected Environment

Fort Greely is in Interior Alaska, on the Richardson Highway. The nearest city to Fort Greely is Delta Junction, about 16 kilometers (10 miles) north of the base. The area is sparsely populated with an economy dependent on Fort Greely, state employment, some agriculture and Alyeska Pipeline Service Company. Fort Greely started arctic training towards the end of the decade and in so doing became a major contributor to the local

economy. In July 1995, the Base Realignment and Closure Commission recommended realignment of Fort Greely, which was completed in July 2001.

Population

The ROI is part of a wider region known as the Southeast Fairbanks Census Area. In 1997, it was estimated that the Census Area had a population of 5,563. The population of the ROI at that time was 2,059, or 37 percent of the Census Area.

Population growth in the Census Area was affected by the reduction in personnel at Fort Greely so that, unlike most of the rest of the state, its population fell to pre-1980 levels between 1990 and 1997. The impact of the downsizing of Fort Greely on the region's population is further emphasized as Fort Greely's share of the Census Area population clearly falls between 1990 and 1997.

The Alaska Native population of the ROI in 1990 was relatively small, with Fort Greely having the lowest density of the three communities at 1 percent. Delta Junction and Big Delta had Alaska Native populations of 4.4 percent and 4 percent respectively.

Employment

Fort Greely prior to realignment accounted for approximately 50 percent of all the employment in its surrounding communities, emphasizing the lack of diversity in the economy of the ROI. The School District is the second largest government employer in the area, along with state and Federal highway maintenance services. The highway also provides some tourism-related employment during the summer months.

Unemployment in 1990 varied significantly among the three ROI communities. In the case of Big Delta, its extremely low unemployment rate was paralleled by its comparatively high percentage of economically inactive residents; 54 percent of its 1990 population was characterized as such.

Retail Sales

Retailing within the ROI is limited to small convenience stores, usually combined with a gas station, and tourism-related retailing, including bars and restaurants. The nearest variety retailing center to the ROI is Fairbanks.

Income

Big Delta had the highest median income among the three communities that are closest to Fort Greely. It also had the highest proportion of residents living below the poverty level.

Housing, Education, and Health

There were 956 homes in the three communities surrounding Fort Greely in 1990. A little over 25 percent were vacant. This aggregate figure, however, masks a significant variation in housing stock and vacancy rates among the three communities.

There are four schools in Delta Junction, with a student roll of 491. The school at Fort Greely is not currently used due to base realignment. Delta Junction has a family medical center, and Fort Greely has a clinic. The nearest hospital is 153 kilometers (95 miles) away at Fairbanks.

Fiscal Condition

Delta Junction raised $150,000 of revenue in 1997 from local service charges and external, state sources. It spent almost $184,000 in the same year, the majority on public safety, roads, parks, and recreation. Delta Junction does not levy a bed tax on temporary accommodation.

3.1.11 WATER RESOURCES

This section describes the existing water resource conditions at each of the proposed sites. Water resources include surface water, groundwater, water quality, and flood hazard areas.

Storm water management activities within the State of Alaska are governed by Title 18 Environmental Conservation, Chapter 60, Article 2 of the Alaska Administrative Code (AAC) in accordance with 40 CFR 122.26. Other applicable codes include Title 18 Environmental Conservation, Chapter 70 Water Quality Standards; Title 11 Natural Resources, Part 6 Lands, Chapter 93 Water Management; and Title 46 Water, Air, Energy, and Environmental Conservation. For construction projects, a copy of the Notice of Intent and SWPPP prepared for the EPA must be provided to the ADEC.

Region of Influence

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations. This includes the cantonment area and an adjacent area several miles south from the cantonment boundary.

Affected Environment

Surface Water

Fort Greely is in the Delta River watershed. The Delta River to the west and Jarvis Creek immediately east are the two primary drainages for the Fort Greely ROI. Both are glacier-fed and silt-laden. The peak flow in these water systems is reached in late summer, when snow and ice melt is augmented by rainfall. Minimum flow occurs in winter when precipitation occurs as snow. Other surface water bodies within the ROI are intermittent, unnamed creeks, and lakes. Jarvis Creek and Delta River are generally frozen solid during the winter.

Although floodplain boundaries have not been developed for the ROI, there is a low probability of flooding. High flows in the Delta River overflow to the west rather than toward the ROI. Jarvis Creek overflowed into an old channel during a 1967 flood. Since a barrier was placed at the overflow location, flooding along the old channel has not occurred.

Due to the relatively flat terrain and permeable soils within the ROI, much of the storm water runoff infiltrates before it reaches a water body. Fort Greely operates under an National Pollutant Discharge Elimination System (NPDES) Multi-Sector Industrial Storm Water Permit and SWPPP. The SWPPP identifies two outfalls from the main cantonment area. One discharges into Jarvis Creek, and the other discharges within 183 to 213 meters (600 to 700 feet) of Jarvis Creek.

Groundwater

One unnamed water-bearing unit has been described in the ROI. This unit consists of a lower stratified gravel layer. The top of the water-bearing unit is encountered at about 52 meters (170 feet) below ground surface. One boring completed at Fort Greely penetrated the alluvium to depths of 122 meters (400 feet) below ground surface. It has been reported that the lower stratified gravel aquifer is at least partially confined by low-permeability lenses and seams that may result in the formation of perched water zones.

Groundwater flows northeasterly at a regional gradient ranging from approximately 1.5 to 6 meters (5 to 21 feet) per mile. Groundwater in the area is recharged continuously by the Delta River and by infiltration of meltwater from the Alaska Range in the late spring and early summer. The depth to groundwater ranges from 53 meters (175 feet) to at least 91 meters (300 feet) below ground surface, and fluctuates in response to seasonal recharge. As of 1983, there were five usable wells on Fort Greely, located near the north end of the existing post, yielding an estimated combined capacity in excess of 15 million liters (4 million gallons) per day. Two new 1,893-liter- (500-gallon-) per-minute wells were developed during initial site preparation activities.

Water Quality

Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water. Secondary drinking water standards are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (skin or tooth discoloration) or aesthetic effects (taste, odor, or color) in drinking water. Surface water quality samples meet the primary drinking water standards; however, the concentrations of aluminum, iron, and manganese were higher than the secondary standards. Measurements of pH on Fort Greely were within the state standards.

Groundwater quality in the vicinity of Fort Greely meets the state drinking water standards.

3.1.12 ENVIRONMENTAL JUSTICE

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued 11 February 1994. Objectives of the Executive Order include development of Federal agency implementation strategies, identification of minority and low-income populations where proposed Federal actions have disproportionately high and adverse human health and environmental effects, and participation of minority and low-income populations. Although an environmental justice

analysis is not mandated by NEPA, DoD has directed that NEPA will be used as the primary approach to implement the provision of the Executive Order.

The 1990 Census of Population and Housing reports numbers including both minority and poverty residents. Minority populations included in the census are identified as Black; American Indian, Eskimo or Aleut; Asian or Pacific Islander; Hispanic; or other. Poverty status (used to define low-income status) is reported as the number of families with income below poverty level ($12,764 for a family of four in 1989, as reported in the 1990 Census of Population and Housing).

Region of Influence

The ROI for environmental justice includes the Census Designated Places (CDP) (Big Delta and Fort Greely) and the closest city, Delta Junction that are in the Southeast Fairbanks Census Area.

Affected Environment

Based upon the 1990 Census of Population and Housing, the Southeast Fairbanks Census Area has a population of 5,913. Of that total, 839 persons, or 14.19 percent, were low income, and 1,305 persons, or 22.07 percent were minority.

3.2 EARECKSON AS, ALASKA

Eareckson AS is on Shemya Island about 2,414 kilometers (1,500 miles) from Anchorage, Alaska, and is part of the Near Islands group at the tip of the Aleutian Island chain. Shemya Island occupies approximately 1,425 hectares (3,520 acres) and is part of the Alaska Maritime National Wildlife Refuge administered by the U.S. Fish and Wildlife Service (USFWS) and is operated by the U.S. Air Force. The island has been developed by the military and continues to operate as an Intelligence Radar site whose principal purpose involves monitoring space and missile activities. The base is under control of the Eareckson AS Program Management Office, part of the 611th Air Support Group at Elmendorf AFB.

Eareckson AS is an isolated self-contained military installation. It has no surrounding communities. There is, therefore, no socioeconomic environment at Eareckson AS to be affected by this action.

3.2.1 AIR QUALITY

Shemya Island has a maritime climate, characterized by long, moderately cold winters and short, cool summers. Shemya Island receives some form of precipitation nearly every day of the year and averages approximately 76 centimeters (30 inches) annually. A general description of air quality is provided in the beginning of section 3.1.1.

Region of Influence

The ROI is generally limited to an area extending no more than a few tens of miles downwind from the source and includes the geographic airshed in which the emissions would occur, in this case, Shemya Island.

Affected Environment

Regional Air Quality

The only significant source of emissions in the vicinity of Shemya Island is Eareckson AS, which operates within the restrictions of its Title V Air Permit. As such, the area is in attainment for the NAAQS and state standards. The EPA has classified Shemya Island (and the vicinity of Eareckson AS) as Class II for Prevention of Significant Deterioration (PSD) review purposes. Class II areas can allow for moderate, well-controlled industrial growth.

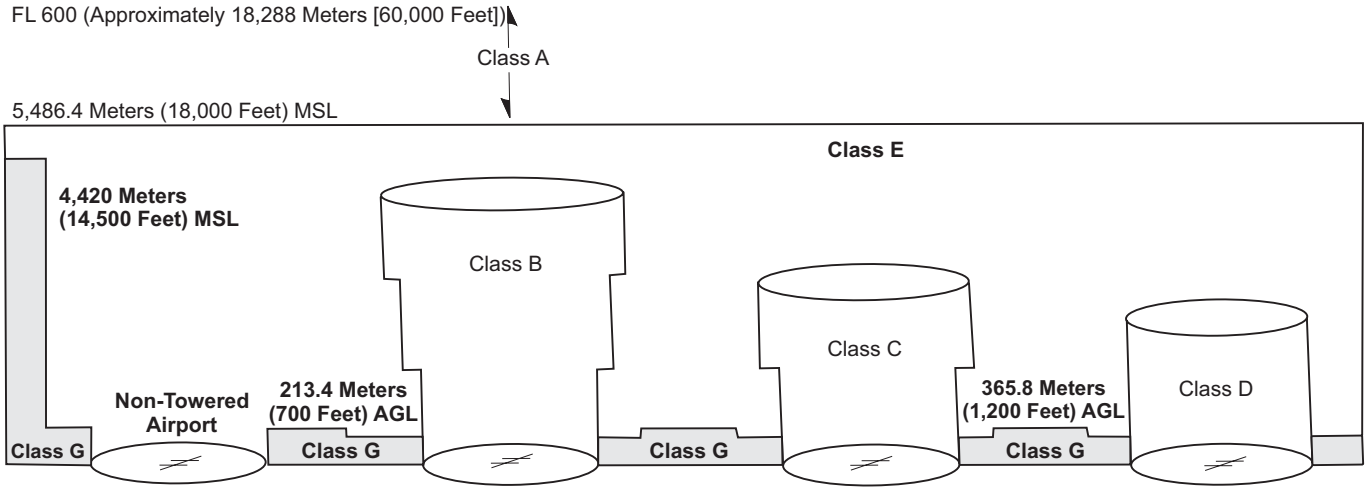
Existing Emissions Sources

Eareckson AS is classified as a major emissions source with emissions from boilers, generators, furnaces, fuel storage, and miscellaneous sources and maintains a Title V Air Permit issued by the ADEC. Annual emissions (1993/1994) included the following: carbon monoxide—91 metric tons (100 tons); oxides of nitrogen—349 metric tons (385 tons); oxides of sulfur—28 metric tons (31 tons); PM-10—9 metric tons (10 tons); and volatile organic compounds—15 metric tons (16 tons). Eareckson AS also emitted 0.57 metric tons (0.63 tons) of hazardous air pollutants). As such, Eareckson AS is not a major source of hazardous air pollutants.

3.2.2 AIRSPACE

Airspace, or that space which lies above a nation and comes under its jurisdiction, is generally viewed as being unlimited. However, it is a finite resource that can be defined vertically and horizontally, as well as temporally, when describing its use for aviation purposes. The scheduling, or time dimension, is a very important factor in airspace management and air traffic control.

Under Public Law 85-725, the Federal Aviation Administration (FAA) is charged with the safe and efficient use of the nation's airspace and has established certain criteria and limits to its use. The method used to provide this service is the National Airspace System. This system is "…a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information and manpower and material" (Aeronautical Information Manual, 1998—FAR/AIM 98). Figure 3-3 depicts the various classes of controlled airspace.



Approximate maximum ceilings:
Class B: 3,048 Meters (10,000 Feet) MSL
Class C: 1,219.2 Meters (4,000 Feet) AGL
Class D: 762 Meters (2,500 Feet) AGL

EXPLANATION

AGL = Above Ground Level
FL = Flight Level
MSL = Above Mean Sea Level

The Six Classes of Non-Military Airspace

Figure 3-3

Not to Scale

Region of Influence

The ROI is defined as that airspace within approximately 185 kilometers (100 nautical miles) of the existing COBRA DANE phased array radar, and the proposed IDT and DSCS on Shemya Island. The potentially affected airspace is described below in terms of its principal attributes, namely: controlled and uncontrolled airspace; en route airways and jet routes, airports and airfields, air navigation and communication facilities, and air traffic control.

Affected Environment

Controlled and Uncontrolled Airspace

The ROI is composed of Class A airspace from 5,486 meters (18,000 feet) mean sea level up to and including flight level 600 (18,288 meters or 60,000 feet). Below 5,486 meters (18,000 feet), the ROI is composed largely of Class G (uncontrolled) airspace, except for the area around Eareckson AS, which is Class E airspace. The Class E airspace extends upward from 213 meters (700 feet) above the surface within a 13-kilometer (6.9-nautical-mile) radius of Eareckson AS, and includes that airspace extending upward from 366 meters (1,200 feet) above the surface within a 48.5-kilometer (26.2-nautical-mile) radius of Eareckson AS, excluding that airspace more than 22 kilometers (12 nautical miles) from the shoreline (see figure 3-4). There is no Class B, Class C or Class D airspace in the ROI. (National Ocean Service, 2000)

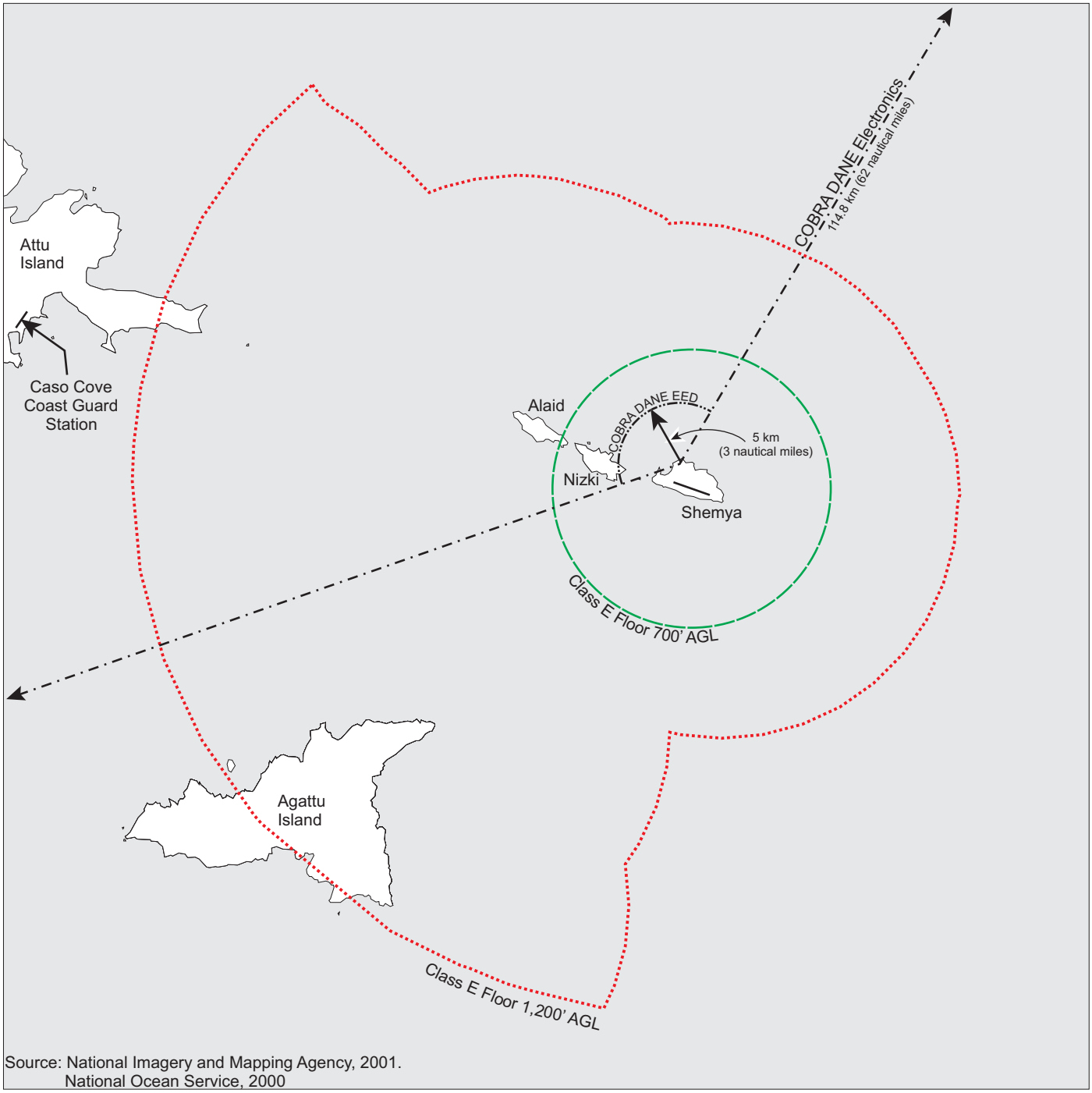
Eareckson AS is currently the site of the COBRA DANE (AN/FPS-108) phased array radar. Formerly used as a strategic warning radar, it is now used primarily for tracking objects in space. It operates in the 1,175 to 1,375 MHz frequency band. The Western Aleutian Islands Sectional Aeronautical Chart includes a radiation hazard notice for Shemya Island. The DoD Flight Information Publication, Area Planning, North and South America, states there is a radiation hazard area from surface to 4,877 meters (16,000 feet) mean sea level for aircraft equipped with externally mounted electroexplosive devices.

Military Training Routes

Although there are no Military Training Routes in the ROI, there is a Military Instrument Flight Rules route (route 604) from St. Paul Island to Eareckson AS. Military Instrument Flight Rules routes are a military backup to the civilian (FAA) system and are used by military aircraft.

Airports/Airfields

There are two military airports/airfields in the airspace ROI: Eareckson AS on Shemya Island, and Casco Cove Coast Guard Station on Attu Island approximately 61 kilometers (33 nautical miles) west of Eareckson AS (figure 3-4). The instrument approach and standard instrument departure tracks into and out of Eareckson AS are to the east, southeast, west, and southwest (National Ocean Service, 2001—U.S. Terminal Procedures, Alaska). There are no public airports or private airfields/airstrips in the ROI. However, two C-130 cargo flights originating out of Elmendorf AFB travel to Eareckson AS on a weekly basis to resupply the AS with necessary commodities (Copeland, 2001).



Source: National Imagery and Mapping Agency, 2001.
National Ocean Service, 2000

EXPLANATION

AGL = Above Ground Level

COBRA DANE Aircraft Electro-Explosive Device (EED), Military Aircraft Electric Interference (surface to 16,000 feet)

COBRA DANE Civilian Aircraft Electronic Interference (surface to 16,000 feet)

Class E Airspace - Floor 700 feet AGL

Class E Airspace - Floor 1,200 feet AGL

Scale 1: 550,000

0 7 14 kilometers

0 4.35 8.7 miles

NORTH

02-09-02 XBR Class E Airspace 3-4

Controlled Airspace

Shemya Island Vicinity

Figure 3-4

Air Navigation and Communications Facilities

Both Eareckson AS and Casco Cove Coast Guard Station on Attu Island are the sites of non-directional radiobeacons. However, Eareckson AS's non-directional radiobeacon is currently non-operational and is due to be replaced (Copeland, 2001). In addition, Eareckson AS is the site of a very high frequency (VHF) Omni-Directional Range/Tactical Air Navigation facility, an airport surveillance radar (AN/GPN-20), and an instrument landing system.

The instrument landing system is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. The ground equipment consists of two highly directional transmitting systems known as the localizer and the glideslope.

One of the four FAA Long Range Navigation radio transmitters in the North Pacific Chain, which operate at the 100 kilohertz frequency, is located on Attu Island. The other three transmitters are well outside the ROI in Saint Paul, Kodiak, and Port Clarence, Alaska (Aeronautical Information Manual, 2001—FAR/AIM 01). There are no other air navigation or communications facilities, including air route surveillance radars, which track aircraft en route and operate in the L-Band (1 to 2 gigahertz) in the airspace ROI.

Air Traffic Control

The airspace ROI lies within the Anchorage Oceanic Control Area/Flight Information Region and within the U.S. Alaskan Air Defense Identification Zone. In the Class A (positive control areas) airspace all operations are conducted under instrument flight rules procedures and are subject to air traffic control clearances and instructions. Aircraft separation and safety advisories are provided by air traffic control, the Anchorage Air Route Traffic Control Center. In Class E airspace (general controlled airspace) operations may be either under instrument flight rules or visual flight rules: separation service is provided to aircraft operating under instrument flight rules only, and to the extent practicable, traffic advisories to aircraft operating under visual flight rules, by the Anchorage Air Route Traffic Control Centers. For Class G airspace (uncontrolled airspace), operations may be either under instrument or visual flight rules, but no air traffic control service is available.

The airspace beyond the 22-kilometer (12-nautical-mile) limit is in international airspace. In this airspace outside U.S. territory, FAA air traffic service is provided in accordance with Article 12 and Annex 11 of the International Civil Aviation Organization (ICAO) Convention. Because it is in international airspace, the procedures of the ICAO, outlined in ICAO Document 444, Rules of the Air and Air Traffic Services, are followed. ICAO Document 444 is the equivalent air traffic control manual to FAA Handbook 7110.65, Air Traffic Control. The FAA acts as the United States agent for aeronautical information to the ICAO, and air traffic in the ROI is managed by the Anchorage Air Route Traffic Control Centers.

3.2.3 BIOLOGICAL RESOURCES

A general description of biological resources is provided in the first paragraph of section 3.1.2.

Region of Influence

The ROI for biological resources includes the area within and adjacent to the Proposed Action sites on Eareckson AS and other important wildlife areas of the surrounding Alaska Maritime National Wildlife Refuge that could potentially be affected by the proposed activities.

Affected Environment

Vegetation

The predominant vegetative associations on Shemya Island consist of beach grass that tends to colonize disturbed areas, and remnants of crowberry tundra (see figure 3-5). Beach grass dominates the shorelines within bays, inlets, and coves of the island. Other plants inhabiting this area are beach pea, seabeach sandwort, cow parsnip, cinquefoil, and species of sedge. The tundra is composed mainly of grasses, sedges, heath, and composite families with an almost continuous mat of mosses and lichens.

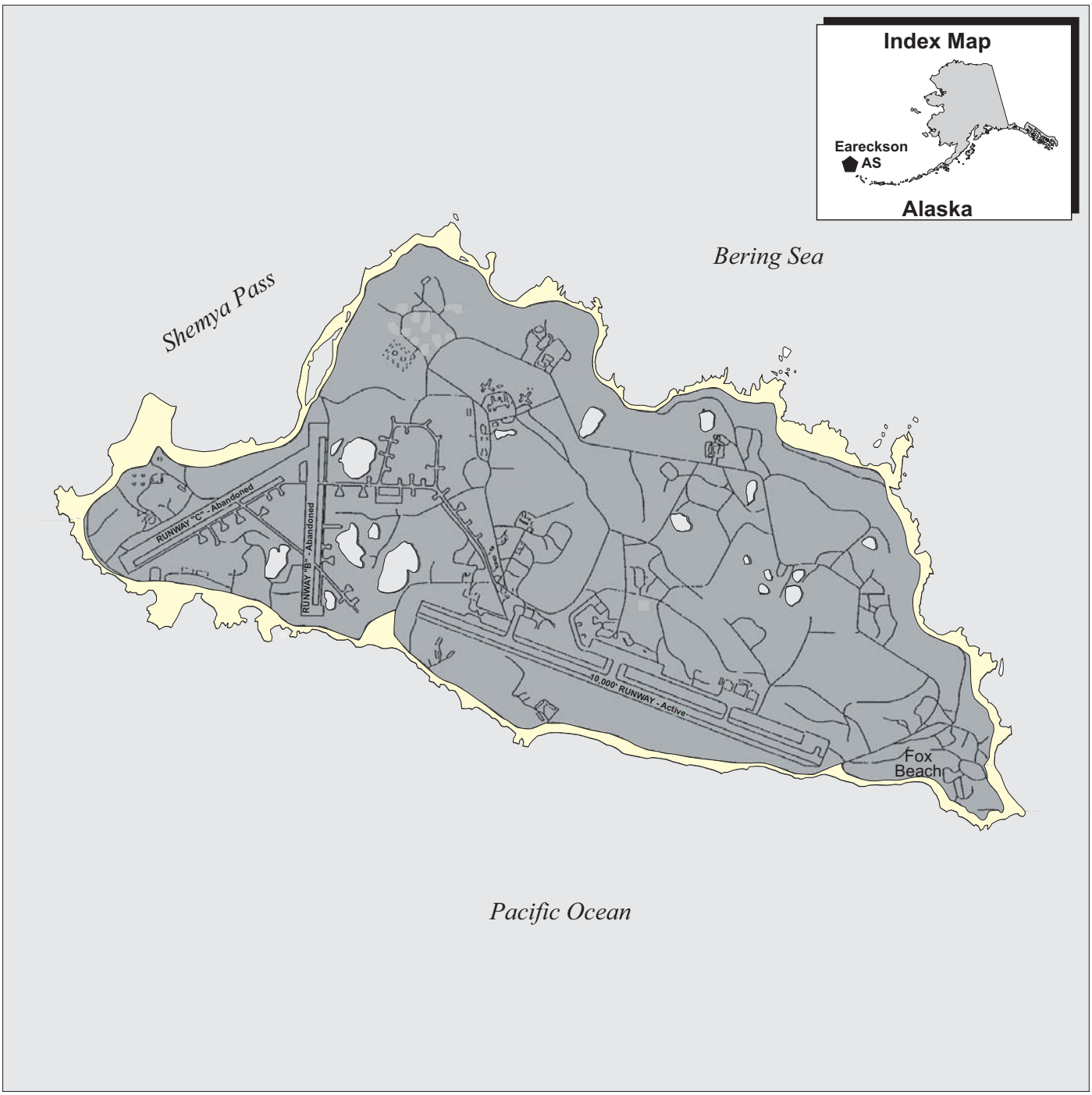
Dwarf shrubs such as crowberry, cloudberry, lapland cornel, and blueberry are located at higher elevations with better drainage. Forbs such as bistort, buttercup, lousewort, monkshood, and violet are scattered throughout the area. There are no large native trees. Only a few Sitka spruce, introduced by the Russians in 1805, and small groves of other trees introduced by Americans during World War II exist on the island today.

Eelgrass beds are confined to lagoons and estuaries and are an important food source for waterfowl and invertebrates and provide food and rearing habitat for juvenile groundfish and salmon. Pondweed, water milfoil, and mare's tail are the primary freshwater vegetation. Large mosses and leafy liverworts are located in freshwater streams.

Wildlife

Marine, freshwater, and potentially anadromous fish occur on and in the area surrounding Shemya Island. However, freshwater fish are not considered a significant resource, and commercial fishing in the local marine area is considered minor (U.S. Air Force, 1998). Anadromous fish of the Near Islands include pink, chum, sockeye, and coho salmon. Shemya Island, however, has no salmon runs.

There are no indigenous terrestrial mammals on Shemya Island. The blue phase arctic fox introduced in 1911 is the largest mammal on the island. The other terrestrial mammals are introduced rodents, deer mice and rats.



EXPLANATION

- Roads
- Water Area
- Beach Grass
- Grasses, Sedges, Heath, and Dwarf Shrubs

NORTH

Scale

0 1,738 3,475 feet

0 530 1,059 meters

02-09-02 br_eas_002_color 3-5

Vegetation

Eareckson Air Station,
Shemya Island, Alaska

Figure 3-5

Shemya Island is along the migratory route of and visited by a high diversity of North American and Asian shorebirds and waterfowl. Its rocky cliffs provide ideal habitat for seabird colonies and roosting sites for the Peale's peregrine falcon. Pelagic and red-faced cormorants and tufted puffins nest offshore on islets located on the north side of Shemya Island, but seabirds have been mainly extirpated from the main island by introduced foxes and rats.

Waterfowl use the lakes of Shemya Island as feeding and resting places during migration. Glaucous-winged gulls are found at Shemya year-round. A few nest on offshore islets, but hundreds feed in the intertidal zone. The emperor goose, a species on the decline, primarily uses the northern shore intertidal areas, but can be found around the entire perimeter of the island. Emperor geese, harlequin ducks and common eiders are among the species of marine birds that use the intertidal and shallow subtidal zones around most of the island. Asiatic waterfowl, shorebirds, raptors, and songbirds use much of the island including the north shore bluffs, which provide important resting habitat during migration. (Siekaniec, 2002).

Harbor seals have been observed along the northwest coastline of Shemya Island.

Threatened and Endangered Species

Species with Federal or state status that potentially occur in the area of Eareckson AS are listed in table 3-1. The Steller sea lion (*Eumetopias jubatus*) is the most abundant marine mammal species found in the area. Haul out occurs on offshore islands northeast of Shemya Island. Two haulout grounds have been located on the north and northwest ends of the island. The northern sea otter (*Enhydra lutris kenyoni*) uses the southwest coastal kelp beds of Shemya Island for feeding, pupping (March through May), and as haulout grounds. Although populations began increasing when all sea otter hunting was prohibited after 1960, the sea otter population in the Aleutian Islands area has declined approximately 70 percent since the early 1990s. The cause of the decline is still a subject of controversy. The Aleutian Islands population of the northern sea otter was recently added to the candidate species list and may be proposed for listing under the Endangered Species Act in the near future.

The blue whale (*Balaena musculus*), bowhead whale (*Balaena mysticetus*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), northern right whale (*Eubalaena glacialis*), and sperm whale (*Physeter macrocephalus*) are seasonal visitors to the waters surrounding Shemya Island. Bowhead and humpback whales may be observed passing by the shore during migration in May and October. Northern right and sperm whales can be observed in the area from April to September. The blue and fin whales may be observed feeding in the area during the summer.

The Aleutian Canada goose *(Branta canadensis leucopareia*) was recently delisted from a threatened species to a recovered one that requires monitoring for the next 5 years. The goose is found on the island from mid April through mid June and mid August through mid

Table 3-1: Sensitive Species with Federal or State Status Under the Endangered Species Act Potentially Occurring in Project Areas

Scientific Name	Common Name	Status		Habitat and Distribution
		State	Federal	
Birds				
Branta canadensis leocopareia	Aleutian Canada goose[1]	--	--	Visitor to Shemya Island from April–June and August–October to feed and for other non-breeding activities
Diomedea albatrus	Short-tailed albatross	E	E	Unlikely visitor to Shemya Island; observed during the summer months in the Aleutian Islands, Bering Sea, and Gulf of Alaska
Somateria fischeri	Spectacled eider	--	T	Unlikely to be observed off the shore of Shemya Island, located in northern Bering Sea in winter
Polysticta stelleri	Steller's eider	--	T[2]	Occasional visitor to intertidal waters of Shemya Island during the winter months
Mammals				
Balaena mysticetus	Bowhead whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed during migration in May and October
Balaenoptera musculus	Blue whale	--	E	Seasonal visitor to the waters surrounding Shemya Island during the summer months
Balaenoptera physalus	Fin whale	E	E	Seasonal visitor to the waters surrounding Shemya Island during the summer months
Megaptera novaeangliae	Humpback whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed during migration in May and October
Eubalaena glacialis	Northern right whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed from April to September
Physeter macrocephalus	Sperm whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed from April to September
Eumetopias jubatus	Steller sea lion	E	T	Haul out grounds on offshore islands northeast of Shemya Island and on the north and northwest ends of the island
Enhydra lutris kenyoni	Northern sea otter	--	C	Uses the southwest coastal kelp beds of Shemya for feeding, pupping (March through May), and as haulout grounds

Source: U.S. Fish and Wildlife Service, 1996, 2002; Alaska Department of Fish and Game, 1997.

[1] Recently delisted

[2] Only the North American breeding population is considered threatened.

– = Not listed

E = Endangered

T = Threatened

C = Candidate

October for non-breeding activities, such as staging, resting, and feeding (crowberry shrubs) during migration. Feeding occurs over the entire island primarily during daylight hours as most of the geese return to neighboring predator-free islands for the night. The geese do not nest on Shemya Island, and the island is not suitable for nesting recovery efforts due to the presence of humans, rodents, and blue phase arctic fox. Removal of foxes would increase goose population and therefore increase the potential for bird strikes and hazard to aircraft (Siekaniec, 2002). (U.S. Fish and Wildlife Service, 2001)

The short-tailed albatross *(Diomedea albatrus*) is officially listed as an endangered species in U.S. territorial waters (Gulf of Alaska, Aleutian Islands, Bering Sea Coast) as well as Japan, Russia, and the high seas (U.S. Fish and Wildlife Service, 2002). Most summer sightings of this albatross are in the Aleutian Islands, Bering Sea, and Gulf of Alaska. Short-tailed albatross probably occur in low numbers near Shemya Island (Siekaniec, 2002). Its presence on Shemya Island is considered unlikely. This species has been proposed for listing for the near-shore areas, 5 kilometers (3 miles) out from U.S. shores, to correct an administrative oversight.

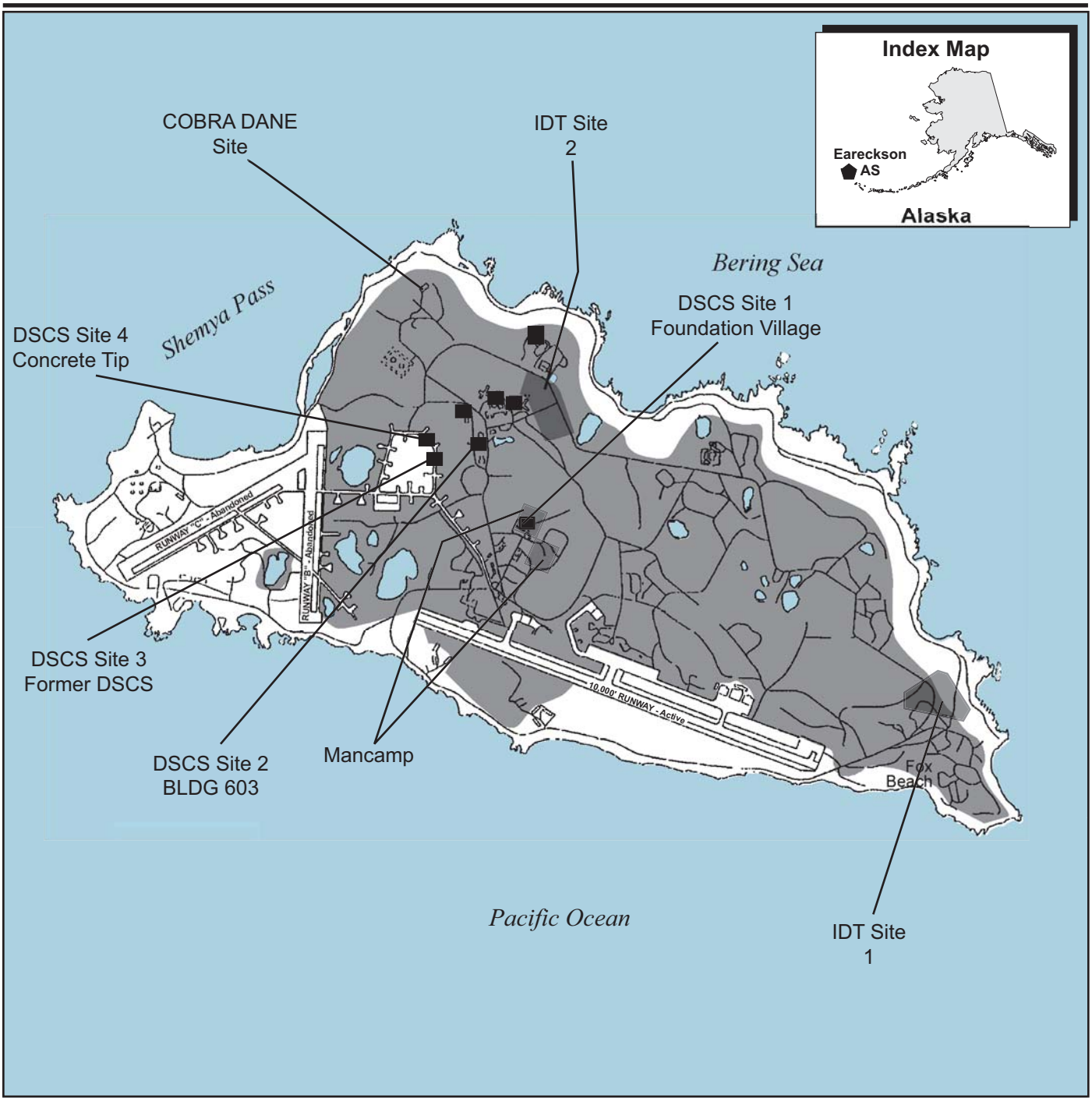
It is highly unlikely that the threatened spectacled eider (*Somateria fischeri*) would be observed offshore of Shemya Island (U.S. Fish and Wildlife Service, 2002). The Steller's eider (*Polysticta stelleri*) may winter annually in low numbers in nearshore marine waters in the western Aleutians and are seen at Shemya Island occasionally (Siekaniec, 2002).

Environmentally Sensitive Habitat

The Department of the Air Force has primary jurisdiction, custody, and control over Shemya Island and its waters (including submerged lands. Shemya Island and its waters (including submerged lands) are part of the Alaska Maritime National Wildlife Refuge and the National Wildlife Refuge System, and the Secretary of the Interior has jurisdiction secondary to that of the Department of the Air Force. No federally designated critical habitat has been identified on Eareckson AS.

A substantial portion of Eareckson AS (80 percent, or approximately 1,140 hectares [2,816 acres]) falls within a wetlands classification under criteria applied by the U.S. Army Corps of Engineers (see figure 3-6). Beaches, cliffs, lakes, disturbed areas west of the abandoned Runway B, areas around Runway 10-28 and slopes south of this runway, and other areas altered by construction of roads, building pads, and structures are the only areas excluded from wetlands classification.

The USFWS has indicated the Upper, Middle, and Lower Lake system is of interest for its ability to support migratory birds and provide a resting place. Asian birds, not seen elsewhere in the United States, are often blown off course during migration by storms and appear to be attracted by the airfield lights located in the vicinity of the lakes at Eareckson AS.



EXPLANATION

- Roads
- Land Area
- Water Area
- Wetlands

NORTH

Scale
0 1,738 3,475 feet
0 530 1,059 meters

02-09-02 br_eas_001 3-6

Wetlands

Eareckson Air Station,
Shemya Island, Alaska

Figure 3-6

3.2.4 CULTURAL RESOURCES

A general description of cultural resources is located in the beginning of section 3.1.3.

Region of Influence

The ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment.

Affected Environment

Prehistoric and Historic Archaeological Resources

It is assumed that the Aleutian Islands were first settled in the Umnak Island area and that inhabitants then spread east and west until the entire chain became occupied. Near Islands assemblages appear distinctive from 2,600 years ago until about 400 years ago, when similarities to other assemblages farther east became more apparent.

It is uncertain whether Shemya Island was inhabited when first sighted by the Russians in 1741. However, Russian records reveal that, when they arrived, practically every island was inhabited. The first recorded contact between Europeans and the native people of the Near Islands was in 1745, when Russian hunters landed on Agattu and Attu in search of sea otters. It has been estimated that at that time the Near Islands had a population of approximately 1,000 Aleuts. Approximately 100 people apparently occupied Shemya Island.

By the end of the 1760s, the Aleut population of the Near Islands had declined and Shemya Island was abandoned as a permanent settlement. It remained essentially unpopulated until around 1922, when introduced arctic fox trapper's cabins were built. In 1940, approximately 40 inhabitants of Attu used the cabins on Shemya for trapping. There were no permanent inhabitants of Shemya Island at that time.

A total of nine prehistoric archaeological sites have been recorded on Shemya Island. Three of the sites were destroyed by previous construction, and the remaining six have been disturbed by construction and/or vandalism. All of the prehistoric sites recorded on Shemya Island are located along the shoreline and represent middens occupied by prehistoric Aleuts. Traces of semi-subterranean houses appear to be present at some sites, and at least one burial has been reported. There have been no reported sites from the higher elevations of the island.

Historic Buildings and Structures

The western Aleutians possessed strategic military importance to the United States during World War II because of their relative proximity to northern Japan, and Shemya Island was especially suitable for long runways and the operation of large bombers.

In June 1942, Japanese carrier-based planes attacked U.S. Army and Navy forces at Dutch Harbor and Japanese troops landed on Attu and Kiska, but Shemya remained unoccupied. The United States began air attacks of Kiska and Attu in May 1943. Towards the last days of this battle U.S. Army units landed on Shemya Island to begin construction of an airfield and, by the end of 1943, the United States had established bases on both Attu and Shemya.

Between 1943 and 1944 the U.S. Army erected Quonset huts, numerous permanent buildings, four massive birchwood hangars, and defensive fortification, such as concrete bunkers and gun emplacements. At the end of 1943, the Aleutians ceased to be a combat theater and the Japanese made no further attempt to contest U.S. control of the island chain; the final American bombing raid from the Aleutians was launched from Shemya in August 1945.

Between 1945 and the early 1950s, Shemya Island had only limited military importance, and activities and personnel at the base were reduced. Its mission was primarily as a refueling stop for support and supply aircraft. In 1954, following the Korean Armistice, the base at Shemya was deactivated and its facilities turned over to the Civil Aeronautics Authority. Subsequently, the facilities were leased to Northwest Orient Airlines, which used them for refueling commercial aircraft until 1961.

In 1958, Shemya Island was reactivated as a U.S. Air Force installation, assigned to the 5040th Air Base Squadron, and many Cold War military facilities were constructed, including a radar facility and three antennas. This radar facility was demolished in the late 1970s and replaced by a phased array radar designated COBRA DANE, which became operational in 1977. In 1993, Shemya AFB was redesignated Eareckson Air Force Station. In 1994, as a result of downsizing, the Air Force Station was further redesignated an Air Station.

Argonne National Laboratory conducted an inventory of historic buildings and structures in 1996. The only facility from the World War II and Cold War periods at Eareckson AS determined to be a historically significant Cold War era property and eligible for listing on the National Register is the COBRA DANE radar.

Native Populations/Traditional Resources

Eareckson AS is located within the traditional territory of the Aleut. The Bureau of Indian Affairs has determined that three of the prehistoric archaeological sites are eligible for conveyance to the Aleut Corporation under section 14(h) (1) of the Alaska Native Claims Settlement Act.

Paleontological Resources

There have been no paleontological sites reported on Shemya Island; however, given the physiographic setting, fossils are possible.

3.2.5 GEOLOGY AND SOILS

A general description of geology and soils is provided in the first paragraph of section 3.1.4.

Region of Influence

The ROI for geology and soils includes that area of Eareckson AS that could potentially be disturbed by construction and operation activities associated with the DSCS, IDT, connecting roads, and infrastructure.

Physiography

Shemya Island is near the western end of the Aleutian archipelago (arc or chain), that forms a bow-shaped string of islands that stretches from the southwest corner of mainland Alaska to within 161 kilometers (100 miles) of the Kamchatka Peninsula of Russia, a distance of over 2,414 kilometers (1,500 miles). Shemya is part of the Near Islands group, the westernmost group of islands in the Aleutian Chain.

Shemya Island is a flat-topped seamount approximately 2.4 kilometers (1.5 miles) wide and 5.7 kilometers (3.5 miles) long on a west-east axis. Typical surface elevations range from 6 to 8 meters (20 to 25 feet) above sea level on the Pacific side to a maximum height of 73 meters (240 feet) on the northern Bering Sea side. The island is rimmed with small sandy/gravely beaches and rugged bedrock crags. A small raised wave-cut platform nearly encircles Shemya Island and suggests previous ocean level changes. The surface is typical of hummocky glaciated terrain and tundra regions. Surface and subsurface drainage flows in a south-southwest direction. The construction of the existing 3,048-meter (10,000-foot) runway has greatly modified the natural surface drainage of the island.

Geology

Regionally, Shemya Island is part of the Aleutian volcanic arc of the North Pacific Ocean. The bedrock geology of the island consists of intrusive and extrusive igneous complexes; primarily Tertiary and Quaternary in age (30 million years to present). Bedrock on the western half of the island consists of a basement complex of fine-banded argillites, limey argillites, siltstone, graywackes, and conglomerates. On the north side of the island (Alcan Cove) silicified and pyritized lavas outcrop. Submarine pyroclasts and volcanic intrusives cover the eastern half of the island. These rocks overlie the sedimentary basement complex of the western half of the island. Intrusives composed of feldspar and horneblende porphyry outcrop along the northeast and southeast shores and locally inland.

Unconsolidated surface materials on Shemya Island are generally sand, gravel, and peat deposited by marine, alluvial, and eolian processes. A thin layer of remnant glacial outwash sand and ground moraine covers most of the island. Peat is the predominant surface material found over the east-northeast portion of the island. The western one-third of the island and part of the south side of the island are covered by active and stable sand dunes.

Soils

A matted accumulation of tundra peat is the predominant surficial soil on the island. The highly saturated material is typical of tundra regions. This layer varies in thickness, but is usually 1 to 2 meters (2 to 5 feet) deep. Depth to bedrock varies from zero to over 8 meters (25 feet). Sand soils over bedrock tend to dominate the south shore beach areas. Most of the surficial materials on Shemya Island can retain and transmit water. Shemya Island has no permafrost.

Mineral Resources

Known mineral resources on Shemya Island are restricted to sand and gravel for construction purposes. The U.S. Air Force has proposed to develop a borrow pit and quarry plan for controlled removal of available aggregate resources to support future construction and maintenance at Eareckson AS. Sand and gravel resource material on the island is limited.

Geologic Hazards

The convergence of the Pacific and North American crustal plates creates one of the world's most active seismic zones. Over 100 earthquakes of magnitude 7 or larger have occurred along this boundary since the turn of the century. Shemya Island falls within seismic zone 4, which reflects the highest hazard potential for earthquakes and severe ground shaking.

Eareckson AS is susceptible to tsunamis (tidal waves) resulting from earthquake ground displacements and earthquake triggered submarine landslides. A tsunami line has been established at the 30-meter (100-foot) elevation contour for new construction.

3.2.6 HAZARDOUS MATERIALS AND WASTE

A general description of hazardous materials and waste is provided in the beginning of section 3.1.5.

Region of Influence

The ROI for hazardous materials and waste includes the Eareckson AS infrastructure and existing facilities within the main base cantonment. The Proposed Action may require the use of base infrastructure and existing facilities.

Affected Environment

Hazardous Materials Management

Eareckson AS routinely receives and stores small quantities of hazardous materials, including a variety of flammable and combustible liquids such as aviation fuels. Additional hazardous materials utilized by the base include acids, corrosives, compressed gases, hydraulic fluids, solvents, paints, paint thinners, and lubricants. Supplies, including petroleum products, arrive either by barge during the summer months or by aircraft year round. JP-8 and gasoline arrive by barge and are stored in bulk storage tanks since they are

used in large quantities. Most other petroleum products and chemicals are used in much smaller quantities and typically arrive in 208-liter (55-gallon) drums or smaller containers. Hazardous materials are controlled and managed through a hazardous materials program.

Storage tanks and associated piping systems at Eareckson AS are used to store and distribute various petroleum products or wastes, and other miscellaneous products. An Environmental Baseline Survey for potential GMD facilities at Eareckson AS was completed in April 2001. Of the 22 former or current UST locations associated with the sites, 15 have been removed. Of the 14 former or current AST locations, only 5 were still in place (National Missile Defense Joint Program Office, 2001). All ASTs and USTs at Eareckson AS are currently being evaluated to determine whether they are needed to support operations under the existing Base Operation Support Contract. Unneeded tanks and their associated pipelines that are found to be in excess will be cleaned, closed, and removed. Chronic low-level oiling of Shemya beaches has been documented over the past decade. The source of the oil is unknown, but it appears to be crude or diesel. Emperor geese and glaucous-winged gulls have been observed with oiled feathers and other species may also be affected (Siekaniec, 2002).

Eareckson AS administers a SWPPP that includes site specific good housekeeping practices, facility surveys, satellite accumulation area inspections, vehicle inspections conducted daily by the operator, employee training, preventive maintenance, and spill prevention and response. Eareckson AS also maintains an Oil and Hazardous Substance Discharge Prevention and Contingency Plan that addresses spill prevention and preparedness. The base submits annual emergency response and extremely hazardous substances updates to the local emergency management officials.

Hazardous Waste Management

Eareckson AS has implemented a Hazardous Waste Management Plan that sets forth the policies and procedures to be followed when handling hazardous wastes. Hazardous wastes generated at Eareckson AS include solvents, petroleum, oil and lubricants, fuel wastes, batteries, asbestos, PCBs, and wastes generated from site remediation. Eareckson AS is defined as a small quantity generator by the EPA and generates less than 100 kilograms (220 pounds) of hazardous waste per month.

Hazardous wastes and waste petroleum products are accumulated at approximately 17 locations throughout the installation. Eareckson AS is not permitted to dispose of hazardous wastes. All hazardous wastes with no energy recovery potential are sent to the Defense Reutilization and Marketing Office at Elmendorf AFB.

Pollution Prevention

The majority of waste streams at Eareckson AS are recycled or utilized for energy recovery. Used fuel, oil, oil filters, absorbent pads, and other petroleum contaminated waste solids are burned for energy recovery. Antifreeze is collected and recycled for reuse on the facility. Batteries are maintained for recycling through the Defense Reutilization and

Marketing Office, and products such as transformer silicon oil are returned to the manufacturer for recycling.

Installation Restoration Program

The U.S. Air Force began the IRP process at Eareckson AS in 1984. Fifty IRP sites have been identified and major Preliminary Assessment activities have been conducted at the installation. Additional information was gathered from site inspections, remedial investigations, and feasibility studies conducted at the 50 sites. Restoration activities were conducted at many of the Eareckson AS sites prior to 1994.

Asbestos

A comprehensive asbestos survey for Eareckson AS was completed in 1992. Based on the results of the survey, asbestos-containing material is assumed or confirmed to be present in 48 facilities. In compliance with standard U.S. Air Force regulations, any friable asbestos-containing material must be removed if it is likely to release airborne fibers and cannot be reliably maintained, repaired, or isolated. The base asbestos manager is contacted at all times before any demolition or renovation occurs in order to take proper action and prevent material from becoming airborne. However, the condition of asbestos in several buildings is unknown and needs to be investigated further.

Polychlorinated Biphenyls

All electrical equipment containing PCBs at Eareckson AS has been replaced, and PCB-containing transformers have been fully cleansed of the PCB-containing fluids. Eareckson AS is considered PCB free.

Lead-based Paint

No facilities at Eareckson AS have been tested for lead-based paint. It should be assumed that most facilities constructed before the implementation of the DoD ban on the use of lead-based paint in 1978 are likely to contain one or more coats of such paint, and are a probable concern. Sixty-nine existing facilities at the site were constructed before 1978.

Radon

Radon testing was conducted at Eareckson AS in May 1988. Of the 12 samples taken, 10 were below the U.S. EPA guidelines of 4 picocouries per liter, and 2 were below detection levels. Hence, radon is not a concern at Eareckson AS.

Pesticides

The use of pesticides in and around Eareckson AS has not been limited to specific sites. The low levels of pesticides detected in sampling media throughout the installation are consistent with the controlled application of pesticide for insect control and does not present a threat to the human health or the environment.

3.2.7 HEALTH AND SAFETY

A general description of health and safety is provided in the beginning of section 3.1.6.

Region of Influence

The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action facilities.

Affected Environment

On-base Safety

The U.S. Air Force has developed standards that dictate the amount of fire equipment that must be present based on the types of aircraft and total square footage of base structures and housing. The Eareckson AS fire department meets these standards, maintaining four crash fire trucks, three structural pumpers, and one spill response truck. One centrally located facility houses the equipment. The positioning of this facility also meets the U.S. Air Force time and distance requirements for facility response.

Safety zones around the airfield have been established to address threats to human safety from aircraft accidents at Eareckson AS. In order to minimize the risk at each end of the runway, a Clear Zone and Approach Zones have been designated. These zones have been established to limit development around the airfield on the island.

Other base safety issues include ESQDs associated with aircraft loading and unloading areas, unexploded ordnance areas, World War II bunkers, and the weather. Although no ordnance is stored on the base, the U.S. Air Force still maintains ESQDs along the aircraft flight line for aircraft using the airfield. There are presently four designated areas on the island that have known unexploded ordnance. These areas are clearly marked and personnel are informed of these areas. Periods of hazardous weather conditions (usually high winds) occur at Eareckson AS, and individuals are warned to take precautions during these conditions. The base safety office may limit outside access during these conditions. The base contractor has a Health and Safety Plan, and there is a full-time emergency medical technician on the island.

The COBRA DANE EWR on Eareckson AS can adversely affect electro explosive devices aboard aircraft. A separation distance of 5 kilometers (3 miles) is recommended for electro explosive devices aboard aircraft, in the presence phase, and 1.20 kilometers (0.75 mile) for electro explosive devices on the ground, in the handling/loading phase.

Radiation Hazards. The RF hazard to flying aircraft with electro explosive devices aboard is out to 5 kilometers (3 miles) in the area in front of the COBRA DANE radar as shown in figure 3-4. The hazard for aircraft on the ground where electroexplosive devices are being handled is 1.2 kilometers (0.75 mile). The RF hazard to personnel that exists directly in front of the COBRA DANE is mitigated by fences that restrict access to the area in front of the radar and by warnings signs that inform personnel of the RF radiation hazard. No hazard to fuels is expected.

COBRA DANE presents the highest probability for radiation hazards. COBRA DANE is a phased-array radar that collects radar information on foreign sea-launched and intercontinental ballistic missiles for intelligence and treaty verification purposes.

COBRA DANE normally operates in the frequency range (1,215 to 1,250 MHz) and on infrequent occasions and for an interval of up to 15 minutes COBRA DANE sometimes operates in the frequency range (1,175 to 1,375 MHz). When the power density is calculated or measured over the 30-minute averaging time (required by the standard at these frequencies) the average power density for the 15-minute maximum duration, 1,175-1,375 MHz frequency range is reduced by half. Its beam is continually scanning, and therefore will interact with the surrounding environment. However, due to the location and orientation of the COBRA DANE antenna on top of a cliff facing the open ocean, the interaction with the environment is limited to sidelobe and backlobe interactions.

The personnel exposure limit standards for uncontrolled environments (locations where the general public has access) for frequencies between 300 and 3,000 MHz requires that the power density not exceed f(MHz)/1,500 milliwatts per square centimeter averaged over a 30-minute duration. For 1,215 MHz and 1,250 MHz the permissible exposure values are 0.81 and 0.83 milliwatts per square centimeter respectively for an average time of 30 minutes. For 1,175 MHz and 1,375 MHz the permissible exposure values are 0.78 and 0.92 milliwatts per square centimeter respectively for an average time of 30 minutes. For the purposes of this analysis, the lowest value of 0.78 milliwatts per square centimeter is used as the permissible exposure requirement. The COBRA DANE can exceed the standard for distances out to approximately 100 meters (328 feet). The area around the face of the COBRA DANE is an enclosed area within government-controlled land that is fenced to assure no unauthorized access occurs within the hazardous area.

3.2.8 INFRASTRUCTURE

A general description of infrastructure elements is provided in the first paragraph of section 3.1.7.

Region of Influence

The ROI includes the utility systems that could potentially be affected by the Proposed Action.

Affected Environment

Water Supply

Potable water on Eareckson AS is collected through an infiltration gallery system and backup wells (see Section 3.2.11, Water Resources). Eareckson AS's potable water system has 25 thousand meters (82 thousand feet) of water lines and a capacity to produce 1.5 million liters per day (0.39 million gallons per day). On average there is a total base usage of 0.22 million liters per day (0.06 million gallons per day).

Wastewater

Eareckson AS's sanitary sewage system has 24 thousand meters (79 thousand feet) of sewer lines and the capacity to treat 0.95 million liters per day (0.25 million gallons per day) of wastewater. On average there is a total base demand for treatment of 0.26 million liters per day (0.07 million gallons per day). The treatment plant provides secondary treatment before ocean out fall.

Solid Waste

The U.S. Air Force at Eareckson AS adopted a regulation in 1991 that established policies and procedures for segregation of solid, nonhazardous waste into two main categories and several subcategories. Junk metal and aluminum cans are categorized as recyclable and are shipped off of the island. Large items such as automobiles, couches, and washing machines are also removed from the island. Heavy plastic, polyvinyl chloride, and all other municipal wastes are disposed of in the Eareckson AS landfill.

The Eareckson AS landfill is located on the southeast point of the island and has been in operation since 1944. The landfill is currently operated under State of Alaska Solid Waste Disposal Permit number 9425-BA009, which permits the disposal of municipal solid waste at the landfill. The landfill sits adjacent to an IRP site. Ground water monitoring has shown that an increase in petroleum product contamination. The Eareckson AS landfill permit expired 1 December 1999. The State of Alaska will not renew the permit, but has issued an administrative extension until a new landfill can be built. Currently, a new landfill design is being proposed for construction in an alternate location (Hostman, 2001).

Electricity

Eareckson AS has six 3-MW diesel generators, only three of which are operating at any one time. Under most conditions, the three generators are run at 55 percent of their capacity, for a total of 4.95 MW. Eareckson AS has an annual usage of 28 million kW-hours.

3.2.9 LAND USE

A description of land use is provided in the first paragraph of section 3.1.8.

Region of Influence

The land use ROI includes the immediate work areas utilized during construction and operation of the Proposed Action facilities.

Affected Environment

Regional Land Use

Eareckson AS is located on Shemya Island near the end of the Aleutian Island chain. The Aleutians West Census Area is unincorporated and has no official zoning ordinances.

However, all development will require review for consistency with the standards of the Alaska Coastal Management Program.

The area around Shemya is virtually all open ocean, with an uninhabited island about 3 kilometers (2 miles) to the west. All of the land uses in the area are compatible with the adjoining areas of Eareckson AS.

Eareckson AS Land Use

Eareckson AS consists of 1,425 hectares (3,520 acres), which is the entire island of Shemya. The island is located wholly within the USFWS-administered Alaska Maritime National Wildlife Refuge. The purposes of the Alaska Maritime National Wildlife Refuge include (1) conserving wildlife and wildlife habitat in their natural diversity, (2) fulfilling international treaty obligations of the United States with respect to fish and wildlife, (3) providing for a subsistence opportunity by local residents, (4) providing a national and international program of scientific research on marine resources, and (5) ensuring water quality and quantity within the refuge.

As mentioned earlier, the Department of the Air Force has primary jurisdiction, custody, and control over Shemya Island and its waters (including submerged lands). Shemya Island and its waters (including submerged lands) are part of the Alaska Maritime National Wildlife Refuge and the National Wildlife Refuge System, and the Secretary of the Interior has jurisdiction secondary to that of the Department of the Air Force.

The southern portion of the air station is dominated by an airfield and airfield support, which consists of support buildings and one active runway. Administrative buildings are scattered throughout the northern portion of the station. Housing is in the north central section of the base, and community and service facilities are in close proximity to the housing and administrative facilities. Industrial sites are scattered throughout the air station, with the remainder of the land being open space. Facilities associated with the airfield, the COBRA DANE Radar, and some housing and administrative accommodations are all of the facilities that are currently in use. The remainder of the facilities is currently inactive.

Coastal Zone Management

All of the communities within the Aleutians West Coastal Resource Service Area (AWCRSA) are coastal, and essentially all developable land within the AWCRSA is located in the "zone of direct influence" of the coastal environment. All major development in the AWCRSA will require review for consistency with the standards of the Alaska Coastal Management Program and the policies of the AWCRSA coastal program.

Federal lands are excluded from Alaska's coastal zone boundaries. Activities on these lands do, however, require preparation of a Coastal Zone Consistency Determination in accordance with the Coastal Zone Management Act of 1972. Any activities on Federal lands and waters that affect any land or water use or natural resource of the AWCRSA coastal zone must be consistent, to the maximum extent practicable, with the enforceable

policies of the AWCRSA coastal management program. A coastal consistency determination for proposed GMD test bed activities on Eareckson AS is included as appendix C.

3.2.10 NOISE

A general description of noise is provided in the beginning of section 3.1.9.

Region of Influence

The ROI for noise includes those areas potentially affected by proposed activities that might experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways potentially affected by proposed activities that might experience a $L_{eq(1\ hour)}$ greater than or equal to 67 dBA.

Affected Environment

Eareckson AS is located on Shemya Island, which has no population other than personnel associated with the air station, and would be expected to have a background noise level of DNL less than or equal to 55 dBA. The closest civilian community is Atka, which is approximately 604 kilometers (375 miles) from Shemya Island.

3.2.11 WATER RESOURCES

A description of water resources is provided in the beginning of section 3.1.11.

Region of Influence

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations.

Affected Environment

Surface Water

Eareckson AS is located in the Shemya Island watershed. Surface water flow on Eareckson AS follows the topography in a south–southwest direction, although the east and west halves of the island are distinct drainage systems. Drainage is generally poor in the interior of the island, resulting in standing water. There is no record of either rainfall induced or coastal flooding on Shemya Island. The small drainage area of the interior is not likely to result in flooding, and the coastline is sufficiently high such that 100-year storm waves would not top the beach crest. However, a tsunami line has been established at the 30-meter (100-foot) elevation mark.

Numerous lakes and ponds exist on the island, generally in the northern and western portions of the island. Except for the western Lake Complex, most of the lakes and ponds have poorly defined drainage basins. Many of the lakes and ponds are situated near

surface water divides or high points, and a significant portion of the available precipitation is absorbed by surficial and near-surface deposits. The remaining water is discharged by streams or springs on the southern coastline. There is not a large runoff on the northern coast of the island due to the increasing northern elevation.

A small watershed located in the eastern part of the island covering an area of approximately 103 hectares (255 acres) is the recharge area for potable water at Eareckson AS. Within this area, surface water infiltrates into a shallow unconfined aquifer.

Storm water flows overland and through culverts, eventually reaching outfall locations at the ocean. Outfalls usually discharge storm water mixed with groundwater that seeps into the drainage channels. Eareckson AS has an NPDES Multi-Sector Industrial Storm Water Permit and SWPPP that document existing conditions and establish practices for prevention of storm water pollution.

Groundwater

Shemya Island has a relatively complex hydrogeological environment. Both confined and unconfined aquifers occur on the island, with some areas having multiple zones of saturation. Groundwater can be encountered either in the surface peat layer that occurs over much of the island, or in the unconsolidated sand and gravel that occurs primarily in the southern coastal area, or in the fractured bedrock in the central portion of the island.

Groundwater flow within the unconsolidated deposits closely follows the surface topography. Most water finds its way into the fractures in the bedrock where it is stored. The general direction of water flow within the bedrock follows surface contours. All of the potential aquifers on the island are either quite thin, have low porosity, or have low permeability. Depth to water varies from approximately 3 meters (10 feet) to more than 60 meters (200 feet) below ground surface.

Potable water is collected through an infiltration gallery system installed in the 1950s. Four horizontal infiltration collectors are installed below the peat layer of the shallow unconfined aquifer. Groundwater from the peat layer enters the collectors and flows to a central holding tank. The water is pumped to the water treatment plant, where it is treated for domestic use, chlorinated, and then pumped into three water storage reservoirs for domestic and construction uses. Two wells provide up to 416 liters (110 gallons) per minute of water as a backup to the water gallery system.

Water Quality

Surface water and groundwater quality is generally good except in isolated areas of known contamination. Water pumped from the water gallery is treated in the water treatment plant before domestic use. Drinking water quality is subject to seasonal variations but is generally within established EPA drinking water standards. However, drinking water samples have exceeded the 1993 action levels for lead and copper.

3.2.12 ENVIRONMENTAL JUSTICE

A general description of environmental justice is given in the beginning of section 3.1.12.

Region of Influence

The ROI for Eareckson AS consists of the Aleutians West Census Area.

Affected Environment

Based upon the 1990 Census of Population and Housing the Aleutians West Census Area had a population of 9,478. Of that total, 848 persons, or 8.95 percent, were low-income; 3,377 persons, or 35.63 percent, were minority. The nearest population center to Eareckson AS is Adak Station on Adak Island, which is approximately 365 miles to the east of Eareckson AS. As of 1999, 80 percent of the population in the Aleutians West Census Area reside in the City of Unalaska, which is located on Unalaska Island approximately 765 miles to the east of Eareckson AS.

3.3 EIELSON AFB, ALASKA

Eielson AFB is located approximately 37 kilometers (23 miles) southeast of Fairbanks, and about 14 kilometers (9 miles) southeast of the city of North Pole within the Fairbanks North Star Borough. The main base consists of approximately 8,021 hectares (19,820 acres). It also manages an additional 15,098 hectares (37,309 acres) at four other locations.

Initial analysis indicated that construction and operation of a Missile Transfer Facility would not result in a substantial increase in hazardous material use or hazardous waste generation or impact to airspace.

The proposed location for the Missile Transfer Facility is a site that has been previously disturbed. No impacts to cultural resources are anticipated.

Construction of the Missile Transfer Facility would result in only a slight short-term positive impact on the economy of the region.

3.3.1 AIR QUALITY

A general description of air quality is provided in the beginning of section 3.1.1.

Region of Influence

The ROI is generally limited to an area extending no more than a few tens of miles downwind from the source and includes the geographic airshed in which the emissions would occur.

Affected Environment

Regional air quality is described in section 3.1.1.

Existing Emissions Sources

Eielson AFB is classified as a major emissions source with emissions from boilers, engines, hush house, gas stations, chemicals, fuel handling, and miscellaneous equipment and maintains a Title V Air Permit through the ADEC. Annual emissions (1997) included the following: carbon monoxide—422 metric tons (466 tons); oxides of nitrogen—1,154 metric tons (1,272 tons); oxides of sulfur—793 metric tons (874 tons); particulate matter—311 metric tons (343 tons); and volatile organic compounds—51 metric tons (56 tons). Eielson AFB also emitted 140 metric tons (155 tons) of hazardous air pollutants.

Eielson AFB is in attainment for all NAAQS and state standards and should be evaluated as a PSD Class II area.

Although the base itself is located in an attainment area, the Fairbanks North Star Borough is in nonattainment for carbon monoxide. During episodes of cold winter weather, atmospheric inversions may trap contaminants and cause exceedances of the NAAQS or state standards. According to Fairbanks North Star Borough studies, approximately 90 percent of all carbon monoxide produced within the borough is from vehicles. Denali National Park, a Class I PSD area, is approximately 180 kilometers (110 miles) from Eielson AFB, and would be within the base's ROI.

The base recently conducted a PSD review and obtained a PSD Operating Permit that addresses emissions of nitrogen oxides. This application restricts oil-fired boilers installed after 1981 to an overall average 50-percent utility and restricts diesel engines installed since 1981 (other than the 25-MW power plant generator) to an overall average of 500 hours of operation per year. These two operating limitations avoid triggering the PSD applicability threshold for sulfur dioxide and reduce the potential-to-emit level for nitrogen oxides from engines installed since 1981.

3.3.2 BIOLOGY

A general description of biological resources is provided in the first paragraph of section 3.1.2.

Region of Influence

The ROI for biological resources includes the area within and adjacent to the proposed Missile Transfer Facility on Eielson AFB (figure 2-8) that could potentially be affected by the proposed activities.

Affected Environment

Vegetation

The vegetation of Eielson AFB, as with the Tanana River Valley and the lowlands of Interior Alaska in general, is composed of boreal (or taiga) forest. Evergreen forests of black and

white spruce dominate this habitat. The presence of black spruce and bogs usually indicates an area underlain by permafrost. There are also extensive stands of deciduous forests of paper birch, quaking aspen, and balsam poplar, which generally develop on permafrost-free soils. Figure 3-7 indicates the location of vegetation types within the proposed project area.

Semi-improved ground areas include unpaved ground within and around the airfield, tank farms, and similar facilities. Most ground is maintained by annual mowing and brush control measures. The dominant cover commonly consists of tickle grass, foxtail barley, Kentucky bluegrass, alsike clover, Canada goldenrod, and yarrow. Along the runway, common fireweed and alpine sweet-vetch are abundant. Patches of smooth brome are also common in open, seeded areas.

No population of either glaucus goosefoot (*Chenopodium glaucus*) or Alaskan paintbrush (*Castelleja annua*) was located during field surveys and neither of these plant species, considered rare by the State of Alaska, is expected to occur within the proposed project area.

Wildlife

French Creek supports spawning and rearing chum salmon, Piledriver Slough supports migrating (possibly) spawning chum salmon. Alaska Department of Fish and Game's "Catalog of Water Important for Spawning, Rearing or Migration of Anadromous Fishes" does not identify Chinook (king salmon) in these water bodies. In addition, French Creek and Piledriver Slough support resident fish, e.g., Artic grayling, whitefish, longnose suckers, and pike. (State of Alaska, Department of Fish and Game, 2002)

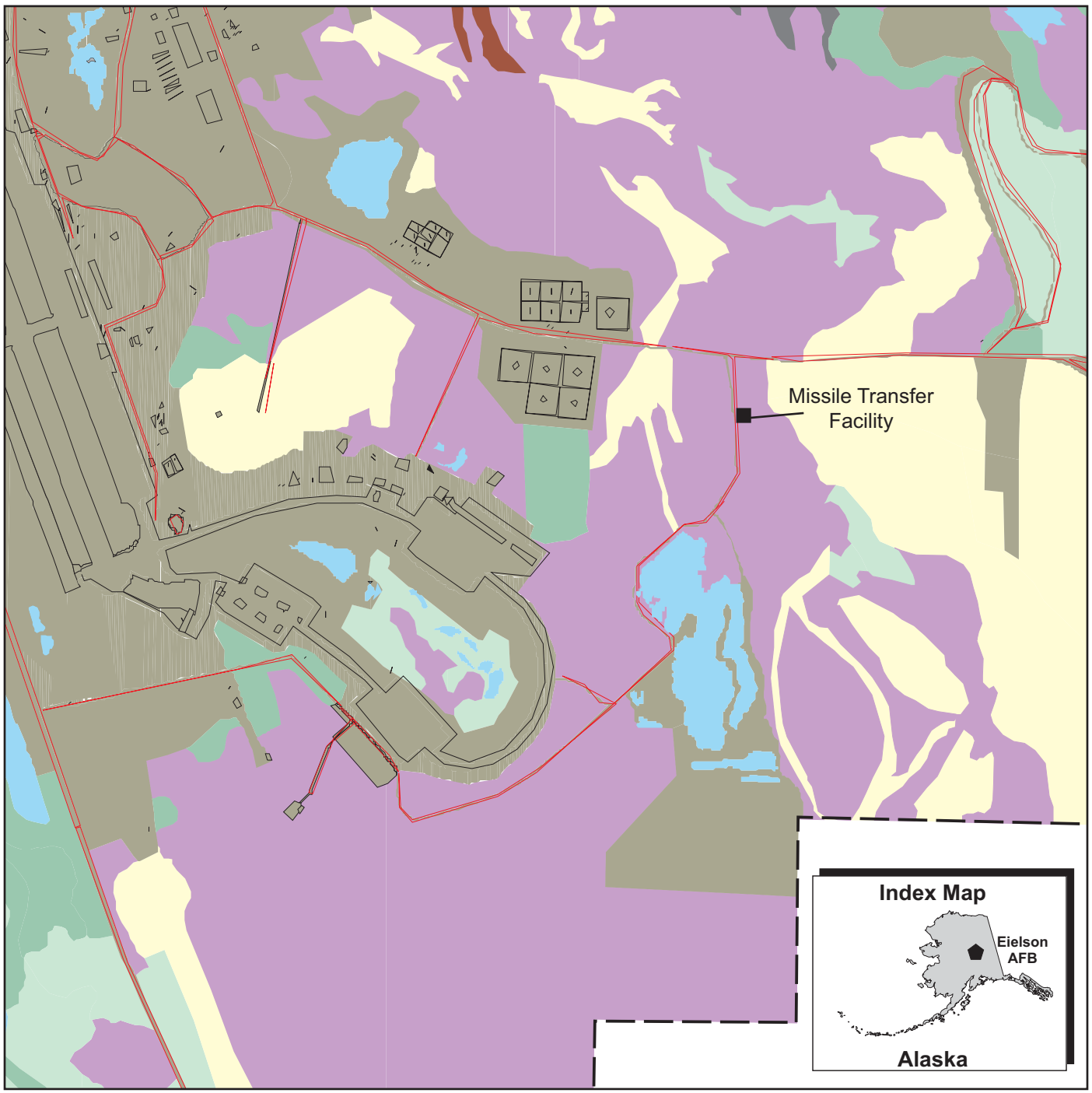
The Tanana Valley provides summer breeding habitat for a variety of migratory birds, in addition to the many year-round residents. Some of the most common species include spruce grouse, ruffed grouse, great horned owl, red-tailed hawk, sharp-shinned hawk, American kestrel, willow ptarmigan, northern goshawk, rock ptarmigan, and a wide variety of waterfowl.

Some of the more important or abundant mammal species include moose, black bear, brown/grizzly bear, snowshoe hare, marten, meadow vole, red-back vole, meadow jumping mice, red squirrel, beaver, muskrat, and mink. North American lynx are occasionally trapped on Eielson AFB.

Sporadic areas of black spruce and old field habitat border the runway and cantonment area. This habitat can support coyote, red fox, red squirrel, common raven, ruffed grouse, and a variety of waterfowl in the open water areas.

Threatened and Endangered Species

No threatened or endangered species have been identified on lands managed by Eielson AFB. The recently delisted American peregrine falcon and arctic peregrine falcon (*Falco peregrinus tundrius*) are known to occasionally pass through the base.



EXPLANATION

- Roads
- Water Area
- Installation Boundary
- Railroads
- Human Disturbance
- Broadleaf Forest
- Mixed Forest
- Black Spruce Forest
- Fresh Sedge Marsh
- Sedge Grass Meadow
- Shrub/Birch Shrub and Serial Herb

NORTH

Scale
0 .8 1.6 miles
0 1.25 2.5 kilometers

02-09-02 Veg Eielson AFB 3-7

Vegetation

Eielson Air Force Base, Alaska

Figure 3-7

Environmentally Sensitive Habitat

No federally designated critical habitat has been identified on Eielson AFB.

Approximately 51 percent of Eielson AFB is composed of wetlands (figure 3-8). The most common type of vegetated wetlands is black spruce wetlands. Most of the wetlands on base have wet soils due to poor drainage caused by permafrost. Vegetated wetlands are located adjacent to the area proposed for use by the Proposed Action.

3.3.3 GEOLOGY AND SOILS

A general description of geology and soils is provided in the first paragraph of section 3.1.4.

Region of Influence

The ROI for geology and soils includes that area of Eielson AFB that could potentially be disturbed by construction and operations associated with the Missile Transfer Facility and connecting infrastructure.

Geology

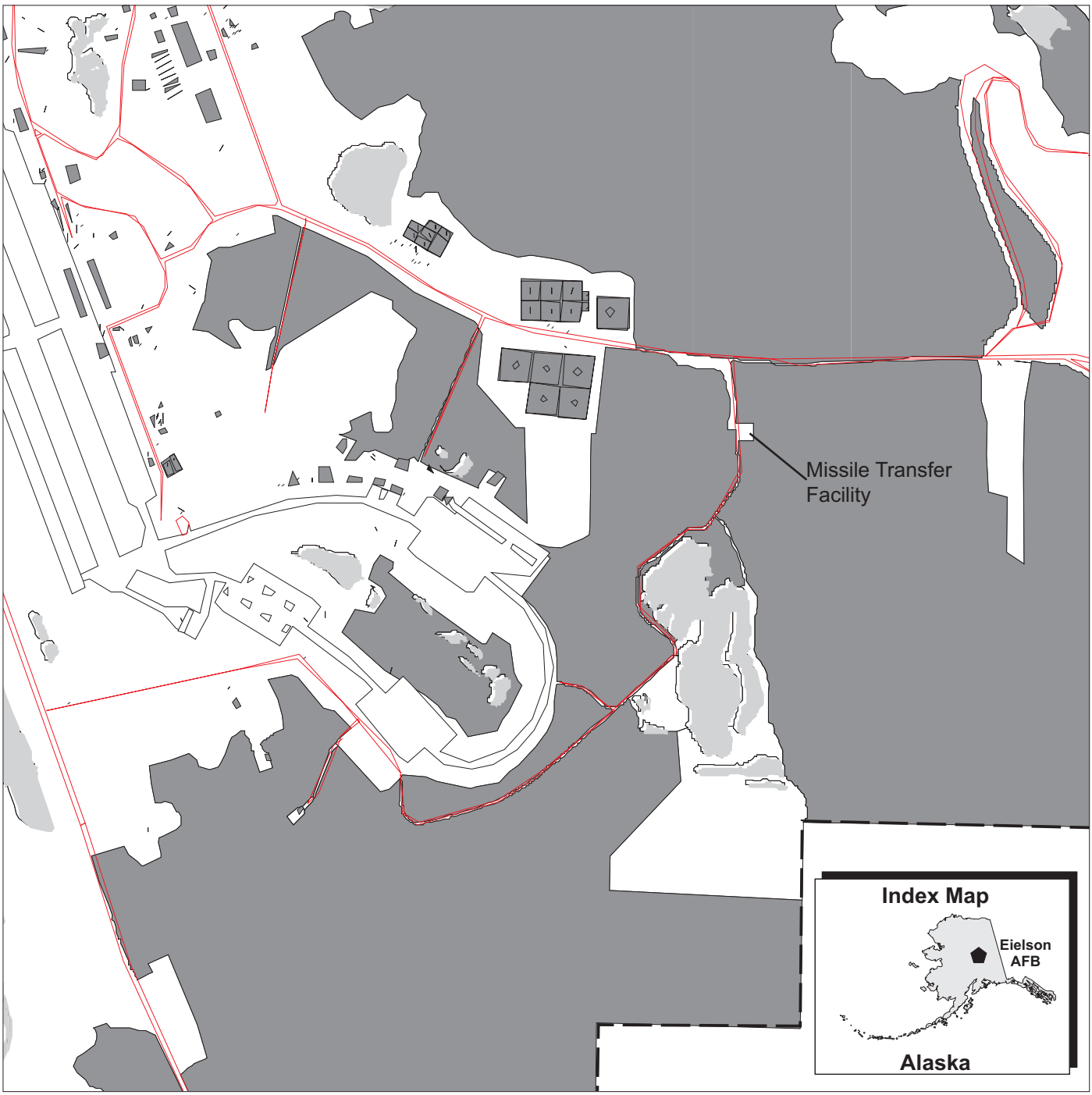
Eielson AFB is located within a large geologic province known as the Yukon–Tanana terrane. This is a region of deformed and faulted metamorphic and igneous rocks of Precambrian to Mesozoic age (800 to 66 million years B.P.), overlain by younger sedimentary formations of Tertiary and Quaternary age (65 million years to present). The Yukon–Tanana terrane is recognized as a complex assemblage of many rock types with a very complicated geologic history. The area is cut by northeast-trending, high angle faults.

During the Quaternary period, alluvial fans were deposited along the southern margin of the Tanana River Valley due to rapid uplift of the Alaska Range and northern foothills and the occurrence of at least four major glacial advances. Aggradation of the river plain built up a thick, layered sequence of unconsolidated silts, sands, and gravels in the lowlands. Unconsolidated deposits are approximately 61 to 91 meters (200 to 300 feet) beneath Eielson AFB but have been estimated to be as great as 229 meters (750 feet) just south of Fairbanks.

Soils

Soils in the Tanana Valley consist of unconsolidated silt sands and gravels, organic silts, sandy silts, and clays. Floodplain soils nearest the active channel are sandy with a thin silt loam layer on the surface. On higher terraces, the soils are predominantly silt belonging to the Salchaket series. On older river terraces, silt loam soils of the Goldstream series dominate and often have a significant organic component. These soils tend to be cold and wet and are generally underlain by permafrost. Clays, sandy silts, and sandy gravelly loams may be found in upland areas of the Tanana River Valley.

Eielson AFB is within a region of discontinuous permafrost. Preliminary geotechnical investigations at the proposed site indicate the presence of permafrost on north-facing slopes, which is typical for areas of discontinuous permafrost. The thawing of permafrost



EXPLANATION

- Roads
- Water Area
- Railroads
- Installation Boundary
- Uplands
- Vegetated Wetlands

Scale
0 .8 1.6 miles
0 1.25 2.5 kilometers

NORTH

Wetlands

Eielson Air Force Base, Alaska

Figure 3-8

in this area could result in subsidence, erosion, and gully formation. The thawing process could also affect water quality by increasing suspended sediment values if soil moved toward water bodies.

Mineral Resources

Mining activities in and around Eielson are primarily for sand and gravel extraction. Sand and gravel have been used for the construction of the Richardson Highway, Eielson AFB, and the Trans-Alaska Pipeline.

Geologic Hazards

Eielson AFB is within the Fairbanks seismic zone, a northeast-trending band of seismic activity. An average of five or six earthquakes a year are actually felt in this zone. In June 1967, a series of three earthquakes of about magnitude 6 had epicenters to the west of Eielson AFB. Two other moderate earthquakes (magnitude 4.0 to 4.6) occurred in this zone in 1977.

3.3.4 HEALTH AND SAFETY

A general description of health and safety is provided in the beginning of section 3.1.6.

Region of Influence

The ROI for health and safety of personnel includes the immediate work areas utilized during construction and operation of the Missile Transfer Facility at Eielson AFB. The ROI for public safety includes properties immediately adjacent to the base and the transportation network for hazardous materials.

Affected Environment

The Eielson AFB Safety Office reviews base safety issues. Other offices, such as the Bioenvironmental Engineering Office, also ensure safe operations by providing services such as sampling of indoor air, water, and unknown material or waste. Eielson AFB maintains mutual aid agreements with the Bureau of Land Management to fight range fires and 10 local fire departments within the surrounding area. The Bureau of Land Management has the primary responsibility of fighting fires in the forested area of Eielson AFB with assistance from the base fire department. The base maintains firebreaks around hazardous areas such as ammunition storage areas and fuel storage areas.

The Eielson AFB fire department, maintains five crash trucks, three structural trucks, two water trucks, two ramp vehicles, two command vehicles, and one hazardous material truck. The base currently has personnel who administer and manage the program for both the flightline and the base facilities. Two fire stations, one along the flightline and the second in the base housing area, provide the base fire protection needs. The positioning of these facilities meets the U.S. Air Force time and distance requirements for facility response.

The threats to human safety from aircraft accidents at Eielson AFB are summarized in the Air Installation Compatible Use Zone (AICUZ) Report. The AICUZ guidelines are based on the type of aircraft at the base and the nature of operations conducted. In order to minimize the risk to the public at each end of the runway, a Clear Zone and two Accident Potential Zones have been designated. The Clear Zone, the area where aircraft mishaps are most likely to occur, is contained within the base boundaries.

Other on-base safety restrictions include ESQDs associated with current operations. There are no electromagnetic radiation (EMR) safety zones on Eielson AFB.

3.3.5 INFRASTRUCTURE

A general description of infrastructure components is provided in the first paragraph of section 3.1.7.

Region of Influence

The ROI for infrastructure is made up of the service areas of each utility provider servicing the base.

Affected Environment

Solid Waste

In 1998 Eielson AFB produced an estimated 4.0 thousand metric tons (4.4 thousand tons) of solid waste. Of that, an estimated 3.0 metric tons (3.3 thousand tons) was transferred to the Fairbanks North Star Borough landfill, 0.76 thousand metric tons (0.83 thousand tons) of combustible waste was used as fuel at the Eielson AFB Refuse Derived Fuel facility, and the rest was recycled or composted.

Off-base. The Fairbanks North Star Borough Landfill has been in operation for approximately 30 years. The newest cell is currently under construction and is anticipated to be in operation within the next year. The landfill can accept asbestos-contaminated waste, household hazardous waste, and waste from conditionally exempt small quantity hazardous waste generators. No other hazardous or radioactive waste can be accepted at the landfill.

It is estimated that the landfill accepts approximately 73 thousand metric tons (80 thousand tons) of waste annually, the majority of which comes from the Fairbanks North Star Borough (which includes both North Pole and Fairbanks). However, they do occasionally accept waste from other boroughs.

Energy

Electricity and Steam—On-base. The Central Heat and Power Plant is the most critical facility on Eielson AFB, as it is the base's primary source for heating and electric power. Operating continuously, year round, it has an annual production of approximately 860 million kilograms (2 billion pounds) of steam and 89 million kilowatt-hours of electricity.

With arctic temperatures dipping as low as -51°C (-60°F), reliable steam heat is critical to operations at Eielson AFB.

Electrical power on Eielson AFB is generated by a series of steam turbine generators in the Central Heat and Power Plant. The base is electrically self-sufficient, except for Charlie Battery, Pedro Dome, Birch Lake, and Flag Hill. All of these areas receive their electricity from Golden Valley Electric Association.

The Central Heat and Power Plant is equipped with five steam turbine generators capable of producing 25 MW of electricity. Eielson AFB also has a contract with Golden Valley Electric Association that allows the base to access 10 MW of power whenever needed.

Power demand varies seasonally, with peak winter demands of approximately 17 MW. In fiscal year 1997, Eielson AFB purchased 13.3 million kW-hours of electricity from Golden Valley Electric Association and produced approximately 89 million kW-hours themselves.

Each of the Central Heat and Power Plant's boilers has a maximum rating of 54 thousand kilograms (120 thousand pounds) of steam per hour. The normal operating range for the boilers is between 27 thousand and 32 thousand kilograms (60 thousand and 70 thousand pounds) of steam per hour. During the summer months, only two boilers are needed for electrical generation. During winter operations, four to five boilers are required to meet the heating load.

3.3.6 LAND USE

A general description of land use is provided in the first paragraph of section 3.1.8.

Region of Influence

The ROI for land use includes those areas potentially affected by the use of facilities and infrastructure at Eielson AFB for the construction and operation of a Missile Transfer Facility.

Affected Environment

Eielson AFB main base encompasses approximately 8,021 hectares (19,820 acres). It manages another 15,098 hectares (37,309 acres) at four other offsite locations. The land uses at Eielson AFB consist of the airfield, airfield operations, industrial, administration, community facilities, medical facilities, housing, recreational, and open space areas.

The airfield land use is the dominant land use category on the base, and consists of the runway, taxiways, and parking/maintenance/arming aprons. Airfield operations are located adjacent to the airfield to the east along Flightline Avenue and essentially coexist with the airfield operations. The main industrial area is located in the central section of the base just east of the airfield operations area. Other industrial areas are scattered in the eastern section of the base and on Engineer Hill.

Military personnel and the general public use Eielson AFB for various recreational activities. These activities include hunting, fishing, trapping, camping, cross-country skiing, snowmobiling, archery, and firing ranges. Some facilities and recreation areas on base are limited to military personnel, retired military, DoD civilians, and their bona fide guests.

3.3.7 NOISE

A general description of noise resources is provided in the beginning of section 3.1.9.

Region of Influence

The ROI for noise includes those areas potentially affected by proposed activities that might experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways potentially affected by proposed activities that might experience a $L_{eq(1\ hour)}$ greater than or equal to 67 dBA.

Affected Environment

The area surrounding Eielson AFB is sparsely populated, and thus expected to have a background noise level of DNL less than or equal to 55 dBA.

Aircraft noise at Eielson AFB occurs during aircraft engine warm-up, maintenance and testing, taxiing, takeoffs, approaches, and landings. Noise contours for aircraft operations were modeled for the Eielson AICUZ Study and updated in 1996.

The noise contour with a DNL value of 65 dBA was estimated to occur outside the base boundaries on land off the northern end of Runway 31. The community of Moose Creek, which has low-density housing, falls within this contour. The highest DNLs occur on the runway and taxiways and were measured at 85 dBA. The loudest noise contours were estimated to have a DNL value of 85 dBA and to surround the majority of the airfield's primary surface.

The main highway in the vicinity of Eielson AFB is the Richardson Highway. At the North end of Eielson AFB the Richardson Highway is a four-lane divided highway, which provides access to the base through the Hursey Gate. At the south end of the installation, the highway is a two-lane highway. The transition from a four-lane divided highway to a two-lane highway occurs south of the Hursey Gate. This gate is the only operational gate at Eielson allowing access to and from the installation. The summer average daily traffic count for the Richardson Highway in the vicinity of the base is 10,461. Assuming an even division of the traffic (i.e., 5,230 on each side of the divided highway), traffic noise levels of $L_{eq(1\ hour)}$ equals 72 dBA, $L_{eq(1\ hour)}$ equals 67 dBA, and $L_{eq(1\ hour)}$ equals 57 dBA are estimated to occur at approximately 15 meters (49 feet), 32 meters (105 feet), and 150 meters (492 feet) from the highway, respectively. For the purpose of analysis, the traffic speed was assumed to be 89 kilometers (55 miles) per hour.

Other than the community of Moose Creek, no noise sensitive receptors (churches, schools, communities) are known to exist in the vicinity of Eielson AFB.

3.3.8 WATER RESOURCES

A general description of water resources is provided in the beginning of section 3.1.11.

Region of Influence

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations.

Affected Environment

Surface Water

The Eielson ROI is located primarily in the Tanana Flats watershed and also extends into the Chena River watershed. Surface water bodies near Eielson AFB include rivers, creeks, sloughs, lakes, and ponds. Surface drainage at Eielson AFB is generally north–northwest, parallel to the Tanana River. Moose Creek is the main receiving stream for small local drainages around the base. Garrison Slough passes directly through the developed portion of the base and consists primarily of engineered drainage channels. Moose Creek discharges into Piledriver Slough just above the confluence with the Tanana River. With the exception of a short period during spring, the surface water elevation in Garrison Slough is lower than the groundwater elevations.

Approximately 34 percent of Eielson AFB is within the 100-year floodplain. Eielson AFB operates under an NPDES Multi-Sector Industrial Storm Water Permit and SWPPP. The SWPPP identifies existing and potential sources of storm water pollution at Eielson AFB and defines Best Management Practices (BMPs) to reduce potential pollution and ensure compliance with permit requirements.

Groundwater

Groundwater on the developed part of the base occurs at depths of 2 to 3 meters (6 to 10 feet) below ground surface. This is an unconfined aquifer associated with the Tanana River floodplain. The aquifer is 61 to 91 meters (200 to 300 feet) thick and overlies the Birch Creek Schist. Flow directions are usually to the north–northwest and parallel the flow of the Tanana River. Local variations in flow directions occur on Eielson AFB near surface water bodies, Power Plant pumping supply wells, and near melting piles of stored snow that create a source of recharge water during breakup.

Groundwater elevations in the unconfined aquifer are subject to seasonal fluctuations, with the highest elevation occurring during and immediately following snowpack melting. The lowest elevations are expected during the fall. During winter, a slow rise in water levels is normal. The magnitude of fluctuations varies from year to year, but generally is in the range of 0.5 to 0.6 meter (1.5 to 2.0 feet).

Groundwater in the upland portion of the base occurs at depths of approximately 15 to 91 meters (50 to 300 feet) in a fractured bedrock aquifer. Downgradient flowpaths are not well defined in this aquifer. Groundwater flow in the bedrock aquifer is controlled largely by the heterogeneities in the bedrock such as fractures or relatively permeable lenses and layers.

Groundwater is the only source of potable water used at Eielson AFB. Additional private and agricultural wells are located within a 5-kilometer (3-mile) radius of the base. These wells are located downgradient, north–northwest, and to the west of the base. Groundwater is also utilized for emergency and firefighting purposes on Eielson AFB.

Water Quality

Background groundwater quality analyses have shown that the average iron and manganese concentrations typically exceed the secondary maximum contaminant levels for drinking water. Arsenic has been identified as a constituent of concern at Eielson AFB, and one background sample exceeded the primary drinking water standard of 50 micrograms per liter.

3.3.9 ENVIRONMENTAL JUSTICE

A general description of environmental justice is given in the beginning of section 3.1.12.

Region of Influence

The ROI includes the Census Area (the Fairbanks North Star Borough), CDPs (Eielson, Fox, Harding Lake, Moose Creek, Pleasant Valley, Salcha, and Two Rivers), and cities (Fairbanks, and North Pole).

Affected Environment

Based upon the 1990 Census of Population and Housing, the Fairbanks North Star Borough had a population of 77,720. Of that total, 5,891 persons, or 7.58 percent were low-income, and 15,256 persons, or 19.63 percent, were minority. However, this borough covers a broad area.

3.4 BEALE AFB, CALIFORNIA

Beale AFB has one of only three operating EWR sites in the United States. Beale AFB currently supports the U.S. Air Force's ongoing early warning and space-tracking missions. The U.S. Air Force, which operates and has real property accountability over the EWR facilities, has initiated the process for a separate NEPA analysis to determine the long–term status of all of the EWRs in the United States. The U.S. Air Force may not complete its NEPA analysis for several years. Upgrades to the Beale AFB to support the test function of validating the GMD operational concept would not foreclose any action the U.S. Air Force determined to be appropriate, after completing its NEPA analysis. Cultural resources and

health and safety are the only resources that have the potential to be impacted by the upgrades and use required for the GMD VOC test site; therefore other resource areas are not analyzed in this document.

3.4.1 CULTURAL RESOURCES

A general description of cultural resources is located in the beginning of section 3.1.3.

Region of Influence

The ROI for cultural resources at each location encompasses all buildings or structures requiring modification or renovation.

Affected Environment

The PAVE PAWS radar at Beale AFB became operational in 1980. Thus, the site is considered part of the Cold War military mission. The U.S. Air Force has initiated consultation with the California SHPO and is currently in the process of having a programmatic agreement signed before providing recently completed Level 1 recordation (i.e., photographs, narrative, drawings) HABS/Historic American Engineering Report (HAER) documentation to the SHPO (Jerry, 2001).

3.4.2 HEALTH AND SAFETY

A general description of health and safety is provided in the beginning of section 3.1.6.

Region of Influence

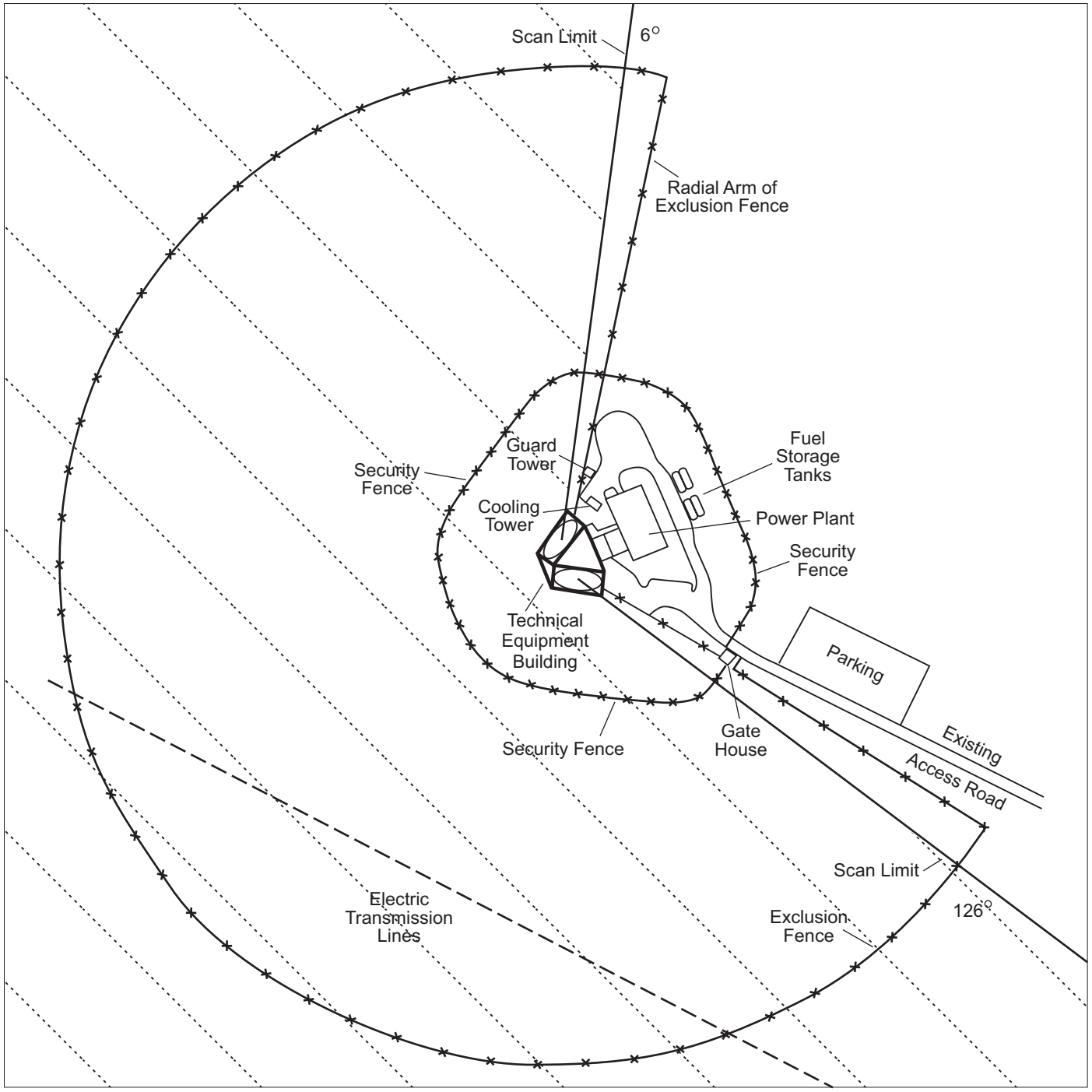
The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action.

Affected Environment

The PAVE PAWS site is located at Beale AFB, California, at coordinates 39.1 degrees north, 121.3 degrees west. The radar face bore sights (relative to true north) are at 306 and 186 degrees for face A (north face) and B (south face), respectively. The radar's scan limits are ±60 degrees of the bore sights. The overall scan coverage is from 126 degrees clockwise to 6 degrees.

Figure 3-9 shows the PAVE PAWS Beale site layout. The exclusion fence is located approximately 305 meters (1,000 feet) from the array of radar elements. The security fence is located approximately 61 meters (200 feet) perpendicular to the bottom edges of the two array faces.

The Beale AFB PAVE PAWS site is at an elevation of 113 meters (372 feet) above sea level. There are several hills to the north of the radar site. The terrain falls off in elevation to the south and west of the radar site.



EXPLANATION

Scan area / direction out to approximately 5,550 kilometers (3,000 nautical miles)

PAVE PAWS Radar and Power Plant Buildings

Beale AFB, California

Figure 3-9

NORTH

0 165 329 feet

0 50 100 meters

02-09-02 beale001 3-9

3.4.3 ENVIRONMENTAL JUSTICE

A general description of environmental justice is given in the beginning of section 3.1.12.

Region of Influence

The ROI for Beale AFB is the Beale AFB CDP.

Affected Environment

Based upon the 1990 Census of Population and Housing, the Beale AFB CDP has a population of 6,912 persons. Of that population, 510 persons, or 7.38 percent were considered low-income, and 1,860 persons, or 26.91 percent, were minority.

3.5 DELTA JUNCTION, ALASKA

A construction contractor mancamp could be established in the City of Delta Junction on private or City-owned cleared or leased land. No data is currently available on its actual location. Construction and operation of the mancamp would follow all applicable environmental regulations and would be performed in accordance with all required permits to minimize the potential of adverse impacts to the environment. The affected environment of the local infrastructure and socioeconomics are addressed below.

3.5.1 INFRASTRUCTURE

Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste.

Region of Influence

The utility systems that could potentially be affected by the Proposed Action include potable water pumping, treatment, storage, and distribution; wastewater collection and treatment; solid waste collection and disposal, and energy generation and distribution, including the provision of electricity and natural gas.

Water

Households in the Delta Junction area maintain individual wells with depths ranging from 46 meters (150 feet) to 110 meters (350 feet). A community water purification plant is not feasible due to the dispersed nature of the area's populace and businesses.

Wastewater

Businesses and residences are dispersed over a large area, so a community wastewater treatment system is not practical. Instead, each household maintains a septic system.

Solid Waste

The city-owned Class III landfill in the Delta Junction area is leased to a private collection company, Delta Sanitation. An Alaska Class III Municipal Solid Waste Landfill is a landfill that is not connected by road to a Class I landfill or, if connected by road, is located more than 80 kilometers (50 miles) from a Class I landfill, and that accepts, for disposal, ash from incinerated municipal waste in quantities less than 1 metric ton (1 ton) daily on an annual average, which ash must be free of food scraps that might attract animals; or less than 5.1 metric tons (5 tons) daily of municipal solid waste, based on an annual average, and is not located in a place where public access is restricted, including restrictions on the right to move to the place and reside there; or that is provided by an employer and that is populated totally by persons who are required to reside there as a condition of employment and who do not consider the place to be their permanent residence.

The current landfill started as a pit with an area of 37 square meters (400 square feet) and a depth of 4.6 meters (15 feet) that was dug in 1984. The total landfill area is approximately 16 hectares (40 acres) bordered by a 30-meter (100-foot) greenbelt of black spruce and birch. The landfill is fenced to deter bears from entry. Delta Sanitation collects up to approximately 76 cubic meters (100 cubic yards) of municipal waste per week from Delta Junction and the outlying areas. This waste is then burned in large "burn boxes" (large incinerators). The resulting ash is then dumped into the landfill pit. Large household waste is also disposed of at the landfill pit. The pit is currently one-third full and has capacity for another 9 to 12 years of use at the current rate. Next to the landfill an additional 32 hectares (80 acres) of land is available for purchase. There is no provision for asbestos-contaminated materials or hazardous waste of any sort. There is limited capacity for clean construction waste.

The ADEC, in coordination with the city council and Delta Sanitation, is in the process of determining what changes will be required to the current solid waste disposal program. No specific changes have been determined, and no specific date of change has been established. However, since the waste disposal program now in effect is not standardized, it is likely that changes of some sort will be instituted.

Electricity and Steam

The Golden Valley Electric Association is a non-profit, member-owned cooperative that provides electrical service to the Fairbanks North Star Borough, the Denali Borough, unincorporated areas between these two boroughs, and along the Richardson Highway to Fort Greely. Golden Valley Electric Association provides electricity to approximately 90,000 people from over 36,000 service locations.

The Golden Valley Electric Association has a generating capability of 224 MW of power, with an additional 70 MW available through the existing Fairbanks/Anchorage intertie. In 1996, they had a peak demand of 134.1 MW and total energy sales of 653 million kW. In 1997 their peak demand was 163 MW.

3.5.2 SOCIOECONOMICS

Each construction contractor would provide housing for its personnel, most likely in the vicinity of Delta Junction. Use of existing housing and motels in Delta Junction as well as establishing a mancamp there could result in cumulative socioeconomic impacts, and information on this resource is provided.

Region of Influence

The ROI for socioeconomics includes Delta Junction.

Delta Junction is contained within the Southeast Fairbanks Census District and is part of the Greely-Delta economic region. There is no well defined political or geographic boundary in this region because most of it is unincorporated.

Affected Environment

Delta Junction is about 16 kilometers (10 miles) north of Fort Greely. The area is sparsely populated with an economy dependent on Fort Greely, state employment, some agriculture and Alyeska Pipeline Services.

A Reuse Plan was produced in order to help the local community prepare for the realignment of Fort Greely that identified two alternatives for the reuse of Fort Greely: a mixed use industrial complex anchored by military, institutional, and industrial uses that could generate up to 600 jobs and a minimum threshold of post operations without a major institutional facility as an anchor that would generate up to 66 jobs. However, in May 2001, the City of Delta Junction notified the Department of the Army that it would not be submitting an Economic Development Conveyance application for surplus portions of Fort Greely. The City would continue its efforts toward joint use of the Allen Army Airfield and continue to work with U.S. Army, Alaska. (City of Delta Junction, 2001)

Population

The population of Delta Junction according to the 2000 Census is 840 (State of Alaska, 2001)

Employment

The total employment of Delta Junction in 2000 was 288. Other major employers are the Delta/Greely School District and Alyeska Pipeline Services. A number of small businesses and state and Federal highway maintenance are also sources of employment (State of Alaska, 2001)

Retail Sales

Retailing within the ROI is limited to small convenience stores, usually combined with a gas station, and tourism-related retailing, including bars and restaurants. The nearest variety retailing center to the ROI is Fairbanks.

Income

Delta Junction had the second highest median income of the three communities that are closest to Fort Greely. It also had the second highest proportion of residents living below the poverty level.

Housing, Education, and Health

Delta Junction has a limited number of rooms in motels, apartments with daily rentals, and bed and breakfasts.

The total number of housing units in Delta Junction is 413, with 168 vacancies (State of Alaska, 2001). Four schools are located in Delta Junction with a student enrollment of 491. Delta Junction has a family medical center. The nearest hospital is 153 kilometers (95 miles) away at Fairbanks.

Fiscal Condition

Delta Junction raised $150,000 of revenue in 1997 from local service charges and external, state sources. It spent almost $184,000 in the same year, the majority on public safety, roads, parks, and recreation. Delta Junction does not levy a bed tax on temporary accommodation.

3.5.3 ENVIRONMENTAL JUSTICE

A general description of environmental justice is given in the beginning of section 3.1.12.

Region of Influence

The ROI for environmental justice includes Delta Junction, which is within the Southeast Fairbanks Census Area.

Affected Environment

Based upon the 1990 Census of Population and Housing, the city of Delta Junction had a population of 651 persons. Of that total, 55 persons or 8.45 percent were low-income, and 61 persons, or 9.37 percent were minority.

3.6 CLEAR AFS, ALASKA

Clear AFS is about 126 kilometers (78 miles) southwest of Fairbanks in the Denali Borough near the community of Anderson. The site currently consists of approximately 4,760 hectares (11,542 acres).

3.6.1 AIR QUALITY

A general description of air quality is provided in the beginning of section 3.1.1.

Clear AFS has a continental or subarctic climate, characterized by long cold winters, short mild summers, and significant changes in the daily pattern throughout the year. The climate and meteorology presented in section 3.2.1 apply to Clear AFS and its immediate environment. Clear AFS is in attainment for all NAAQS and state standards and should be evaluated as a PSD Class II area. Denali National Park is a Class I PSD area, approximately 40 kilometers (25 miles) south of Clear AFS. It would be within the base's air quality ROI. All other areas within the ROI are Class II for PSD determination purposes.

Region of Influence

For inert pollutants (all pollutants other than ozone and its precursors, nitrogen oxide and Reactive Organic Compounds), the ROI is generally limited to an area extending no more than a few tens of miles downwind from the source.

Existing Emissions Sources

Clear AFS operates under a Title V Air Permit. The station generates its own energy through a series of coal-fired steam turbine generators. The steam generated is also used for heating a portion of the base. Smaller fuel-oil furnaces are used in those areas not heated by the power plant's steam. Emergency power is provided through a series of diesel-fuel generators. There is also an emergency water pump to maintain the availability of water on Clear AFS. The cafeteria operates a solid waste incinerator to dispose of dry waste generated from cafeteria operations packaging. Various shops and operational sites on-station generate a variety of hazardous air pollutants and volatile organic compounds, which may act as ozone precursors. The emissions inventory (1997) included the following: carbon monoxide—178 metric tons (196 tons); oxides of nitrogen—487 metric tons (537 tons); oxides of sulfur—239 metric tons (263 tons); PM-10—57 metric tons (63 tons); and volatile organic compounds—4 metric tons (5 tons). Clear AFS also emitted 49 metric tons (54 tons) of hazardous air pollutants. As such, Clear AFS is a major source of hazardous air pollutants.

3.6.2 BIOLOGICAL RESOURCES

A general description of biological resources is provided in the first paragraph of section 3.1.2.

Region of Influence

The ROI for biological resources includes the area within and adjacent to the sites on Clear AFS that could potentially be affected by the Proposed Action.

Affected Environment

Vegetation

The predominant vegetative cover on proposed Site A is tall aspen forest that shows evidence of fire. Small areas of gravel barren are also present along the southern edge of this site. Vegetation at proposed Site B consists mainly of aspen-black spruce forest, black spruce forest and woodland, and aspen-birch forest. Figure 3-10 indicates the location of plant cover types within the proposed project area. A variety of grasses, sedges, and willows are located at both sites.

IDT Site 1 is located in an area composed of aspen-birch forest and black spruce forest and woodland. IDT Site 2 is in an area composed of aspen-black spruce forest. IDT Site 3 is located within an area composed of aspen-birch forest and floodplain deciduous and white spruce forest.

Gravel barren communities are not common in central Alaska but are present in much of the western portion of Clear AFS. Gravel barrens, characterized by dry meadows and dwarf woodlands, tend to occur where the fine soil cap is nearly absent. The community supports a variety of lichens and mosses at ground level and scattered black spruce and white spruce.

Wildlife

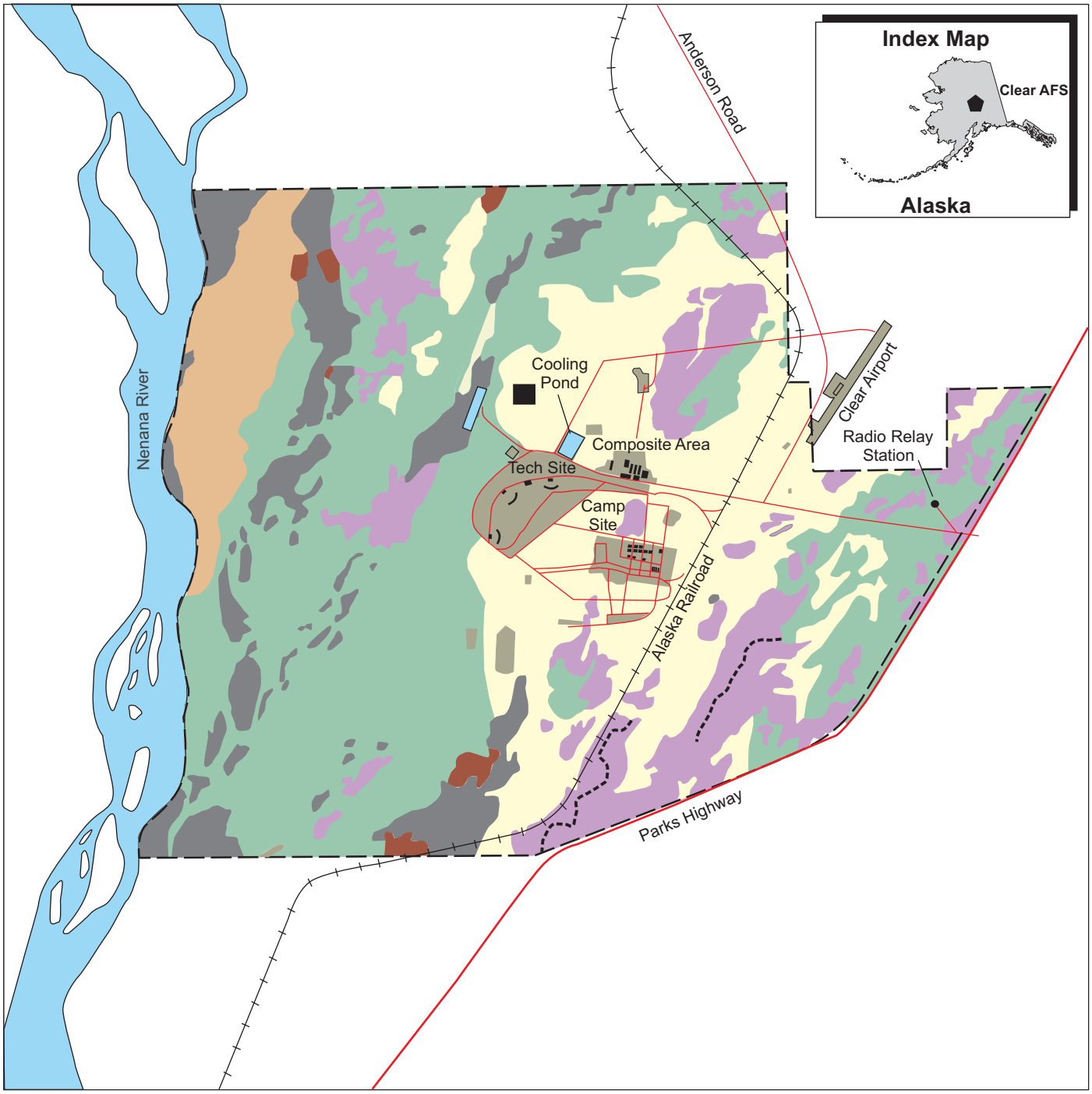
The wildlife at Clear AFS is typical of the fairly undisturbed nature of the station and its vicinity. Mammals commonly observed throughout the area include red fox, coyote, black bear, brown/grizzly bear, snowshoe hare, red squirrel, porcupine, mink, marten, beaver, muskrat, and moose. Clear AFS provides foraging, migrating, and nesting habitat for a variety of bird species. Birds commonly observed include ruffed grouse, Canada goose, mallard, cliff swallow, American robin, yellow-rumped warbler, and dark-eyed junco.

The Nenana River forms the west boundary of Clear AFS and is designated an anadromous stream. This portion of the Nenana River supports chinook, coho, and salmon (migration) along with resident fish (e.g. Artic grayling, whitefish, pike). Coho salmon spawning areas have been documented approximately 4.82 kilometers (3 miles) downstream on the Nenana River. Lost Slough (branches off of the Nenana River at the northwest corner of the boundary) and many of its tributaries are documented as spawning areas for chinook, coho, and chum salmon. (State of Alaska, Department of Fish and Game, 2002)

The Nenana River valley, which lies within the Tanana River Basin, is an important migratory route for waterfowl and other birds. Species observed during migration include sandhill crane, Canada goose, belted kingfisher, numerous swallows and warblers, red-tailed hawk, American kestrel, great horned owl, spotted sandpiper, and green-winged teal.

Threatened and Endangered Species

No Federal or state listed threatened, endangered, or candidate species of vegetation or wildlife are found at Clear AFS. No Federally designated critical habitat has been identified



Vegetation

Clear Air Force Station, Alaska

Figure 3-10

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on Clear AFS. Protected bird species, including the recently delisted peregrine falcon, may migrate through the area.

Environmentally Sensitive Habitat

No federally designated critical habitat has been identified on Clear AFS.

Wetlands cover approximately 9.5 percent of Clear AFS (444 hectares [1,096 acres]). Most of these wetlands are classified as riverine wetlands and occur along the channel of the Nenana River. The remaining wetlands include palustrine (non-flowing water) wetlands. Wetlands within or adjacent to potential GBI VOC test sites are shown in figure 3-11.

A small area (2.7 hectares [6.6 acres]) of palustrine scrub/shrub, broad-leaved deciduous (PSS1) wetlands is located within the area proposed for the location of Site A, less than 1 percent of the wetlands on Clear AFS. These PSS1 wetlands are considered to be "low value" by the U.S. Army Corps of Engineers since they do not contribute significantly to the local diversity of fish, flood control, or sediment retention, but do provide habitat for wildlife. Proposed Site B is located within an area where PSS1 wetlands are more prevalent, approximately 55 hectares (135 acres) or approximately 12 percent of the wetlands on Clear AFS.

The gravel barrens located on Clear AFS may be considered as unusual communities since they do not normally occur in central Alaska. While possessing unique plants, there is no evidence that gravel barrens provide critical habitat for wildlife.

3.6.3 CULTURAL RESOURCES

A general description of cultural resources is provided in the beginning of section 3.1.3.

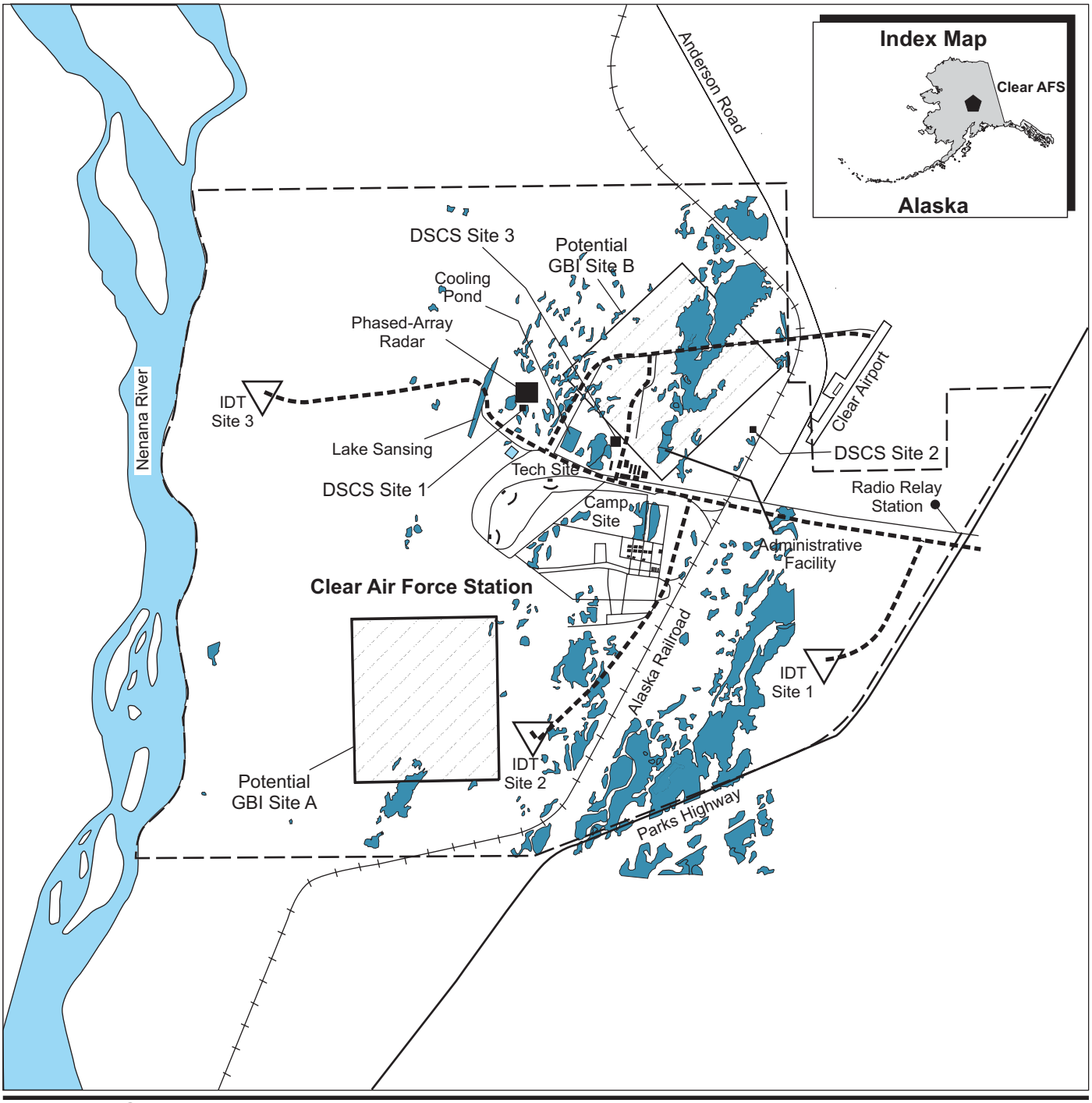
Region of Influence

The term ROI is synonymous with the "area of potential effect" as defined under cultural resources regulations, 36 Code of Federal Regulations (CFR) 15 Part 800.16(d). In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. The currently defined ROI for Clear AFS includes construction sites and any other areas where ground disturbance could occur (e.g., utility corridors, roads, or runway modifications).

Affected Environment

Prehistoric and Historic Archaeological Resources

Archaeological evidence indicates that the region around Clear AFS has been occupied for about 12,000 years. Although no specific sites have been found within the boundary of the installation, sites in nearby locations have been dated to that time frame.



EXPLANATION

- Roads
- Water Area
- Wetlands*
- Installation Boundary
- Railroads
- Fiber Optic Cable (FOC) Route

* Note: This figure only depicts wetlands within or adjacent to potential GBI sites and is not inclusive of all wetlands on Clear AFS.

NORTH

0 2,500 5,000 feet

0 762 1,524 meters

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Wetlands

Clear Air Force Station, Alaska

Figure 3-11

A 1991 survey identified no prehistoric archaeological sites and recorded two historic archaeological sites (a railroad camp and a portion of the Alaska Railroad bed), both of which have been determined to be potentially eligible for inclusion in the National Register.

An additional survey in 1994 (covering over 809 hectares [2,000 acres]) of the installation to build upon the previous survey and provide a basis for a Cultural Resources Management Plan also identified no prehistoric archaeological sites.

The currently defined ROI has not been surveyed for prehistoric or historic archaeological resources. As described in the Cultural Resources Management Plan, the entire ROI is situated within the area determined by Northern Land Use Research to be of low archaeological potential (and requiring no further studies); the Alaska State Historic Preservation Officer has concurred with these findings.

Historic Buildings and Structures

In 1995, an inventory and evaluation of Cold War-era properties at 21st Space Wing installations identified eight Ballistic Missile Early Warning System buildings/structures at Clear AFS as potentially eligible for listing in the National Register, and the Alaska SHPO has concurred.

The currently defined ROI for cultural resources at Clear AFS is devoid of standing buildings and structures.

Native Populations/Traditional Resources

Clear AFS is located within the traditional territory of the Nenana–Toklat band of the Lower Tanana Athapaskan Indians. Athapaskan bands used the area seasonally for hunting moose and small game animals. No Alaska Native traditional cultural properties have been identified within the boundary of Clear AFS.

Paleontological Resources

Most of Clear AFS is situated within a broad glaciofluvial outwash plain composed of sandy gravel; portions of the ROI may be underlain by permafrost.

Although no paleontological remains have been recorded within the boundary of the installation, evidence of several forms of extinct animals has been found in the vicinity.

3.6.4 GEOLOGY AND SOILS

A general description of geology and soils is provided in the first paragraph of section 3.1.4.

Region of Influence

The ROI for geology and soils includes that area that could potentially be disturbed by construction and operation activities associated with the GBI field, BMC3, related facilities, and connecting roads and infrastructure.

Affected Environment

Physiography

Clear AFS is located in the Yukon Region of Interior Alaska on the southern margin of the Tanana–Kuskokwin Lowlands physiographic province, adjacent to the Northern Foothills province of the Alaska Range. The Lowlands can be characterized as a broad, relatively flat, sediment-filled depression formed by glacial meltwater outwash. The Nenana River floodplain flanks the western edge of Clear AFS. Clear AFS is covered with many interlaced channels, terraces, and banks. Local topographic relief of these features generally ranges between 0.5 to 2.0 meters (2 to 7 feet). Surface elevations are greatest at the southern Clear AFS boundary at approximately 198 meters (650 feet); however, the regional surface gradient is relatively mild at about 5 meters per kilometer (25 feet per mile) to the north.

Geology

The mountain building and glacial history of the Alaska Range to the south have influenced the geology of Clear AFS. Glacial advances ceased abruptly at the present escarpment of the Northern Foothills of the Alaskan Range. The uplift of the Northern foothills, advance and retreat of the glaciers, and subsequent erosion by major drainages originating in the Alaska Range and foothills provided the source for major sedimentary deposition in the Tanana River Valley.

The sediments underlying Clear AFS are derived from several sources: alluvial fans developed upon the Nenana gravel pediment (a gently sloping bedrock with low-relief covered with gravel and sand) at the mountain front; Pleistocene glacial outwash (cobbles, sand, and silt debris); Holocene alluvial sediments (mostly silt and sand) from the Nenana River; wind transported silt (loess) reworked from channel bars onto terraces; and Modern colluvium from water reworked loess. The sedimentary wedge is primarily composed of sandy gravel, poorly stratified with well to poorly graded coarse sand. The thickness is estimated to exceed several hundred feet.

Soils

Generally, soils at Clear AFS are predominately well drained sands and gravels overlaid with a thin layer of silt. These soils vary from 0.9 meter (3 feet) to 1.8 meters (6 feet) deep, and then a sandy gravel horizon varying from the 1.8-meter level (6 feet) to below 9 meters (30 feet) occurs below the layer of silty soils. Areas dominated by spruce are generally covered by a peat layer 0.3 meter (1 foot) thick over a silt horizon that varies from 0.9 to 1.5 meters (3 to 5 feet) in depth. Under this horizon are horizons of sand, silt, and gravel combinations.

Silty soils of the station are generally well drained, although the drainage may be impeded in some areas by intermittent pockets of permafrost. Areas covered by the peat are more susceptible to permafrost, and drainage is poor. Permafrost may extend below 8 meters (25 feet) in these areas. The occurrence of permafrost at Clear AFS is discontinuous and comparable to Fairbanks and other areas in the Tanana Valley. The permafrost is sporadic, and locations free of permafrost can be outlined by drilling. Soils at Clear AFS have low erodibility. Erosion is minimized by vegetation and low annual precipitation.

3.6.5 HAZARDOUS MATERIALS AND WASTE

A general description of hazardous materials and waste is provided in the beginning of section 3.1.5.

Region of Influence

The ROI for hazardous materials and hazardous waste management includes the Clear AFS infrastructure and existing facilities. Additional facilities associated with the Proposed Action could be constructed within the boundaries of the base.

Affected Environment

Hazardous Materials Management

Hazardous materials are regularly used and stored throughout Clear AFS. The most commonly utilized hazardous materials include paints, paint thinners and removers, adhesives, solvents, sodium dichromate, hydrostatic fluids, batteries, pesticides, petroleum, oil, and lubricants. Hazardous materials are controlled and managed through a pharmacy program. Hazard Communication training is provided to all personnel whose jobs involve handling or managing hazardous materials. Material Safety Data Sheets for hazardous materials are maintained on file in the workplace, where they are used or stored, and in a central repository maintained on the Hazardous Material Information System.

There are 29 ASTs, ranging in size from 189 to 113,562 liters (50 to 30,000 gallons), at Clear AFS. They serve as storage tanks for petroleum for building heat and vehicle fueling. All USTs have been removed from Clear AFS.

Clear AFS has developed a Spill Prevention and Response Plan, which combines both a Spill Prevention Control and Countermeasures Plan that describes the procedure, methods, and equipment used to prevent spills, and an Oil and Hazardous Substances Pollution Contingency Plan that details procedures for releases, accidents, and spills involving these substances. The base also complies with reporting requirements by submitting annual emergency response and extremely hazardous substances updates to local emergency management officials.

Hazardous Waste Management

Clear AFS is a large quantity generator of hazardous waste and is allowed to accumulate waste for up to 90 days. Hazardous waste streams generated by operations at Clear AFS

include waste paint; waste paint with methyl ethyl ketone, lead and mercury; solvents; batteries; waste oil with lead, sulfide, cadmium, and chromium; and spill residuals. In 1997, Clear AFS generated 4,977 kilograms (10,973 pounds) of hazardous waste.

Clear AFS operates one central accumulation point for storage of hazardous waste located in the composite area at Building 250. Waste from the six satellite accumulation points is forwarded to the central accumulation point. Waste is then shipped to a permitted storage facility at Fort Wainwright, Alaska operated by the Defense Reutilization and Marketing Office and then shipped to a final permitted treatment, storage, and disposal facility.

Clear AFS has developed a Hazardous Waste Management Plan that includes designation of responsible personnel, hazardous waste identification and management practices, training requirements, hazardous waste storage, accumulation point managers, and turn-in procedures.

Pollution Prevention

Clear AFS' Pollution Prevention Management Plan aids in the elimination or reduction of hazardous substances, pollutants, and contaminants.

Clear AFS also administers a hazardous materials pharmacy program that tracks hazardous materials from the point at which they are brought onto the facility until they are brought back to the pharmacy, either as empty containers or as excess material. This pollution prevention initiative is designed to control and reduce the amount of hazardous materials at the installation.

Recycling capabilities in Alaska are very limited. Since 1992, an average of 22,525 liters (5,950 gallons) of waste oil, 665 kilograms (1,470 pounds) of asphalt, 2,655 kilograms (5,850 pounds) of rags, and 2,790 kilograms (6,150 pounds) of paper per year have been burned in the power plant.

Installation Restoration Program

IRP investigations at Clear AFS since 1991 have identified 23 sites of potential contamination. Of these sites, 22 are considered closed sites, pending the state's written approval. Clear AFS is not on the National Priorities List site and does not have a Federal Facility Agreement.

Asbestos

Clear AFS has developed an Asbestos Management Plan and an Asbestos Operations Plan that includes designated personnel responsible for asbestos management, descriptions of asbestos management activities, and discussions of record keeping procedures. The Asbestos Operations Plan establishes procedures for asbestos abatement and includes

budgeting concerns, planning procedures, notification requirements, health and safety equipment requirements, and an overview of a small-scale removal.

An asbestos survey was conducted on all facilities on Clear AFS in 1986. All facilities contain asbestos, except the main dormitory, which was remodeled. Prior to any building modifications, all asbestos in the affected area is removed in accordance with Federal Regulations. Asbestos-containing material wastes are disposed of in the Clear AFS landfill, which is permitted to accept asbestos.

Up to 0.3 square meter (3 square feet) of asbestos-containing material can be handled by the installations' contractor. Asbestos repair or removal of more than 0.3 square meter (3 square feet) of asbestos-containing material will be handled by other contractors specializing in asbestos abatement.

Polychlorinated Biphenyls

A site wide PCB inventory was conducted in 1990, and all known PCB and PCB-contaminated equipment has either been removed or purged and refilled with non-PCB fluid. Removal of suspected PCB-contaminated radio frequency interference filters is planned. As ballasts and small capacitors are replaced, they are stored in Building 252 for later disposal in accordance with applicable regulations.

Lead-based Paint

Most of the buildings on Clear AFS contain lead-based paint, except for dormitories 203 and 204, which have been remodeled. Prior to any building modification, all lead-based paint in the affected area is removed in accordance with Federal regulations. Clear AFS has a comprehensive lead-based paint management plan.

Radon

With guidance from the Bioenvironmental Engineer at Eielson AFB, Clear AFS has developed and administrated a radon assessment and mitigation program. Radon inspection surveys were performed for Clear AFS in 1995. Radon levels were found to be well below the current U.S. EPA guidelines of 4 picocuries per liter (Clear Air Station, 1995—Site Radon Inspection Report).

Pesticides

The use of pesticides at Clear AFS is only on an as-needed, seasonal basis. Applications are kept to a minimum, and are restricted to developed areas of the installation. When utilized, pesticides are pre-approved by the Federal Pesticides Working Group and applied by state-certified personnel. Aerial spraying is not conducted, and pesticides are not applied to any waters of the state.

3.6.6 HEALTH AND SAFETY

A general description of health and safety is provided at the beginning of section 3.1.6.

Region of Influence

The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action facilities. The ROI for public safety includes properties immediately adjacent to the air station and the transportation network for hazardous materials.

Affected Environment

The Clear AFS fire department maintains one structural pumper, a smaller firefighting vehicle, and an emergency command vehicle. One centrally located facility houses the equipment. The positioning of this facility meets the U.S. Air Force time and distance requirements for facility response. The base contractor has a Health and Safety Plan and there is a full-time emergency medical technician on the base.

Base health and safety issues at Clear AFS include EMR associated with operation of the Ballistic Missile EWR and runway approach clearance zones at the end of the Clear Airport public airstrip. To ensure operational safety around the EWR, a 1,524-meter (5,000-foot) control zone is maintained for structures emanating in a northwesterly direction from the radar. Radiation exposure measurements taken in surveys identified areas in which the power density levels exceeded the permissible exposure level of 4 milliwatts per square centimeter. These areas are within the base Technical Site where the radar facilities are located. All areas in which radiation levels above the permissible exposure level were measured have been posted with warning signs, and access is strictly controlled during radar operation. The base also maintains a Radiation Protection Program, which is implemented by the Radiation Protection Officer. This program is intended to identify, monitor, and control areas and sources of potentially hazardous radiation, and to provide training for personnel working at the site with respect to such hazards.

A new solid state phased-array radar was installed at Clear AFS and became operational in early 2001 (Raytheon, 2001). The former mechanical radar was decommissioned. Ground-level measurements taken at a distance of 305 meters (1,000 feet) from similar radar as the new phased-array averaged 0.005 milliwatt per square centimeter, well below the permissible exposures for uncontrolled environments (areas where the general public has access) level for frequencies of 420 MHz of 0.29 milliwatts per square centimeter averaged over 30 minutes. In addition, the phased-array radar is not expected to be a threat to fuel-handling operations or to ground-based electroexplosive devices.

Clear Airport is a small public airstrip northeast of the base. The runway approach clearance zones on the southern end of the runway are on Clear AFS boundary. The airstrip is primarily used by small private planes and has no scheduled commercial service.

3.6.7 INFRASTRUCTURE

A general description of infrastructure elements is provided in the first paragraph of section 3.1.7.

Region of Influence

The utility systems that could potentially be affected by the Proposed Action include potable water pumping, treatment, storage, and distribution; wastewater collection and treatment; solid waste collection and disposal, and energy generation and distribution, including the provision of electricity and natural gas.

Affected Environment

Water Supply

On-base. Clear AFS obtains its potable water from wells with a total capacity of 55.2 million liters per day (14.6 million gallons per day), and average daily water consumption for industrial and domestic use was 35.5 million liters per day (9.37 million gallons per day) in fiscal year 1995. Chlorination is provided for the potable water.

Five wells in the Technical Site supply water for the power plant's turbine condenser cooling, demineralization, and plant cooling. These wells have a combined capacity of approximately 19 million liters per day (5 million gallons per day). Average daily consumption in 1995 was 11 million liters per day (3 million gallons per day). Industrial water is cycled through a 62.1-million-liter (16.4-million-gallon) cooling pond. Excess water is discharged to Lake Sansing. Two of the industrial wells at the power plant can also be used to supply potable water for domestic purposes.

Seven wells in the Technical Site supply water to the radar facilities for cooling and to heat exchangers that cool radar equipment located in buildings 101 and 102. These wells have a combined capacity of 24.2 million liters per day (6.38 million gallons per day).

Water for domestic purposes is supplied by three wells with a total capacity of 12.3 million liters per day (3.24 million gallons per day). Water consumption for domestic purposes averaged 0.64 million liters per day (0.17 million gallons per day) in 1995. Water used for human consumption, food preparation, and fire protection is chlorinated.

Off-base. Cities potentially impacted by activities at Clear AFS include Anderson, Cantwell, Ferry, Healy, Lignite, McKinley Park, and Nenana. In all of these cities except for Nenana, the majority of homes have individual wells, septic systems, and plumbing.

The Nenana water system is approximately 20 years old. It has two wells able to be used as potable water sources. The primary well is 61 meters (200 feet) deep and has a pumping capacity of 0.545 million liters per day (0.144 million gallons per day). The secondary well is 21 meters (70 feet) deep and is rarely used. The system has a storage capacity of approximately 1.6 million liters (0.42 million gallons), and average usage is approximately 0.136 million liters per day (0.036 million gallons per day).

Approximately 75 percent of the city is served by the current system, and a study is underway to upgrade the design to incorporate approximately 90 percent of the community. Those not on the city water system have their own private wells.

Wastewater

On-base. Based on potable water pumping records from January 1996 to February 1997, the average daily domestic wastewater flow for Clear AFS is 0.87 million liters per day (0.23 million gallons per day). Sanitary sewage from all Camp facilities with water service (except Buildings 26 and 51 and the Composite Area) is conveyed by gravity flow to an Imhoff tank, which functions much like a septic tank. Sanitary sewage from the Composite Area is conveyed to the Imhoff tank via a lift station. The Imhoff tank is cleaned by moving accumulated sludge into a drying bed and then transferring the dried sludge to the base landfill. The effluent from the Imhoff tank drains into a leach field.

The new leach field that currently accepts the effluent from the Imhoff tank was designed using performance data from the previous two leach fields. The new leach field has an area of approximately 2.4 thousand square meters (26 thousand square feet) and is estimated to be able to accept the current load of 0.87 million liters per day (0.23 million gallons per day) for 10 to 20 years.

Sanitary sewage from the Technical Area flows into septic tanks with leaching wells or pits. Each of three Scanner buildings, the two Tracker buildings, and the power plant has its own septic tank and leaching well or pit.

Cooling water from the Clear AFS Power Plant is discharged to a ditch at a point 15 meters (50 feet) from where the ditch flow enters Lake Sansing. This discharge is covered by State of Alaska Wastewater Disposal Permit number 9531-DB004. The permit requires the discharge to be no more than 23 million liters per day (6.2 million gallons per day).

There are continued concerns regarding the unwanted goldfish (domestic fish released into the system) that reside in the power plant, cooling pond, discharge ditch, and Lake Sansing. Unless all goldfish are completely removed from the power plant system, the possibility remains for unauthorized release of these fish into waters of the Nenana River drainage

Off-base. Wastewater treatment for the city of Anderson homes without septic systems consists of a sewage lagoon. The system has a capacity of approximately 2.2 million liters per year (0.6 million gallons) with an average use of 1.5 million liters per year (0.4 million gallons). Wastewater treatment for the city of Nenana consists of a piped gravity system that collects the sewage and a secondary rotating biological contactor treatment plant. Approximately 75 percent of the city homes are connected to the sewer system, and a study is underway to determine an efficient method of connecting up to 90 percent of the community. No allowance is made for industrial waste treatment. The current system has a treatment capacity of approximately 0.23 million liters (0.06 million gallons) per day and is generally operated at or near capacity.

Solid Waste

On-base. The annual solid waste production on Clear AFS is approximately 5,168 cubic meters (6,760 cubic yards) or about 1,533 metric tons (1,690 tons). The break down of the waste stream is 20 percent municipal waste, 16 percent construction waste, and 64 percent fly ash. The waste is collected from containers throughout Clear AFS and taken to the Denali Borough landfill. The previously used Clear AFS landfill has been closed.

Off-base. The Nenana landfill was closed in July 1998. Solid waste in Nenana and the area surrounding Clear AFS is collected by a private firm and delivered to the Denali Borough landfill.

Energy

Electricity—On-base. Electricity is generated onsite at the Clear AFS Power Plant by three General Electric, Class A, 7.5-MW generators. Each turbine generator is powered by steam from three coal-fired boilers. The combined electrical generating capacity of the three generators is 22.5 MW. Average demand is 9 MW, for an annual consumption of 78.8 million kW-hours. An emergency General Motors, Class C, 1,400 horsepower, 1-MW diesel generator is also available. The Clear AFS electrical system is not connected to the public grid.

Electricity—Off-base. The Golden Valley Electric Association is a non-profit, member-owned cooperative that provides electrical service to the Fairbanks North Star Borough, the Denali Borough, unincorporated areas between these two boroughs, and along the Richardson Highway to Fort Greely. Clear AFS, Eielson AFB, Fort Wainwright, Fort Greely, Fort Knox Gold Mine, the University of Alaska Fairbanks, and the communities of Fairbanks, North Pole, Nenana, Delta Junction, and Healy are all located in Golden Valley Electric Association's service area. Golden Valley Electric Association provides electricity to approximately 90,000 people via over 36,000 service locations.

The Golden Valley Electric Association has a generating capability of 224 MW of power, with an additional 70 MW available through the existing Fairbanks/Anchorage intertie. In 1996, there was a peak demand of 134.1 MW and total energy sales of 653 million kilowatt-hours. In 1997 the peak demand was 163 MW.

3.6.8 LAND USE

A general description of land use is provided in the first paragraph of section 3.1.8.

Region of Influence

The ROI for land use includes the installation property and surrounding adjacent lands.

Affected Environment

Clear AFS is located in Interior Alaska, in the northeast corner of the Denali Borough. The Denali Borough is the zoning and development authority in the region. However, almost

the entire zone is virtually zoned as "unrestricted use," which allows almost any type of development unless individual communities vote to have further zoning or land use regulations. Since Clear AFS is a Federal property, it does not fall under the jurisdiction of the local planning authorities. The area around Clear AFS is sparsely populated and consists of undisturbed forestland. The nearest inhabited structure is just to the south of the base, and the community of Anderson is 8 kilometers (5 miles) to the north. The city of Anderson operates a small airport on the adjacent property to the west. None of the land uses in the area are incompatible with adjoining land uses of Clear AFS.

Clear AFS Land Use

Clear AFS consists of 4,670 hectares (11,542 acres) with approximately 142 hectares (350 acres) of the installation developed and the remainder relatively undisturbed forested land. Of the total acreage at Clear AFS, 4,666 hectares (11,530 acres) are withdrawn from the public domain from the Department of the Interior, Bureau of Land Management, and 4.7 hectares (11.5 acres) are by easement from the State of Alaska.

The mission facilities of Clear AFS are divided into three main areas and are centrally located on the installation. The Composite Area contains the headquarters, housing, recreation, community service, and administrative facilities, and is just inside the main gate to the north. The Technical Site (also known as the Operations Area) is located to west of the Composite Area and contains the deactivated Ballistic Missile Early Warning System radar and related equipment as well as the power plant. Just north of the Technical Site is the site of the Solid State Phased-Array Radar that replaced the EWR. The third area is the Camp Area, which is located to the south of the Composite Area. This area is composed of civil engineering maintenance shops, security police offices, a fire station, and transient lodging. The remainder of the installation is open space consisting of mostly undisturbed forest that is at times used by military personnel for recreation activities and hunting.

Stationed personnel use the base for various recreational activities. Hunting and fishing are the most common activities. There are also hiking, cross-country skiing, running, picnicking, snowshoeing, snowmobiling, and off-road vehicle use. Use is limited to military personnel, and there is no subsistence hunting or fishing occurring on base.

3.6.9 NOISE

A general description of noise is provided in the beginning of section 3.1.9.

Region of Influence

The ROI for noise includes those areas potentially affected by proposed activities that might experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways potentially affected by proposed activities that might experience a $L_{eq(1\ hour)}$ greater than or equal to 67 dBA.

Affected Environment

The area surrounding Clear AFS is sparsely populated and is expected to have a background noise level of DNL less than or equal to 55 dBA. Furthermore, no major sources of noise are known to exist around the NMD site at Clear AFS, thus traffic is the main source of noise at Clear AFS and vicinity.

The main highway in the vicinity of Clear AFS is the George Parks Highway. The summer average daily traffic count for the George Parks Highway in the vicinity of Clear AFS is 2,011. Traffic noise levels of $L_{eq(1\ hour)}$ equals 72 dBA, $L_{eq(1\ hour)}$ equals 67 dBA, and $L_{eq(1\ hour)}$ equals 57 dBA are estimated to occur at approximately 14 meters (46 feet), 31 meters (101 feet), and 143 meters (469 feet) from the highway, respectively. For the purpose of analysis, the speed of the traffic was assumed to be 105 kilometers (65 miles) per hour.

No noise sensitive receptors (churches, schools, communities) are known to exist in the vicinity of the proposed sites at Clear AFS.

3.6.10 SOCIOECONOMICS

A general description of socioeconomics is provided in the first paragraph of section 3.1.10.

Region of Influence

For the purposes of analysis, the economic ROI is considered to coincide mainly with the Denali Borough boundary, within which several small centers of population exist. These include Anderson, Cantwell, Ferry, Healy, Lignite, Nenana, and McKinley Park.

Affected Environment

Clear AFS is in the Denali Borough in Interior Alaska. It is within the city boundary of Anderson, 126 kilometers (78 miles) southwest of Fairbanks and 459 kilometers (285 miles) north of Anchorage. The AFS was founded in 1961 as a ballistic early warning site a year before Anderson was incorporated. Clear AFS is in a sparsely populated region that, until the late 1960s, had a rudimentary road network. Over 90 percent of the residents of Anderson are employed by Clear AFS or other Federal and state entities.

Population

Denali Borough was incorporated in 1990, with a population of 1,797. The 2000 U.S. Census population count for the borough shows an increase of 5.3 percent to 1,893 people. Alaska Natives comprised 8.6 percent of the population of Denali Borough in 2000. The population of Alaska grew by 14 percent during the same period. An increasing proportion of the borough's citizens live within the six communities listed above—88 percent in 1990, growing to 92 percent in 1997. Over two-thirds live in the cities of Anderson and Healy. While Healy grew by 513 people between 1990 and 2000, Anderson lost 261 residents. Nenana grew from a population of 393 in 1990 to 402 in 2000.

Employment

Denali Borough had 759 jobs in 1990, almost half of which were at, or dependent on, Clear AFS. The other main employers in the borough are the Usibelli Coal Mine, Golden Valley Electric Association and the local School District. Tourism-related industry also accounts for a significant proportion of local jobs. Denali National Park provided virtually all McKinley Park's 84 jobs in 1990.

Highway tourism, based on the George Parks Highway that links Anchorage to Fairbanks, is important to communities such as Cantwell, Healy, and Lignite.

The Usibelli Coal Mine, located at Healy, employs 145 people and supplies over 800,000 tons of coal a year to the local power company, the University of Alaska and the military. In 1990, 127 people in Nenana's population were employed, with over one half occupying Federal, state, or local jobs. Other significant sources of employment included Yutana Barge Lines and various local tourist destinations. Unemployment in 1990 reached 17.5 percent.

The overall unemployment rate in Denali Borough was 10.1 percent in 1990, with 35.6 percent of the total population stating that they were economically inactive. These figures, however, masked extremes within the borough communities, where unemployment rates were as low as 3.9 percent in Healy and as high as 34.6 percent in Cantwell and 39.1 percent in Ferry. These extremes underline the statistical impact of very low regional population counts.

Retail Sales

Retailing in Denali Borough is carried out on a very limited basis, providing for basic needs. According to the 1992 Census of Retail Trade, there were eight retailing establishments in the borough. In aggregate, they employed 20 people and had an annual turnover of about $3.2 million. They included a food store, two gas stations, three restaurant/bars and two miscellaneous stores. Fairbanks is the nearest variety retailing center to the ROI.

Nenana has a small amount of retailing that in 1990 employed 20 people, suggesting that it matches Denali Borough with respect to this activity.

Income

In 1990, Denali Borough had a median household income of $47,884; exactly half the households had an income higher than this figure, while half had household incomes lower. Ten percent of the residents of Denali Borough were living below the poverty level in 1990. Nenana had a median income of $27,292 and 10.4 percent of its population were below the poverty level in 1990.

Housing, Education, and Health

Denali Borough had 1351 housing units, according to the 2000 Census. Of these, about 42 percent were vacant. Nenana had an additional 210 housing units in 2000, and about 19 percent were vacant.

There are three schools in Denali Borough and two in Nenana, with a total roll of about 2260 students. Denali Borough's schools are located in Anderson, Cantwell, and Healy.

Health care in Denali Borough and Nenana is provided at clinics or on an auxiliary basis by one or other of the emergency services. The nearest hospital to Denali Borough is in Fairbanks. There are clinics at Nenana, Anderson, Cantwell, and Healy. Clear AFS has a clinic that is restricted to Clear AFS personnel, unless emergency assistance is required.

Fiscal Conditions

In 1999, Denali Borough raised almost $2.06 million of operating revenues from various sources including taxes and external state funds. An important source of tax revenue was the 7 percent bed tax levied on temporary accommodation within the borough. About 52 percent of the operating revenue was applied to local education. The remaining 48 percent of revenues was split among government administration (13 percent), public safety (about 6 percent), public services (about 3 percent), and surplus funds (26 percent).

Nenana raised almost $4.2 million in operating revenues in 1999, over 80 percent of which was obtained from state and Federal sources. Nenana does not levy a bed tax. About 73 percent of revenues was spent on local education services.

3.6.11 WATER RESOURCES

A general description of water resources is provided in the beginning of section 3.1.11.

Region of Influence

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations.

Affected Environment

Surface Water

Clear AFS is located in the Nenana River watershed. Surface water flow on Clear AFS follows the topography in a northeasterly direction. Runoff follows several small creeks north of the station that flow into the Nenana River. Due to the low mean annual precipitation of 33 centimeters (13 inches) for the area, very little overland flow occurs other than at spring. The 100-year floodplain of the Nenana River is restricted to the westernmost portion of the installation.

Four primary bodies of water are contained on or border Clear AFS. The largest of these is the Nenana River, which runs along the entire west boundary of Clear AFS. The other water bodies, Lake Sansing, the power plant cooling ponds, and the radar cooling water reject ditch, are man-made. There are approximately 1.6 kilometers (1 mile) of relatively undisturbed wilderness between the Nenana River and any developed area on Clear AFS. Lake Sansing is a groundwater infiltration area (approximately 5 hectares [12 acres]) contained in an old gravel borrow pit, and is fed by the radar operations cooling pond overflow via the reject ditch and by rainfall. The cooling pond is an unlined reservoir (approximately 3 hectares [8 acres]) that receives water through an underground pipe from the power plant. There is no surface water within the areas proposed for use.

Clear AFS does not discharge storm water into any "waters of the United States," and is currently not required to have a NPDES Multi-Sector Industrial Storm Water Permit. However, Clear AFS has prepared a SWPPP to establish a system and guidelines to reduce or eliminate potential storm water pollution.

Groundwater

The groundwater within the ROI occurs in an unconfined aquifer composed of unconsolidated sand and gravel. Depth to water ranges from approximately 17 to 20 meters (55 to 65 feet) below the surface, and tends to flow north at a gradient of about 1 meter (3 feet) per mile. The groundwater receives its recharge from the infiltration from the Nenana River, surface water features, and precipitation. The groundwater discharges about 8 kilometers (5 miles) north of Clear AFS into Julius Creek and Clear Creek.

Water for domestic and industrial use at Clear AFS is obtained from 15 wells completed to depths of approximately 46 meters (150 feet).

Water Quality

Water quality is subject to seasonal variations, but which are within established EPA drinking water standards. There are several water supply wells down gradient from the onsite landfill that are checked for water quality on a regular basis. No contaminants were detected in monitoring wells installed around the site landfill during the previous monitoring of groundwater at the landfill.

3.6.12 ENVIRONMENTAL JUSTICE

A general description of environmental justice is given in the beginning of section 3.1.12.

Region of Influence

The ROI for Clear AFS consists of the Denali Borough (formerly the Yukon-Koyukuk Census Area), Ferry, Healy, and Lignite CDP, and Anderson and Nenana City.

Affected Environment

This borough during the 1990 Census was the Yukon-Koyukuk Census Area. Since that time it has been divided and Clear AFS now falls into the Denali Borough. This document will refer to data from the 1990 Census and will refer to the ROI as the Yukon-Koyukuk Census Area. Based upon the 1990 Census of Population and Housing, the Yukon-Koyukuk Census Area had a population of 8,478. Of that total, 2,208 persons, or 26.05 percent, were low-income, and 4,957 persons, or 58.47 percent, were minority. This borough covers a wide area.