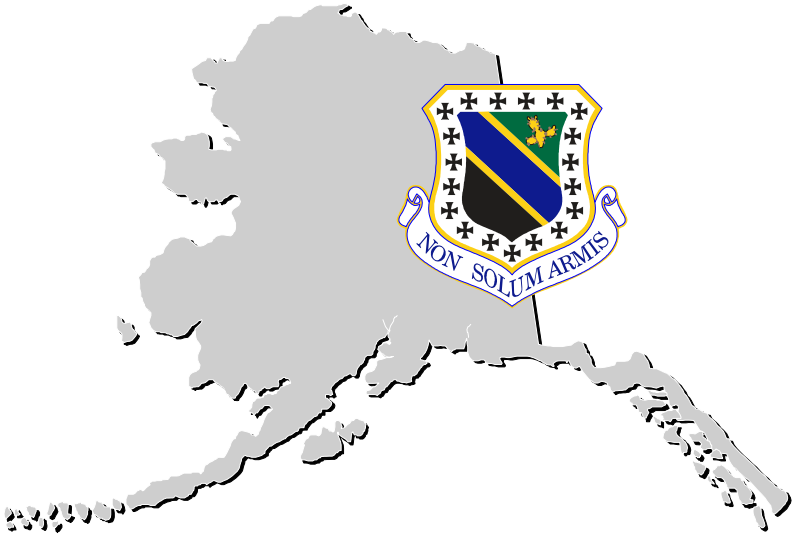

UNITED STATES AIR FORCE
ELMENDORF AIR FORCE BASE, ALASKA

DRAFT
ENVIRONMENTAL ASSESSMENT

GRADY HIGHWAY EXTENSION (SHIP CREEK CROSSING)
ELMENDORF AFB AND FORT RICHARDSON, ALASKA

MARCH 2005

DRAFT FINDING OF NO SIGNIFICANT IMPACT

PROPOSED ACTION: The Air Force proposes to construct a new access road and bridge connecting Elmendorf Air Force Base (AFB) to U.S. Army Fort Richardson, Alaska. The road and bridge would be located entirely on Fort Richardson property and would become property of the Army upon completion of construction. The Proposed Action would include construction of a bridge over Ship Creek.

PURPOSE AND NEED: The purpose of the Proposed Action is to improve connectivity between Elmendorf AFB and Fort Richardson. The action is needed to: improve fire and emergency response access between the installations; reduce traffic on Davis Highway and in the Elmendorf AFB runway clear zone; improve access to consolidated community services; and, provide an alternate access route for Phase II Private Sector Financed (PSF) housing on Elmendorf AFB.

ALTERNATIVES CONSIDERED: Four alternatives were developed and considered by the Air Force: military construction (MILCON) funding of a new access road and bridge; a southerly extension of the Davis Highway; an eastern alignment ("Park Route") upstream of the Proposed Action connecting to Fort Richardson at Fifth Street; and, use of access at Arctic Valley Road and Sixth Street. These alternatives were eliminated from further consideration because they did not meet the selection criteria or were otherwise determined to be unfeasible. The EA evaluated the Proposed Action (or "Downstream Route"), an Alternative Action (or "Footbridge Route") and the No Action Alternative. Under the No Action Alternative, military personnel and dependents would continue to use existing roadways on both installations.

SUMMARY OF FINDINGS FOR THE PROPOSED ACTION:

Noise. Noise impacts from site clearing and construction of the new road and bridge over Ship Creek would be limited to short-term, localized increases in noise levels directly associated with the use of construction equipment. After the road and bridge are constructed, resultant noise levels would not be expected to exceed the Air Force criteria of DNL 75 dBA. These effects would not be considered significant impacts to the noise environment.

Land Use. The Proposed Action would result in the conversion of approximately 7.1 acres of open space into roadway. The undeveloped land proposed for the roadway would be entirely within the undeveloped open space and outdoor recreation area of Fort Richardson. The Proposed Action would not result in any adverse effects on existing sensitive land use nor would it interfere with the activities or functions of adjacent existing or proposed land uses. Impacts to land use would not be considered significant.

Air Quality. Fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated during site clearing and road construction. Air pollutant emissions would be short-term and localized, and would not result in any adverse effects on overall ambient air quality. Construction activities associated with the Proposed Action would result in particulate matter emissions that represent less than 0.4 percent of the inventory of emissions for Air Quality Control Region (AQCR) No. 8. Therefore, the air quality impacts from the Proposed Action would not be considered significant.

The Proposed Action is located in an attainment and non-classified area for ambient air quality standards, and therefore, the U.S. Environmental Protection Agency (EPA) General Conformity Rule (Title 40 Code of Federal Regulations Part 51, Subpart W and Part 93) implementing the conformity provisions of the Clean Air Act does not apply.

Water Resources. The construction of a road and bridge on Fort Richardson would not result in adverse effects to surface or groundwater quality or quantity. The Proposed Action would be designed and constructed with standard erosion control measures that would be incorporated into project planning.

Construction of the proposed road and bridge would avoid water wells and the associated protected zone around the wells. The Air Force would ensure that wells and the wellhead protection areas are protected in accordance with applicable regulations. Impacts to groundwater on Fort Richardson would not be expected to occur.

Hazardous Materials and Wastes. Through compliance with hazardous materials management procedures, significant impacts from hazardous materials would not be anticipated. The volume of chemicals procured for road and bridge construction would not be expected to impact the ability of the Base to meet its reduction goals. The generation of hazardous waste would not be expected during the road construction. The Proposed Action would not be expected to result in interference with ongoing remediation or investigation activities on Fort Richardson. Herbicide and pesticide contamination is not suspected as the site for the proposed road was not used for agricultural purposes.

Biological Resources. The construction of the proposed road and bridge on Fort Richardson would result in the loss of approximately 7.1 acres of winter range habitat for moose, and 1.07 acres of spring and summer habitat. The Proposed Action would include enhancement of a barren landfill and surrounding area to provide future high quality moose habitat in accordance with the ongoing moose habitat mitigation plan for Phase II PSF housing.

The proposed site is bear (primarily black bear) habitat. The adjacent Ship Creek riparian zone also serves as a travel corridor for both species of bears. The proposed road and bridge could increase the risk for bear-human conflicts.

The Proposed Action would not result in any impacts to threatened or endangered species, because no federally listed species are known to exist on Fort Richardson.

The Proposed Action would result in the loss of approximately 1.07 acres of wetlands. Runoff from the bridge and road into Ship Creek and surrounding wetlands could include harmful substances such as oil, gasoline, and other automobile fluids, and could also introduce more human trash into the area. The Proposed Action would also bisect the wetlands, changing contiguous wetland habitat into smaller, isolated parcels of wetlands. Some degradation of habitat due to edge effects (*i.e.* introduction of trash, lighting, and noise) would be expected. This alteration of the landscape would particularly affect large mammals moving through the site, as well as resident and migratory birds, and other small resident wildlife species. Construction of the proposed roadway would result in changes to nesting habitat for birds (including raptors) from noise, lighting, and removal of vegetation.

Cultural Resources. The Proposed Action would not be located in or near NRHP-listed historic properties on Fort Richardson. The Air Force would ensure that any potentially historic structures that may be on the site are evaluated for historical significance.

The Proposed Action would involve ground-disturbance during demolition and construction, and may result in the inadvertent discovery of subsurface cultural materials. Damage to, or loss of any cultural artifacts would be considered a significant impact. To avoid this impact, the Air Force will ensure that procedures for emergency discovery of cultural material are followed.

The Proposed Action would not be located in any area that is in use by a federally recognized Alaska Native tribe. Impacts to traditional cultural resources would not be expected as a result of the Proposed Action.

Geological Resources. Construction on Fort Richardson would occur within an area where the physiographic features and geologic resources have been previously modified by prior military activities such as training and recreation. The site for the road is relatively flat. Alteration of ground surface would be minimal. Therefore, impacts to physiography and geology would be minimal.

Construction would occur within an area in which the soils have been modified prior human activity. Earthwork at these locations and at the undeveloped sites would be planned and conducted to minimize the duration of exposure of unprotected soils. Installation of best management practices would minimize erosion during construction. Best management practices for backfilling and use of borrow pits would also be incorporated into project plans. Therefore, adverse effects to soils would be minimal.

Transportation Systems. The Proposed Action would result in temporary and localized traffic increases during the construction phase. The new access road would result in beneficial changes to existing traffic patterns and volumes.

Safety. The road and bridge on Fort Richardson would be located within 0.5 mile of active antenna fields managed by the Air Force. A health hazard associated with EMF has not been established to exist. The antenna field would not be expected to result in any increase in EMF-related health risks to vehicular passengers on the proposed road or bridge.

The proposed road on Fort Richardson would be located within one mile of ammunition storage areas. Ammunition areas are managed by the Army in accordance with DoD safety standards for ordnance storage. These standards are designed to provide protection against serious injury, loss of life and damage to property. The road and bridge would not be sited within any explosive safety arcs as defined by DoD guidance. The ammunition storage areas are not considered a safety risk to the proposed road.

Environmental Justice. No adverse effects or disproportionately high impacts to any low-income or minority populations are expected. Impacts to environmental justice would not be anticipated.

SUMMARY OF FINDINGS FOR THE ALTERNATIVE ACTION: The environmental impacts of the Alternative Action (Footbridge Route, east of the Proposed Action) would be similar to the Proposed Action, except as described herein. Construction of the alternative alignment for the access road would result in the conversion of approximately 7.8 acres of open space into roadway. Impacts to land use would not be considered significant. Air pollutant emissions of CO, VOC, NOx, and SOx during construction would be less than the Proposed Action. Construction activities associated with the Alternative Action would result in particulate matter emissions that represent less than 0.3 percent of the inventory of emissions for AQCR No. 8. Impacts to air quality would not be considered significant. Construction of the alternate alignment of the access road and bridge over Ship Creek would result in loss of approximately 7.1 acres of moose habitat and 1.075 acre of wetlands. With incorporation of avoidance measures into the project design would result in impacts that would not be considered significant.

CUMULATIVE IMPACTS: The environmental assessment (EA) reviewed cumulative impacts that could result from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions. With incorporation of specific design features and best management practices, cumulative impacts that would result from the Proposed or Alternative Action would not be considered significant.

MITIGATION: No mitigation measures are required for the Proposed and Alternative Action. Although no mitigation is required, specific design features and best management practices will be implemented to prevent or minimize the potential for environmental impacts. Specific mitigation measures identified as a result of regulatory permit requirements will be incorporated into design and construction.

FINDING OF NO PRACTICABLE ALTERNATIVE: This Finding of No Practicable Alternative (FONPA) documents Army and Air Force compliance with Executive Order (E.O.) 11990, *Protection of Wetlands*, and E.O. 11988, *Floodplain Management*. These orders direct federal agencies to provide leadership and take action to minimize destruction, loss, or degradation of wetlands, and to restore, preserve and enhance the natural and beneficial values served by wetlands and floodplains, and reduce the risk of flood loss, to minimize the impact of flood on human safety, health and welfare. Both orders require than an agency shall avoid undertaking or providing assistance for new construction located in wetlands and floodplains. The orders also require that if the head of the agency finds no practicable alternative to such construction, they must ensure that the proposed action includes all practicable measures to minimize harm to wetlands and floodplains that may result from such use.

The bridge over Ship Creek would be constructed with an at-grade crossing of the creek. Abutments would be constructed on either side of the creek above the 100-year floodplain. No equipment would be placed in Ship Creek, and all work would be conducted above the high water mark. The existing streambed would not be modified. Construction of the bridge would be conducted in accordance with stipulations to be identified in the Army Corps of Engineers Section 404 permit.

Construction of the proposed Grady Highway extension would result in the loss of 1.07 acres of wetlands north and south of Ship Creek. The proposed alignment of the Downstream Route (Proposed Action) would traverse 0.91 acre of Wetland A north of Ship Creek and 0.16 acre of Wetland B south of the creek (total of 1.07 acre of wetlands).

The Air Force considered and evaluated an Alternative Action (Footbridge Route east of the Proposed Action) which would result in loss of 1.075 acre of wetland. The Alternative Action would result in additional impact to 0.005 acre of Wetland C south of Ship Creek. The Alternative Action would require a longer construction period due to the length of the road. The Downstream Route is preferred because it provides the most direct access from the existing Grady Highway to Fort Richardson with construction of a narrower bridge over Ship Creek. This alignment provides a shorter road than the Alternative Action.

Prevalence of wetlands in the riparian zone associated with Ship Creek precludes the ability to provide a new transportation corridor in this area with complete avoidance of wetlands. Historic channels of Ship Creek are present throughout the project area. The possibility of a meandering road to avoid delineated wetlands would not enable the roadway to meet the design criteria for safe passage of 2,400 vehicles per day at a design speed of 40 miles per hour, and would also result in excessive construction costs associated with a longer road. The Air Force is working with the Army and regulatory agencies to implement a moose habitat compensation plan that includes restoration of habitat that would be lost as a result of road construction. The Air Force will ensure that requirements identified in the U.S. Army Corps of Engineers Clean Water Act Section 404 permit for this action are incorporated into design and construction.

Without the proposed extension of Grady Highway, improved emergency access between Elmendorf AFB, Fort Richardson, housing areas and the hospital used by both installations would not be provided. This would not result in traffic reduction on Davis Highway, in the Elmendorf AFB runway clear zone, and in road segments subject to railroad crossings. An alternate access route for the PSF II housing would not be provided.

Pursuant to E.O. 11988 and E.O. 11990, and taking the above information into account, there is no practicable alternative to alignment of the proposed extension of the Grady Highway along the Downstream Route with its crossing at Ship Creek, and the Proposed Action includes all practicable measures to minimize harm.

DECISION: Based on the EA conducted in accordance with the National Environmental Policy Act, the Council on Environmental Quality regulations, and implementing regulations set forth in 32 CFR 989 (Environmental Impact Analysis Process), it is concluded that, with incorporation of best management practices for resources as described herein as well as incorporation of specific regulatory permit requirements, the environmental effects of the proposed construction and operation of the Grady Highway extension and associated Ship Creek crossing on Fort Richardson, Alaska, are not significant, and that preparation of an environmental impact statement is not warranted. For these reasons, a finding of no significant impact is made. An EA, dated March 2005, is hereby incorporated by reference, and is on file at 3rd Wing Public Affairs, Environmental Community Affairs Coordinator, 10480 22nd Street, Suite 118 Elmendorf AFB, AK 99506 ATTN: Mr. Jon Scudder.

APPROVED:

JAMES STURCH, Colonel, USAF
Vice Commander, 3rd Wing
Elmendorf Air Force Base, Alaska

Date

DONNA G. BOLTZ
Colonel, U.S. Army
Commanding

Date

DRAFT
ENVIRONMENTAL ASSESSMENT

GRADY HIGHWAY EXTENSION
(SHIP CREEK CROSSING)

ELMENDORF AFB AND FORT RICHARDSON, ALASKA

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MARCH 2005

COVER SHEET

ENVIRONMENTAL ASSESSMENT
GRADY HIGHWAY EXTENSION (SHIP CREEK CROSSING)
ELMENDORF AFB AND FORT RICHARDSON, ALASKA

Responsible Agency: Department of the Air Force, 3rd Mission Support Group, 3rd Civil Engineer Squadron, Elmendorf Air Force Base (AFB), Alaska

Cooperating Agency: United States Army Garrison Alaska (USAG-AK)

Proposed Action: Army/Air Force Access Road and Bridge, Elmendorf AFB and Fort Richardson, Alaska

Report Designation: Environmental Assessment (EA)

Abstract: The Air Force proposes to construct a new access road and bridge connecting Elmendorf AFB to U.S. Army Fort Richardson. The road and bridge would be located entirely on Fort Richardson property and would become property of the Army upon completion of construction. The purpose of the Proposed Action is to improve transportation between Elmendorf AFB and Fort Richardson. The action is needed to improve fire and emergency response access between the installations, reduce traffic on Davis Highway, improve access to consolidated community services, and provide an alternate access route for Phase II Private Sector Financed (PSF) housing on Elmendorf AFB. This EA evaluates the Proposed Action, the No Action Alternative, an Alternative Action, and the cumulative impacts of other actions announced for the project area. Under the No Action Alternative, military personnel and dependents would continue to use existing roadways on both installations. Resources considered in the impact analysis were: noise; land use; air quality; water resources; hazardous materials and wastes; biological resources; cultural resources; geological resources; and, safety. With the incorporation of specific design features, best management practices, and compliance with regulatory permits, significant impacts would not be expected to result from the Proposed Action, Alternative Action, or the No Action Alternative.

Comments: The public review period for this document will close on May 3, 2005. Written comments and inquiries regarding this document should be directed to: Mr. Jon Scudder, 3rd Wing Public Affairs, Environmental Community Affairs Coordinator, 10480 22nd Street, Suite 118, Elmendorf AFB, AK 99506. Phone: (907) 552-8970 Fax: (907) 552-5111.

Privacy Advisory: Letters or other written comments on the Draft EA will be accepted by the Air Force through May 3, 2005. As required by law, comments received will be addressed in the Final EA and will be made available to the public. Due to privacy requirements, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ACMP	Alaska Coastal Management Program
ACOE	U.S. Army Corps of Engineers
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADT	average daily traffic
AF	Air Force
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AFM	Air Force Manual
AICUZ	air installation compatible use zone
AIHA	American Industrial Hygiene Association
AK	Alaska
AMATS	Anchorage Metropolitan Area Transportation Study
AOC	Area of Concern
APZ	Accident Potential Zone
AQCR	air quality control region
AR	Army Regulation
AUL	Authorized User List
B.A.	Bachelor of Arts
B.S.	Bachelor of Science
BASH	Bird-Aircraft Strike Hazard
BCE	Base Civil Engineer
bgs	below ground surface
Bldg	Building
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERL	Construction Engineering Research Laboratory
CES	Civil Engineer Squadron
CFR	Code of Federal Regulations
CO	carbon monoxide
CPlan	Contingency Plan
CRM	Cultural Resources Manager
CZ	clear zone
dB	decibel
dBA	A-weighted sound level
DNL	day-night average sound level
DoD	Department of Defense
DoDD	Department of Defense Directive
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
E.O.	Executive Order

EA	environmental assessment
EBS	Environmental Baseline Survey
ECOP	Environmental Condition of Property
EIAP	environmental impact analysis process
EIS	environmental impact statement
EMF	electric and magnetic fields
EMS	environmental management system
EPA 17	Products containing the 17 chemicals listed under the voluntary 33/50 USEPA Industrial Toxics Program
EPCRA	Environmental Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESOHCAMP	Environmental Safety and Occupational Health Compliance and Management Program
F	Fahrenheit
FAA	Federal Aviation Administration
FFA	Federal Facilities Agreement
FO/CO	Field Grade Officer/Company Grade Officer
FONSI	finding of no significant impact
FR	Federal Register
ft	foot
FY	fiscal year
HAZMAT	hazardous materials
HAZWASTE	hazardous wastes
HQ	headquarters
HUD	Housing and Urban Development
HVAC	Heating, Ventilation and Air Conditioning
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
ITAM	Integrated Training Area Management
LBP	lead based paint
LEIS	Legislative Environmental Impact Statement
L_{eq}	energy equivalent sound level
L_{max}	maximum sound level
LOS	level of service
LRAM	Land Rehabilitation and Management
M.A.	Master of Arts
M.S.	Master of Science
MFH	military family housing
$\mu g/m^3$	microgram per cubic meter
MILCON	military construction
MOA	Memorandum of Agreement
MP	Milepost
MSGP	Multiple-Sector General Permit
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System

NPL	National Priority List
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O_3	ozone
ODS	ozone depleting substance
OPlan	Operational Plan
OU	Operable Unit
P.E.	Registered Professional Engineer
P.L.	Public Law
P2	Pollution Prevention
P2 MAP	Pollution Prevention Management Action Plan
PACAF	Pacific Air Forces
PAM	Army Pamphlet
Pb	lead
PCB	polychlorinated biphenyls
Ph.D.	Doctor of Philosophy
PM_{10}	particulate matter equal to or less than 10 microns in aerodynamic diameter
POL	petroleum, oil and lubricants
ppm	parts per million
PPOA	Pollution Prevention Opportunity Assessment
PSD	Prevention of Significant Deterioration
PSF	private sector financed
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
Sec.	Section
SEL	sound exposure level
SERA	Alaska State - Environmental Restoration Agreement
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SOP	Standard Operating Procedures
SO_x	sulfur oxides
SPCC	Spill Prevention Control and Countermeasures
SWPP	Storm Water Pollution Prevention
SWPPP	Storm Water Pollution Prevention Plan
tons/yr	tons per year
TSCA	Toxic Substances Control Act
TSP	total suspended particulates
U.S.	United States
U.S.C.	United States Code
USAF	United States Air Force
USAG-AK	United States Army Garrison Alaska
USARAK	United States Army, Alaska
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compounds
yr	year

CHAPTER 1
PURPOSE AND NEED

This chapter has five sections: the purpose of and need for the Proposed Action; the location of the Proposed Action; a summary of the scope of the environmental review; identification of the biophysical resources applicable to the environmental assessment; and, a listing of applicable regulatory requirements.

1.1 PURPOSE AND NEED FOR ACTION

The Air Force proposes to construct a new Army/Air Force access road and bridge that would connect Elmendorf Air Force Base (AFB) to U.S. Army Alaska - Fort Richardson. The purpose of the Proposed Action is to improve transportation between Elmendorf AFB and Fort Richardson.

The Proposed Action is needed for four reasons:

- **Improve Emergency Access.** The proposed access route would improve fire and emergency access, response time and transport between the installations in accordance with DoD Instruction 6055.6 (*DoD Fire and Emergency Services Program*). This instruction specifies the time/distance response requirements that must be met 90 percent of the time, along with time limits for delivery of fire suppression water. The Proposed Action would enable improved Hazardous Material (HAZMAT) response from Elmendorf AFB to Fort Richardson, and improved ambulance access from Fort Richardson to and from the Hospital. Ambulances from Fort Richardson currently must traverse Davis Highway (which has an Alaska Railroad crossing) in order to transport patients to the Hospital. The proposed access road would provide unimpeded access for emergency vehicles to and from Fort Richardson and Elmendorf AFB. Emergency response time to the Phase II PSF housing area would be reduced. This would result in improved emergency access and the ability to realign assets to improve response times and efficiency in accordance with the consolidation of services between both installations.

- **Traffic Reduction on Davis Highway.** The roadways in the area of Arctic Warrior Drive, Davis Highway and Provider Drive have become congested and are a hindrance to the flow of traffic on Elmendorf AFB. This congestion typically coincides with the daily working hours of Base personnel. The intersections of Davis Highway with Vandenberg Avenue and Talley Avenue are located in the Elmendorf AFB runway clear zone where traffic volumes should be reduced. Conventional street lighting cannot be installed in this clear zone and airfield lighting is visible to drivers during nighttime hours. In addition, the Alaska Railroad crosses Davis Highway approximately 1,500 ft east of its intersection with Vandenberg Avenue. Depending on the season, up to 20 trains cross the Davis Highway each day causing traffic stoppage of approximately five minutes.

- **Improve Access to Consolidated Community Services.** The new road would improve connectivity to community facilities (i.e., housing, medical services, shopping, gas station and banking) without traversing industrial areas (i.e., airfield approach, ammunition storage areas) or the Alaska Railroad crossing. Improved access is needed for military personnel and families who use the Hospital, Joint Military Mall and Bartlett High School. Reduced driving distances could offer improved safety for personnel who travel between Elmendorf AFB and Fort Richardson.

- **Alternate Route for New Housing.** The action is needed to provide an alternate access route for the Phase II Private Sector Financed (PSF) housing being constructed on Elmendorf AFB northeast of the Joint Military Mall. This housing area currently has a single access via Zeamer Avenue which connects to the northeast corner of the Base Exchange.

1.2 LOCATION OF THE PROPOSED ACTION

Fort Richardson is located in south-central Alaska (latitude/longitude: 61°15'N/149°18'W) north of Anchorage. The installation is bordered on the west by Elmendorf AFB, on the east by Chugach State Park and on the south by residential, industrial, and business districts of Anchorage. Figure 1-1 shows the location of Fort Richardson and surrounding areas.

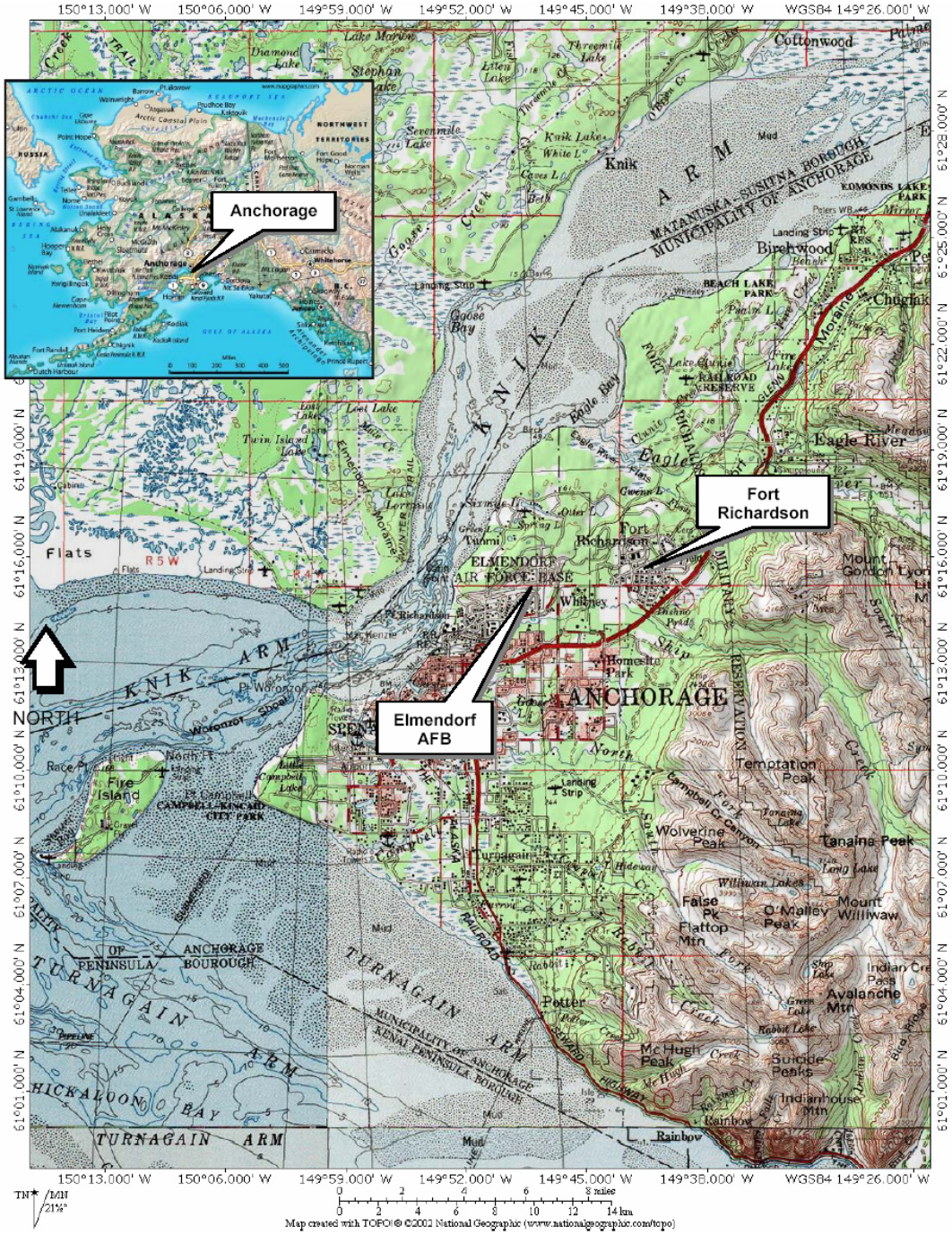
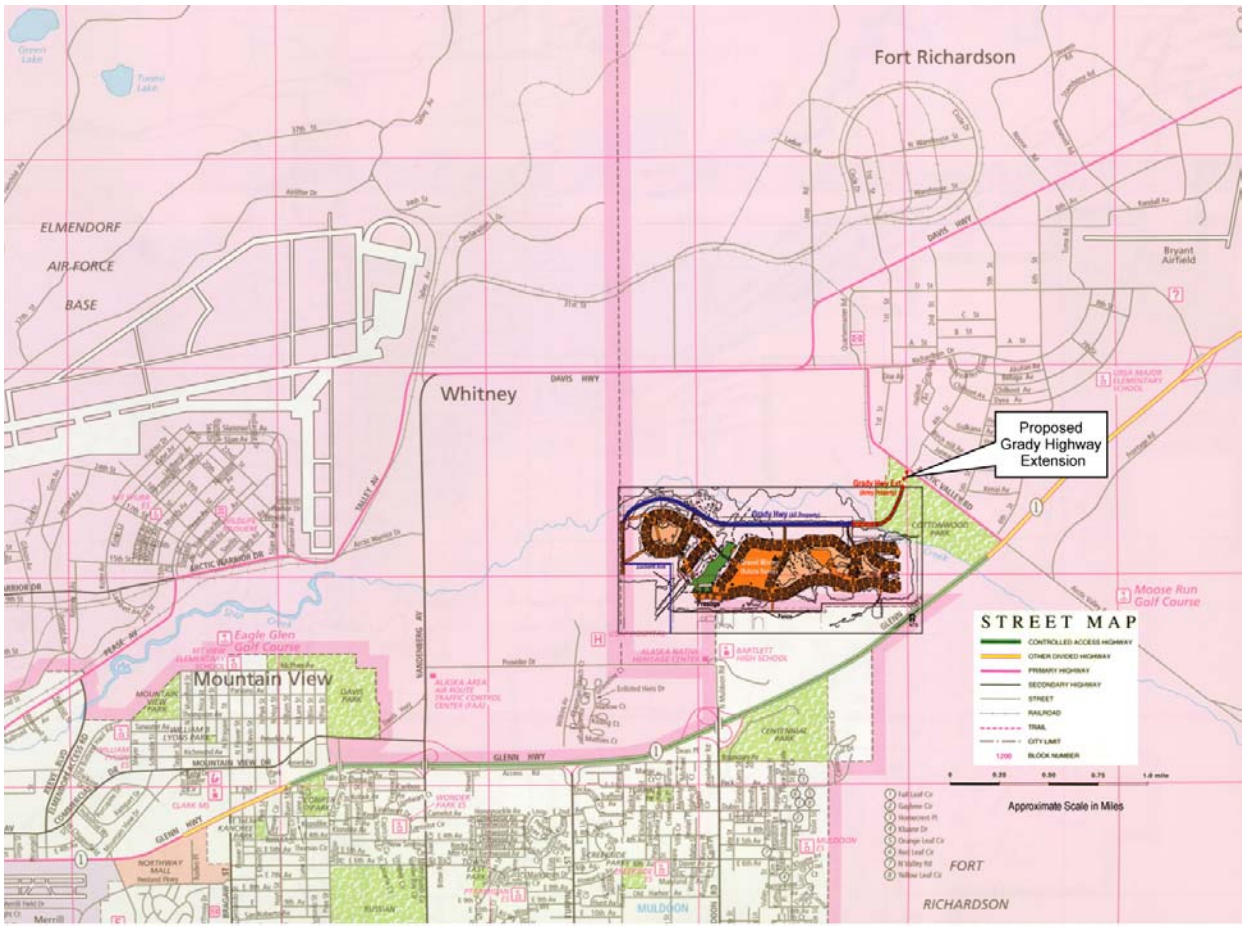


Figure 1-1. Location of Elmendorf Air Force Base and Fort Richardson, Alaska

The proposed road and bridge would be located on U.S. Army property and would be constructed by the Air Force. The proposed road would be located on Fort Richardson directly east of the Elmendorf AFB boundary. The road would connect Phase II PSF housing to a location at the intersection of Fourth Street and Arctic Valley Road on Fort Richardson. Because this alignment crosses Ship Creek, a new bridge would be required to traverse Ship Creek south of Fourth Street and Arctic Valley Road on Fort Richardson. The location of the proposed extension of the Grady Highway is shown on Figure 1-2.



Source: Modified from Rand McNally, 2002 (copyright 2002 by Rand McNally, reprinted with permission)

Figure 1-2. Location of Proposed Grady Highway Extension

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental assessment (EA). The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (40 CFR Sections 1500-1508) and 32 CFR 989 (*Air Force Environmental Impact Analysis Process*), 15 Jul 99, and amended 28 Mar 01. U.S. Army regulations for NEPA are defined in 32 CFR Part 651, *Environmental Analysis of Army Actions; Final Rule, March 29, 2002.* These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an EA:

- Briefly provide evidence and analysis to determine whether the Proposed Action might have significant effects that would require preparation of an environmental impact statement (EIS). If the analysis determines that the environmental effects will not be significant, a finding of no significant impact (FONSI) will be prepared; or,

- Facilitate the preparation of an EIS, when required.

This EA assesses the proposed construction and operation of a new access road and bridge connecting the Phase II PSF housing area to Fort Richardson. This study evaluates the potential environmental impacts that may result from the implementation of the Proposed Action as well as possible cumulative impacts from other actions planned for Elmendorf AFB and Fort Richardson. The EA also identifies required environmental permits relevant to the Proposed Action. As appropriate, the affected environment and environmental consequences of the Proposed Action may be described in terms of site-specific descriptions or regional overview. Finally, the EA identifies mitigation measures to prevent or minimize environmental impacts, as required.

1.4 Identification of Biophysical Resources Applicable to the Environmental Assessment

The following biophysical resources were identified for study at Fort Richardson and Elmendorf AFB: noise; land use (including recreation); air quality; water resources; hazardous materials and wastes; biological resources; cultural resources; geological resources; infrastructure and utilities; transportation systems; public services; and, safety.

Initial environmental analyses indicated that the proposed activities would not result in either short- or long-term impacts to the Air Installation Compatible Use Zone program, visual resources, socioeconomics or environmental justice. The reasons for not addressing this and other subjects are discussed in the following paragraphs:

- **Air Installation Compatible Use Zone Program and Airspace and Airfield Operations.** The Proposed Action would not involve any aircraft or result in any aircraft operations, nor would it result in any change in existing and planned aviation activities in the vicinity of the housing areas on Elmendorf AFB. For this reason, accident potential, encroachment, airspace and airfield operations are not evaluated in this EA.

- **Visual Resources.** No change in visual character of the housing area and its surroundings, or loss of scenic views on Elmendorf AFB or Fort Richardson would be expected to result from the Proposed Action. Placement of the new access road and bridge on Fort Richardson property would not result in loss of scenic views. For these reasons, visual resources are not evaluated in this EA.

- **Socioeconomics.** There would be no change in the number of personnel authorizations at Fort Richardson and Elmendorf AFB as a result of the Proposed Action. Thus, no long-term changes would be anticipated to area population, housing requirements, school enrollment, or economic factors (*i.e.*, sales volume, income, or employment). The Proposed Action would result in beneficial impacts to the local economy as a result of direct and indirect business sales, income and employment from construction of the road and bridge. It is not anticipated that construction workers would relocate to the Anchorage area as a result of the proposed construction. The Proposed Action would not result in the need for additional housing or rental units in the Anchorage area or changes to school enrollment. No substantial change to economic factors from the proposed construction activities or long-term operation would be expected to result from the new road and bridge. For these reasons, socioeconomic resources were not assessed in this EA.

- **Infrastructure and Utilities.** The Proposed Action would not result in any substantial increases on the demand for water, wastewater treatment, natural gas or electricity (the proposed road and bridge would not have street lighting). Unsuitable soils would be spoiled on either Elmendorf AFB or Fort Richardson. Solid waste generated from the construction activities would be disposed in the Anchorage Regional Landfill, which has sufficient capacity to accommodate this solid waste. Stormwater management is evaluated as part of construction management (Subchapters 3.11 and 4.11). For these reasons, infrastructure and utilities were not assessed in this EA.

- **Public Services.** The Proposed Action would not have any effect on the need for police protection, fire protection or medical services. The Proposed Action would result in improved response times for emergency service vehicles as well as increased productivity and efficiency of equipment and manpower in the Fire Protection Flight. For these reasons, public services were not assessed in this EA.

- **Hazardous Materials.** Because the Proposed Action includes construction of a road and bridge without the need for demolition of existing buildings, it is generally expected that asbestos, radon and polychlorinated biphenyls (PCBs) would not be encountered. Any lead based paint and PCBs encountered would be managed in accordance with established Air Force and Army regulations and guidance, including management plans for lead based paint and PCB. Radon levels above regulatory action levels would not be expected at the site. For these reasons, the evaluation in this EA is limited to hazardous materials, hazardous wastes, environmental restoration program, pesticides and underground storage tanks.

- **Environmental Justice.** Based on the analyses conducted for this EA, it was determined that activities associated with the Proposed Action would not have adverse effects at any location for noise, land use, air quality or cultural resources. Since the Proposed Action would not have any adverse effect, no disproportionately high and adverse impacts upon minority and low-income populations would be anticipated. Therefore, environmental justice is not evaluated in this EA.

The baseline conditions used for the environmental evaluation in this EA are assumed to be Fiscal Year (FY) 2004.

1.5 Applicable Regulatory Requirements

Potential regulatory permits applicable to the Proposed Action are presented in Table 1-1. The Proposed Action may require environmental permits and amendments to existing permits. The contractor would be responsible for ensuring that applicable permits are identified and obtained from base, local, state, and federal agencies. The Air Force would coordinate permit requirements identified by the construction contractor during the project. The Air Force would coordinate regulatory requirements with the U.S. Army for activities on Fort Richardson.

In addition to permit requirements, the Air Force will also be required to initiate the following consultation or coordination processes regarding the Proposed Action:

- Consultation with the Alaska State Historic Preservation Officer (SHPO) regarding the potential effects of the Proposed Action on cultural resources in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended and 36 CFR 800).

- Consultation with the Alaska Division of Government Coordination to obtain a Coastal Zone Consistency Determination in accordance with the Federal Coastal Zone Management Act of 1976, the Alaska Coastal Management Program (ACMP) and Alaska Administrative Code, Title 6, Chapter 50.

Table 1-1. Potentially Required Federal Permits, Licenses, or Entitlements for the Proposed Action

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
National Pollutant Discharge Elimination System Permit	Actions to protect water resources from pollutants that may be carried by storm water runoff. A storm water discharge permit shall be required for construction activities that disturb soil on Elmendorf AFB.	Clean Water Act, P.L. 92-500, 33 U.S.C. et seq., 40 CFR Part 122	U.S. Environmental Protection Agency and Alaska Department of Environmental Conservation.
Section 404 of the Clean Water Act (CWA) Permit	Excavation in, or discharge of fill material into, waters of the United States, including wetlands. A Wetlands Mitigation Plan and State of Alaska water quality assurance approval may also be required.	Clean Water Act, P.L. 92-500, 33 U.S.C. et seq., 40 CFR Part 122	U.S. Army Corps of Engineers
Archaeological Resources Protection Act Permit	Excavation and/or removal of archaeological resources from public lands or Indian lands and carrying out activities associated with such excavation and/or removal.	Archaeological Resources Protection Act of 1979, 16 U.S.C. Sec. 470cc	U.S. Department of the Interior - National Park Service

- Consultation with the Alaska Department of Fish and Game regarding the need for a Title 41 Fish Habitat Permit for work in and near Ship Creek. The Air Force and Army would be required to comply with the Essential Fish Habitat Provisions (50 CFR 600) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.). These provisions promote the protection of essential fish habitat in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat.

- The Air Force would be required to obtain an approved Fort Richardson Excavation Clearance Form to accompany an approved DA Form 4283 before commencing with any disturbance of soil regardless of the size, depth or nature of excavation for the proposed road.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter has nine sections: a history of the formulation of alternatives; identification of alternatives eliminated from further consideration; a detailed description of the Proposed Action; a description of the No Action Alternative; a description of the Alternative Action; identification of other actions announced for the project area; a comparison of the environmental impacts of all alternatives; identification of the preferred alternative; and, a discussion of mitigation requirements.

2.1 BACKGROUND

Because Elmendorf AFB lacks adequate real estate in suitable areas for the construction of family housing, the Air Force and Army transferred approximately 352 acres of land from Fort Richardson, Alaska to Elmendorf AFB as stipulated in a Memorandum of Agreement (MOA) signed in July 2004. This agreement implemented a land transfer and grant of easements through Fort Richardson that allowed Elmendorf AFB to construct the second phase of Private Sector Financed (PSF) housing, and associated roadways related to this housing, in accordance with mission priorities and the maintenance of existing or improved levels of service to the total military force. This action was approved by the headquarters of each military branch and made available for Congressional review. An Environmental Assessment of the Phase II PSF housing on the transferred property was completed in June 2004, and a Finding of No Significant Impact for this action was signed on 15 June 2004. The Air Force also completed an Environmental Baseline Survey (EBS) of the 352-acre parcel of land on Fort Richardson. In addition, the Army completed an Environmental Condition of Property (ECOP) for this land in early 2004. The 352 acres of land were transferred on August 1, 2004.

As part of the Phase II PSF housing project, the Air Force constructed a new arterial road, known as the Grady Highway. The Grady Highway is the single access road for Phase II PSF housing area and connects Westover Avenue adjacent to the Base Exchange/Commissary. Because the proposed roadway and bridge over Ship Creek, connecting the new housing to Fort Richardson were not sufficiently defined at the time of preparation of the Phase II PSF housing EA, a separate environmental analysis is required for the connecting roadway (known as the "Grady Highway extension") and bridge as shown on Figure 2-1. The proposed access road and bridge would be funded as part of the Phase II PSF housing privatization project.

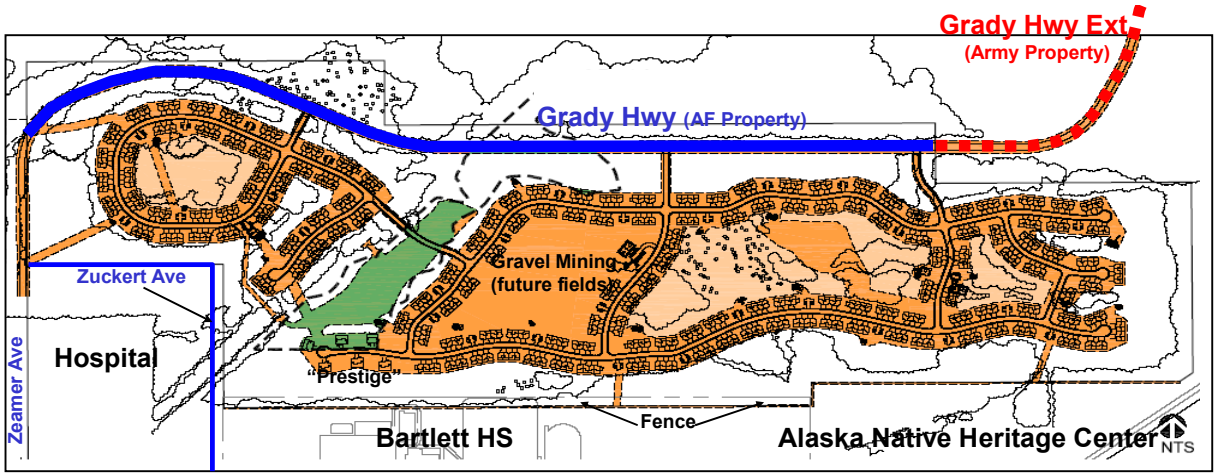


Figure 2-1. Proposed Grady Highway Extension to Fort Richardson

2.2 History of the Formulation of Alternatives

The Army and the Air Force (hereinafter referred to as "the Services") explored various alternatives for improving access between Elmendorf AFB and Fort Richardson. Given the location of the Phase II PSF housing area and existing joint military services in relation to Elmendorf AFB and Fort Richardson, the Services decided to design a roadway that would facilitate movement between both installations. The Services identified three selection criteria for alternative road alignments:

- A new arterial road must connect the Phase II PSF housing area to Fort Richardson.
- The new road must provide improved access to Base facilities, including joint facilities; and,
- The new road must be sited to provide an alternate, direct access to the Phase II PSF housing area.

The Services initially identified three candidate alignments for the new access road and bridge over Ship Creek. Each of these alignments met the three criteria identified above, and is described in Table 2-1 and shown on Figure 2-2.

Table 2-1. Candidate Alignments for Grady Highway Extension

Alignment	Description/Location of Road	Bridge Description
1 Downstream Route	Located near the fish hatchery, approximately 3,100 feet in length and connecting to Fourth Street and Arctic Valley Road.	A new, 34.5-ft wide bridge with a 128-ft clear span across Ship Creek using abutments above the water line would be required.
2 Footbridge Route	Located further east of the fish hatchery, approximately 3,400 feet in length and connecting to Fourth Street and Arctic Valley Road.	The existing footbridge over the creek would be demolished, with the exception of abutments above the water line that would be reused. A new bridge would be constructed to have a 110-ft clear span across Ship Creek and a width of 45.6 ft with a new pedestrian path.
3 Park Route	Approximately 3,300 feet in length, this route would be upstream of the pedestrian bridge and adjacent to the Cottonwood Park connecting to Fifth Street and Arctic Valley Road.	This alignment would require a 34.5 ft wide and 128 ft long bridge over Ship Creek.

2.3 Alternatives Eliminated from Further Consideration

The Services considered a range of alternatives that would provide improved access between Elmendorf AFB and Fort Richardson. The reasons for eliminating preliminary alternatives are described herein.

2.3.1 Military Construction (MILCON) Funding for Road and Bridge Construction

Traditional military construction (MILCON) using funding for the construction of a new access road and bridge was identified as an alternative. Traditional MILCON sources for road construction are not funded sufficiently to fully fund the proposed access road and bridge.

2.3.2 Southerly Extension of Davis Highway

The Services considered a southerly extension of the Davis Highway to the Phase II PSF housing area. This alignment was determined to be too close to ammunition storage areas and the antenna field. This route would not provide shorter distances for travel between the installations for emergency vehicles and military personnel. A southerly route from Davis Highway would require a crossing over Ship Creek. For these reasons, this alternative was eliminated from further consideration.

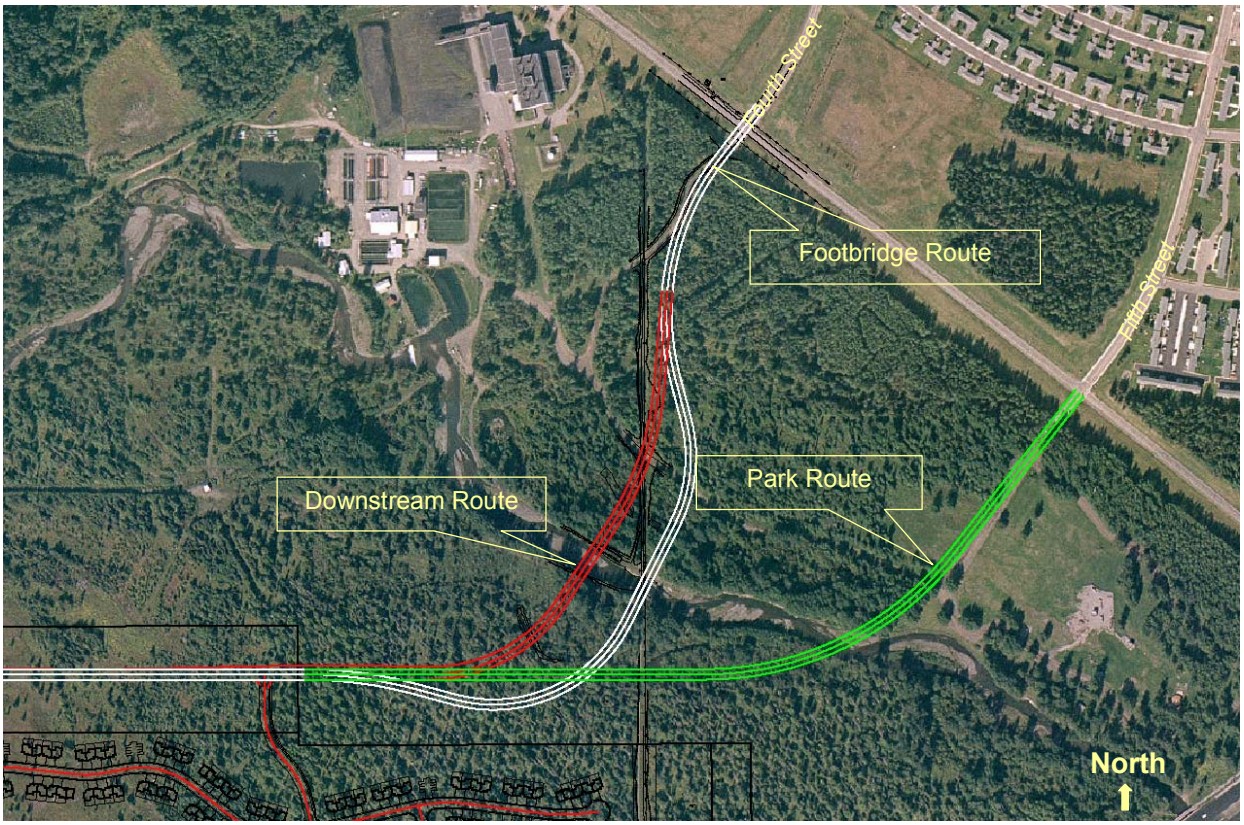


Figure 2-2. Candidate Alignments for Proposed Extension of Grady Highway

2.3.3 Alternative Alignment (Park Route)

The Services considered the easternmost road alignment (Park Route) and new bridge upstream of the existing pedestrian bridge. The Services determined that this alignment would not be viable because:

- construction would require one or more in-water piers due to width of the creek at this location;
- the route would be in close proximity to active recreational areas at Cottonwood Park; and,
- the connection with the existing road system at Fifth Street on Fort Richardson would disperse traffic into a commercial zone with a non-signalized four-way intersection near the parking lot of an existing elementary school. Fifth Street is also the primary entrance to Cottonwood Park. Connection to Fourth Street is preferable because it traverses the northwest perimeter of the housing area and provides direct access to Headquarters Loop for traffic calming purposes.

For these reasons, this alternative alignment was eliminated from further consideration.

2.3.4 Access Via Arctic Valley Gate on Fort Richardson

The Services considered the possibility of access via a former gate at Arctic Valley Road and Sixth Street. The Army formerly operated an unmanned, exit gate at this location with access to the Glenn Highway. Due to security considerations, this gate has been permanently closed and the Army has no plans to reopen this gate. Additionally, major changes (i.e., an interchange) to the Glenn Highway would be required to accommodate traffic from a gate at Arctic Valley Road. The Services determined that this alignment would not be viable because it would not offer an alternate access from the Phase II PSF housing area, nor would it improve emergency access between the installations.

2.4 Detailed Description of the Proposed Action

As a solution to providing improved access between Elmendorf AFB and Fort Richardson, the Services have entered into an agreement to construct a new access road and bridge over Ship Creek. The land upon which the road and bridge would be constructed is owned by the Army. A Right of Entry for this land would be granted by the Army to the Air Force for the duration of construction only. The road would be constructed to connect the northeastern edge of the 352 acre-parcel of land (Phase II PSF housing area) to the cantonment of Fort Richardson. The location of the proposed new access road and bridge is shown on Figure 2-2 as the Downstream Route.

The Proposed Action would require construction of a new road to extend the Grady Highway from the Phase II PSF housing area to Fort Richardson. The route would be located south and east of the Alaska Department of Fish and Game (ADFG) fish hatchery, downstream of the existing pedestrian bridge. The Downstream Route would be approximately 3,100 feet in length and connect to Fourth Street and Arctic Valley Road. A new, 34.5-ft wide bridge with a 128-ft clear span across Ship Creek and would be required. The pedestrian bridge would remain in its existing condition. The contractor would identify the required permits and ensure the permits are obtained from the applicable base, local, state, or federal agency.

Site Description. This site for the proposed road is within a former Army training area (Training Area 15) located northeast of Bartlett High School, the Alaska Native Heritage Center, and the DoD Hospital. The proposed extension to the Grady Highway would be constructed in undeveloped area northeast of the Phase II PSF housing area.

Starting at Arctic Valley Road and Fourth Street, the alignment would traverse the forested, undeveloped western portion of an area known as Cottonwood Park adjacent to Ship Creek and the Glenn Highway on Fort Richardson. The eastern developed portion of Cottonwood Park consists of wooded and grassy areas with individual and large group picnic areas that include grills, tables, overhead cover and playground equipment. The primary entrance to Cottonwood Park is located at Fifth Street and Arctic Valley Road. A pump house surrounded by eight non-potable water wells, comprising the Alaska Department of Fish and Game (ADFG) wellfield, is located north and northwest of the proposed road extension. The proposed bridge crossing over Ship Creek would be located downstream of the existing pedestrian bridge. The proposed road would also be located near the ADFG wellfield south of Ship Creek and the ADFG fish hatchery. Fort Richardson's former central heating and power plant, which now serves as the Municipal Light and Power Feeder Distribution Center for Fort Richardson, is located on Arctic Valley Road north of the ADFG fish hatchery. The ADFG wellfield and Cottonwood Park are shown on Figure 2-3.

The Army has completed restoration of stream banks at two locations along Ship Creek between the ADFG fish hatchery and the Glenn Highway, as shown on Figure 2-4. Areas B, C, F and G were restored in 2003 and 2004. Areas A, D, E and H have been identified as areas that require restoration; however, this work has not been funded at this time. The proposed road alignment would be located within stream restoration area D.

Road Description. The proposed access road would be a two-lane road approximately 3,100 feet in length and approximately 40 ft wide. The proposed road would become an extension of the existing

Grady Highway which is the single access road to, and north of, the Phase II PSF housing area. The road would extend from the northeastern edge of the Phase II PSF housing area (e.g., at the boundary between Elmendorf AFB and Fort Richardson) to a point near the intersection of Fourth Street and Arctic Valley Road on Fort Richardson. The new road would allow vehicular travel between Elmendorf AFB and Fort Richardson, and provide an alternate access to the Phase II PSF housing area. The road would have a design speed of 40 miles per hour and an average daily traffic (ADT) of 2,400 vehicles per day (VPD) in each direction. The road would not include any security gates or guard shacks.

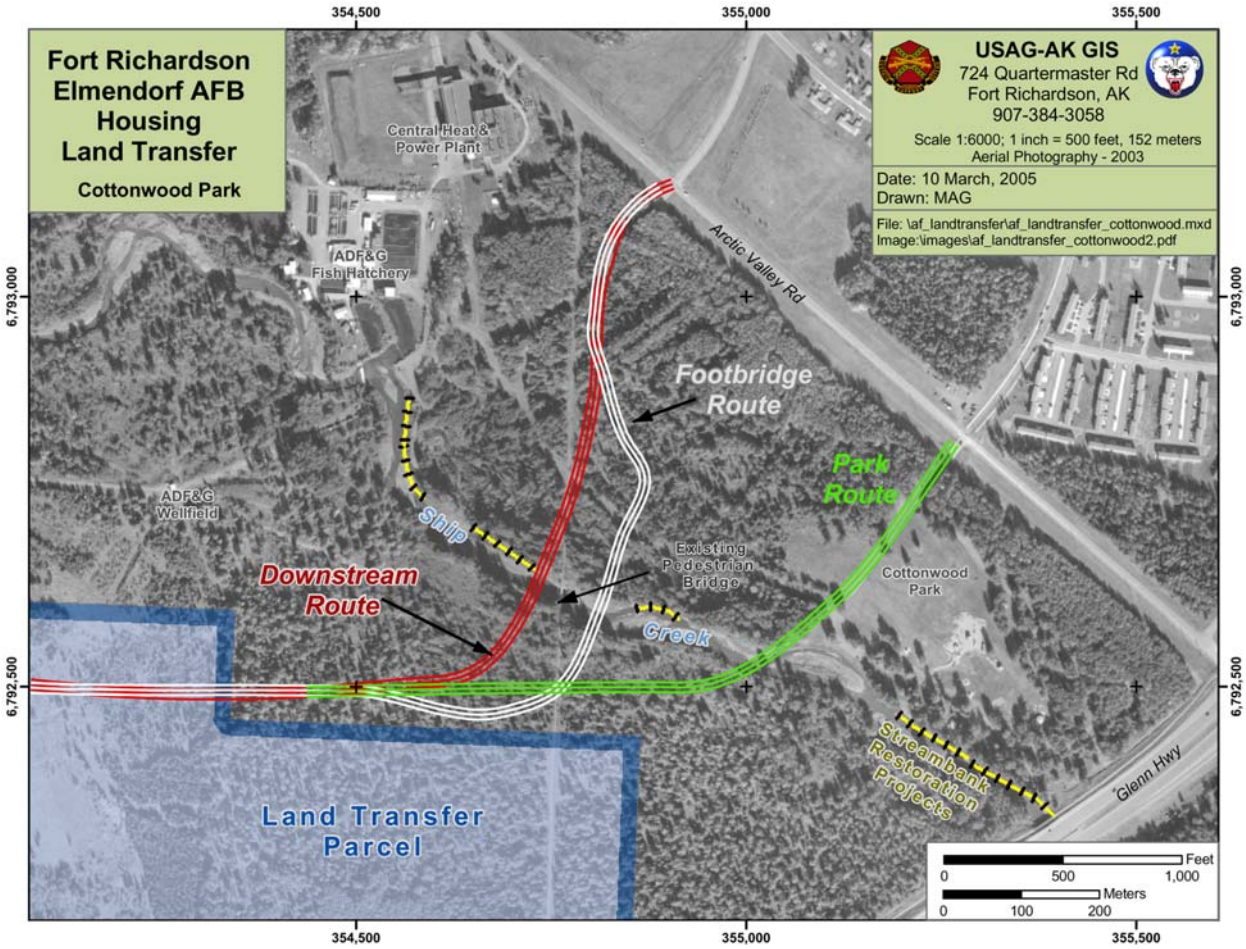


Figure 2-3. ADFG Wellfield and Cottonwood Park on Fort Richardson

Because the proposed road would be situated in historical moose migration areas, the planned right-of-way for the road will require ample visibility to avoid vehicular collisions with moose when traveling at 40 mph. The project would include approximately 30 feet of clearing on both sides of the road with gradual slopes for optimum visibility.

The road would be designed to accommodate safe access from the new Phase II PSF housing area. The intent of the design is to provide as direct and unimpeded flow for through traffic as possible while employing safe traffic engineering practices for vehicles entering from or leaving to the housing areas. Turn lanes, signage, physical barriers and street lights shall be incorporated into road design as appropriate, while traffic lights are to be minimized. The road would be constructed to American Association of State Highway and Transportation Officials (AASHTO) design standards and shall meet all AASHTO requirements for roadside design including all topography, drainage and roadside features. Preliminary design of the roadway has been reviewed by U.S. Army Garrison Alaska (Fort Richardson) wildlife staff and the Alaska Department of Fish and Game.

Design of the new road from the Phase II PSF housing area to Arctic Valley Road would minimize encroachment into the riparian zone (100-year flood zone).

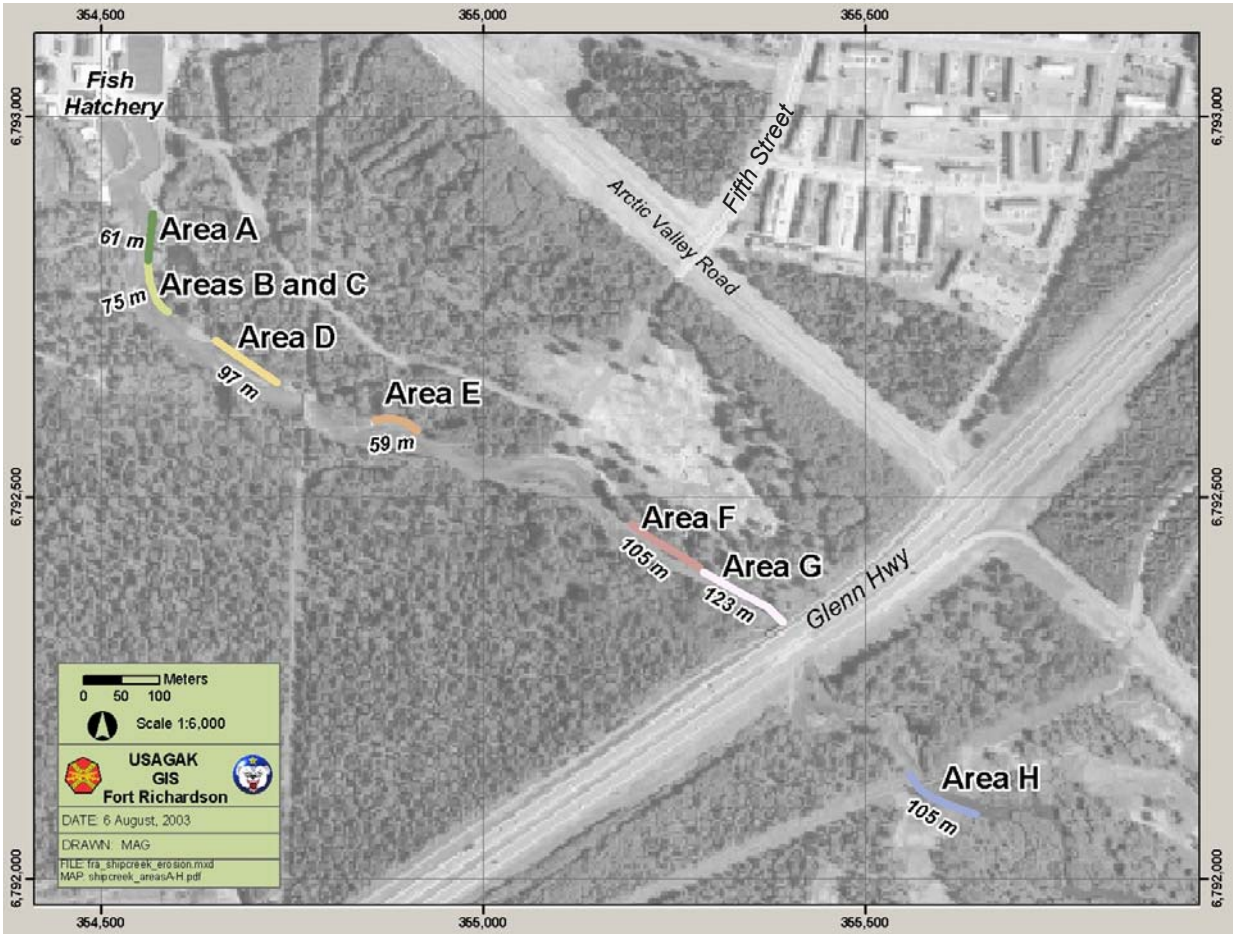


Figure 2-4. Ship Creek Restoration Sites

Bridge Description. A new bridge over Ship Creek would be constructed to AASHTO design standards for highway bridges and meet HS20-44 design load classification. The clear roadway width of the bridge would be 30 feet and 6 inches. The new bridge would have a 128-ft clear span across Ship Creek and a width of 34 feet and 6 inches. No pedestrian path/bicycle lane would be provided. The existing bike path/footbridge would remain at its upstream location. The bridge would incorporate all safety features and appurtenances as required by AASHTO standard specifications.

2.4.1 Construction Activities

Construction of the Proposed Action would require site clearing followed by road and bridge construction, as described herein.

Site Clearance. The proposed site for the new access road would be cleared of vegetation and debris. The total area to be cleared would be approximately 7.1 acres (3,100 feet of road with clearance width of approximately 100 feet). Vegetation may be retained in certain areas in order to allow for the aesthetic character along the periphery of the road.

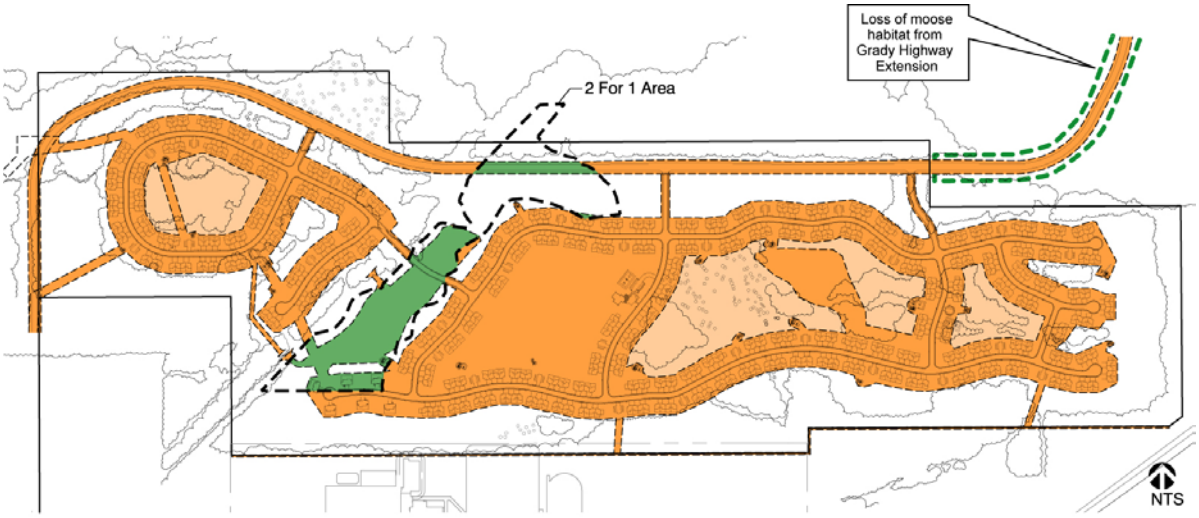
Bridge Construction. The bridge over Ship Creek would be constructed to enable an at-grade crossing of the creek. Abutments would be constructed on either side of the creek above the 100-year floodplain.

No equipment would be placed in Ship Creek, and all work would be conducted above the high water mark. The existing streambed would not be modified. Construction of the bridge would be conducted in accordance with the Army Corps of Engineers Section 404 permit.

Moose Habitat Replacement. As part of the Phase II PSF housing project, loss of moose habitat is being mitigated by relocation of trees and topsoil from the housing site to the Base landfill area. Mitigation of additional areas may also be accomplished by:

- Hydro-axing up to 80 acres on Fort Richardson lands behind the cemetery;
- Clearing and root-raking up to 60 acres of birch forest at three locations on Elmendorf AFB north of the airfield;
- Clearing and root-raking up to 40 acres of black spruce forest on the Fort Richardson and Elmendorf AFB border north of the Davis Highway; and,
- Management by the Air Force (3rd Civil Engineering Squadron) of up to 40 acres of runway clear zone for shrub habitat attractive to moose.

Portions of the Phase II PSF housing area have been established as mitigation for the Hospital construction project. These areas require 2:1 mitigation. All other areas to be disturbed require mitigation at a ratio of 1:1. As part of the 2004 MOA, the Army will be required to revise its installation moose habitat plan to incorporate the ongoing moose habitat replacement activities associated with the Phase II PSF housing area. The additional acreage of moose habitat to be lost as a result of the construction of the proposed access road has been incorporated into the ongoing habitat replacement. The Moose Habitat Plan associated with the new housing area is provided on Figure 2-5. This plan includes 5.5 acres of habitat on Fort Richardson that would be lost as a result of road construction.



MOOSE HABITAT LOST/DISTURBED		
Lost 156.9 Acres	Replace at 1 to 1	156.9 Acres
Lost (Ft. Richardson) 5.5 Acres	Replace at 1 to 1	5.5 Acres
Encircled by housing 32 Acres	Augment at 1 to 2	16 Acres
Lost (2 for 1) 11.6 Acres	Replace at 2 to 1	23.2 Acres
Moose Habitat Replacement Required	Total	201.6 Acres

MOOSE HABITAT REPLACED	
Land Fill	70 Acres
Runway Clear Zone	40 Acres
Area 2A From Appendix AD	40 Acres
Area 2B From Appendix AD	51.6 Acres
Total Replacement Provided	201.6 Acres

Figure 2-5. Moose Habitat Plan for Phase II PSF Housing Area

Construction Period. It is anticipated that the proposed access road and bridge would be constructed during construction of the Phase II PSF housing project. Construction of the road and bridge is expected to occur over a 12-month period.

2.4.2 Operation of the New Access Road

Upon completion and acceptance of the road extension, the Army will accept ownership of the road including the new bridge over Ship Creek. All future repairs, snow removal, replacements, and other measures necessary to maintain serviceability of this section of the Grady Highway will become the responsibility of the Army. Maintenance and snow removal standards will be comparable and coordinated between the respective engineering departments, and standards will be reflected in subsequent agreements.

2.5 Description of the No Action Alternative

Under the No Action Alternative, the Fort Richardson extension to the Grady Highway would not be constructed. Military personnel and dependents would continue to use either the Davis Highway and other roadways on the base to access Fort Richardson and Elmendorf AFB, or they would leave the base and use Glenn Highway and either the Muldoon Road or Boniface Road exits. The No Action Alternative would not fulfill the need for the Air Force to improve ground access between the installations, as well as improved emergency response times. The No Action Alternative, or maintaining the status quo, is not desirable because existing roadways experience traffic congestion, cross a railroad track, enter an airfield clear zone, or require leaving the base. The No Action Alternative would result in continuation of a single access into the Phase II PSF housing area.

2.6 Description of the Alternative Action

The Air Force is also considering an alternative alignment for the extension of Grady Highway. The Alternative Action (or "Footbridge Route") would be located east of the Downstream Route (Proposed Action). The Footbridge Route would be approximately 3,400 feet in length and connect to Fourth Street and Arctic Valley Road. The existing footbridge is shown on Figure 2-6.

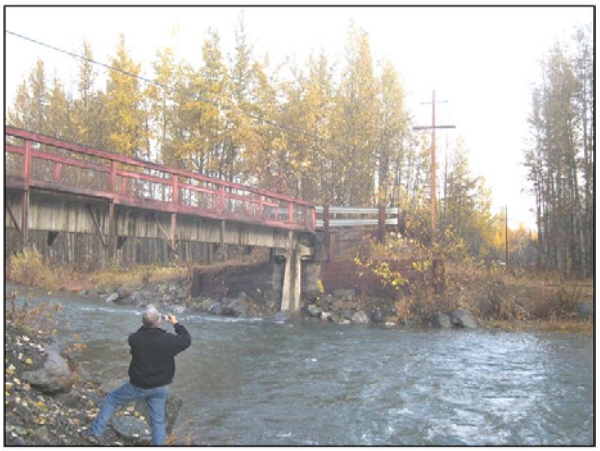


Figure 2-6. Existing Footbridge Over Ship Creek on Fort Richardson

For the Alternative Action, the existing pedestrian bridge over Ship Creek would be demolished and a new bridge constructed in accordance with AASHTO design standards for highway bridges and meet HS20-44 design load classification. Existing locations of abutments would be reused. The clear roadway width of the bridge would be 30 feet and 6 inches. The modified bridge would have a 110-ft clear span across Ship Creek (130 ft total length including supports) and a width of 45 feet and 6 inches including a 10 ft pedestrian path/bicycle lane on one side. Construction activities would take into consideration the existing gas main that runs beneath the existing pedestrian bridge as well as overhead power and communication lines. The bridge would incorporate all safety features and appurtenances as required by AASHTO standard specifications. Construction of the bridge would be conducted in accordance with stipulations to be identified in the Army Corps of Engineers Section 404 permit.

The Alternative Action would result in a longer road length with a shorter but wider span of bridge over Ship Creek. All other aspects of the Alternative Action would be the same as the Proposed Action.

2.7 Other Actions Announced for the Project Area

A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The Air Force has announced other projects for Elmendorf AFB that could occur during the same time period as the Proposed Action. These projects are:

- C-17 Beddown and Flight Training Areas
- F/A-22 Beddown/Fighter Town East (1,000 ft extension of runway)
- Construction of Phase II PSF Housing on Elmendorf AFB

The Air Force Capital Improvements Program for Elmendorf AFB has identified 31 short range projects for Fiscal Year (FY) 2004 through 2009, and 26 long-range projects for FY 2010 and beyond (USAF, 2004).

The Army has identified several planned projects for Fort Richardson:

- Stationing of an airborne brigade (up to an additional 2,300 soldiers);
- Improvements to Davis Highway;
- Construction of family housing;
- Construction of security fencing near the Phase II PSF housing area;
- Barracks revitalization in 2007; and,
- Construction of strategic deployment infrastructure.

On Fort Richardson, the Army is also transforming the 172nd Infantry Brigade (Separate) to a Stryker Brigade Combat Team with changes to force structure, ranges, facilities and infrastructure on Fort Wainwright, Fort Richardson and outlying training areas. The Final EIS and Record of Decision for this action were released in June 2004. These projects are assessed from a cumulative perspective in this EA.

In addition, the Alaska Railroad plans to construct an extension of the double track from Milepost (MP) 119.8 to MP 120.8 northeast of Vandenberg Avenue (ARRC, 2005).

2.8 Comparison of Environmental Effects of All Alternatives

Table 2-2 summarizes the impacts of the Proposed Action, Alternative Action and No Action Alternative.

2.9 Identification of the Preferred Alternative

The preferred alternative is to implement the Proposed Action as described in Subchapter 2.4.

2.10 Mitigation Requirements

With the exception of loss of wetlands associated with Ship Creek as a result of access road construction, mitigation measures would not be required for the Proposed or Alternative Action. Impacts to wetlands associated with Ship Creek will be avoided or minimized through design and construction that incorporates requirements identified in the U.S. Army Corps of Engineers Section 404 permit review process.

Project design and management would incorporate specific design features and best management practices that would prevent and/or minimize the potential for environmental impacts. The Proposed Action would include moose habitat replacement and enhancement to compensate for loss of habitat (and

reduce potential moose-human conflicts) that would result from construction of the new access road and bridge over Ship Creek. Design and management practices are detailed in Chapter 4, Environmental Consequences, and summarized in Table 2-3.

Table 2-2. Summary of Environmental Impacts

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Noise (Subchapter 4.1)	Noise impacts from site clearing and construction of the new road and bridge over Ship Creek would be limited to short-term, localized increases in noise levels directly associated with the use of construction equipment. After the road and bridge are constructed, resultant noise levels would not be expected to exceed the Air Force criteria of DNL 75 dBA. These effects would not be considered significant impacts to the noise environment.	No change from the baseline condition as described in Subchapter 3.1.
Land Use (Subchapter 4.2)	***Proposed Action:*** The Proposed Action would result in the conversion of approximately 7.1 acres of open space into roadway. The undeveloped land proposed for roadway would be entirely within the undeveloped open space and outdoor recreation area of Fort Richardson. The Proposed Action would not result in any adverse effects on existing sensitive land use nor would it interfere with the activities or functions of adjacent existing or proposed land uses. Impacts to land use would not be considered significant. ***Alternative Action:*** Construction of the alternative alignment for the access road would result in the conversion of approximately 7.8 acres of open space into roadway. As described for the Proposed Action, impacts to land use would not be considered significant.	No change from the baseline condition as described in Subchapter 3.2.
Air Quality (Subchapter 4.3)	***Proposed Action:*** Fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated during site clearing and road construction. Air pollutant emissions would be short-term and localized, and would not result in any adverse effects on overall ambient air quality. Construction activities associated with the Proposed Action would result in particulate matter emissions that represent less than 0.4 percent of the inventory of emissions for Air Quality Control Region (AQCR) No. 8. This region is in attainment, and therefore, a conformity determination would not be required. Therefore, the air quality impacts from the Proposed Action would not be considered significant. ***Alternative Action:*** Air pollutant emissions of CO, VOC, NOx, and SOx during construction would be the less than the Proposed Action. Construction activities associated with the Alternative Action would result in particulate matter emissions that represent less than 0.3 percent of the inventory of emissions for AQCR No. 8. Impacts to air quality would not be considered significant.	No change from the baseline condition as described in Subchapter 3.3.
Water Resources (Subchapter 4.4)	The construction of a road and bridge on Fort Richardson would not result in adverse effects to surface or groundwater quality or quantity. The Proposed Action would be designed and constructed with standard erosion control measures that would be incorporated into project planning. Construction of the proposed road and bridge would avoid water wells and the associated protected zone around the wells. The Air Force would ensure that wells and the wellfield protection areas are protected in accordance with applicable regulations. Impacts to groundwater on Fort Richardson would not be expected to occur.	No change from the baseline condition as described in Subchapter 3.4.

Table 2-2. Summary of Environmental Impacts (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Hazardous Materials and Wastes (Subchapter 4.5)	Compliance with hazardous materials management procedures would not result in significant impacts from hazardous materials. The volume of chemicals procured for road and bridge construction would not be expected to impact the ability of the Services to meet their reduction goals. The generation of hazardous waste would not be expected during the road construction. The Proposed Action would not be expected to interfere with ongoing remediation or investigation activities on Fort Richardson. Herbicide and pesticide contamination is not anticipated since the site for the proposed road was not used for agricultural purposes.	No change from the baseline condition as described in Subchapter 3.5.
Biological Resources (Subchapter 4.6)	***Proposed Action:*** The construction of the proposed road and bridge on Fort Richardson would result in the loss of 7.1 acres of winter range habitat for moose, (including 1.08 acres of spring and summer habitat). The Proposed Action would include enhancement of a currently barren landfill and surrounding area to provide future high quality moose habitat in accordance with the ongoing moose habitat mitigation plan for Phase II PSF housing. The proposed site is bear (primarily black bear) habitat. The adjacent Ship Creek riparian zone also serves as a travel corridor for both species of bears. The proximity of human development to bear habitat may result in an increase in risk for bear-human conflicts. The Proposed Action would not result in any impacts to threatened or endangered species, because no federally listed species are known to exist on Fort Richardson. The Proposed Action would not affect any Alaska species of concern. The Proposed Action would not be expected to substantially diminish a regionally or locally important plant or animal species. The Proposed Action would not be expected to result in a substantial infusion of exotic plant or animal species. The Proposed Action would result in the loss of approximately 1.07 acre of wetlands. Runoff from the bridge and road into Ship Creek and surrounding wetlands could include harmful substances such as oil, gasoline, and other automobile fluids, and could also introduce more human-generated trash into the area. The Proposed Action would also bisect the wetlands, changing contiguous wetland habitat into smaller, isolated parcels of wetlands. Some degradation of habitat due to edge effects (*i.e.,* introduction of trash, lighting, and noise) would be expected. This alteration of the landscape would particularly affect large mammals moving through the site, as well as resident and migratory birds, and other small resident wildlife species. Construction of the Proposed Action has the potential to change the environment with respect to birds (including raptors) nesting in the area by harassing birds through noise, lighting, and removal of habitat. ***Alternative Action:*** Construction of the alternate alignment of the access road and construction of new bridge east of the existing footbridge would result in loss of 7.8 acres of moose habitat and 1.075 acre of wetland. Other impacts to biological resources would be the same as the Proposed Action.	No change from the baseline condition as described in Subchapter 3.6.

Table 2-2. Summary of Environmental Impacts (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Cultural Resources (Subchapter 4.7)	The Proposed Action would not be located in or near NRHP-listed historic properties on Fort Richardson. The Air Force would ensure that any potentially historic structures that may be on the site are evaluated for historical significance. The Proposed Action would involve ground-disturbance during construction, and may result in the inadvertent discovery of subsurface cultural materials. Damage to, or loss of any cultural artifacts would be considered a significant impact. To avoid this impact, the Air Force will ensure that procedures for emergency discovery of cultural material are followed. The Proposed Action would not be located in any area that is in use by a federally recognized Alaska Native tribe. Impacts to traditional cultural resources would not be expected as a result of the Proposed Action.	No change from the baseline condition as described in Subchapter 3.7.
Geological Resources (Subchapter 4.8)	Construction on Fort Richardson would occur within an area where the physiographic features and geologic resources have been previously modified by prior military activities such as training and recreation. The site for the road is relatively flat. Alteration of ground surface would be minimal. Therefore, impacts to physiography and geology would be minimal. Construction would occur within an area where the soils have been modified by prior human activity. Earthwork at these locations and at the undeveloped sites would be planned and conducted to minimize the duration of exposure of unprotected soils. Installation of best management practices would minimize erosion during construction. Best management practices for backfilling and use of borrow pits would also be incorporated into project plans. Therefore, adverse effects to soils would be minimal.	No change from the baseline condition as described in Subchapter 3.8.
Transportation (Subchapter 4.9)	The Proposed Action would result in temporary and localized traffic increases during the construction phase. The new access road would result in beneficial changes to existing traffic patterns and volumes.	No change from the baseline condition as described in Subchapter 3.9.
Safety (Subchapter 4.10)	The road and bridge on Fort Richardson would be located approximately 0.5 mile southeast of active antenna fields managed by the Air Force. A health hazard associated with electric and magnetic fields (EMF) has not been established to exist. The antenna field would not be expected to result in any increase in EMF-related health risks to vehicular passengers on the proposed road or bridge. The proposed road on Fort Richardson would be located within one mile of ammunition storage areas. Ammunition areas are managed by the Army in accordance with DoD safety standards for ordnance storage. These standards are designed to provide protection against serious injury, loss of life and damage to property. The road and bridge would not be sited within any explosive safety arcs as defined by DoD guidance. The ammunition storage areas are not considered to be a safety risk to the proposed road.	No change from baseline conditions described in Subchapter 3.10.

[1] Impacts of the Alternative Action would be the same as the Proposed Action, except as noted.

Table 2-3. Summary of Best Management Practices

Resource	Best Management Practices
Noise	▪ Development of a housing vacancy plan that would keep occupied units as far away as possible from planned construction activity.
Land Use	Proposed changes in land use as a result of the construction of the new road and bridge will be included in the update to the General Plan for Fort Richardson.
Air Quality	Watering the disturbed areas of the construction site would reduce total suspended particulate emissions as much as 50 percent.
Water Resources	▪ Design and construction of proposed road and bridge to incorporate adequate storm drainage. ▪ Compliance with provisions of the MSGP, SWPPP and BMPs to prevent or minimize the potential for impacts to water resources. ▪ Include erosion control measures for all ground-disturbing construction activities. Comply with standard erosion control practices for ground disturbing activities. ▪ Consult with the Alaska Department of Environmental Conservation, Division of Air and Water Quality, Watershed Management Section, to determine whether a wastewater disposal permit will be required during planned construction activities. ▪ Conduct earthwork to minimize the duration of exposure of unprotected soils. ▪ Establish single point construction entries to minimize erosion during road construction. ▪ Reestablish grass and other landscaping in disturbed areas immediately after construction is completed. ▪ The proposed bridge would be designed and constructed in consideration of planned restoration of the stream bank along Ship Creek (Area D). ▪ Construction work in and near Ship Creek would be conducted in accordance with permit stipulations in the Army Corp of Engineers Section 404 permit.
Hazardous Materials and Wastes	▪ Work shall be managed in accordance with the *Elmendorf AFB Oil Discharge Prevention and Contingency Plan* (CPlan). The contractor shall be required to immediately contact USAG-AK Directorate of Public Works (DPW) Environmental Compliance if a hazardous substance or petroleum product is released or, if excavation activities encounter contaminated soil, tanks, or debris. ▪ In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor will take immediate action to contain and clean up the spill. ▪ Contractor spill clean up personnel will be trained and certified to perform spill clean up. ▪ The contractor will be responsible for the proper characterization and disposal of any waste and clean up materials generated. ▪ All waste and associated clean up material will be removed from the Base and transported and/or stored in accordance with regulations until final disposal. ▪ All details concerning the spill will be provided to the Air Force in the form of a written incident report. ▪ The contractor is responsible for restoring a spill site to the condition prior to the spill or to an improved condition. ▪ Fueling and lubrication of equipment will be conducted in a manner that affords maximum protection against spills. ▪ Secondary containment is required around temporary fuel oil or petroleum storage tanks larger than 660 gallons and is recommended for smaller tanks. ▪ The Air Force will ensure that coordination with the USAG-AK DPW Environmental Restoration Office is conducted before any construction work is initiated. ▪ The Air Force will ensure that a proper Base Civil Engineer (BCE) Work Clearance Request is processed and routed through 3 CES/CEV for each construction area in accordance with 3rd Wing Instruction 32-1007 (12 July 2001). ▪ The Air Force will ensure that a USAG-AK Excavation Clearance Request is obtained and approved from the Directorate of Public Works.

Table 2-3. Summary of Best Management Practices (Cont'd)

Resource	Best Management Practices
Biological Resources	▪ To minimize the potential for human-moose conflicts, landscaping for the road shoulders and bridge areas will specify shrubs and plants that are low in moose palatability, and are in accordance with species approved in the Base landscape plan; yet ensure that animals have sufficient cover to attempt road crossings. ▪ Enhancement of barren landfill and surrounding areas to provide future high quality moose habitat (distribution of soils on closed landfills). ▪ Land/timber management practices to optimize return of moose habitat. ▪ Design of roadway right-of-ways to be wide enough and sloped appropriately for drivers to adequately spot and avoid moose or other large wildlife species crossing the road' and incorporate signage depicting wildlife crossing and reduced speeds on the bridge and through the wetland areas, where wildlife routinely migrate. ▪ Implement measures to trap and divert runoff to avoid introduction of pollutants into the watershed via Ship Creek and adjacent wetlands. ▪ Prepare a 404 Permit under the direction of the U.S. Army Corps of Engineers to mitigate for impacts to wetlands (approximately 1.07 acres). ▪ Avoid impacts to nesting birds and raptors (pursuant to the Migratory Bird Treaty Act) by either having construction during the nesting season (April through August, or as determined by the resource agencies), or undertaking nesting bird surveys by a qualified biologist. A qualified biologist would be on-site at the start of construction.
Cultural Resources	▪ In the event any previously undetected archaeological resources are discovered during earthwork, the construction contractor will be required to stop construction activities in the affected area and contact the USAG-AK Cultural Resources Manager (CRM) and the Elmendorf AFB CRM or designate. The CRM will follow the procedures in Section 4.5.1 (Inadvertent Discovery of Archaeological Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups. In the event further investigation is required, any data recovery would be performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archaeological Properties. ▪ In the event that any Alaska Native human remains are encountered during construction, excavation will stop and the Fort Richardson and Elmendorf AFB Cultural Resources Manager will be notified immediately. The CRM will follow the procedures in Section 4.5.2 (Discovery of Human Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups.
Geological Resources	▪ The Air Force would ensure that specific recommendations included in the geotechnical investigation for the road and bridge areas are followed to the maximum extent practicable. ▪ Best management practices identified for Water Resources would ensure that potential impacts to geologic resources and excessive erosion are avoided or minimized. ▪ All backfill material would be obtained from existing pits on Elmendorf AFB or Fort Richardson (no new pits would be opened or otherwise required as a result of the Proposed Action). ▪ The Air Force would also ensure that a separate reclamation plan is prepared for the State of Alaska for any excavation of gravel in any pit that exceeds 50,000 cubic yards per year. ▪ No metal, wood, rubble or other material shall be placed in any borrow pits (concrete rubble is allowable). ▪ In the event any other material is placed in a borrow pit, the contractor would be required to remove this material and dispose of the material off-base. ▪ Excavated material from road or bridge sites would be used to backfill borrow pits wherever possible.
Transportation	▪ In order to avoid potential traffic conflicts, the Air Force would ensure that Bartlett High School, the Alaska Native Heritage Center, and DoD Hospital are notified of the construction schedule.
Safety	(None)

CHAPTER 3
AFFECTED ENVIRONMENT

This chapter describes the existing environmental resources that could be affected by, or could affect the Proposed Action, No Action Alternative, or the Alternative Action at Elmendorf AFB and Fort Richardson. Within this context, only those Base-specific components relevant to the potential impacts are described in detail.

3.1 NOISE

3.1.1 NOISE DESCRIPTORS

Noise is usually defined as unwanted sound, a definition that includes both the psychological and physical nature of the sound (AIHA, 1986). Under certain conditions, noise may cause hearing loss, interfere with human activities at home and work, and may affect human health and well being in various ways.

Sound pressure level can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude.

Different sounds have different frequency content. When describing sound and its effect on a human population, A-weighted (dBA) sound levels 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. For example, 65 dBA is equivalent to normal speech at a distance of three feet.

Another descriptor, day-night average sound level (DNL), was developed to evaluate the total daily community noise environment. DNL is the energy averaged A-weighted acoustical levels for a 24-hour period with a 10 dB upward adjustment added to the nighttime levels (10:00 p.m. to 7:00 a.m.). This adjustment is an effort to account for the increased sensitivity of most people to noise in the quiet nighttime hours. Federal agencies such as the DoD, the United States Environmental Protection Agency (USEPA), the Federal Aviation Administration (FAA), and the United States Department of Housing and Urban Development (HUD) have adopted DNL as the accepted unit for quantifying human annoyance to general environmental noise.

The sound exposure level (SEL) is used to supplement the DNL, especially where sleep disturbance is a concern. The SEL value represents the A-weighted sound level integrated over the entire duration of the noise event and referenced to duration of one second. When an event lasts longer than one second, the SEL value will be higher than the highest sound level during the event. The maximum sound level (L_{max}) is the highest instantaneous sound level observed during a single noise event no matter how long the sound may persist.

3.1.2 NOISE CRITERIA AND REGULATIONS

According to Air Force, FAA and HUD criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds the DNL of 75 dBA; “normally unacceptable” in regions exposed to noise between the DNL of 65 to 75 dBA; and “normally acceptable” in areas exposed to noise where the DNL is 65 dBA or less. DNL is the energy average A-weighted acoustical levels for a 24-hour period with a 10 dB upward adjustment added to the nighttime levels (10:00 p.m. to 7:00 a.m.). This adjustment is an effort to account for the increased sensitivity of most people to noise in the quiet nighttime hours. DNL has been adopted by federal agencies including the

DoD, USEPA, FAA, and HUD as the accepted unit for quantifying human annoyance to general environmental noise.

3.1.3 Baseline Noise Conditions

Airfield operations are the primary source of noise at Elmendorf AFB and the Fort Richardson cantonment. The Base maintains two operational runways and noise level contours extend in northeasterly and westerly directions. Aircraft activities include pilot training, aircraft maintenance, and transient military aircraft operations. During periods of no flying activity at Elmendorf AFB, noise results primarily from aircraft maintenance and shop operations, ground traffic movement, occasional construction, and similar sources. This noise is almost entirely restricted to Base property and is comparable to sounds that occur in typical urban communities. It is primarily during periods of aircraft ground or flight activity that the noise environment changes.

Noise from aircraft operations at Elmendorf AFB has been characterized in noise studies conducted as part of the AICUZ program. Baseline noise conditions in the area of the proposed road are below 65 DNL (USAF, 2001).

The existing noise environment on Fort Richardson is also influenced by weapons training activities on the northwestern portion of the installation. Two primary noise zones with significant noise exposure and severe noise levels have been identified associated with outlying training areas, as shown on Figure 3-1.

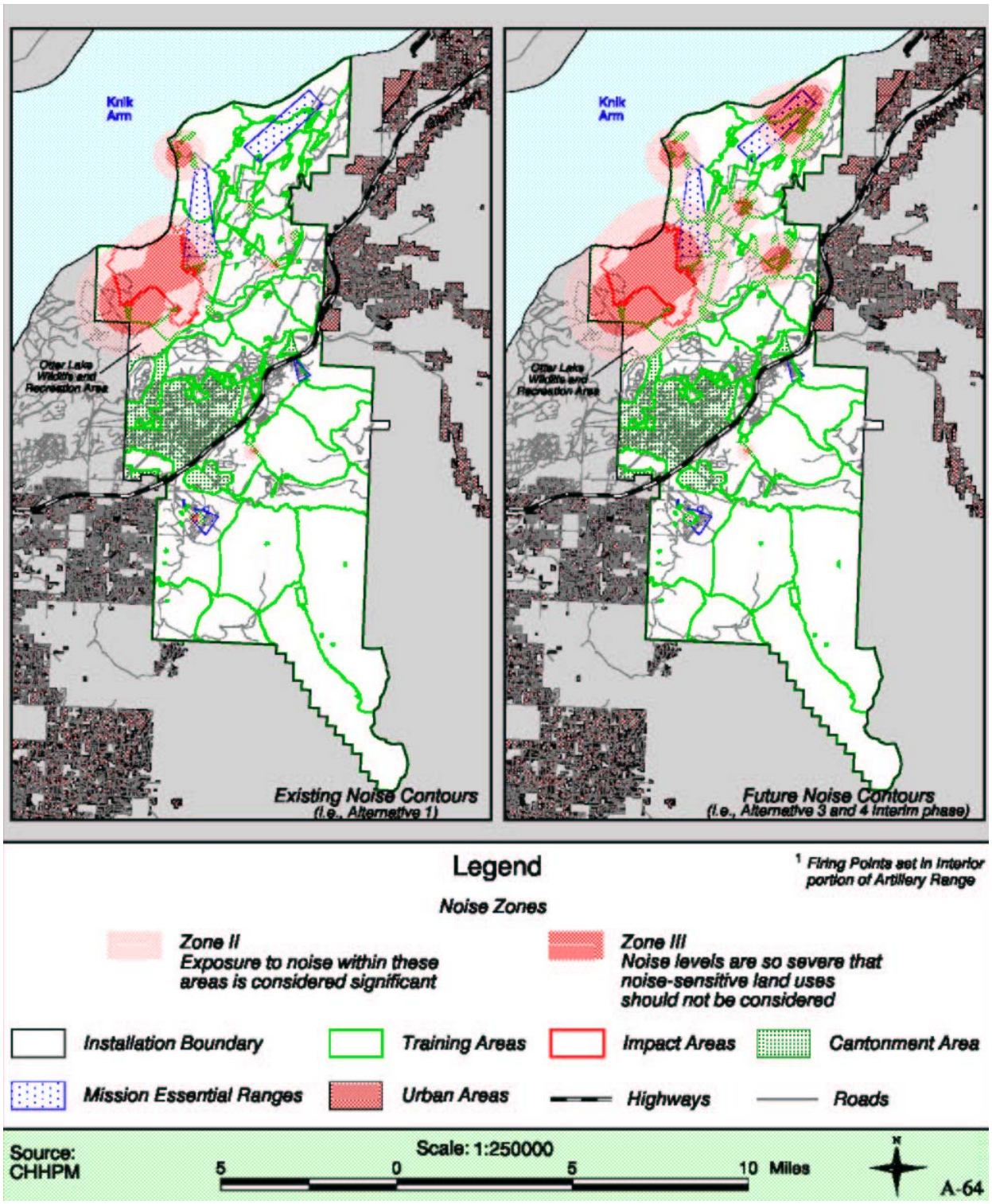
The existing noise level at the proposed road and bridge site is influenced by flightline activities on Elmendorf AFB, as shown on Figure 3-2. Airfield operations on Elmendorf AFB are the predominant noise source, with less influence from the noise of Army training operations in the two main training areas north and east of the site.

Noise levels associated with Bryant Army Airfield are limited to fixed-wing and rotary aircraft used by the Alaska Army National Guard, while helicopter landing zones are located north, east and south of the proposed site. In addition to military aircraft, commercial and general aviation aircraft flights at the Ted Stevens Anchorage International Airport and, to a lesser extent, Merrill Field result in exposure of local residents and workers to aircraft noise. Vehicular traffic on Glenn Highway, extending near the southeast boundary of Elmendorf AFB and the southwest boundary of Fort Richardson, is a major source of surface transportation noise within areas located along the roadway. Based on revalidation of the Elmendorf AFB AICUZ study, land areas exposed to military aircraft noise levels of DNL 65 dB or higher are confined primarily to areas within Elmendorf AFB and Fort Richardson. The only off-base areas affected by noise levels exceeding DNL 65 dB are over water in the Knik Arm of the Cook Inlet (USAF, 2004). Existing noise levels on the site for the proposed access road would be less than the 65 DNL noise level.

3.1.4 Future Noise Conditions

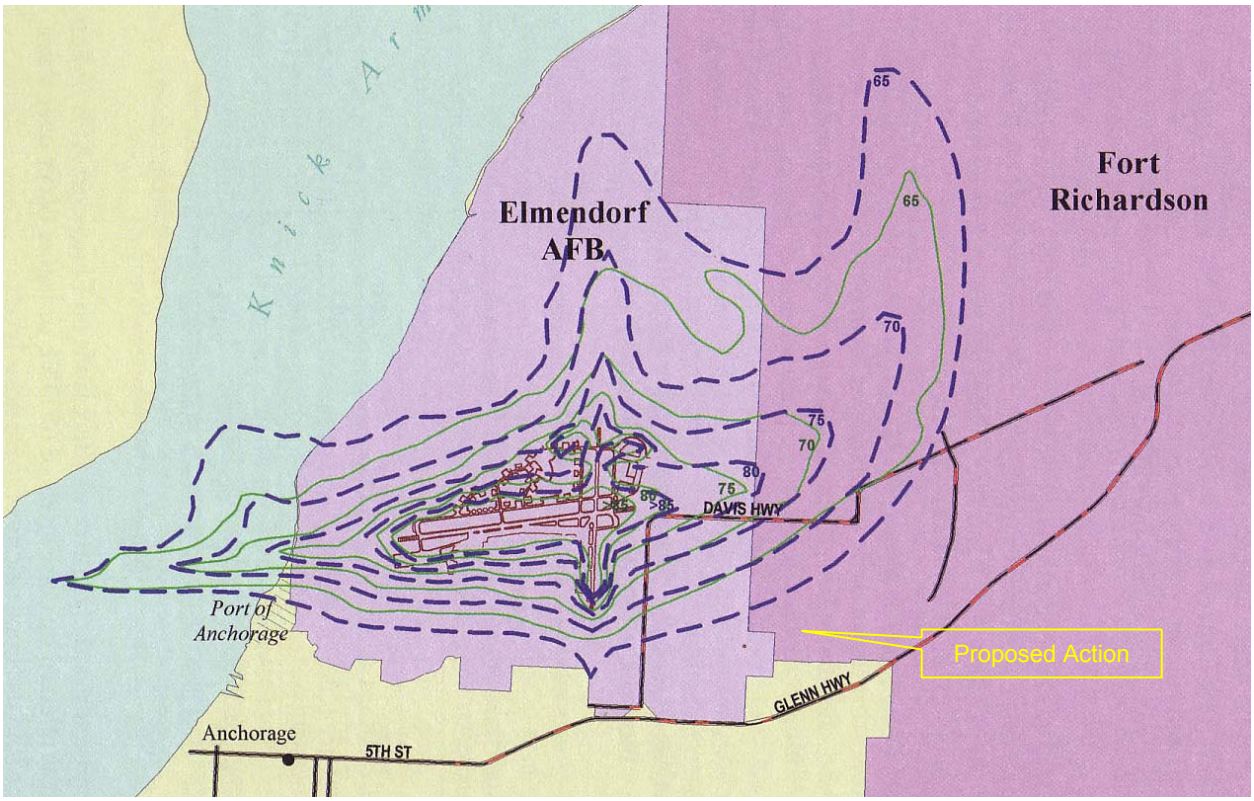
Future noise levels at Elmendorf AFB would be expected to change as a result of future aircraft operations, including C-17 beddown. The future noise level in the vicinity of the proposed road is projected to remain below the DNL 65 dB level (USAF, 2004).

Future noise conditions on Fort Richardson are expected to remain similar to existing conditions with zones of significant and severe noise levels in the training areas on the north and east portions of the installation. Future noise levels on the northwest corner of the proposed site would be within the projected 65 DNL noise level, with the remaining portion of the site below the 65 DNL noise level.

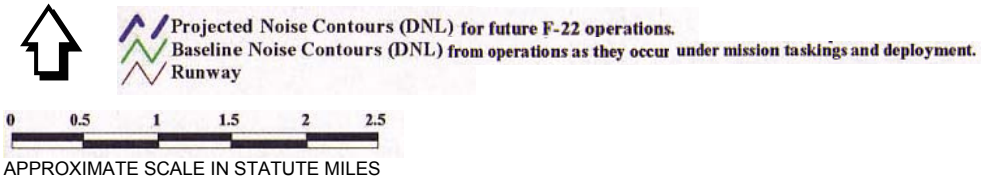


Source: Formoso, 2003

Figure 3-1. Noise Zones on Fort Richardson



Source: USAF, 2001



APPROXIMATE SCALE IN STATUTE MILES

Figure 3-2. Baseline and Projected Noise Level Contours at Elmendorf AFB

3.2 Land Use

3.2.1 Land Use Plans and Policies

To guide future development and land use decisions on Elmendorf AFB, the Air Force has prepared a land use component to the General Plan for Elmendorf AFB. The land use component identifies and analyzes the functional relationships of organizational units and activities assigned to Elmendorf AFB, and supports the existing and future mission requirements by allocating or reserving the land necessary to support ongoing and proposed operations. The Integrated Natural Resources Management Plan (INRMP) for Elmendorf AFB has identified eight land management units and five special interest areas on the Base that would require special considerations or unique management activities (USAF, 2000).

The U.S. Army Garrison Alaska manages land resources to achieve its training and testing objectives, maintain force readiness and ensure environmental stewardship. The Integrated Training Area Management (ITAM) program is the Army's formal strategy for sustaining use of training and testing lands (USARAK, 2001a) while the Master Plan ensures the cohesive integration of land use requirements and future plans for the cantonment and outlying training areas. The INRMP for Fort Richardson has identified nine military land uses on the installation: cantonment, recreation, ammunition area, natural

resources management, commercial, right of ways, easements, leases, and training areas. The Ship Creek Riparian Area is the only special interest management area on the installation in the vicinity of the proposed site for the extension of the Grady Highway (USARAK, 2001a).

The proposed site for the new access road and bridge would be located entirely on Fort Richardson. For this reason, the existing and planned land use for the proposed road and bridge area is characterized from U.S. Army planning information.

3.2.2 Existing Land Use

Existing land use on Fort Richardson includes 5,760 developed acres in the cantonment located along the Glenn Highway near the center of the installation. The remaining 55,000 acres are comprised of maneuver and impact areas that include training areas, firing ranges, landing zones and drop zones (USARAK, 2001a).

The proposed site for the proposed access road and bridge on Fort Richardson is located in Training Area 15, south of the cantonment and north of Bartlett High School. This training area has not been used by the Army in recent years. Ammunition Storage Area A is located approximately 1.5 mile north of Ship Creek. Ammunition Storage Area B is located approximately 0.7 mile northwest of the proposed access road.

Public access into training areas on Fort Richardson is allowed (subject to safety restrictions and military security) when access does not impair the military mission, as determined by the installation commander. Activities that are not compatible with training areas include installation or enactment of any permanent non-military structures, easements, or leases (USARAK, 2001a).

Fort Richardson is managed for a variety of public recreational uses, although such areas may be closed temporarily during periods of military use. Public recreation areas on the installation vary depending on the season. Off-limits areas are restricted to public access and use on a year round basis. The outdoor recreation management designation of the proposed road and bridge site is Limited Recreation (open to hiking, skiing, berry picking, birdwatching, and other low impact activities). No motorized vehicles are allowed. During March to May and November to February, trails through the Phase II PSF housing site were used by Bartlett High School for cross country running and cross-country skiing. Upon completion of the housing area, recreational use would be limited to areas south of the housing security fencing.

The proposed road alignment would traverse a developed recreational area on Fort Richardson known as Cottonwood Park, located northwest of the Glenn Highway and southeast of Arctic Valley Road. Cottonwood Park consists of wooded and grassy areas with individual and large group picnic areas that include grills, tables, overhead cover and playground equipment. This area is for authorized use only and is not a public park.

The U.S. Bureau of Land Management (BLM) holds timber rights for most Fort Richardson lands. Vegetation manipulation by USARAK on lands where the BLM holds rights must be approved by the BLM. Timber harvests are permitted while management of the area is primarily for military use. Forest management on Fort Richardson is required in accordance with Public Laws 106-65 (Military Land Withdrawal Act) and 86-797 (Sikes Act).

The Army has conducted an inventory of forest resources on Fort Richardson. High, medium and low priority forest management areas have been identified for forest management actions to be accomplished from 2002 through 2006. The proposed site for the new access road and bridge is located in a forest management area that is designated as Protected (no forest management is planned for this area).

3.2.3 Future Land Use

The Army has developed a future land use plan for Fort Richardson. The plan consolidates housing, community facilities, outdoor recreation and administrative facilities in the cantonment while training areas

are located north and southwest of the cantonment. The future land use designation for the proposed road and bridge site on Fort Richardson is Open Space and Outdoor Recreation, as shown in Figure 3-3.

Figure 3-3. Future Land Use Plan for Fort Richardson

3.3 Air Quality

3.3.1 Climate and Meteorology

The climate at Elmendorf AFB and Fort Richardson is transitional between the interior climate of Alaska and the maritime climate of coastal Alaska. This climate is shielded by the nearby Alaska Range, Talkeetna and Chugach Mountains. The Pacific Ocean's Alaska Current is also a moderating influence on the climate at Elmendorf AFB. Summers are cool, ranging from 47 to 65 degrees F. Winters are cold, varying from 4 to 30 degrees F. The mean annual temperature is 35 degrees F. Average annual precipitation is 16.1 inches, with most rainfall occurring from June through October. Annual snowfall in the project area averages approximately 40 inches.

3.3.2 Air Pollutants and Regulations

Air quality in any given region is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter (μg/m3). Air quality is not only determined by the types and quantities of atmospheric pollutants, but also by surface topography, the size of the air basin, and by the prevailing meteorological conditions.

The Clean Air Act (CAA) Amendments of 1990 directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure cleaner air for all Americans. The promulgation of the CAA was driven by the failure of nearly 100 cities to meet the national ambient air quality standards (NAAQS) for ozone and carbon monoxide and by the inherent limitations in previous regulations to effectively deal with these and other air quality problems.

The USEPA established both primary and secondary NAAQS under the provisions of the CAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (i.e., soils, vegetation, and wildlife) from any known or anticipated adverse effects from a criteria air pollutant. The CAA also set emission limits for certain air pollutants for new or modified major sources based on best demonstrated technologies, and established health-based national emissions standards for hazardous air pollutants.

NAAQS are currently established for six air pollutants (known as "criteria air pollutants") including carbon monoxide (CO), nitrogen oxides (NO_x, measured as nitrogen dioxide, NO_2), ozone (O_3), sulfur oxides (SO_x, measured as sulfur dioxide, SO_2), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 microns, collectively referred to as total suspended particulates (TSP).

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered as an air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. O_3 is formed in the atmosphere from its precursors, NO_x and volatile organic compounds (VOC), which are directly emitted from various emission sources. For this reason, NO_x and VOC are commonly reported in an air emissions inventory instead of O_3.

The CAA does not make the NAAQS directly enforceable, but requires each state to promulgate regulatory requirements necessary to implement the NAAQS. The CAA also allows states to adopt air quality standards that are more stringent than the federal standards. The State of Alaska Department of Health has adopted state ambient air quality standards that are as stringent as, or more stringent than, the NAAQS, as shown in Table 3-1.

Table 3-1. National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS[a,b,c]	Secondary NAAQS[a,b,d]	Alaska Standards[a,b]
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 $\mu g/m^3$) 35 ppm (40,000 $\mu g/m^3$)	No standard No standard	9 ppm 35 ppm
Lead	Quarterly	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Nitrogen Oxides (measured as NO_2)	Annual	0.0543 ppm (100 $\mu g/m^3$)	0.0543 ppm (100 $\mu g/m^3$)	0.053 ppm
Ozone	1-hour	0.12 ppm (235 $\mu g/m^3$)	0.12 ppm (235 $\mu g/m^3$)	0.12 ppm
Particulate Matter (measured as PM_{10})	Annual 24-hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour	0.03 ppm (80 $\mu g/m^3$) 0.14 ppm (365 $\mu g/m^3$) No standard	No standard No standard 0.50 ppm (1,300 $\mu g/m^3$)	0.03 ppm 0.14 ppm 0.50 ppm (1,300 $\mu g/m^3$)

[a] National and state standards, other than those based on an annual or quarterly arithmetic mean, are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is less than or equal to one.

[b] The NAAQS and Alaska standards are based on standard temperature and pressure of 25 degrees Celsius and 760 millimeters of mercury.

[c] National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA.

[d] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.

3.3.3 Local Air Quality

The USEPA classifies the air quality within an area according to whether or not the concentration of criteria air pollutants in the atmosphere exceeds primary or secondary NAAQS. All areas within each air quality control region (AQCR) are assigned a designation of attainment, maintenance or nonattainment for each criteria air pollutant. An attainment designation indicates that the air quality within specific areas of an AQCR is either "unclassified" or that the air quality is as good as or better than NAAQS for individual criteria air pollutants. Unclassified indicates that the air quality within an area cannot be classified and is therefore treated as attainment. A maintenance area is a redesignated nonattainment area for any air pollutant that has attained the national primary ambient air quality standard for that air pollutant. Nonattainment indicates that concentration of an individual criteria air pollutant at a specific location exceeds primary or secondary NAAQS. Before a nonattainment area is eligible for reclassification to attainment status, the state must demonstrate compliance with NAAQS in the nonattainment area for three consecutive years and through extensive dispersion modeling, demonstrate that attainment status can be maintained in the future even with community growth.

The State of Alaska Department of Environmental Conservation (ADEC) has primary jurisdiction over air quality and stationary source emissions at Elmendorf AFB and Fort Richardson. The installations are located on the outskirts of the Anchorage metropolitan area within the Cook Inlet Intrastate AQCR No. 8. This AQCR encompasses 44,000 square miles including the Municipality of Anchorage, the Kenai Peninsula Borough, and the Matanuska-Susitna Borough. Regional air pollutant emissions for the Anchorage area are shown on Table 3-2.

Table 3-2. Regional Air Pollutant Emissions in AQCR No. 8

Location	CO (tons/yr)	VOC (tons/yr)	NO_x (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)
Cook Inlet Intrastate AQCR No. 8	332,021	56,708	28,203	1,780	67,013
Source: USAF, 2001					

Air quality in the Cook Inlet Intrastate AQCR has been designated as either attainment or unclassifiable/attainment for all pollutants with the exception of CO and PM_{10}. As shown on Figure 3-4, the metropolitan Anchorage area is classified as a serious maintenance area for CO. Eagle River, a community of approximately 25,000 people located 10 miles northeast of Anchorage, has been classified as moderate nonattainment for PM_{10}. The air quality at Elmendorf AFB and Fort Richardson is classified as attainment for all ambient air quality standards. The Base is located adjacent to the northern boundary of the Anchorage CO serious maintenance area. There are no Class I Prevention of Significant Deterioration (PSD) areas within a 62-mile radius of Elmendorf AFB (USAF, 2001).

Air pollutant emissions at Elmendorf AFB and Fort Richardson include stationary and mobile sources. Stationary source emissions include jet engine testing (off the aircraft), external combustion sources, degreasing operations, storage tanks, fueling operations, heating, solvent usage, surface coating, asphalt production, and miscellaneous general process operations. The Air Force is in the process of converting units connected to the existing steam plant to individual boilers. Mobile sources of air pollutants are primarily from aircraft operations, aerospace ground equipment, ground support equipment, and maintenance aircraft operations performed with the engines still mounted on the aircraft.

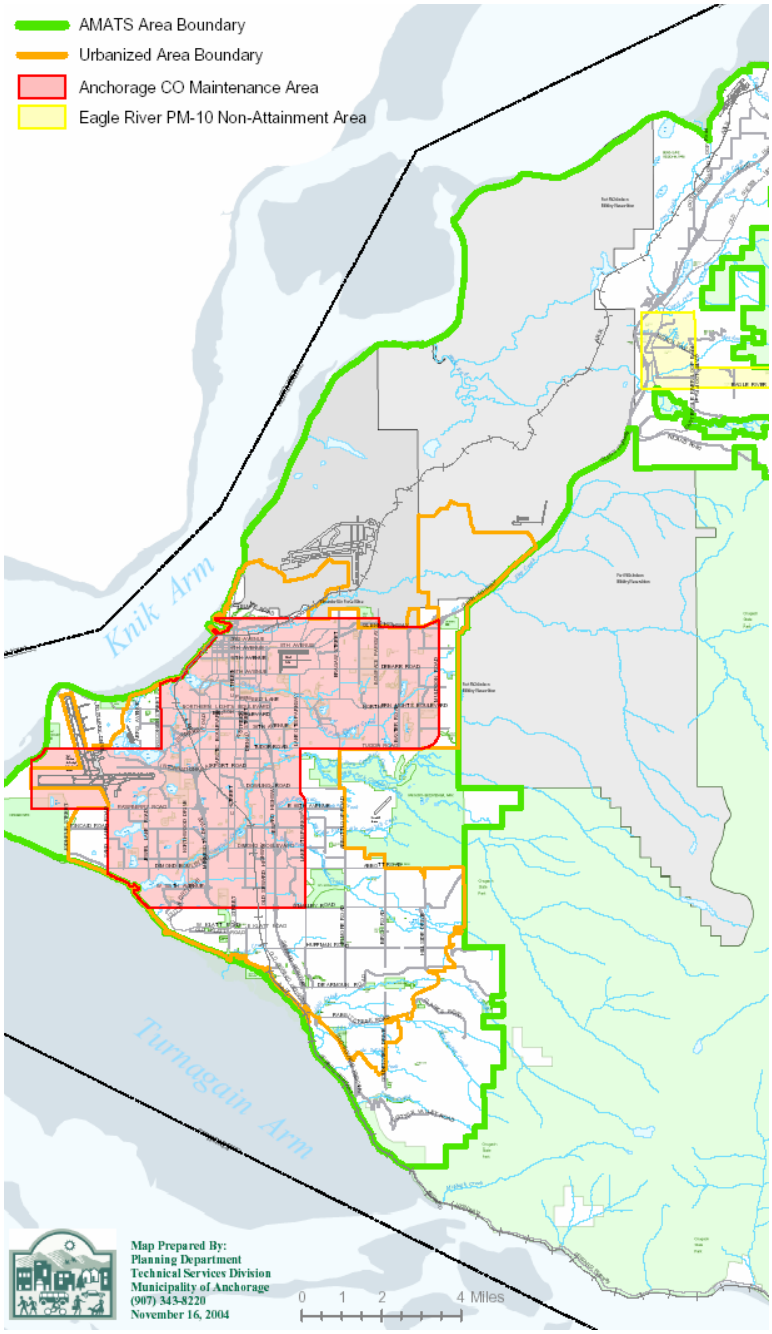


Figure 3-4. Air Quality Designations in the Anchorage Metropolitan Area

3.4 WATER RESOURCES

The water resources on Elmendorf AFB and Fort Richardson are described in terms of surface water and groundwater conditions. The only surface water feature in the project area is Ship Creek.

3.4.1 SURFACE WATER

In 1972, the U.S. Congress passed the Federal Water Pollution Control Act to protect surface waters from pollutants in storm water discharges. The USEPA has been given the authority to implement the requirements of the Clean Water Act. Because Alaska is a non-delegated state, the National Pollutant Discharge Elimination System (NPDES) program is administered by the USEPA. Alaska is also required to maintain compliance with the Multi-Sector General Permit (MSGP) program for industrial activities.

The Air Force and Army have each prepared a Storm Water Pollution Prevention Plan (SWPPP) for their installations that identifies pollutant sources that may affect the quality of storm water associated with construction activities at the site. The plan also identifies best management practices (BMP) to reduce pollutants in storm water discharges. Physical, structural and managerial BMPs are described in the SWPPP to minimize or eliminate the potential for spills and leakage of construction materials and erosion of disturbed areas by water and wind. The SWPPP includes: erosion and sediment control; non-storm water management; post-construction storm water management; waste management and disposal; maintenance, and employee training to inspect BMPs.

Ship Creek is an important local stream and the third largest recreational fishery in Alaska after the Kenai and Russian Rivers (USAF, 2004). Ship Creek is the second largest source of surface water on Fort Richardson and Elmendorf AFB. The creek drains a watershed of 117 square miles, 90 of which are in the Chugach Mountains. The Ship Creek watershed is a primary source of drinking water for Fort Richardson and is a protected water body. From the mountains, the creek flows west across a coastal plateau through Fort Richardson. The Anchorage area comprises 27 square miles of the creek's watershed. Ship Creek traverses Fort Richardson for approximately eight miles, including across a forested coastal plain to the western boundary of the installation at an elevation of 230 ft above sea level. The channel of Ship Creek is approximately 20 feet wide and 2 feet deep. The stream bottom is rocky and gravelly, with an average slope of 3 percent. Flow in Ship Creek is seasonally influenced and averages 144 cubic feet per second. Flow is generally highest during spring runoff and lowest during late winter. Portions of Ship Creek experience no flow on the surface during late winter (USAF, 2004). Ship Creek and its floodplain above the Glenn Highway is the least disturbed portion of the creek on Fort Richardson. The Army is in the process of completing streambank restoration at four areas along Ship Creek between Glenn Highway and the ADFG Fish Hatchery (Figure 2-4).

The quality of surface water on Fort Richardson appears to be good, although localized and temporary sedimentation may have occurred (USARAK, 2001a).

3.4.2 GROUNDWATER

Two freshwater aquifers underlie most of Fort Richardson. These aquifers flow west from the Chugach Mountains to the Cook Inlet and are recharged by groundwater originating from precipitation in the mountains. The aquifers lie in different soil strata separated by an impermeable clay layer. The upper aquifer can be accessed at depths of less than 50 feet, while the lower aquifer is reached from 300 to 400 feet below the surface. Wells drilled into the aquifer can produce up to 1,500 gallons of water per minute.

Three water wells are classified as active and used regularly on an annual basis to augment water requirements on Fort Richardson and Elmendorf AFB. Water enters the aquifer for these wells by seeping through fractures in the bedrock as well as from snowmelt. Aquifers are also recharged by streams where surface water is percolated into the ground. The groundwater recharge area for the three wells is designated as the Drinking Water Protection Area, which includes an area defined by the Army as the wellhead protection zone. In this zone, voluntary protection efforts are implemented to prevent the release of contaminants that could impact the drinking water wells (ADEC, n.d.).

Industrial activities on Fort Richardson have resulted in effects on some regions of groundwater from underground storage tanks, chemical storage and chemical release. These areas are being intensively monitored in accordance with formal agreements between the Army, EPA and the State of Alaska, and there is no indication of deep groundwater contamination. Additionally, restoration projects by the Army have been undertaken to mitigate previous damage to groundwater quality (USARAK, 2001a).

3.5 Hazardous Materials and Wastes

3.5.1 Hazardous Materials

Hazardous materials (HAZMAT) are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA). Hazardous wastes (HAZWASTE) are defined by the Solid Waste Disposal Act and the Resource Conservation and Recovery Act (RCRA). In general, both HAZMAT and HAZWASTE include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released or otherwise improperly managed.

All organizations, including contractors, using HAZMAT on Elmendorf AFB must comply with AFI 32-7080, *Pollution Prevention Program,* AFI 32-7086/PACAF Supplemental Hazardous Material Management, and the Elmendorf AFB 3rd Wing Operations Plan 19-3, *Hazardous Waste, Used Oil and Hazardous Materials Management Operating Plan* (OPlan 19-3). The Environmental Flight (3 CES/CEV) manages the Base HAZMAT program and conducts routine inspections to ensure HAZMAT compliance.

Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, establishes the Army's responsibility and policy document for environmental quality. Army Pamphlet (PAM) 200-1, *Environmental Protection and Enhancement*, provides the detailed guidance to support implementation of AR 200-1. Chapter 4, Hazardous Materials Management of PAM 200-1, defines requirements and guidance for HAZMAT management at Army installations. The Hazardous Materials Control Group at Army installations implements an intensive and integrated life cycle management approach. In order to closely monitor use of HAZMAT, the Hazardous Substance Management System is used to collect HAZMAT usage and user data. Only those on the Authorized Users List (AUL) may use HAZMAT.

In 2000, the Army prepared an Environmental Management Plan (USARAK Regulation 200-1) that sets forth the environmental management system (EMS) for its installations in Alaska. The guidance identifies policy, general requirements, training and communications, emergency preparedness and response, monitoring and measurement and correction actions (USARAK, 2000a). The Army has also prepared a Hazardous Materials and Regulated Waste Management Plan that identifies responsibilities and provides procedures for identifying hazardous materials and regulated waste (USARAK, 2000b).

3.5.2 Hazardous Wastes

Unless otherwise exempted by CERCLA regulations, RCRA Subtitle C (40 CFR Parts 260 through 270) regulations are administered by the USEPA and are applicable to the management of hazardous wastes. HAZWASTE must be handled, stored, transported, disposed, or recycled in accordance with these regulations.

Elmendorf AFB has a RCRA Part B Permit (AK8570028649) and is a large-quantity HAZWASTE generator. HAZWASTEs on Elmendorf AFB are primarily from industrial activities associated with aircraft operations and maintenance. HAZWASTEs are managed in accordance with the Elmendorf AFB 3rd Wing Operations Plan 19-3, *Hazardous Waste, Used Oil and Hazardous Materials Management Operating Plan* (OPlan 19-3). The Environmental Flight (3 CES/CEV) manages the Base hazardous waste program.

HAZWASTEs are initially stored at either satellite or 90-day accumulation sites located throughout the Base. Elmendorf AFB also has one hazardous waste Treatment Storage and Disposal Facility operated

by the Defense Reutilization and Marketing Office (DRMO) located on the Base. Hazardous wastes removed from the Base must be disposed of at U.S. EPA-approved disposal facilities.

The Base conducts routine Environmental, Safety and Occupational Health Compliance and Management Program (ESOHCAMP) inspections to comprehensively evaluate its operations to identify problems and provide recommendations to remedy problem areas.

Fort Richardson has a RCRA Part A Interim Permit (AK1210022157) and is a large-quantity HAZWASTE generator, with wastes from industrial activities primarily in support of rapid deployment of troops, equipment and supplies, including vehicle and generator maintenance. Hazardous wastes are managed in accordance with USARAK Pamphlet 200-1, Chapter 5, Hazardous and Solid Waste Management.

HAZWASTEs are initially stored in satellite accumulation points and then transferred to accumulation areas. Procedures are in place for the management of HAZWASTEs in these facilities prior to transfer for disposal to the DRMO. Compliance inspections of these storage facilities are conducted on a routine basis to ensure compliance with RCRA regulations. HAZWASTE reduction strategies for Fort Richardson are defined in the installation's Integrated Solid Waste Management Plan and Pollution Prevention Plan.

3.5.3 Environmental Restoration Program

The Environmental Restoration Program (ERP), formerly known as the Installation Restoration Program (IRP), is a subcomponent of the Defense Environmental Restoration Program that became law under SARA of 1986. The ERP requires each DoD installation to identify, investigate, and remediate environmental contamination that occurred prior to 1984. The ERP is the DoD program for implementing the requirements of Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The ERP follows the CERCLA process for potential hazardous sites. The ERP was developed to:

- Identify and evaluate hazardous material disposal sites;
- Control the migration of hazardous contaminants;
- Control hazards to health or welfare that may have resulted from past disposal operations; and,
- Clean up on a "worst first" basis, contamination from past hazardous waste sites at active military installations, government owned/contractor operated facilities, and used DoD sites.

The proposed road and bridge would be located on land entirely within Fort Richardson. Fort Richardson was listed on the National Priority List (NPL) by the USEPA in 1994. By its listing on the NPL, Fort Richardson, as a Federal site, was subject to the remedial response requirements of CERCLA. In December 1994, the Army, USEPA and the Alaska Department of Conservation (ADEC) signed a Federal Facilities Agreement (FFA) where five designated Operable Unit (OU) areas have been identified on Fort Richardson. Operable Unit E (Building 35752) is within one mile of the proposed road and bridge.

Buildings 35610 and 35620 are freshwater pump stations located on the Fort Richardson property north of the Phase II PSF housing area. These buildings are pump houses used to operate water supply wells on Fort Richardson. A 600-gallon heating oil tank is located at each building; the tanks were removed and replaced in 1996. Fuel was released into soil and groundwater at the sites from underground storage tanks that had been located next to the buildings. Site assessments conducted at the time of tank removal indicated that diesel contamination was present in the soil, and a release investigation was subsequently conducted. In 1999, petroleum-contaminated soils were excavated and thermally remediated off-site. Remediated soil was returned to the site and used as backfill. After the source removals were complete, the Army monitored the sites for several years to confirm that fuel contamination in groundwater was below ADEC cleanup levels. The contaminated sites have been cleaned up and the sites closed, requiring no further remedial action (USAG, 2004). The Army is developing closure reports for these two buildings.

Buildings 35610 and 35620 are underground storage tank (UST) Two-Party Agreement sites between the Army and the State of Alaska. There are two separate two-party agreements which focus on petroleum-contaminated source areas at Fort Richardson: one for USTs; and one for petroleum source areas not

associated with USTs. The non-UST Two-Party Agreement is also known as the State-Fort Richardson Environmental Restoration Agreement. Two-Party Agreement sites are not included in the work being conducted under CERCLA. Two-Party Agreements guide the way in which the Army performs necessary site assessments, monitoring, remediation, and closure of POL-contaminated source areas not subject to CERCLA oversight.

3.5.4 PESTICIDES

The 3rd CES Pest Management Section on Elmendorf AFB is responsible for vertebrate and invertebrate pests as well as weed and insect control on Elmendorf AFB, and is accomplished in accordance with the Integrated Pest Management Plan (USAF, 2000). Pesticides, herbicides, and other similar chemicals have been used for the purpose of maintaining landscaped areas within the MFH areas on Elmendorf AFB. Minimal application of herbicides has been performed at the housing areas. When these types of chemicals have been used, their applications have been conducted in accordance with manufacturer's specifications, and have been applied by personnel properly trained in their use. No evidence of bulk storage of pesticides, herbicides, and other similar chemicals has been found at Elmendorf AFB (USAF, 2002).

AR 200-5, Pest Management, defines the Army's Integrated Pest Management program, requires the preparation of the Installation Pest Management Plan, and provides specific requirements for personnel training, recordkeeping and reporting, procurement, design of pesticide storage facilities, handling and application of pesticides, disposal of unused pesticides, contingency and readiness, health and safety, contracting, and self-help.

Fort Richardson has an Integrated Pest Management Plan, approved in 2004, that identifies pesticide reduction and basic training certification of Army and Army contractor pest control personnel. The plan includes chemical use (restricted to USEPA-approved chemicals), pesticide certification, invasive and exotic plant control, wildlife conflicts, domestic pets, insects and small mammals, beavers, moose, bears, cliff swallows, predator control, other animals, injured animals and Bird-Aircraft Strike Hazard (BASH) Management.

The proposed road and bridge site is primarily undeveloped land and pesticides are not believed to have been applied in past years. The Phase II PSF housing site was formerly a communications site with approximately 20 antennas erected on 421 acres. Soil sterilizers have been used in the existing antenna field north of Ship Creek adjacent to the proposed housing site to control vegetation under the antennas. There are no records to show if pesticides were used in the old antenna field south of Ship Creek (the proposed housing site).

3.5.5 UNDERGROUND STORAGE TANKS

Based on available documents, historical use of the site, and interviews with knowledgeable personnel, no underground storage tanks are located on the proposed road or bridge site. Underground diesel storage tanks adjacent to Buildings 35610 and 35620 were removed in 1996. One 300-gallon aboveground diesel storage tank is located at Pump House Building 35630 within the Phase II PSF housing area.

3.6 BIOLOGICAL RESOURCES

3.6.1 VEGETATION

From a regional perspective, the entire Fort Richardson area is topographically diverse with vegetation communities that include coastal salt marshes, alpine tundra, shrublands, snowbeds and meadows. Five zones of vegetation and plant habitats are present on Fort Richardson: coastal halophytic zone, lowland interior forest zone, subalpine zone, alpine zone and artificially cleared or disturbed zone. Based on vegetation mapping conducted in 1998 (USARAK, 2001a), the vegetation on the proposed road site is characterized by dry forb herbaceous, ericaceous dwarf scrub, closed needleleaf forest, open needle leaf

forest, disturbed areas and unmapped areas. The approximate elevation ranges from 300 to 225 mean feet above sea level (msl), with a western aspect. Ship Creek drains the Chugach Mountains, and empties into the Knik Arm of Cook Inlet.

Eight forest types are found on Fort Richardson: white spruce, paper birch, quaking aspen, cottonwood and balsam Poplar, black spruce, mixed spruce-hardwood, and brush. Fort Richardson does not have a significant market for forest products.

The proposed road site is located on protected forest, under the ownership of Fort Richardson. The proposed site was mature interior forest originally before it was cleared in 1973 for the construction of an Air Force antenna field and communications site. The antennas and communications system were originally constructed on both sides of Ship Creek. In the 1980s, the part of the antennas and communications system south of Ship Creek was deactivated. The antennas were removed and the land has been managed primarily for winter moose habitat. The focus has been to promote early successional hardwood vegetative growth by mechanical manipulation. This was accomplished by recycling older unproductive and overgrown vegetation by a rotary ax. Forest management activities, including timber removal activities or stand improvement/regeneration, are not planned for this site.

The proposed site for the road is a forested area that consists of mature spruce and aspen with browsed willows in the understory in and around small clearings.

3.6.2 WILDLIFE

Wildlife found on Fort Richardson includes large and small mammals, birds, fish and amphibians. Mammals found on the installation include moose, brown bear, black bear, Dall sheep, coyote, wolf, lynx, red squirrel, snowshoe hare, hoary marmot, marten, beaver, river otter, wolverine, red fox, porcupine and mink. Over 150 species of birds are reported from Fort Richardson. Ten species of fish, including five species of salmon, are found in the lakes and waterways on Fort Richardson. A fish hatchery is located on Ship Creek northwest of the proposed site for the road and bridge (Figure 2-3). An active bald eagle nest is located near Ship Creek north of the project area. Wildlife resources in the vicinity of the proposed road and bridge are shown on Figure 3-5.

Fort Richardson has the largest concentration of wintering moose in the Anchorage urban area. During the 17-year period from 1986 to 2003, the moose population on Fort Richardson has averaged 510 animals. Fort Richardson and the Alaska Department of Fish and Game manage the moose population through regulated annual moose hunts and improvement of moose browse and the clearing and rehabilitation of areas for preferred plant species. Early successional species such as birch, aspen and willow provide excellent moose habitat. Active moose habitat is managed utilizing a Hydro-Ax™ to clear mature brush and promote regeneration of browse. This method has generally helped to increase the food supply, although some areas are heavily overbrowsed (USARAK, 2001a). Overbrowsing is presumed to be a factor contributing to winter moose mortality.

The construction of security fencing on Elmendorf AFB and Fort Richardson has resulted in the elimination of portions of habitat for large mammals through exclusion. Security fencing that surrounds the runway minimizes moose-aircraft conflicts. However, security fences in other areas (i.e., east of the DoD Hospital) have resulted in separation of cows and calves, and disruption to historical movement patterns. This has resulted in incidents of moose traveling through Base gates and moose-human conflicts.

The proposed road site is composed of three types of terrestrial wildlife habitat: needleleaf forest, broadleaf forest and areas modified by humans. A variety of mammals and bird species utilize these habitat types. Moose utilize a variety of habitat types, but the critical habitat is regenerating broadleaf forests created through intentional manipulation or as a result of disturbance by man. The browse provided by this habitat is very important to moose winter survival.

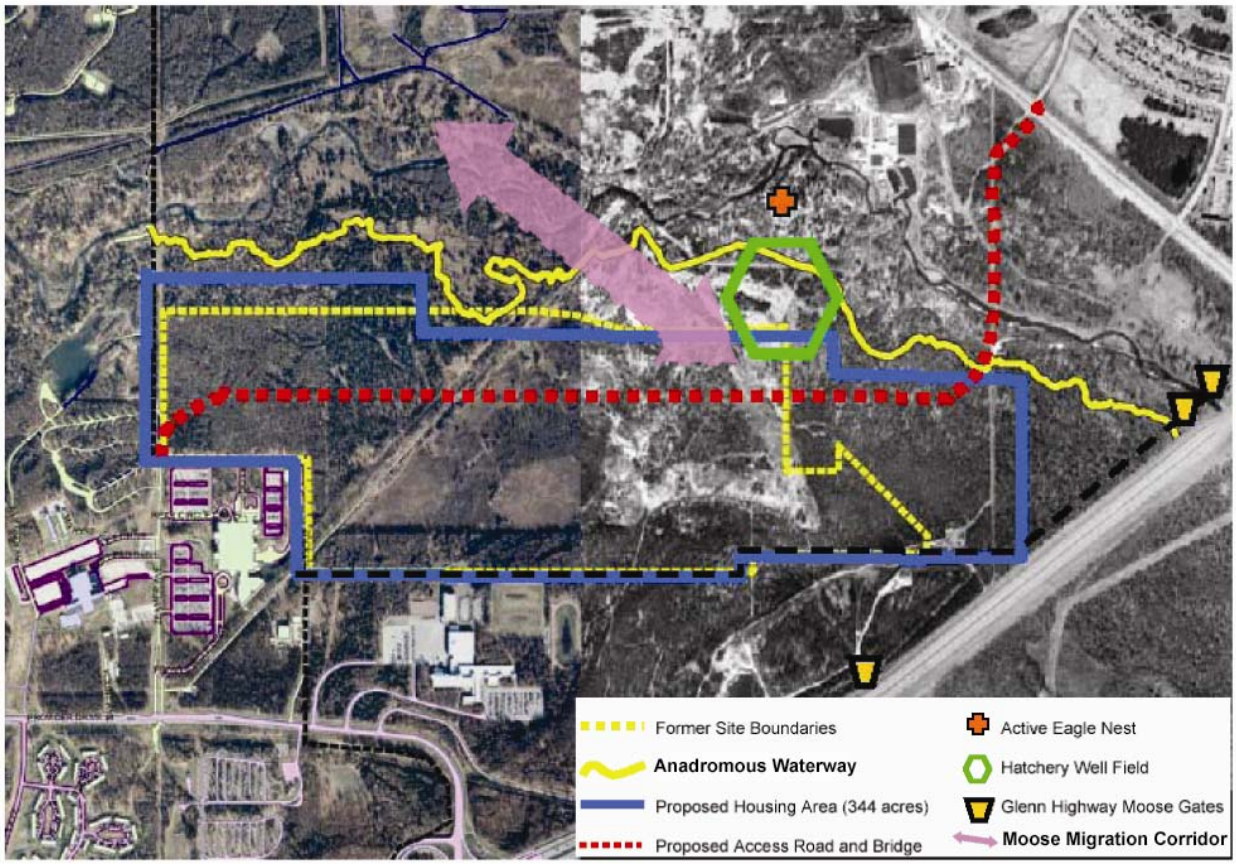


Figure 3-5. Wildlife Resources on Fort Richardson Property

The proposed road site is located entirely in an area considered to be important moose winter range within the central and south portions of Fort Richardson. It is estimated that a resident population of 140 moose is supported in this area, with a population of over 200 resident and migratory moose occurring in mid- to late-winter. The moose migration corridor in the vicinity of the proposed road is shown on Figure 3-5.

Ship Creek is an anadromous[1] waterway that provides important habitat for salmon and other resident fish species. The creek is a community fisheries restoration project managed by the Alaska Department of Fish and Game.

The proposed road site is situated between the cantonments of Elmendorf AFB and Fort Richardson. The habitat, bisected by Ship Creek, is crucial to the health and sustainability of the moose population in the southern-central portion of Fort Richardson. This area is surveyed for moose by the Alaska Department of Fish and Game and Fort Richardson on an annual basis using fixed-wing aircraft. The proposed site for the road is located within Survey Unit 8. This survey unit has supported an estimated average of 48 moose over the period 1991 through 2003, based on annual surveys. This number represents the resident moose found in this area in the early winter. Within the antenna field area bisected by Ship Creek, a total of 14 moose are estimated to occur in the 421 acres of land south of Ship Creek (Quirk, 2003).

In 1996, the DoD Hospital was constructed immediately southwest of the site on a 60-acre tract of land. To compensate for loss of habitat, approximately 25 acres of overgrown habitat in the antenna field and

[1] Migrating up a river from the sea in order to breed in freshwater.

south of Ship Creek was recycled to develop moose browse. This property is exhibiting the effects of moose overbrowsing.

Elmendorf AFB and Fort Richardson biologists, in coordination with Alaska Department of Fish and Game, have identified in excess of 300 acres of land that can be enhanced and managed as future moose habitat. These areas are prioritized by proximity and expected future value to moose. Due to different vegetation type and structure at each potential site, different treatments would be necessary to achieve ideal moose habitat. The overriding goal is long-term stability of the moose habitat by land restriction or designation. As part of its ongoing conservation effort, the Air Force is planning to construct evapotranspiration landfill covers that incorporate soil amendments and a vegetation mix that should provide desirable moose browse. A preliminary total of approximately 56 acres of landfills to be closed on Elmendorf AFB have been identified in the 2003 Evapotranspiration Landfill Cover Feasibility Study (USAF, 2003b). The Air Force is in the process of replacing 201.6 acres of moose habitat that would be lost as a result of construction of Phase II PSF housing as shown on Figure 3-6.

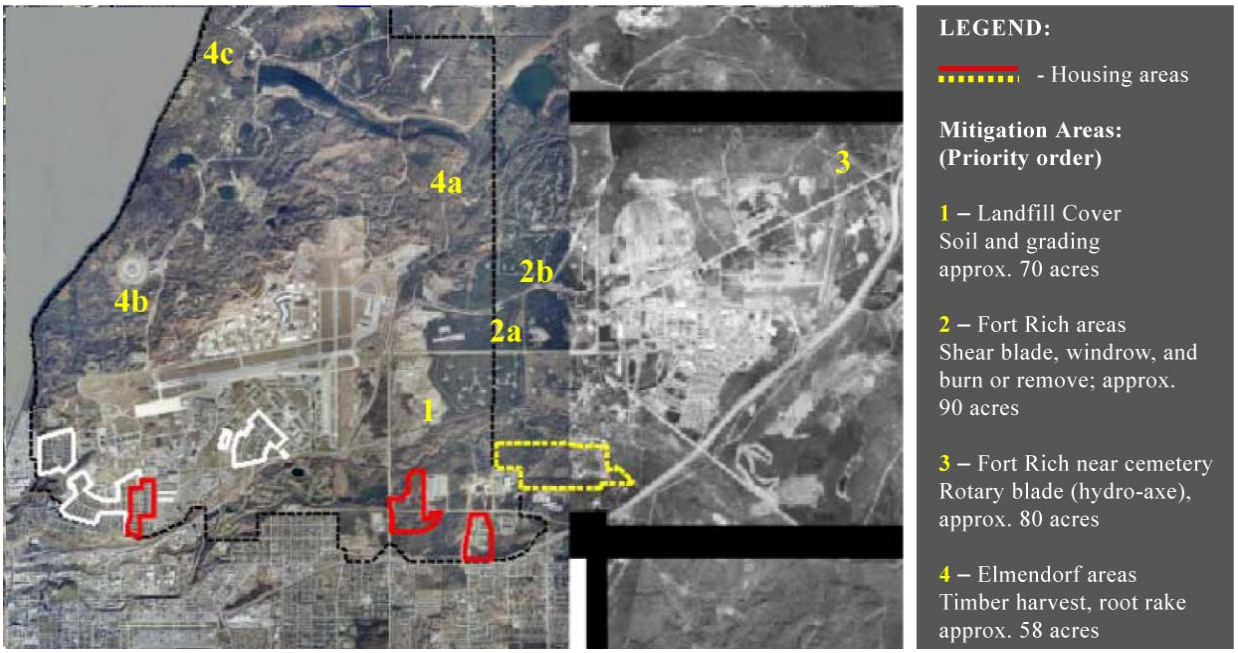


Figure 3-6. Moose Habitat Compensation for Phase II PSF Housing Area

The proposed road site is in an area that serves as habitat and an important travel corridor for bears. Black bears potentially den in the area. Large, hollow black cottonwood trees are frequently used by black bears for denning as an alternative to dens that are dug. This type of tree is common along the Ship Creek riparian zone.

Bear feeding opportunities and attractions also exist in the subject area. In addition to vegetation commonly consumed by bears, both black and brown bears will take advantage of young moose calves which are common in early summer within the site. If future management of the Ship Creek fishery allows for the upstream escapement and spawning of salmon, both species of bear will have a strong attraction to the area for feeding. Currently, only a rare salmon escapes above the Elmendorf fish hatchery dam to make its run upstream to spawn. There is local civic interest to encourage state managers to facilitate the passage of salmon up Ship Creek to produce a more natural system. As evidence to the potential attraction by this new run of salmon, Cottonwood Park, east of Ship Creek and within the proposed road corridor, is frequently visited by black bears seeking food from picnickers and garbage receptacles.

The Ship Creek riparian zone is an important wildlife travel corridor. The Glenn Highway wildlife underpass was designed to accommodate wildlife passage and may serve to funnel bears and other

wildlife onto a narrow strip of vegetation along both banks of Ship Creek. Bears likely use the corridor to travel between both sides of the highway. The thick undergrowth along the creek provides bears a secure area to travel, rest, feed or access nearby food sources.

The high potential and current frequency for bear-human conflicts in the Anchorage Municipality, which includes Elmendorf AFB and Fort Richardson, prompted the formation of the Anchorage Bear Committee. The committee is made up of biologists and land management representatives from the state, municipality, military installations and interested citizens. The committee's goal is to develop an urban bear management plan that includes bear awareness by the public, waste management practices that minimize the creation of bear attractants, and identification and protection of important bear habitat and travel corridors. As participants in the committee, the Air Force and Army are expected to enact the plan on each installation.

3.6.3 Threatened and Endangered Species

No federally listed threatened or endangered wildlife species inhabit Fort Richardson. The peregrine falcon (*Falco peregrinus anatum*), delisted in 1999, is known to over-fly the areas during migration and has been verified at Eagle River Flats. One known nesting site has been found in the project area (Figure 3-5). The bald eagle (*Haliaeetus leucocephalus*), a threatened species in other states, is afforded special protection under the Bald Eagle Protection Act and state law. This species is common on Fort Richardson. Trumpeter swan (*Cygnus buccinator*) and golden eagle (*Aquila chrysaetos*) are of special concern for wildlife management on Fort Richardson. Trumpeter swan is the world's largest waterfowl species and a migrant on the installation. The golden eagle is a resident of alpine habitats on Fort Richardson (USARAK, 2001a).

The Canada lynx (*Lynx canadensis*) has been listed as threatened in the Lower 48 states. The lynx, a common furbearer in Alaska, is generally considered to be cyclic, following the cyclic high and low populations of showshoe hare, its primary prey species. When snowshoe hare are abundant on Fort Richardson lynx can be common.

State of Alaska Species of Concern that may occur in the project area include five species of birds. The habitat of each of these species is described in Table 3-3. Alaska Species of Concern shown on Table 3-3 are not expected to nest in the area but may forage in trees and shrubs as they pass through during migration. The olive-sided flycatcher and blackpoll warbler are nesters in appropriate habitat on Elmendorf AFB and Fort Richardson. The proposed road site may provide marginal habitat for the blackpoll warbler. Proposed moose habitat replacement sites that include stands of black spruce may provide nesting habitat for the olive-sided flycatcher. These species also fall within the jurisdiction of the Migratory Bird Act.

The Elmendorf AFB Integrated Natural Resources Management Plan identifies species of special interest on the Base. In addition to threatened and endangered species, a number of key species have been identified. Key (or keystone) species are indicator species whose populations and health can be used as indications of overall ecosystem health. On Elmendorf AFB, moose and snowshoe hare are key species for terrestrial habitats in the boreal forest ecosystem. Key species for wetlands are beaver and selected passerines. Plant indicator species in wetland ecosystems include willow, alder, devil's club and early seral stages of aspen (USAF, 2000).

Two plant species on the federal endangered list occur in Alaska, neither of which is found on Fort Richardson. One former candidate category 2 species, *Taraxacum carneocoloratum*, has been found in alpine areas of the Chugach Mountains. A total of 22 vascular plant species of concern are known to occur on Fort Richardson. Many of these species are alpine natives that would not be expected to occur on the southern portion of the installation.

Table 3-3. Alaska Species of Concern in the Project Area

Common Name	Scientific Name	Habitat
Olive-sided flycatcher	*Contopus cooperi*	Coniferous forests and forested wetlands. Nests in conifers. Recorded as uncommon breeder during summer 2003.
Gray-cheeked thrush	*Catharus minimus*	Mixed deciduous-coniferous woodlands, shrub thickets, coniferous forests. Forages for food in open areas near thickets and on the tundra. Nests in bushes or low trees. Not recorded as nester on Elmendorf AFB
Townsend's warbler	*Dendroica townsendi*	Coniferous forests, mixed deciduous-coniferous woodlands. Rare migrant on the Base.
Blackpoll warbler	*Dendroica striata*	Coniferous forests, mixed deciduous-coniferous woodlands, shrub thickets. Nests in small conifers or on the ground under conifers. Recorded as uncommon breeder during summer 2003.
American peregrine falcon	*Falco peregrinus anatum*	Open country, especially shores in marshes frequented by waterfowl and shorebirds, as well as cliffs on the islands, along the coast and in the mountains. Nests on cliff edges. Migrates through the Elmendorf AFB area.
Source: USAF, 2001; Griese, 2004		

3.6.4 WETLANDS

Executive Order 11990 (Protection of Wetlands) defines jurisdictional wetlands to generally include swamps, bogs and similar areas such as sloughs, mud flats and natural ponds that are inundated by surface or groundwater with a frequency sufficient to support prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Permanent water such as streams, reservoirs and deep lakes are not considered to be wetlands.

Freshwater and saltwater marshes, bogs, lakes and lake margins and riparian areas are found on Fort Richardson. National Wetlands Inventory (NWI) mapping of Fort Richardson was completed in 1978 and revised in 1996. The proposed road to be constructed would cross wetlands associated with Ship Creek. Wetlands in the area of the proposed road and bridge on Fort Richardson have been formally delineated as jurisdictional wetlands as defined under Section 404 of the Clean Water Act.

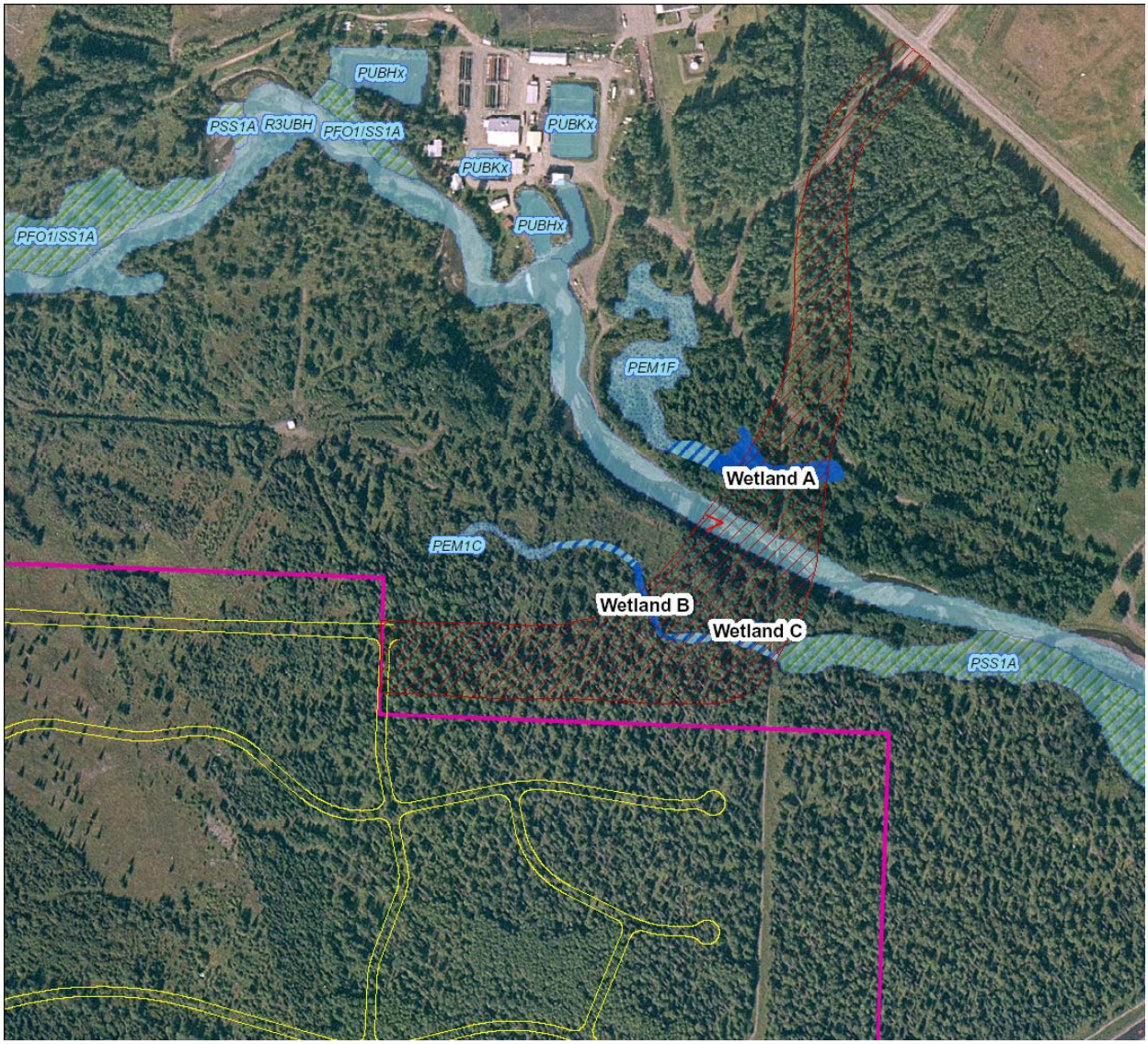
Wetland delineation for the proposed road site conducted in June 2004 identified two wetlands associated with Ship Creek. The field reconnaissance of the site indicated positive hydrophytic vegetation, hydric soils and wetland hydrology. These three physical parameters determine the presence of wetlands.

Three distinct wetlands were identified: Wetland A north of Ship Creek; Wetland B south of Ship Creek, and Wetland C east of Wetland B (Figures 3-7 through 3-9). Wetlands on the site appear to be limited to within approximately 200 to 300 feet of Ship Creek, which is identified from National Wetland Inventory (NWI) mapping as Riverine, Unconsolidated Bottom, Permanently Flooded Wetland Area (R3UBH). The NWI classification is based on interpretation of aerial photographic data and topographic maps limited to the time of production and may not reflect recent changes in physical conditions. The hydrology of both wetland areas appears to originate from runoff from the headwaters of Ship Creek in the Chugach Mountains, and shallow groundwater conditions. Both wetlands provide functions related to water quality improvement and habitat for wildlife. The wetlands appear to be part of the hyporheic zone[1] present in the natural hydrology of Ship Creek. These wetlands appear to have developed in depressions and floodplain channels where water is either shallow or exposed to the surface during periods of high water (GeoEngineers, 2004). A summary of NWI classifications and wetland parameters based on field observations of wetlands in the project area is provided in Table 3-4.

[1] The saturated zone under a river or stream, comprising substrate with the interstices filled with water.

Figure 3-7. Pond on Western Portion of Wetland A

Figure 3-8. Large Ponded Area on Eastern Portion of Wetland B (East of Footbridge)



Legend

- Proposed Ship Creek Bridge Crossing
- Proposed Roadways

July 2004 Wetlands Delineation

- *Wetlands within 100-ft of proposed bridge crossing*
- *Wetlands included in GEI survey not listed on NWI*

National Wetlands Inventory

- *Freshwater Emergent Wetland*
- *Freshwater Forested/Shrub Wetland*
- *Freshwater Pond*
- *Lake*
- *Riverine*
- *Other*
- Phase II PSF Housing Boundary

Notes:

Data Sources:
- 2004 Wetland Survey data, Nebraska Site Boundaries and proposed subdivision linework from Lounsbury and Associates.
- Wetlands boundaries downloaded from the National Wetlands Inventory, date unknown, and may not match with aerial coverage. Wetland definitions (i.e. PEM1C) can be found on www.nwi.fws.gov/mapcodes.htm.
- Aerial photograph from Lounsbury and Associates, date unknown.

Coordinate System:
NAD27 UTM Zone 6N

Feet
0 250 500

N

Source: GeoEngineers, 2004

Figure 3-9. Wetlands in the Vicinity of Ship Creek, Fort Richardson

Table 3-4. Wetlands in the Project Area

Area	NWI Classification	Field Observations (June 2004)	
		Description	Estimated Size
Wetland A	The western portion of Wetland A is classified as PEM1F (Palustrine, Emergent, Persistent, Semipermanently Flooded)	Largely wooded with a large ponded area along the west boundary of the wetland. This ponded area is part of the hyporheic zone, with observed flow patters connecting to Ship Creek, as the creek turns north, to the west of the pond. Several other small ponded areas are present throughout Wetland A. Dominant vegetation includes thin-leaf alder, devil's club and field horsetail.	39,854 sq ft (0.91 acre)
Wetland B	The eastern portion of Wetland B is classified as PSS1A (Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Temporarily Flooded). The western connection is identified as PEM1C (small Palustrine, Emergent, Persistent, Seasonally Flooded).	A narrow depressional area with exposed water demonstration flow characteristics of the hyporheic zone associated with Ship Creek. Large ponded area east of the footbridge and utility corridor was likely connected to this wetland area before separation of the corridor by addition of fill material. Another ponded area with standing water was observed in an apparent side channel or exposed area of the hyporheic zone. Dominant vegetation includes thin-leaf alder, cottonwood, lady fern, highbush cranberry, tuberous spring beauty and marsh fivefinger.	7,142 sq ft (0.16 acre)
Wetland C	(Not classified)	Area of standing water consisting of part of an old channel bed; dominant plants are thin-leaf alder, cottonwood and devil's club.	200 sq ft (0.005 acre)
		Total	**47,196 sq. ft (1.075 acre)**

Source: GeoEngineers, 2004; PND Incorporated, 2004
[1] Reflects estimated size of this wetland area from the proposed bridge alignment and

The Army has prepared a Wetlands Management Plan that includes an environmental limitations overlay for summer and winter land use. The designations indicate significant or minor limitations of activities that will be allowed in training areas on Fort Richardson. The Ship Creek corridor is designated in the Wetlands Management Plan as having significant limitations or restrictions. Notification to the Army Range Control for use of this area is required, limitations are imposed on stream crossings, and construction activities are restricted. The proposed site is located on either side of Ship Creek, and the road would require crossing of Ship Creek.

The Ship Creek Riparian Area is a special interest management area that is considered an important or fragile natural area. This area was identified in the USAG-AK INRMP because it warrants special conservation efforts, in accordance with AR 200-3. The Ship Creek Riparian Area is an approximately 0.5-kilometer corridor along the course of Ship Creek that spans Fort Richardson. Ship Creek and its riparian habitat are important and sensitive areas that require protection to insure maintenance of its health and natural function. Water quality of Ship Creek is important because any deterioration will affect downstream locations. Development is not planned to occur in riparian areas. Tree cutting will be minimized. Troops and other authorized users will continue to have pass-through access (USARAK, 2001a).

3.6.5 FLOODPLAINS

As defined in Executive Order 11988 (Flood Plain Management), floodplains are lowland and relatively flat areas adjoining inland and coastal water that would be inundated by a 100-year flood. Federal agencies are required to reduce the risk of flood loss to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

The only 100-year floodplain on Elmendorf AFB is associated with Ship Creek, a tributary of the Knik Arm. The Ship Creek 100-year flood plain travels through approximately four miles of Elmendorf AFB and drains approximately 5,000 acres. In recent years, this area has flooded resulting in damage to stream channelization structures near the golf course. Ship Creek has not experienced a 50-year flood since 1990 (USAF, 1998a).

The floodplain associated with Ship Creek in the vicinity of the proposed road and bridge on Fort Richardson was studied in 2004 in order to determine the 100-year water surface elevation in the area. Ship Creek is typically confined by high ground near the banks of the active channel. This high ground forms a levy to generally confine the flow in the channel, particularly upstream of the weir. The channel upstream of the weir has been straightened leaving remnant channels and sloughs outside of the main channel. The natural formed surface and remnant channels outside the high ground bordering the channel can be at an elevation equal to or near the base of the active Ship Creek channel. If water has a path into these areas, they will flood. Based on review of existing topographic features and elevation data and the roughness of the ground, it does not appear that a significant portion of the flow will pass through these areas. The amount of water that enters these areas will be a function of the duration of the high water and topographic conditions which are not well defined. Areas below the given water surface elevation will flood under prolonged, steady-state conditions (Shannon & Wilson, Inc., 2004). The estimated extent of inundation is shown in Figure 3-10.

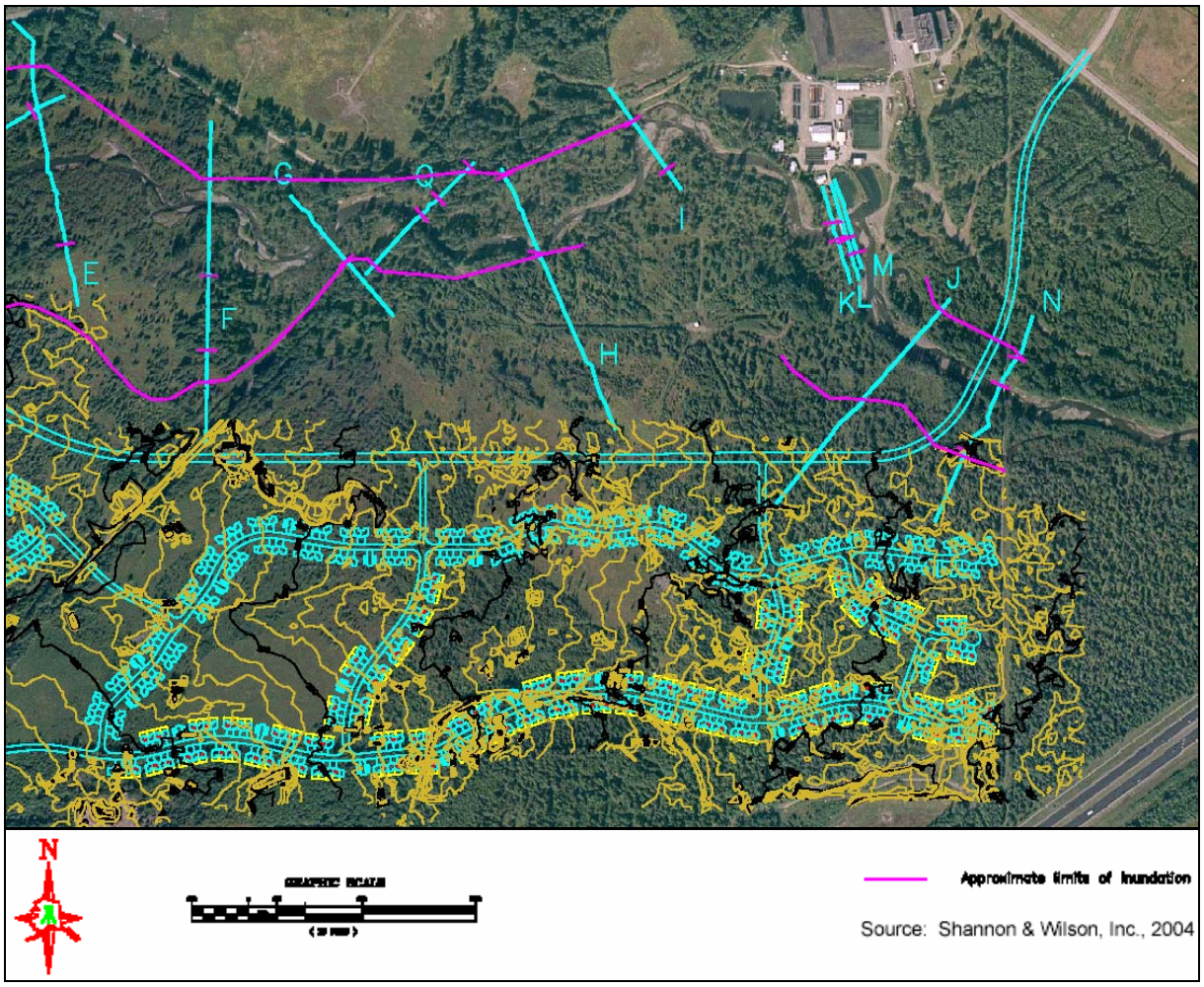


Figure 3-10. Estimated Limits of Inundation in the Vicinity of Ship Creek, Fort Richardson

3.7 CULTURAL RESOURCES

Cultural resources are defined as any historic, archaeological and Native American properties of interest or artifacts (USAF, 1994). Historic properties, under 36 CFR 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places" (NRHP). The term "eligible for inclusion in the National Register" includes both listed and eligible properties that meet NRHP listing criteria as found in 36 CFR Part 60.

The Air Force has prepared an Integrated Cultural Resources Management Plan (ICRMP) for Elmendorf AFB as part of the Base General Plan. The five-year plan, for fiscal years 2002 through 2006, provides for effective management of cultural resources on the Base (USAF, 2003a).

The Army has prepared an Integrated Cultural Resources Management Plan for Fort Richardson for 2002 through 2006. The plan provides guidance and procedures to enable USARAK to meet its legal responsibilities at Fort Richardson for identification, evaluation and protection of cultural resources while causing the least disturbance to the military mission (USARAK, 2001b).

3.7.1 ARCHAEOLOGICAL RESOURCES

A total of 27 archaeological sites have been identified on Elmendorf AFB property. These sites include concrete bunkers and pits, military defensive sites, homesteader cabin remains, possible Native Alaskan/traditional cache pits, military ground defensive positions, a borrow pit/landfill and a rail spur. Four of these sites (homesteader or log cabin ruins) were recommended for further archaeological study to determine their eligibility for the National Register, and are considered potentially eligible for listing. Six other sites appear to be ineligible although further archival study was recommended (USAF, 2003a).

Only limited portions of Fort Richardson have been surveyed for archaeological resources. Five known archaeological sites exist on the 61,000 acres of Fort Richardson. The installation has a relatively low potential to contain prehistoric sites. Only one of the five identified sites has a prehistoric component. All five sites have been determined ineligible for the National Register (USARAK, 2001b). None of the sites are located on or near the proposed road.

In 2002, the Army conducted a cultural resources survey for the power line road located in the area of the Phase II PSF housing southeast of the proposed road. No archaeological resources were identified during this survey.

Five areas on Fort Richardson have a relatively high potential to contain archaeological resources: the mouth of Eagle River; the shoreline of Knik Arm; upstream portions of Ship Creek south of Glenn Highway; the Fossil Creek drainage; and, the Elmendorf Moraine. The proposed site for the new access road and bridge is not located in any of these areas with high archaeological sensitivity.

The proposed road and bridge would be located within Training Area 15, a relatively small and isolated training area south of the cantonment. The training intensity in Training Area 15 is considered low. No known archaeological sites have been identified on the proposed site for the access road.

In 2003, the Army conducted a cultural resources survey and shovel probing of the proposed streambank rehabilitation areas along Ship Creek between the Glenn Highway and the ADFG fish hatchery. No cultural material was observed during the pedestrian survey and shovel probing in this extensively disturbed area. The Army determined that impacts to any cultural resources in the area from streambank restoration work would be minimal as a result of heavy equipment use and installation of rootwads for erosion control purposes. The Army determined that any impacts to undisturbed ground would be minimal, and that the project would have no effect on archaeological resources. Due to the high probability of finding cultural material at Ship Creek, it was recommended that an archaeological monitor be on site during ground disturbing activity (USAG, 2003).

3.7.2 Historic Resources

The proposed road and bridge would be located entirely on Fort Richardson. Therefore, historic resources on Elmendorf AFB are not discussed in this evaluation.

Two properties on Fort Richardson are listed on the National Register of Historic Places. Nike Site Summit Historic District and the Fort Richardson National Cemetery were placed on the National Register of Historic Places in 1996 and 1984, respectively.

The Army identified 46 properties on Fort Richardson that are 50 years of age or older. These structures were constructed in the 1940s and include officers' quarters, warehouses, igloo storage and vehicle maintenance structures. The Army is in the process of inventorying and documenting these properties to determine eligibility for the National Register. In early 2003, the Army completed a study on the Cold War context for Fort Richardson to provide guidelines for evaluation of Cold War historic properties on the installation (USARAK, 2003).

Three water well and pump buildings (Buildings 35610, 35620 and 35630) are located on Fort Richardson in the vicinity of the proposed road. Bldg 35630 is located within the Phase II PSF housing area. These utility buildings were constructed from 1957 to 1958, and have not been formally inventoried or identified as eligible for the National Register (USARAK, 2003).

Several abandoned building foundations, a buried building and a concrete bunker are also present in the area. These structures have not been evaluated for historic significance. The year of construction of these structures is not known, and these buildings have not been formally inventoried or identified as eligible for the National Register (USARAK, 2003).

The Alaska SHPO issued a "No Historic Properties Affected" for the Ship Creek streambank rehabilitation project on August 5, 2003 (USAG, 2003).

3.7.3 Traditional Cultural Resources

Fort Richardson lies within the traditional lands of the Denaina Athabaskans. Two federally recognized tribes are located near Fort Richardson: the Native Village of Eklutna and the Knik Village.

3.8 Geological Resources

3.8.1 Physiography and Geology

Geology of the Fort Richardson area was shaped by the formation of the Chugach Mountains in the late Paleozoic and Mesozoic Eras and the subsequent flow of sediments into lowlands during the Tertiary period. Bedrock of metamorphic rocks of the McHugh complex is found in the Chugach Mountains. This bedrock in lowlands rarely surfaces due to its cover of thick deposits of unconsolidated material that accumulated during the Holocene Period. Fort Richardson straddles both the alluvial fan of the Anchorage plain and the moraine and glacial alluvium complex near the shore of Knik Arm. The gravel alluvium of the Anchorage plain underlies the main cantonment (USARAK, 2001a).

The surface geology in the area of the site is composed of glacioalluvial and other related alluvial and deltaic deposits. An area of estuarine and glacioestuarine deposits is also found in this location.

The Fort Richardson area is seismically active and has experienced at least nine major earthquakes in the last 85 years. The area has experienced tremors and ash fall from volcanic eruptions of Mount Spurr, Mount St. Augustine, and Mount Redoubt since 1954. Two faults border Anchorage: the Border Ranges Fault bisects Fort Richardson; and another fault in the Chugach Mountains skirts the Ski Bowl area of Fort Richardson (USARAK, 2001a).

3.8.2 TOPOGRAPHY

Fort Richardson lies between the Turnagain Arm and the Knik Arm of the Cook Inlet in a roughly triangular-shaped lowland. To the east, the Chugach Mountains rise abruptly to elevations over 5,000 feet. From an elevation of 1,000 feet at the base of the mountains, the land declines into the Anchorage plain to the coast. The Anchorage Plain is a glacial moraine that extends from the mountain front westward and northwestward. Steep bluffs, broken only by principal streams such as Eagle River, characterize the edge of the plain as it drops sharply to the sea (USARAK, 2001a).

3.8.3 SOILS

Soils on Fort Richardson are shallow, immature and deficient in primary plant nutrients, especially nitrogen and phosphorous. Soils often exhibit low water retention capability. In depressions and saturated areas, such as wetlands, surface horizons may be covered with peat (partially decomposed herbaceous vegetation) (USARAK, 2001a).

Soils on the site for the proposed road are associated with the Moose River-Niklason complex. Moose River is listed as hydric on the hydric soils of Alaska list. Moose River series covers 50 to 90 percent of the map unit and Niklason series covers 10 to 30 percent, respectively. Moose River is a very poorly-drained silt loam with moderate permeability grading to gravelly sand with rapid permeability from 50 to 60 inches below ground surface (bgs). Niklason is a moderately well-drained silt loam with moderately rapid permeability grading to gravelly sand with moderate permeability from 28 to 60 inches bgs. Both soil series are listed as prone to flooding and high water tables (i.e., water within 6 inches of the ground surface) (GeoEngineers, 2004).

3.9 TRANSPORTATION SYSTEMS

Access to Fort Richardson and Elmendorf AFB is provided through five entrance gates:

- Boniface (Main) Gate located off Glenn Highway (primary access into Elmendorf AFB);
- Muldoon Gate serves the east and Hospital vicinities;
- Post Road Gate located to the west of Boniface Gate;
- Government Hill Gate serves as the western point of access into a residential area; and,
- Fort Richardson Main Gate located off the Glenn Highway (primary access into Fort Richardson).

The Glenn Highway is a major arterial connecting Fort Richardson and Elmendorf AFB to the greater Anchorage area. Glenn Highway bisects Fort Richardson through the center of the installation. As the primary access to the installation, the Glenn Highway is the most heavily used highway in the State, connecting south-central Alaska to the Matanuska Valley. The Glenn Highway experiences up to 50,000 vehicles per day in each direction between Muldoon Road and Boniface Parkway.

Table 3-5. Average Daily Traffic Counts Near Elmendorf AFB

Intersection		Data Year	ADT
North/South Street	East/West Street		
Boniface Parkway	Debarr	2002	48,400
Boniface Parkway	Glenn Highway	2003	20,500
Muldoon Road	Boundary	2003	34,800
Source: Municipality of Anchorage, 2002 and 2003			

Average daily traffic is a measurement of the total volume of traffic for a 24-hour period calculated to represent an average day. The average daily traffic (ADT) on roadways in the vicinity of the proposed new access road is shown on Table 3-5. Projected ADT for roadways at four locations near Elmendorf AFB are shown on Table 3-6.

Table 3-6. Projected Average Daily Traffic for Roadways Near Elmendorf AFB

Location	2003	2004	2005	2006	2007
Boniface Parkway south of Glenn Highway	20,026	20,626	21,245	21,883	22,539
Muldoon Road south of Glenn Highway	30,131	31,035	31,966	32,925	33,913
C Street south of Government Hill Gate	12,572	12,949	13,337	13,737	14,149
A Street south of Government Hill Gate	7,790	8,024	8,265	8,513	8,768
Source: USAF, 2004					

Roadways in the area of Arctic Warrior Drive and the Davis Highway have become congested and are a hindrance to the flow of traffic on Elmendorf AFB. This congestion typically coincides with the daily working hours of personnel on Elmendorf AFB (USAF, 2004).

Access to the Phase II PSF housing area is via the existing Grady Highway which connects to the northeast corner of the Joint Community Complex adjacent to the DoD Hospital.

In addition to vehicular roadways, the Alaska Railroad traverses the eastern portion of Elmendorf AFB north of Ship Creek. The Denali Star Train crosses Davis Highway each day on its route between Anchorage and Wasilla. In winter and summer, 8 and 20 trains cross Davis Highway each day, respectively, at this location. There are 12 crossings per day in April/May and in September/October.

A traffic engineering study for Elmendorf AFB was conducted in 1998 to identify new access road alternatives for the Joint Mobility Center, Community Center and additional housing. Operational and physical improvements to the roadway network were recommended in order to accommodate the increase in military personnel on Elmendorf AFB and Fort Richardson (USAF, 1998b). The 1998 study identified specific improvements to Davis Highway to reduce safety hazards. In addition, the calculated Level of Service (LOS) for many of the roadways in the Community Center area and Davis Highway, were determined to be at unacceptable levels.

Roadway improvements in the vicinity of the Boniface Gate have included:

- realignment of the intersection of Vandenberg Avenue and Arctic Warrior Drive;
- construction of the new Boniface Gate;
- realignment of the intersection of Vandenberg Avenue and Provider Drive; and,
- closure of the intersection of Talley Avenue and Arctic Warrior Drive.

The Air Force is in the process of evaluating current traffic conditions for area roadways and access gates.

3.10 SAFETY

The primary safety considerations for the Proposed Action would be factors relevant to placement of a new access road on an existing military installation. Safety considerations are limited to:

- health hazards associated with exposure to electric and magnetic fields (EMF) due to the proximity of the proposed site to antenna facilities on Elmendorf AFB and Fort Richardson;
- placement of a new road near existing ordnance storage;
- placement of a new road in or near the existing Airfield Clear Zone; and,
- placement of a new road in areas used by large mammals for crossings.

Antenna Facilities. The proposed site for the new access road and bridge is located approximately 0.5 mile southeast of the active antenna field managed by the 3rd Communication Squadron on Elmendorf AFB. The antenna field has various high frequency, long range omnidirectional antennas that emit signals in all directions.

Explosives Storage. The storage of explosive material (i.e., ordnance) is located northwest of the proposed access road and bridge. Ammunition Storage Area A is located approximately 1.5 mile north of Ship Creek. Ammunition Storage Area B is located less than a mile northwest of the proposed access road. Ammunition storage areas are managed by the Air Force and Army in accordance with DoD safety standards for ordnance storage. These standards apply to DoD ammunition and explosives facilities, and are designed to provide protection against serious injury, loss of life and damage to property. Explosive storage areas are shown on Figure 3-11.

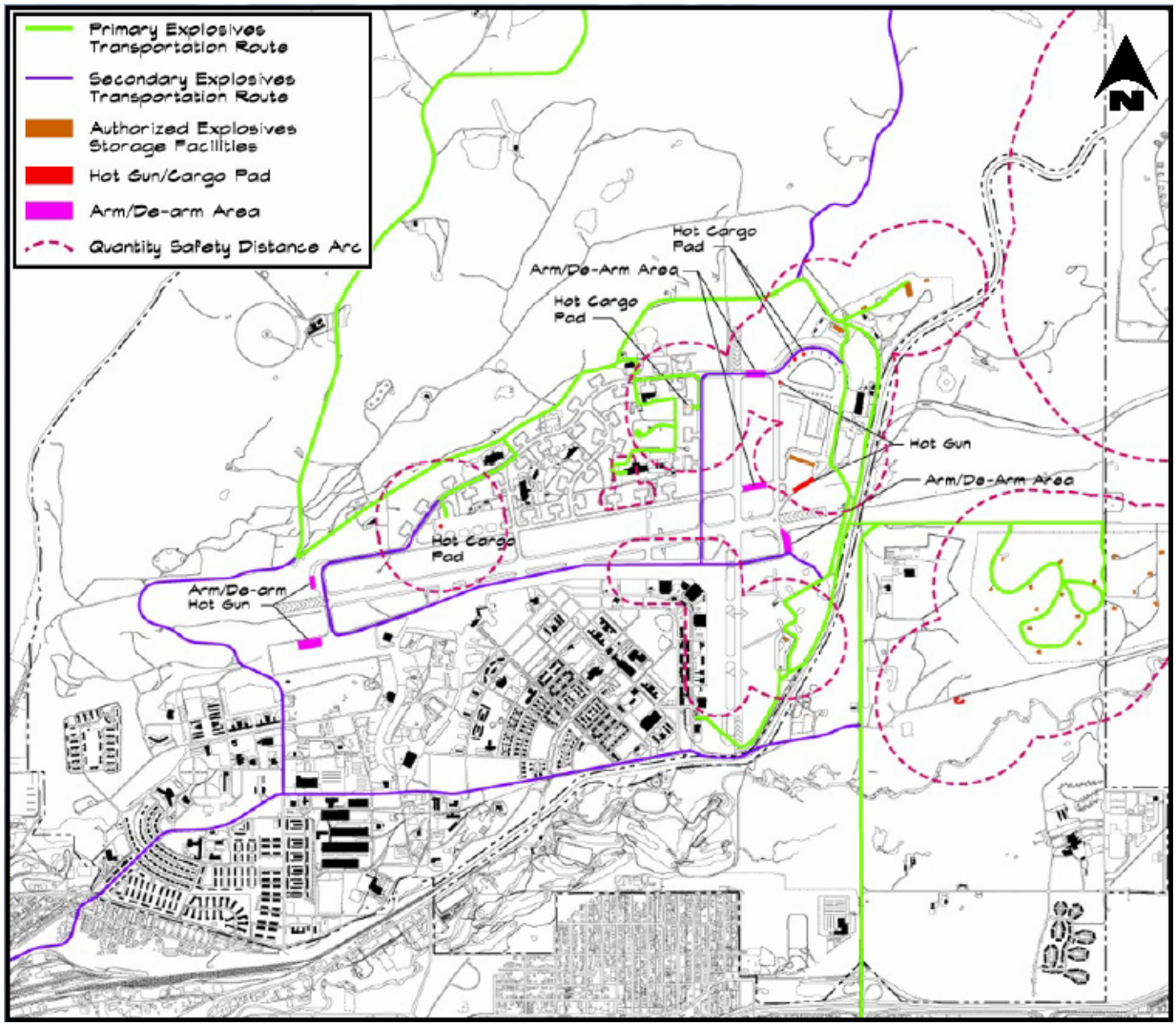


Figure 3-11. Explosives Storage Areas on Elmendorf AFB

Airfield Clear Zone and Accident Potential Zones. The Airfield Clear Zone (CZ) for the Elmendorf AFB runway starts at the end of the runway and extends outward 3,000 feet and is 3,000 ft wide feet beyond the end of the runway as shown on Figure 3-12. This figure also shows Accident Potential Zones (APZ) which extend an additional 5,000 ft from the CZ (for APZ I) and 7,000 ft from APZ I (for APZ II). Davis

Highway and portions of Vandenberg Avenue are located within the runway CZ and APZ I. The proposed access road alignment south of Davis Highway would not overlay the airfield CZ or any APZ.

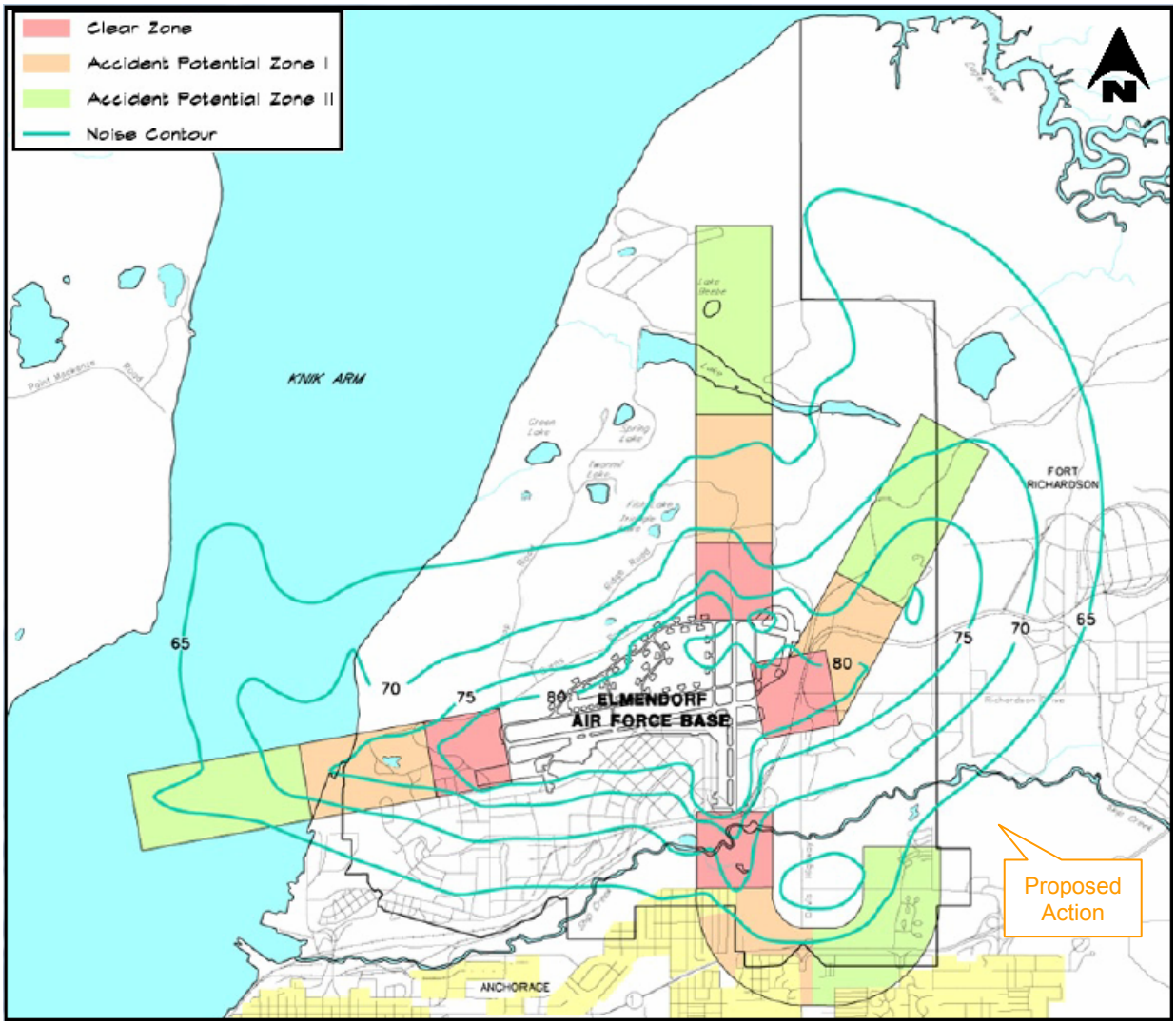


Figure 3-12. Runway Clear Zones and Accident Potential Zones on Elmendorf AFB

Large Mammal Crossing Areas. The proposed site for the access road is within moose habitat. Both moose and bear have been observed in the area. The primary response to nuisance, injured or dangerous wildlife on Elmendorf AFB lands has been delegated to 3 CES/CEVP military conservation agents by the Alaska Department of Fish and Game and 3rd Wing Commander. Wildlife (i.e., large mammal) conflicts on Fort Richardson are handled by USAG-AK Natural Resources and the Provost Marshal's Office.

3.11 Storm Water Management and Water Quality Requirements

A significant portion of the annual precipitation in Anchorage occurs as snowfall (average annual snowfall is 61 inches). Under typical rainfall conditions, storm water runoff from Fort Richardson, as a whole, is low. Due to the relatively flat topography, vegetated areas and general permeable soils in the area, much of the non-snowmelt runoff infiltrates before it can reach a surface water body.

Storm water drainage systems and management practices are in place for industrial areas within the Fort Richardson cantonment. These areas drain to a culvert at Richardson Drive and Arctic Valley Road where storm water is discharged to an unlined, open ditch that leads to Ship Creek. This drainage ditch intersects with the ditch at Arctic Valley Road and First Street which drains the southeastern portion of Fort Richardson. Storm water runoff from golf course maintenance facilities may have the potential to also reach Ship Creek.

Storm water is managed on Fort Richardson in accordance with watershed management goals for surface water management, groundwater management and erosions control. Surface water management consists of protecting creeksides, stream banks and areas immediately adjacent that are easily damaged. Erosion is currently not a significant threat to water quality and the Land Rehabilitation and Management (LRAM) Program further guards against future threats (USARAK, 2001b).

Erosion control and stream bank stabilization on Fort Richardson is required in accordance with Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal Legislative Environmental Impact Statement (LEIS) and Public Law 86-797 (Sikes Act) which implements the INRMP. On Fort Richardson, road drainage is often inadequate for proper distribution of runoff. Road damage can occur in a short period of time, especially during spring breakup. The repair of erosion sites along Ship Creek is an ongoing activity at Fort Richardson (USARAK, 2001b).

There are two storm water outfalls that discharge to Ship Creek. Outfall 1 discharges to Ship Creek southwest of the main cantonment on Fort Richardson, approximately 2,000 ft west-southwest of the Power Plant (Building 36012). Most of the main cantonment, including regulated facilities, drain to Outfall 1. In accordance with the Storm Water Pollution Prevention Plan for Fort Richardson, both outfalls are considered the points of compliance for the installation and facilities up-drainage from their outfalls. Both outfalls area designated locations for storm water pollution prevention monitoring.

3.12 Site Contamination Control

The Air Force has taken a proactive and dynamic role in developing a pollution prevention (P2) program to implement the regulatory mandates in the Pollution Prevention Act of 1990; Executive Order (E.O.) 12856 Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements; E.O. 12873 Federal Acquisition, Recycling, and Waste Prevention; and E.O. 12902 Energy Efficiency and Water Conservation at Federal Facilities. The Air Force P2 program incorporates the following principles in priority order:

- Generation of hazardous substances, pollutants, or contaminants will be reduced or eliminated at the source whenever feasible (source reduction).
- Pollution that cannot be prevented will be recycled in an environmentally safe manner.
- Disposal, or other releases to the environment, will be employed only as a last resort and will be conducted in an environmentally safe manner, according to regulatory guidance.

AFI 32-7080, *Pollution Prevention Program*, dated 12 May 1994, provides the directive requirements for the Air Force P2 program. AFI 32-7080 incorporates by reference applicable Federal, DoD, and Air Force level regulations and directives for pollution prevention. The requirements of AFI 32-7080 have been incorporated into a Pollution Prevention Management Action Plan (P2 MAP) for Elmendorf AFB. The P2 MAP is used to manage the actions needed to develop and execute an installation's P2 program. P2 MAPs are based on recurring opportunity assessments designed to continually evaluate an installation's success in achieving pollution prevention at the highest level in the hierarchy of action. The P2 MAP incorporates management strategies for meeting the goals of the program elements of the Air Force P2 program. These elements address reduction and elimination of ODS, EPA 17 industrial toxics, hazardous waste, solid waste, recyclable materials, and energy conservation.

The Army's P2 program is defined in PAM 200-1, Chapter 10, Pollution Prevention, and was also developed to comply with the Pollution Prevention Act of 1990 and E.O. 12856. The Army's P2 program within an installation consists of, but is not limited, to the following elements:

- A P2 management structure composed of a P2 coordinator, a steering group, and working teams;
- A baseline year and baseline tracking to determine reductions;
- Pollution Prevention Opportunity Assessments (PPOA) to identify processes where P2 can be applied;
- P2 goals as they relate to pollution reduction, mission, and management;
- Development and implementation of a P2 Plan;
- Training staff in P2 and awarding organizations for their contributions to the P2 program; and,
- Affirmative procurement that complies with the requirements of E.O. 13101 (purchase of designated materials containing recycled materials) and RCRA Section 6002 (purchase of materials that contain the highest percentage of recovered materials).

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter provides the scientific and analytic basis for comparing the environmental consequences of the Proposed Action, the No Action Alternative, and the Alternative Action. The probable effects of each alternative on environmental resources are described for Elmendorf AFB and Fort Richardson.

The specific criteria for determining the significance of impacts and assumptions for the analyses are presented under each resource area. Significance criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria. Long-term implications of the Proposed Action and alternatives are also presented in this chapter.

4.1 NOISE

In considering the basis for evaluating significance of noise impacts, several items were examined, including: 1) the degree to which noise levels generated by construction, addition, and alteration activities were higher than the ambient noise levels; 2) the degree to which there is annoyance and/or activity interference; and 3) the proximity of noise-sensitive receptors to the noise source.

An environmental analysis related to noise includes the potential impacts on the local population. This analysis estimates the extent and magnitude of the noise generated by the Proposed Action.

As described in Subchapter 3.1.1, the metric most widely used for noise-compatible planning is DNL. Air Force planning policy includes interpretation of DNL in terms of compatible land use. This is based on relationships between DNL and the probability of highly annoying the population. However, since the primary noise sources associated with the proposed road and bridge would be temporary, short-term construction as well as vehicular traffic noise during operations, the energy equivalent sound level (L_{eq}) is also utilized.

4.1.1 PROPOSED ACTION (DOWNSTREAM ROUTE)

The Proposed Action would result in short-term and intermittent increases in noise levels associated with the site clearing and construction of the proposed road and bridge.

Noise impacts from construction activity of the project are a function of the noise generated by construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Normally, construction activities are carried out in stages and each stage has its own noise characteristics based on the mixture of construction equipment in use.

The primary source of noise during site clearing and construction would be generated by equipment and vehicles involved in site preparation, grading, construction (asphalt paving), and finishing work. Construction noise would be intermittent and short-term in duration. Typical maximum noise levels generated by these activities range from 75 to 89 dB at 50 feet from the source. Sensitive receptors in the vicinity of these short-term activities would include occupied housing units near the work site, industrial uses on the outskirts of the cantonment of Fort Richardson, and recreational users at Cottonwood Park.

Table 4-1 shows the projected L_{eq} noise levels at 50 feet and at the closest residential areas, a 100-foot distance, during each stage or phase of construction. For the purposes of this assessment, it is estimated the shortest distance between a construction noise source and a residence would be approximately 100 feet. The nearest sensitive receptors at Phase II PSF housing, the Hospital and Bartlett High School may experience a temporary increase in noise levels during construction work on the site. Occupants at the Chugach housing area, approximately one mile southwest of the proposed road, would not be expected

to experience any temporary increase in noise from construction. Outdoor noise levels at the closest occupied Phase II PSF housing units could be between 72 and 73 dBA, which would be clearly audible and above ambient noise levels. However, this noise would be below the normally acceptable construction noise limit of 75 dBA. It is anticipated the construction activities would occur for up to 12 hours per day, 6 to 7 days per week, during the seasonal construction period. Nearby residents should not experience loss of hearing although some temporary annoyance associated with noise may occur. Sleep interference is unlikely because the construction activities would occur during the daytime (it is possible that some sleep disturbance may occur for shift workers).

Table 4-1. Estimated Construction Noise Levels

Construction Activity and Equipment	Number of Equipment or Vehicles	Sound Level at 50 ft (15 m), dBA	Effective Usage Factor	Hourly L_{eq} at 50 ft (15 m), dBA	Hourly L_{eq} at 100 ft (30 m), dBA
Site Preparation and Grading					
Bulldozer	1	88	0.08	77	71
Backhoe (rubber tire)	1	80	0.08	69	63
Front End Loader (rubber tire)	1	80	0.08	69	63
Flat Bed Truck (18-wheel)	1	75	0.08	64	58
Scraper	1	89	0.08	78	72
			Overall L_{eq} =	**79**	**73**
Roadway Construction and Finishing					
Front End Loader (rubber tire)	1	80	0.08	69	63
Concrete Truck	1	75	0.03	59	53
Concrete Finisher	1	80	0.08	69	63
Crane	1	75	0.08	64	58
Asphalt Spreader	1	80	0.08	69	63
Roller	1	80	0.08	69	63
Flat Bed Truck (18-wheel)	1	75	0.08	64	58
Trenching Machine	1	85	0.08	74	68
			Overall L_{eq} =	**79**	**73**

Although short-term increases in noise levels would occur during construction, the primary source of noise at Elmendorf AFB would continue to be from aircraft operations and the noise contours would remain as depicted in Figures 3-1 and 3-2. Noise from flying activities would tend to mask the noise generated by construction projects for the same exposure area. The perception would be that construction noise likely would not be discernible during periods of aircraft operations. However, there could be periods of time during which construction noise could be discerned and provide minor annoyance. Due to the intermittent nature of construction noise, the overall DNL noise level would not be expected to change from existing conditions.

The proposed road would be located in an undeveloped area with noise levels below DNL 65 dBA. After the road and bridge are constructed, an increase in vehicular-related noise would result from occupants accessing the Phase II PSF housing area and general traffic utilizing this road to traverse between installations. The proposed road would be used by emergency vehicles, including those with sirens. Based on the projected roadway operating capacity with an Average Daily Traffic (ADT) of 2,400 vehicles (2 percent medium trucks, 1 percent heavy trucks), of which, 20 percent would occur during the peak

hour, operating at a speed of 40 mph, peak hour L_{eq} and DNL traffic noise levels were both calculated. The projected traffic noise levels were determined for the new roadway within the study area using the FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108.

The resulting peak hour L_{eq} noise level in the project area would increase to approximately 57 dBA at a distance of approximately 100 feet from the edge of roadway. The DNL at the same distance would be approximately 54 dBA. The distance from the center line of the roadway to the FHWA impact criterion of 67 dBA contour line would be approximately 32 feet. This predicted noise levels would be below the normally acceptable FHWA Noise Abatement Criteria limit of 67 dBA L_{eq} for traffic noise and the Air Force acceptable land use criterion of 65 DNL for residential areas. For these reasons, significant impacts to the noise environment would not be anticipated.

Traffic adjacent to the Joint Community Complex would experience an increase in volume. Operation of the proposed road and bridge would not be expected to result in noise-related annoyance or interference with human activities in the project area, or adverse effects on sensitive noise receptors. The resultant noise level associated with the roadway at this location would not be expected to exceed the Air Force criteria of DNL 75 dBA. Although the ambient noise level would increase, impacts to the existing noise environment would not be considered significant.

To prevent or minimize adverse effects on the noise environment, the Air Force would ensure that the following best management practice is incorporated into the project:

- Development of a housing occupancy plan that would place new residents in units as far away as possible from construction of the Grady Highway extension.

With incorporation of this best management practice into the project, impacts to the noise environment would not be considered significant.

4.1.2 No Action Alternative

The noise environment at Elmendorf AFB and Fort Richardson would not change from baseline conditions as a result of implementation of the No Action Alternative.

4.1.3 Alternative Action (Footbridge Route)

The Alternative Action would result in noise impacts that would be similar to that described for the Proposed Action. The alternate route east of the Proposed Action would not result in significant impacts to the noise environment.

4.1.4 Mitigation

Mitigation measures would not be required for the Proposed or Alternative Action.

4.2 Land Use

In considering the basis for evaluating significance of impacts on land use, several items were examined, including: (1) the degree to which the location of facilities would adversely affect existing sensitive land use; (2) the degree to which construction and/or operation of facilities would interfere with the activities or functions of adjacent existing or proposed land uses; and, (3) the degree to which any physical changes in land use would affect surrounding uses and compatibility with land use plans.

4.2.1 Proposed Action (Downstream Route)

The Proposed Action would result in construction of the Grady Highway extension on Fort Richardson. This land would be managed in accordance with USAG-AK land use planning objectives and policies. Construction on the land for the road would be managed by the Air Force with the exception of land to be

controlled by the Army for wellhead protection areas and utility corridor easements. The Proposed Action would result in the conversion of 7.1 acres of open space/outdoor recreation land on Fort Richardson (Army training area) into roadway. Placement of the roadway at this location would transect the open space on either side of Ship Creek and bisect a westerly portion of Cottonwood Park. Approximately 1,200 feet of road would be located within a forested portion of the western section of Cottonwood Park. Although the park would become separated by the proposed road, interference with existing recreational activities would not be expected. Impacts to forest resources would not be expected as a result of the Proposed Action. This land to be converted to roadway is not subject to forest management practices. Placement of the road would not be expected to result in adverse effects to sensitive land uses. The proposed roadway would connect the Phase II PSF housing area on Elmendorf AFB with housing areas on Fort Richardson. The resultant land use would support the future land use designation for this area of Fort Richardson, as shown on Figure 3-3 (page 3-6).

4.2.2 No Action Alternative

Land use on Fort Richardson and Elmendorf AFB would not change from the baseline condition as a result of the No Action Alternative.

4.2.3 Alternative Action (Footbridge Route)

The Alternative Action would result in the conversion of up to 7.8 acres of open space/outdoor recreation land on Fort Richardson. The resultant land use would support the future land use designation for this area of Fort Richardson. Other impacts to land use would be the same as described for the Proposed Action.

4.2.4 Mitigation

No mitigation measures are required.

4.3 Air Quality

Impacts to air quality would be considered significant if federal actions resulted in violation of a NAAQS, contributed to an existing or projected air quality violation, exposed sensitive receptors to substantial pollutant concentrations, or exceeded any significance criteria for maintenance of air quality.

4.3.1 Proposed Action (Downstream Route)

Fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated during the construction of the new road connecting the new housing area to Fort Richardson. Fugitive dust would be generated from activities associated with site clearing, grading, cut and fill operations, and from vehicular traffic moving over the disturbed site. These emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. For evaluation purposes, construction activities would occur over a one year period. As a standard construction practice, construction sites will be watered as necessary to minimize fugitive dust emissions. Air pollutant emissions would be localized in the immediate work area, and would not result in any adverse effects on overall ambient air quality.

Emissions from construction activities associated with the Proposed Action are shown in Table 4-2. The PM_{10} values reflect a 50 percent reduction in emissions due to watering of the site.

Table 4-2. Estimated Construction-Related Air Pollutant Emissions from the Proposed Action

Activity	CO	VOC	NO_X	SO_X	PM_{10}
Road Construction (tons/yr)	2.13	0.14	0.74	0.08	31.54
AQCR No. 8 Emissions (tons/yr)	332,021	56,708	28,203	1,780	67,013
Percentage of Emissions	0.00064%	0.00035%	0.00261%	0.00476%	0.04707%

Because of their short duration, construction-related emissions would not contribute to long-term air pollution problems. Emissions during construction of the road would be less than allowable significance thresholds, and therefore, would not be considered adverse.

Analysis of the data presented in Table 4-2 indicates that the overall ambient air quality within the Cook Inlet Intrastate AQCR No. 8 would be only slightly affected by the implementation of the Proposed Action at Elmendorf AFB and Fort Richardson. Increased emissions primarily from short-term construction activities would produce slightly elevated air pollutant concentrations. The effects would be temporary, fall off rapidly with distance from the installation, and would not result in any long-term impacts to air quality.

Based on the requirements outlined in the USEPA general conformity rule published in 58 Federal Register 63214 (November 30, 1993) and codified at 40 CFR Part 93, Subpart B (for federal agencies), a conformity analysis is required to analyze whether the applicable criteria air pollutant emissions associated with the project equal or exceed the threshold emission limits that trigger the need to conduct a formal conformity determination. The intent of the conformity rule is to encourage long range planning by evaluating the air quality impacts from federal actions before the projects are undertaken. This rule establishes an analysis process for determining whether a proposed project in a nonattainment area conforms to the state requirements and federal standards. Emissions from the Proposed Action need to be compared with de minimis thresholds for any criteria pollutant in a nonattainment or maintenance area. Emissions from the Proposed Action also need to be evaluated to determine if they are regionally significant for any criteria pollutant in nonattainment. AQCR No. 8 is in nonattainment for PM_{10} and is a maintenance area for CO. The PM_{10} values are well below the 70 tons per year de minimis threshold and fall well below the 10 percent level that would be considered regionally significant by the USEPA. The CO values are well below the 100 tons per year de minimis threshold. For these reasons, a conformity determination would not be required.

Visibility impairment from emissions from the Proposed Action would not be of concern since there are no Class I PSD areas within a 62-mile radius of Elmendorf AFB. Therefore, the air quality impacts from the Proposed Action would not be considered significant.

4.3.2 No Action Alternative

There would be no change from the baseline air quality conditions as a result of the No Action Alternative.

4.3.3 Alternative Action (Footbridge Route)

The Alternative Action would result in air pollutant emissions associated with the modification of the footbridge and the construction of the new road. The estimated air pollutant emissions associated with the Alternative Action are shown on Table 4-3. The PM_{10} values reflect a 50 percent reduction in emissions due to watering of the site.

Table 4-3. Estimated Construction-Related Air Pollutant Emissions from the Alternative Action

Activity	CO	VOC	NO_X	SO_X	PM_{10}
Road Construction (tons/yr)	2.34	0.15	0.80	0.09	34.59
AQCR No. 8 Emissions (tons/yr)	332,021	56,708	28,203	1,780	67,013
Percentage of Emissions	0.00071%	0.00026%	0.00284%	0.00518%	0.05162%

Emissions for the Alternative Action would be almost equivalent to the Proposed Action; however, the Alternative Action emissions are less than the Proposed Action emissions. Analysis of the data presented in Table 4-3 indicates that the overall ambient air quality within the Cook Inlet Intrastate AQCR No. 8 would be only slightly affected by the implementation of the Alternative Action at Elmendorf AFB and Fort Richardson. Increased emissions primarily from short-term construction activities would produce slightly elevated air pollutant concentrations. The effects would be temporary, fall off rapidly with distance from the installation, and would not result in any long-term impacts to air quality.

As described for the Proposed Action, a USEPA conformity determination would not be required. The Alternative Action would not result in emissions that exceed USEPA *de minimis* threshold level for nonattainment (or maintenance) areas for any of the criteria pollutants. Therefore, the air pollutant emission impacts from the Alternative Action would not be considered significant.

4.3.4 Mitigation

Potential criteria pollutant emissions associated with the Proposed or Alternative Action do not exceed significance criteria requirements. Therefore, no mitigation measures for air quality would be required.

4.4 Water Resources

Impacts to water resources would be considered significant if any of the following were to occur: substantial flooding or erosion; adverse effects on any significant water body (such as stream, lake, or bay); exposure of people to reasonably foreseeable hydrologic hazards such as flooding or tsunamis; or, adverse effects to surface or groundwater quality or quantity.

4.4.1 Proposed Action (Downstream Route)

Runoff from construction areas could contain contaminants that could degrade the quality of receiving waters. The potential for increased erosion and sedimentation could occur as a result of grading and construction of the new road and bridge. These activities would result in soil disturbance and increased erosion and sedimentation that could potentially enter surface waters if not properly managed.

The Air Force would ensure that construction activities are conducted in accordance with the applicable storm water discharge permit for any areas that result in soil disturbance. Site-specific management plans and Best Management Practices (BMP) would be implemented to control erosion and prevent sediment, debris or other pollutants from entering storm water during site activities. Construction sites shall be inspected once every seven days and changes to BMPs documented. Storm water pollution prevention shall be part of the completed project infrastructure.

The Elmendorf AFB SWPPP identifies erosion control practices to be followed for exposed soil surfaces. These standard erosion control practices include:

- Minimizing soil disturbance whenever possible;
- Use of mulch or artificial cover where repeated disturbance is expected;

- Stabilization of soil within 30 days of final disturbance through vegetative or permanent artificial means (e.g., paving or rip-rapping); and,

- Adherence to appropriate state and federal permits and procedures for significant excavation (more than one acre of disturbed soil).

With adherence to best management practices, adverse effects from erosion would be avoided. Significant impacts to surface water would not be expected as a result of the Proposed Action.

The proposed road and bridge would not result in any substantial change in the amount of impervious areas that could reduce percolation. Storm water runoff would continue to flow into natural drainage areas.

Specific BMPs to prevent discharge of contaminants into surface waters during road and bridge construction would be followed during construction activities. In the SWPPP, the specific BMPs that would pertain to the Proposed Action include:

- Covering of outside storage of any materials or wastes;

- Adherence to state and federal guidelines for erosion and sedimentation control in any area of disturbed soil; and,

- Keep parking areas, roadways and storage areas orderly and free of materials that could add pollutants to storm water;

The SWPPP also specifies procedures for spill prevention and response, routine inspection of discharges at sites, and proper training of employees. With implementation of BMPs, impacts to surface water quality at Elmendorf AFB would not be considered significant.

The Air Force would ensure that the following best management practices to prevent or minimize impacts would be incorporated into project design and implementation:

- Design and construction of the road and bridge to incorporate adequate storm drainage.

- Compliance with provisions of the MSGP, SWPPP and BMPs to prevent or minimize the potential for impacts to water resources.

- Include erosion control measures for all ground-disturbing construction activities. Comply with standard erosion control practices for ground disturbing activities.

- The contractor shall cease excavation if groundwater is encountered, and immediately notify 3 CES/CEVP or 3 CES/CEVR.

- The contractor shall ensure that a SWPPP and a Construction General Permit Notice of Intent with a site-specific BMP map are prepared and implemented for construction activities (site-specific SWPPPs are subject to inspection at any time by the USEPA).

- Conduct earthwork to minimize the duration of exposure of unprotected soils.

- Establish single point construction entries to minimize sediment and erosion during construction. Only one construction entrance on the south side of Ship Creek, and existing roads at Arctic Valley Road would be used.

- Reestablish grass and other landscaping in disturbed areas immediately after construction is completed.

The excavation required for road and bridge construction may be expected to exceed 5 feet in depth and groundwater may be encountered. With implementation of BMPs, impacts to groundwater quality at Fort Richardson would not be considered significant.

Construction of the road and bridge on Fort Richardson would be accomplished with standard erosion control practices. Construction would avoid standby water wells near the site. The Army would be responsible for physical security of a defined protective zone around existing standby water wells to ensure that groundwater quality is protected. The Air Force would ensure that wells and associated protection areas are protected in accordance with applicable regulations. The Air Force and the Army will ensure that wellhead protection areas near the work site are avoided. For these reasons, impacts to groundwater on Fort Richardson would not be expected to occur.

Construction of the proposed new roadway from Elmendorf AFB to Fort Richardson would be conducted in accordance with standard management practices that incorporate measures to avoid detrimental effects to Ship Creek. The Air Force will coordinate design and construction of bridge abutments in consideration of planned restoration of streambanks at Area D along Ship Creek (Figure 2-4). Construction work in and near Ship Creek would be conducted in accordance with permit stipulations as determined in the Army Corps of Engineers Section 404 permit.

4.4.2 No Action Alternative

The No Action Alternative would not result in any construction activities at Elmendorf AFB or Fort Richardson. No change to surface or groundwater resources would occur.

4.4.3 Alternative Action (Footbridge Route)

The impacts of the Alternative Action would be the same as described for the Proposed Action.

4.4.4 Mitigation

With adherence to Section 404 permit stipulations (including any mitigation measures identified therein), the Proposed Action would not be expected to result in any significant impacts to surface or groundwater resources at Elmendorf AFB. Mitigation measures would not be required for the Proposed Action.

4.5 Hazardous Materials and Wastes

Impacts to hazardous materials and waste management would be considered significant if the federal action resulted in noncompliance with applicable federal and Alaska regulations or caused waste generation that could not be accommodated by current or planned Elmendorf AFB waste management capacities.

4.5.1 Proposed Action (Downstream Route)

Hazardous Materials. Products containing hazardous materials would be procured and used during construction of the new road. Hazardous materials used by the construction contractor would be managed in accordance with regulatory requirements. Contractors would be required to use and store hazardous materials in accordance with all federal, state, local and Air Force regulations. Specifically, the contractor is prohibited from using ODS, mercury, polychlorinated biphenyls, asbestos-containing material (ACM), or materials that contain potentially hazardous concentrations of lead such as LBP. Hazardous materials will not be stored in containers in direct contact with the ground. Containers will be kept closed when not in use.

The Air Force would ensure that the following best management practices for hazardous materials or wastes are implemented as a requirement of the construction contractor:

- Work shall be managed in accordance with the *Elmendorf AFB Oil Discharge Prevention and Contingency Plan* (CPlan). The contractor shall be required to immediately contact USAG-AK DPW Environmental Compliance if a hazardous substance or petroleum product is released or, if excavation activities encounter contaminated soil, tanks, or debris.

- In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor will take immediate action to contain and clean up the spill.

- Contractor spill clean up personnel will be trained and certified to perform spill clean up.

- The contractor will be responsible for the proper characterization and disposal of any waste and clean up materials generated.

- All waste and associated clean up material will be removed from the Base and transported and/or stored in accordance with regulations until final disposal.

- All details concerning the spill will be provided to the Air Force in the form of a written incident report.

- The contractor is responsible for restoring a spill site to the condition prior to the spill or to an improved condition.

- Fueling and lubrication of equipment will be conducted in a manner that affords maximum protection against spills.

- Secondary containment is required around temporary fuel oil or petroleum storage tanks larger than 660 gallons and is recommended for smaller tanks.

With compliance with hazardous materials management procedures, significant impacts from hazardous materials would not be anticipated.

Hazardous Wastes. Hazardous waste generated during road construction would not impact hazardous waste management at Elmendorf AFB. Any hazardous wastes from road construction would be managed in accordance with the Elmendorf AFB Solid Waste Management Plan and OPlan 19-3.

The construction contractor shall maintain records of all waste determinations, including appropriate results of analysis performed, substances and sample locations, date and time of collection, and other pertinent data as required by 40 CFR Part 280, Section 74 and 40 CFR, Part 262, Subpart D. Any hazardous waste generated shall be handled in accordance with all federal, state, and local laws and regulations, including RCRA requirements for waste management and Department of Transportation requirements for waste transport. Contractor-generated hazardous waste will be disposed of as required.

Environmental Restoration Program. The only contaminated sites near the proposed road and bridge that are undergoing remediation or investigation are ST37 and the Building 35752 source area from OU E on Fort Richardson. The Proposed Action would not be expected to result in interference with ongoing remediation activities on Fort Richardson or Elmendorf AFB. It is unlikely that any activities associated with construction activities would impact the sites because the ERP sites are not located within the construction zone.

The following best management practices would be implemented:

- The Air Force will ensure that coordination with the ERP Office is conducted before any construction work is initiated. The Air Force will ensure that construction activities are coordinated with ongoing remediation or investigation activities at any CERCLA or SERA sites.

- The Air Force will ensure that a proper Base Civil Engineer (BCE) Work Clearance Request is processed and routed through 3 CES/CEV for each construction area in accordance with 3rd Wing Instruction 32-1007 (12 July 2001).

- The Air Force will ensure that a USAG-AK Excavation Clearance Request is obtained from, and approved by, the Directorate of Public Works.

Coordination with the ERP Office would avoid conflicts with ongoing remediation and investigation activities on Fort Richardson or Elmendorf AFB. Therefore, impacts to site ST37, OU E, or to ERP management and site activities would not be anticipated.

Pesticides. Herbicide and pesticide contamination of the proposed road site is not suspected as these sites were not formerly used for agricultural purposes. The use of herbicides and pesticides would be applied to road shoulders and landscaped areas to prevent the growth of weeds and the proliferation of insects following completion of construction of the road. Application of herbicides and pesticides would be conducted in accordance with Army procedures and manufacturer's instructions.

Underground Storage Tanks. The proposed construction of the access road and modifications to the bridge would not be expected to encounter any underground storage tanks. In the event that an underground storage tank is encountered, the contractor will suspend work in the immediate area and notify 3 CES/CEV, the Elmendorf AFB ERP Office, and the U.S. Army Alaska Directorate of Public Works/Environmental Resources Department.

4.5.2 No Action Alternative

There would be no change from the baseline condition to hazardous material usage, hazardous waste generation or management, environmental restoration program, pesticide management or underground storage tanks as a consequence of the No Action Alternative.

4.5.3 Alternative Action (Footbridge Route)

The Alternative Action would result in the same impacts as the Proposed Action for hazardous material usage, hazardous waste generation or management, environmental restoration program, pesticide management or underground storage tanks.

4.5.4 Mitigation

No mitigation measures would be required.

4.6 Biological Resources

Effects on biological resources would be considered significant if the federal action: substantially diminished habitat for a plant or animal species; resulted an impact to threatened or endangered species; substantially diminished a regionally or locally important plant or animal species; interfered substantially with wildlife movement or reproductive behavior; resulted in a substantial infusion of exotic plant or animal species; or, resulted in detrimental effects on wetlands or floodplains.

4.6.1 Proposed Action (Downstream Route)

The Proposed Action would result in construction of a new access road and bridge over Ship Creek on Fort Richardson. The Proposed Action would result in the loss of 7.1 acres of wildlife habitat on Fort Richardson and the compensation of moose habitat at other locations on the installation and Elmendorf AFB. The extension of Grady Highway would be constructed on approximately 7.1 acres of protected forest. Construction of this road on Fort Richardson would result in the loss of dry forb herbaceous vegetation, ericaceous dwarf scrub, open and closed needleleaf forest and disturbed areas. The loss of 7.1 acres of vegetation would represent 0.13 percent of the undeveloped land on Fort Richardson. Moose

would also be impacted by the loss of wetlands, which provide valuable water and summer forage. Moose are also known to utilize wetlands as a means to protect calves from predators, and to escape irritation from flies and other insects during the summer. The Proposed Action would result in the loss of approximately 7.1 acres of winter range moose habitat (including 1.08 acre of spring and summer habitat). This comprises wildlife habitat in the broadleaf forest, needleleaf forest, wetlands, and areas modified by humans. This area is estimated to support approximately 14 moose that reside in the antenna field and approximately 60 or more moose from areas in the surrounding Elmendorf AFB and Fort Richardson.

To compensate for the loss of moose habitat, the Air Force is implementing a Moose Habitat Compensation Plan in consultation with the U.S. Army and the Alaska Department of Fish and Game. The Plan defines replacement habitat sites and specifies the appropriate management practices for moose habitat in the area south of Ship Creek. The following elements will be included in the Moose Habitat Compensation Plan:

- The Air Force would enhance a currently barren landfill and surrounding areas to provide future high quality moose habitat. Additional acres of moose habitat enhancement would be specified by location, acreage and treatment technique in response to a predetermined habitat replacement formula. The Air Force will work with agencies to determine the appropriate reduction in moose population that can be sustained on reduced availability of winter habitat. The design of the proposed road and bridge would include consideration of large wildlife passage and human safety in coordination with the U.S. Army and the Alaska Department of Fish and Game.

- The Air Force would follow land/timber management practices to optimize return of moose habitat. Replacement sites would be prioritized by proximity to the affected area, enhancement potential, and long term stability of the enhanced sites by land designation that discourages future construction. The quantity of replacement acreage will follow a predetermined formula based on quantity and quality of habitat lost.

- Moose habitat replacement would include the distribution of soils on the closed Elmendorf AFB landfill and surrounding acreage in accordance with recommendations in the 2003 Evapotranspiration Landfill Cover Feasibility Study. The soils would allow development of an evapotranspiration cover for the landfill as well as desirable moose habitat on the landfill and surrounding areas.

- The Air Force and U.S. Army would coordinate with Alaska Department of Fish and Game to set appropriate moose harvest levels for succeeding annual moose hunts on both installations. Temporary reduction of moose numbers will be necessary during the period that moose habitat is diminished.

- To minimize the potential for moose-human conflicts, landscaping of road shoulders would be restricted to shrubs and trees that have low moose palatability, and are in accordance with species approved by the Base landscape plan.

- Roadway right-of-ways would be wide enough and sloped appropriately for drivers to adequately spot and avoid moose or other large wildlife species crossing the road.

Construction of the road in the 7.1 acres of traditional bear habitat and an adjacent bear travel corridor would likely increase bear-human conflicts. This area has historically provided attractive habitat for both species of bears. Bear-human interactions typically occur at higher frequency in the Ship Creek riparian zone.

The Ship Creek riparian zone will continue to serve as an important bear travel corridor for both species of bears as well as moose. All species, when suddenly confronted at close range can become defensive and attack humans or their pets; therefore, trails should not be developed within or paralleling the edge of the riparian zone. Trails that must cross the zone should cross perpendicular to the zone and near

roadways, and trails should provide ample visibility for the user to identify wildlife using the trail at a safe distance. Signage along the road should indicate sensitive wildlife resources in the area and potential road crossing areas, and reduced speeds through the wetlands and bridge approaches could also lessen the frequency of collisions.

Placement of a new road connecting the housing area is not expected to impede movement of wildlife south of the cantonment on Fort Richardson. Wildlife movement is already impeded by fencing along Glenn Highway that bisects existing moose winter range. Wildlife desiring to cross the highway are funneled through the underpass at Ship Creek. A roadway without a fence would not impede wildlife at that same level, thus existing wildlife movements would not be expected to change substantially as a result of the proposed access road. Impediment to wildlife travel would likely be temporary and during periods of high traffic volume. Movement of moose through the seasonal ranges would be expected to continue, including movement in the winter range on both sides of the Glenn Highway.

The construction of the proposed road and bridge would not result in any significant impacts to threatened or endangered species, because no federally listed species are known to exist on Fort Richardson.

Upon completion of construction, road shoulders would be landscaped in accordance with the Architectural Compatibility Guidelines and Landscape Development Plan for Elmendorf AFB. The Proposed Action would not be expected to result in a substantial infusion of exotic plant or animal species. It would be important for the landscaping to be of a type and amount of ground cover that would not encourage wildlife browsing or preclude a driver's ability to see the animal, but that would also be sufficient to allow wildlife to some protection and safety when crossing.

Construction of the new road would result in the loss of approximately 1.07 acre of wetlands. This loss is comprised of 0.91 acre of Wetland A north of ship Creek and 0.16 acre of Wetland B south of the creek. Placement of the proposed road would bisect wetlands on either side of the creek (Wetland C would be avoided). These alterations would lead to several foreseeable changes to the environment. Runoff from the bridge and road into Ship Creek and surrounding wetlands could include harmful substances such as oil, gasoline, and other automobile fluids, and could also introduce more human-generated trash into the area. Measures to trap and divert runoff would avoid introduction of pollutants into Ship Creek and the wetlands, and would benefit humans, wildlife and habitat near the area, as well as avoid adverse effects on downstream habitats.

The Proposed Action would bisect the wetlands, changing contiguous wetland habitat into smaller, isolated parcels of wetlands. Some degradation of habitat due to edge effects (i.e., introduction of trash, lighting, and noise) would be expected. This alteration of the landscape would particularly affect large mammals moving through the site, as well as resident and migratory birds, and other small resident wildlife species.

Construction of the proposed road could affect nesting of birds (including raptors) in the area from noise, lighting, and removal of vegetation. A qualified biologist would be onsite at the start of construction activities during the nesting season (generally April through August) in order to avoid impacts to nesting birds. A qualified biologist may also conduct surveys for nesting birds to determine if avoidance would be required.

Placement of the new road from Phase II PSF housing to Arctic Valley Road would require crossing of Ship Creek. The road site on Fort Richardson traverses the 100-year stream bank; however, bridge abutments would be constructed above the 100-year flood zone. Design of the proposed road would minimize encroachment into the riparian zone associated with Ship Creek. Design and construction of the roadway would be conducted in accordance with stipulations of the Corps of Engineers Section 404 permit. The Proposed Action would not be expected to result in significant adverse effects on wetlands or floodplains.

4.6.2 No Action Alternative

The No Action Alternative would not result in any construction activities on Fort Richardson or Elmendorf AFB. No change to biological resources would occur.

4.6.3 Alternative Action (Footbridge Route)

With the exception of impacts to wetlands and upland habitat, the Alternative Action would result in the same effects to biological resources as the Proposed Action. The alternate route (Footbridge Route) would result in loss of 7.8 acres of habitat. The Alternative Action would result in the loss of approximately 1.075 acre of wetland consisting of Wetlands A, B and C (Figure 3-9). Because the road would be longer, there would be a slightly greater loss of upland habitats, which could include dry forb herbaceous vegetation, ericaceous dwarf scrub, open and closed needleleaf forest. Design and construction of the proposed road and bridge would be conducted in accordance with stipulations in the U.S. Army Corps of Engineers Section 404 permit.

4.6.4 Mitigation

With incorporation of best management practices and avoidance measures, including stipulations of the Section 404 permit, impacts to biological resources would not be considered significant.

4.7 Cultural Resources

Impacts on cultural resources would be considered significant if a federal undertaking would directly or indirectly impact archaeological resources, historic resources, or traditional cultural resources. The nature and potential significance of cultural resources in the potentially affected area was identified by considering the following definition. Historic properties, under 36 Code of Federal Regulations (CFR) Part 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP." For the purposes of these regulations this term includes, artifacts, records, and remains that are related to and located within such properties. The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet NRHP listing criteria. Therefore, sites not yet evaluated are considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

4.7.1 Proposed Action (Downstream Route)

The proposed construction of the proposed Grady Highway extension would require clearing and grading on undeveloped land. Because the activity is considered to be facilities development and construction, this ground-disturbing activity may have a potential effect on subsurface cultural resources.

The management of cultural resources on the proposed road site on Fort Richardson would be accomplished in accordance with procedures in the Elmendorf AFB Integrated Cultural Resource Management Plan.

Archaeological Resources. The Proposed Action would involve ground-disturbance during site clearance and construction, and may result in the inadvertent discovery of subsurface cultural materials on Fort Richardson property. Damage to, or loss of any cultural artifacts would be considered a significant impact. To avoid or minimize the potential for adverse impacts to cultural resources, the Air Force will ensure that the following best management practice is accomplished:

- In the event any previously undetected archaeological resources are discovered during earthwork, the construction contractor will be required to stop construction activities in the affected area and contact the Elmendorf AFB Cultural Resources Manager (CRM) or designate. The CRM will follow the procedures in Section 4.5.1 (Inadvertent Discovery of Archaeological Remains) of the ICRMP and will then notify the Fort Richardson CRM, SHPO and appropriate

Alaska Native tribes. In the event further investigation is required, any data recovery would be performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archaeological Properties.

With implementation of this best management practice, the Proposed Action would not result in any significant adverse effects on archaeological resources.

Historic Resources. The Air Force and Army are required to comply with existing legislation to ensure that properties that may qualify for inclusion on the National Register must not be inadvertently transferred, sold, demolished, substantially altered or allowed to deteriorate significantly. The Proposed Action would not be located in or near any of the three NRHP-eligible historic districts on Elmendorf AFB, nor would it be located in or near any historic properties on Fort Richardson.

In accordance with the NHPA and 36 CFR 800, the Air Force and Army will conduct informal consultation with the Alaska SHPO as part of the Section 106 consultation process for this action. The Air Force will follow all SHPO requirements to prevent or mitigate adverse effects to historic resources.

To avoid or minimize the potential for adverse impacts to historic resources, the Air Force will ensure that the following best management practice is accomplished:

- The Air Force would ensure that any existing, potentially historic structures that may be encountered on the Fort Richardson property to be constructed for the proposed road are evaluated for historical significance. A report of findings shall be provided to the Alaska SHPO for evaluation and consultation in accordance with Section 106 of the NHPA.

With implementation of this best management practice, the Proposed Action would not result in any significant adverse effects on historic resources.

Traditional Cultural Resources. The Proposed Action would not be located in any area that is currently in use by any federally recognized Alaska Native tribe. Impacts to traditional cultural resources would not be expected as a result of the Proposed Action. To avoid or minimize the potential for adverse impacts to traditional cultural resources, the Air Force will ensure that the following best management practice is accomplished:

- In the event that any Alaska Native human remains are encountered during construction, excavation will stop and the Elmendorf AFB and Fort Richardson Cultural Resources Managers will be notified immediately. The CRMs will follow the procedures in their respective ICRMPs and will then notify the SHPO and appropriate Alaska Native tribes.

With implementation of this best management practice, the Proposed Action would not result in any significant adverse effects on traditional cultural resources.

4.7.2 No Action Alternative

Under the No Action Alternative, there would be no construction activities or change from the baseline conditions. Therefore, the No Action Alternative would have no impact on any cultural resources.

4.7.3 Alternative Action (Footbridge Route)

The Alternative Action would result in the same effects as the Proposed Action.

4.7.4 Mitigation

No mitigation measures are required.

4.8 Geological Resources

An impact to geological resources would be considered significant if it resulted in substantial erosion or if alteration of ground surface features occurred through activities such as excavation.

4.8.1 Proposed Action (Downstream Route)

Construction of the proposed road and bridge on Fort Richardson would occur within an area where physiographic features and geologic resources have generally not been modified by prior Army activities (e.g., military training, recreation, and hydroaxing). Alteration of ground surface on the relatively flat site would be limited to clearing, excavation to shallow depths, and grading. Impacts to physiography and geology would not be considered significant.

Soils on the Fort Richardson site would not be expected to present future development obstacles in that erosion potential is low. Earthwork at these locations and at the undeveloped sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Installation of best management practices such as described in Subchapter 4.4.1 would minimize erosion during earthwork. Specific best management practices (BMPs) would be determined in the Stormwater Pollution Prevention Plan (SWPPP) for the construction NPDES permit. BMPs could include a rocked construction entrance, dust control, and erosion control (i.e., silt fences). Grass and other landscaping would be reestablished in the disturbed areas immediately after construction is completed, thereby reducing the potential for erosion.

The following best management practices would be accomplished as part of the Proposed Action:

- All backfill material would be obtained from existing pits on Fort Richardson and/or Elmendorf AFB (no new pits would be opened or otherwise required as a result of the Proposed Action).
- The Air Force would also ensure that a separate reclamation plan is prepared for the State of Alaska for any excavation of gravel in any pit that exceeds 50,000 cubic yards per year.
- No metal, wood, rubble or other material shall be placed in any borrow pits (concrete rubble is allowable).
- In the event any other material is placed in a borrow pit, the contractor would be required to remove this material and dispose of the material off-base.
- Excavated material from road and bridge construction sites would be used to backfill borrow pits wherever possible. Pit management plans are required by the State of Alaska for single use pits that remove more than 50,000 cubic yards of material per year.
- The Air Force would design and construct the road and bridge in accordance with recommendations in the geotechnical investigation to be prepared for the site.

With implementation of best management practices, impacts to geologic resources on Fort Richardson would not be considered significant.

4.8.2 No Action Alternative

No ground disturbing activities would occur. Therefore, no impact to physiographic features and soils would be anticipated.

4.8.3 Alternative Action (Footbridge Route)

Impacts to physiographic features and soils as a result of the Alternative Action would be the same as described for the Proposed Action.

4.8.4 MITIGATION

Mitigation measures would not be required.

4.9 TRANSPORTATION SYSTEMS

An impact to transportation systems would be considered significant if it resulted in the need for new or increased government services, or if the action resulted in traffic conditions that would be considered unacceptable.

4.9.1 PROPOSED ACTION (DOWNSTREAM ROUTE)

The Proposed Action may result in temporary and localized traffic increases in the roadways northeast of the Joint Community Complex area on Elmendorf AFB and Fourth Street/Arctic Valley Road on Fort Richardson during construction activities. Construction vehicles would access the work site via Provider Drive and the Glenn Highway. Temporary increases in traffic could result from the presence of construction vehicles. During construction, temporary detours may occur although no road closures would be expected. These conditions would not be expected to result in any substantial change to existing traffic patterns or volumes on Elmendorf AFB or Fort Richardson. In order to avoid potential traffic conflicts, the Air Force would ensure that Bartlett High School, the Alaska Native Heritage Center, and DoD Hospital are notified in advance of the construction schedule.

The proposed access road and bridge would result in improvement to existing traffic conditions by decreasing traffic volume at the intersection of Vandenberg and Talley Avenues with the Davis Highway. The proposed road would provide an alternate access route for occupants of Phase II PSF housing units on Elmendorf AFB.

The proposed Grady Highway extension would be designed to accommodate traffic flow of 2,400 vehicles per day (VPD) in each direction between the installations. The proposed road is expected to reduce the volume of traffic on Davis Highway by:

- Providing an alternate route for traveling between the Joint Military Mall/Hospital and Fort Richardson;
- Providing a new southerly access to Fort Richardson from the Boniface Gate (by avoiding the intersection of Arctic Warrior Drive and Vandenberg Avenue);
- Providing an alternate access for occupants of the Phase II PSF housing area; and,
- Providing an alternate route to Fort Richardson for occupants of housing along Provider Drive.

The Proposed Action would not be expected to result in any traffic conditions that would be considered unacceptable. The proposed road would not be expected to result in any increase in traffic hazards or risks. Completion of the Grady Highway extension would not be expected to result in any long-term changes in traffic patterns that cannot be accommodated by the existing roadway network. No changes to the Level of Service at area roadways would be anticipated.

The Proposed Action would not be expected to generate any substantial increase in use of the Boniface or Muldoon Gates. Driving patterns by Army and Air Force personnel would not be expected to differ from current conditions. It is possible that traffic on Davis Highway and Glenn Highway could decrease as a result of easier access to community center facilities. The Proposed Action would not be expected to degrade service levels or increase congestion.

4.9.2 No Action Alternative

The Proposed Action would not result in any change to baseline traffic conditions. Existing roadway systems on Fort Richardson and Elmendorf AFB would continue to experience congestion.

4.9.3 Alternative Action (Footbridge Route)

The Alternative Action would result in the same impacts to transportation systems as described for the Proposed Action.

4.9.4 Mitigation

No mitigation measures are required.

4.10 Safety

The elements of the action with a potential to affect safety are evaluated relative to the degree to which the action increases or decreases safety risks to Base personnel, the public and property. Impacts to safety would be considered significant if the action resulted in a substantial increase in safety risk.

4.10.1 Proposed Action (Downstream Route)

The Proposed Action would not result in any increase in the safety risk because the proposed roadway would not result in exposure of humans to any increase in safety hazards. Traffic reduction on Davis Highway as a result of the Proposed Action would be considered a beneficial impact to safety.

The new access road would be located in proximity to antenna fields and ammunition storage areas. The electric and magnetic fields (EMF) generated by antennas is typically a safety concern. The strength of electric and magnetic fields decreases with distance from the source. Evidence concerning health risks from exposure to magnetic fields is inconclusive at this time. After 30 years of research, health hazards associated with EMF has not been demonstrated. No federal or State laws limit the level of EMF in residences or the amount to which a person can be exposed; however, EMF health risks should be considered in planning efforts.

The antenna field north of the proposed roadway has omnidirectional antennas that would not be expected to result in any increase in EMF-related health risks to vehicular passengers on the proposed road or bridge.

The proposed access road would be located within one mile of ammunition storage areas. These areas are located approximately 0.5 miles north of Ship Creek. Ammunition areas are managed by the Army in accordance with DoD safety standards for ordnance storage. These standards apply to DoD ammunition and explosives facilities, and are designed to provide protection against serious injury, loss of life and damage to property. The proposed road and bridge would not be sited within any explosive safety arcs as defined by DoD guidance. The ammunition storage areas are not considered to be a safety risk to the proposed road.

The primary response to nuisance, injured or dangerous wildlife on the proposed road and bridge would be the responsibility of Fort Richardson military conservation agents at the USAG-AK DPW Natural Resources and the Provost Marshal's office.

4.10.2 No Action Alternative

The No Action Alternative would not result in any change to baseline conditions.

4.10.3 Alternative Action (Footbridge Route)

The Alternative Action would result in the same impacts as the Proposed Action.

4.10.4 Mitigation

No mitigation measures are required.

4.11 Storm Water Management and Water Quality Requirements

Storm water management would be conducted during both the construction and operation of the access road and bridge. The project would be subject to an NPDES general permit for storm water discharges associated with construction activities. With the implementation of the SWPPP for construction activities, no impacts to water quality at Ship Creek would be expected. No mitigation measures would be required.

The Proposed Action would result in the need for new storm water systems for the proposed road and bridge. The Proposed Action would include surface and storm drainage systems as part of the road and bridge design. The Army and Air Force would incorporate the new road and bridge into their management programs to prevent roadway deterioration that could result from improper storm water drainage. The Army and Air Force would identify areas essential to the management of snow removal and storm water drainage systems, and preserve such areas, in planning for future development and growth. For this reason, impacts to storm water management would not be expected as a result of the Proposed Action.

During operations, the new road would be managed in accordance with current Storm Water Pollution Prevention Plan including compliance with any best management practices identified in the NPDES permit. These procedures include monitoring and reporting requirements. Compliance with these procedures would prevent adverse impacts to water quality at Ship Creek. No mitigation measures would be required.

4.12 Site Contamination Control

The Proposed Action would not affect ongoing investigations or remediation projects on Fort Richardson. In the event that contaminated soil is encountered during construction, the Air Force would coordinate activities with the U.S. Army. Contaminated soil encountered during construction of the new access road and bridge will be segregated, profiled and properly disposed. Contaminated soil will be removed from the site and replaced with clean fill. Adverse effects from site contamination would not be expected.

Maintenance-related activities for the new access road and bridge would be conducted in accordance with Army regulations and requirements for prevention of release of hazardous substances and hazardous wastes. Specific standard operation procedures (SOP) would be instituted to prevent contamination on the site. This includes training requirements and specific plans outlining work procedures and preventative actions (e.g., SPCC plan).

Pollution Prevention. Annual purchases of products containing EPA 17 and ODS chemicals, off-base transfers of hazardous waste, disposal of municipal solid waste, and consumption of energy would increase slightly during the proposed construction activities. Specifically, products containing EPA 17 and Environmental Planning and Community Right-to-Know Act (EPCRA) chemicals would be procured for use in construction of housing units. However, it is not anticipated that the volume of chemicals procured would impact the ability of the Base to meet its reduction goals.

The generation of hazardous waste would increase slightly during the construction. However, these increases would be temporary and would not impact the ability of either installation to attain the hazardous waste reduction goals.

4.13 Cumulative and Long-Term Impacts of the Proposed Action

4.13.1 Noise

Noise impacts from the Proposed Action would result in short-term increases in localized noise during road construction. After the road and bridge are constructed, ambient noise levels would increase. This increase in ambient noise level would be compatible with the planned land use for the site, and would not be expected to result in annoyance or effects on sensitive receptors. The resultant ambient noise level from the proposed extension of the Grady Highway would not be expected to exceed Air Force noise criteria and, therefore, would not be considered a significant cumulative impact to the noise environment. The Proposed Action would not contribute to any long-term cumulative impacts to the noise environment at Elmendorf AFB or Fort Richardson.

4.13.2 Land Use

Construction projects planned for Elmendorf AFB and Fort Richardson would be consistent with planned land use patterns. In consideration of the use of open space for construction of the DoD Hospital and Phase II PSF housing, the Proposed Action would contribute to an ongoing cumulative loss of open space on Elmendorf AFB and Fort Richardson. The Proposed Action would be consistent with planned land use for these sites, and incompatible land uses would not result. For this reason, cumulative impacts would not be considered significant.

4.13.3 Air Quality

Air pollutant emissions from the construction activities associated with the Proposed Action may occur during the same time period as other ongoing and planned construction projects on Elmendorf AFB and Fort Richardson. Short-term emissions from construction emissions that would be generated in the project area would not be expected to substantially contribute to cumulative impacts to air quality. The air pollutant emissions associated with these activities would not be considered significant.

4.13.4 Water Resources

The Proposed Action is one of a number of other planned projects involving construction on Fort Richardson and Elmendorf AFB and the surrounding area, as identified in Subchapter 2.7. Construction activity on Elmendorf AFB would occur in areas that are not in proximity to water resources. Other planned projects on Fort Richardson and Fort Richardson would not occur near Ship Creek. With adherence to best management practices for storm water management and groundwater protection, the Proposed Action would not be expected to cumulatively contribute to impacts on water resources.

4.13.5 Hazardous Materials and Wastes

Hazardous Materials. Other planned projects may occur at Fort Richardson and Elmendorf AFB during the same period as the Proposed Action. As with the Proposed Action, it is anticipated that the quantity of products containing hazardous materials used during construction would be minimal, and their use would be temporary. Other projects would also be required to comply with installation procedures for the handling of hazardous materials. Therefore, hazardous material management would not be impacted by the Proposed Action or other planned projects at Elmendorf AFB or Fort Richardson.

Hazardous Wastes. Any hazardous waste generated as a result of the proposed construction would be properly contained, stored, and disposed by the construction contractor in accordance with applicable Alaska regulations and the appropriate Fort Richardson and Elmendorf AFB management plans. Any increases in hazardous waste resulting from these other actions would not impact hazardous waste management because the installation would continue to comply with requirements and not be subject to additional regulatory requirements by the USEPA or the State of Alaska.

Environmental Restoration Program. Ongoing remediation programs at ERP sites at Fort Richardson and Elmendorf AFB would not be affected by the construction of the proposed road and bridge. With coordination of planned projects with ongoing ERP activities, no cumulative effects would be expected.

Pesticides. Pesticide use and disposal from the Proposed Action and other actions would be managed in accordance with established regulations and guidance. No cumulative impacts would be expected.

Underground Storage Tanks. Underground storage tanks associated with other actions would be managed in accordance with established regulations and guidance. No cumulative impacts would be expected.

4.13.6 Biological Resources

The ongoing loss of habitat for large mammals on Elmendorf AFB and Fort Richardson is considered an existing cumulative impact to biological resources. Security fencing at both installations has resulted in loss of habitat and effects on wildlife movement. Other planned projects may occur at Elmendorf AFB and Fort Richardson during the same period as the Proposed Action. As with the Proposed Action, each of these planned projects would be evaluated for impacts to biological resources. Other projects would also be required to comply with natural resource management practices. The Proposed Action would contribute to ongoing habitat loss on Elmendorf AFB and Fort Richardson. Compensation for habitat loss from construction of housing on the Fort Richardson property has been included in project planning. For this reason, the cumulative impact of the Proposed Action on biological resources would not be considered significant.

4.13.7 Cultural Resources

The Proposed Action is one of a number of other planned projects involving construction on Fort Richardson and Elmendorf AFB and the surrounding area, as identified in Subchapter 2.7. The Proposed Action could have the potential to cumulatively contribute to disturbances of previously undetected cultural material that may be present beneath the surface. However, with implementation of the best management practice identified herein, such impacts would be prevented or minimized. Therefore, the Proposed Action would not be expected to contribute to cumulative impacts on cultural resources.

4.13.8 Geological Resources

The Proposed Action is one of a number of other planned projects involving construction on Fort Richardson and Elmendorf AFB, as identified in Subchapter 2.7. Construction activity on Fort Richardson and would occur in areas where the physiographic features and soils have been previously disturbed and modified by prior human activities. The Proposed Action would not be expected to cumulatively contribute to impacts to geologic resources.

4.13.9 Transportation

The Proposed Action is one of a number of other planned projects on Elmendorf AFB and Fort Richardson, as identified in Subchapter 2.7. Each of these other actions would be required to evaluate the effects of the action on transportation systems. The Army and Air Force are in the process of upgrading roads and intersections to accommodate ongoing growth and associated traffic demands. The Proposed Action to provide an alternate access between Elmendorf AFB and Fort Richardson would result in positive impacts to traffic conditions by alleviating traffic conditions on existing roadways. The Proposed Action would not be expected to cumulatively contribute to impacts on transportation systems.

4.13.10 Safety

The Proposed Action is one of a number of other planned projects on Fort Richardson and Elmendorf AFB, as identified in Subchapter 2.7. Each of these other actions would be required to evaluate the

effects of the action on safety considerations. The Proposed Action would not be expected to cumulatively contribute to safety risks.

4.14 Indirect Impacts

While direct environmental effects are caused by the action and occur at the same time and place as the action, indirect effects are those effects caused by the action that occur at a later time or are farther removed in distance from the action but are still reasonably foreseeable. As defined in 40 CFR Part 1508.8, indirect effects may include growth inducing effects and other effects related to the induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. The Proposed Action would result in a new access road and bridge over Ship Creek. This road would provide access for authorized personnel only and would not be considered a public roadway. The availability of a new access road and bridge at this location would not be expected to result in any indirect effects associated with population growth or land use in the Anchorage area.

4.15 Unavoidable Adverse Environmental Impacts

Section 102(2)(C)(ii) of NEPA requires Federal agencies to identify any adverse environmental effects that cannot be avoided should the Proposed Action be implemented.

Unavoidable impacts would result from the implementation of the Proposed Action:

- Noise from site clearing and roadway construction activities would occur. This increase in noise level would be short-term and limited to the immediate area of construction. Noise-generating activities would take place during daytime hours and would be at levels that would not cause hearing impairment.
- Loss of approximately 7.1 acres of open space would result from construction of the proposed road.
- The emission of air pollutants associated with site clearing and construction would be an unavoidable condition, but is not considered significant.
- The loss of aggregate used for concrete, which would become inaccessible, would occur as a result of the construction activities. However, the impact would be insignificant due to the relatively small amount needed and the local availability of this resource.
- The use of nonrenewable energy resources is an unavoidable, but the amount used would not be considered significant.
- Site grading would remove vegetation and habitat for wildlife that includes moose. Loss of 7.1 acres of moose habitat would be unavoidable. The Proposed Action would include enhancement of barren areas (i.e., landfills on Elmendorf AFB that are scheduled to be closed) for future use as moose browse (see Subchapter 4.7.1).
- Loss of up to 1.07 acre of wetlands would be an unavoidable adverse impact of road construction.
- Temporary and localized increases in traffic would be unavoidable during the construction period.

With incorporation of appropriate design features into the project and compliance with stipulations of regulatory permits, unavoidable impacts would be prevented or minimized.

4.16 Relationship Between Short-Term Uses and Enhancement of Long-term Productivity

Section 102(2)(C)(iv) of NEPA requires Federal agencies to identify the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity.

The Proposed Action would contribute to an intensification of land use on Fort Richardson. Development of the Proposed Action would result in a loss of up to approximately 7.1 acres of open space on Fort Richardson (the Alternative Action would result in loss of approximately 7.8 acres). This open space is an Army training area that has been designated for future housing. Therefore, the Proposed and Alternative Action would not be expected to result in any cumulative land use or aesthetic impacts to Fort Richardson. Long-term productivity at Fort Richardson would not be affected by the Proposed Action.

4.17 Irreversible and Irretrievable Commitment of Resources

Section 102(2)(C)(v) of NEPA requires Federal agencies to identify any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented. This could include the consumption of material resources, energy resources, and human resources. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects the use of these resources would have on consumption or destruction of a resource that could not be replaced in a reasonable period of time.

The irreversible environmental changes that would result from implementation of the Proposed or Alternative Action involve the consumption of material resources, energy resources, and human resources. The use of these resources is considered to be permanent. Loss of petroleum-based products such as gasoline and diesel would be partially offset by fuel savings that would result from shorter travel distances using the proposed road.

Material resources used for the Proposed Action include building materials (for construction), concrete and asphalt for the roadway, and other various materials. The materials that would be consumed are not in short supply and are readily available from suppliers in the Anchorage area. Use of these materials would not limit other unrelated construction activities, and therefore, would not be considered significant.

Energy resources would be irretrievably lost. These include petroleum-based products such as gasoline and diesel fuel, natural gas and electricity. During construction, gasoline and diesel fuel would be used for operation of the construction equipment and other vehicles. Consumption of these energy resources would not place a significant demand on their availability in Alaska. Therefore, no significant impacts would be expected.

The use of human resources for construction is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

CHAPTER 5
LIST OF PREPARERS

This chapter provides the names and qualifications of staff members who were primarily responsible for preparation of this EA. This list includes the key management personnel, investigators and technical personnel that contributed to document preparation.

Name	Degree	Professional Discipline	Years of Experience
Crisologo, Rosemarie	B.S., Biological Sciences M.S., Environmental Engineering	Environmental Science	23
Gaddi, Elvira, P.E.	B.S., Chemical Engineering M.S., Chemical Engineering	Environmental Compliance	25
Luc, Thanh	B.S., Mechanical Engineering	Noise Control Engineering	13
Schnapp, Angela	B.S., Nuclear Engineering M.S., Environmental Engineering	Environmental Engineering	9
Wallin, John	B.A., Biology M.A., Management	Environmental Science	27
Wooten, R.C.	Ph.D., Ecology/Biology	Environmental Science	31

CHAPTER 6
CONSULTATION AND COORDINATION

This chapter lists the individuals consulted during the preparation of this EA.

6.1 Persons and Agencies Consulted

6.1.1 Federal Agencies

U.S. Air Force

Air Force Center for Environmental Excellence

Lynch, Nicholas, Capt (AFCEE/HDP)

Elmendorf AFB, Alaska

Payne, Valerie (3 CES/CEVP)
Walters, Kenneth (3 CES/CEI)
Griese, Herman (3 CES/CEVP)
Scudder, Jon (3 WG/PA)
Bennyhoff, William (3 CES/CEF)
Cockrell, Sean (3 CES/CEOE)
Webber, Donald (3 CS/SCX)

U.S. Army

U.S. Army Garrison Alaska, Directorate of Public Works

Gardner, Kevin (Environmental Planner)
Berta, Brandon (Fort Richardson ITAM Coordinator)

CHAPTER 7
REFERENCES CITED

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