CHAPTER 3

Affected Environment

3.1 Introduction

This chapter presents descriptions of the affected environment for the valued environmental component (VECs) analyzed in this *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* (Aviation Environmental Impact Statement [EIS] or EIS). The description of each VEC addresses the baseline condition and the factors that influenced this condition. This EIS addresses the important past human actions and natural events that have altered the condition of each VEC analyzed in detail in this EIS.

3.1.1 Presentation of VECs

The VECs are the resources, ecosystems, and human communities of concern that could be affected by the Proposed Action. The Army conducted an initial review of the VECs and subsequently ranked them in terms of their relative potential to be affected by the Proposed Action (see Subsection 1.4.2.2). The categories of VECs and the associated level of analysis necessary are based on the potential for impacts to occur. Based on the relative rankings for potential significant impacts to occur, the VECs are grouped into one of three categories: Primary, Secondary, and Other Areas of Focus (see Table 3.1.a and Chapter 4). In this chapter, the VECs that have a low to very low potential to result in adverse impacts are discussed in this introductory subsection. Each of the low-ranked VECs is discussed briefly to explain why no or little impact is anticipated. Based on this early evaluation, these VECs are not discussed in detail in the remainder of this chapter or in Chapter 4. Quick Look Questions prepared to support cumulative effects analysis for the VECs (see Section 4.12) also support the relative VEC ranking identified in Table 3.1.a. Answers to the Quick Look Questions are provided in Appendix E.

TABLE 3.1.a
Presentation of Valued Environmental Components
USARAK Aviation EIS

Section	Valued Environmental Component
Primary VECs—High Potential for Significant Impacts	
3.2	Airspace Management
3.3	Cultural and Visual Resources
3.4	Noise
3.5	Hazardous Materials/Hazardous Waste
3.6	Wildlife and Fisheries
Secondary VECs—Medium Potential for Significant Impacts	
3.7	Air Quality
3.8	Socioeconomics
3.9	Soils and Permafrost
3.10	Water Resources (Surface Water and Groundwater)
3.11	Subsistence and Recreation

TABLE 3.1.a
Presentation of Valued Environmental Components
USARAK Aviation EIS

Section	Valued Environmental Component
Other Areas of Focus—Low to Very Low Potential for Adverse Impact (Discussed in Subsection 3.1.2)	
3.1.2.1	Traffic/Transportation Systems
3.1.2.2	Vegetation
3.1.2.3	Wetlands
3.1.2.4	Fire Management
3.1.2.5	Geological Resources
3.1.2.6	Safety
3.1.2.7	Land Use/Energy/Utilities
3.1.2.8	Environmental Justice

3.1.2 Other Areas of Focus

This section addresses those VECs that have a low or very lot potential for impact, as outlined in Table 3.1.a. Each VEC is described in a separate subsection that presents an overview of the VEC, notes standard practices that the Army employs to protect and mitigate effects to the VEC, and describes the rationale for not analyzing further these VECs in this EIS. The Army implements a number of Army regulations, management plans, and mitigation measures to avoid, minimize, and mitigate impacts to these VECs; summaries of these are also provided in the text that follows. The fact that the Proposed Action has little potential for direct impact means the Proposed Action will not contribute to any potential cumulative impact of these environmental components. Accordingly, this EIS does not consider the potential for cumulative impacts to these VECs, which is supported by the Quick Look Questions provided in Appendix E.

3.1.2.1 Traffic/Transportation Systems

Direct traffic impacts associated with either of the two action alternatives are anticipated to be minimal and primarily related to increases to military population on installations and training activities at outlying training areas. Currently, U.S. Army Alaska (USARAK) deployment miles are greatest between the Fort Wainwright (FWA) Main Post and Yukon Training Area (YTA) and Donnelly Training Area (DTA). Deployment miles may also include rail and air transport methods. AR 385-55, *Prevention of Motor Vehicle Accidents* (U.S. Department of the Army, 1987), and United States Army Garrison (USAG) Alaska Regulation 55-2, *Transportation Operations and Planning in Alaska* (USARAK, 2001), provide detailed regulations for convoy preparation and implementation. Additional information can be found in the *Final Environmental Impact Statement for Transformation of U.S. Army Alaska, Vol. 2*, Appendix H (USARAK, 2004a). Army convoys are subject to an Alaska Department of Transportation and Public Facilities (Alaska DOT&PF) permitting process. USARAK would continue to follow Army regulations and other practices to manage potential traffic and transportation system effects. These include continuation of the convoy permitting process with Alaska DOT&PF and considering alternate travel routes and methods for military convoys, including line haul, airlift, and rail if available. To avoid public highway travel concurrent with military convoys, the Army will continue its public notification of imminent convoy activity, make USARAK long-term training and convoy

schedules available to the public, segment large convoys, and stagger convoy departure times to reduce impacts to traffic on the public roads.

Access to FWA and within the Main Post is provided by State and local roads, railway main lines and spurs, Ladd Army Airfield (AAF), and Fairbanks International Airport. The scope evaluated in this EIS for potential non-training-related traffic and transportation impacts includes those State and local roads providing access to the FWA Main Post and the main roads within the FWA Cantonment, Fort Richardson (FRA), Eielson Air Force Base (AFB), and DTA.

The major State and local roads serving Fairbanks and the Main Post include the Richardson, Parks, and Steese highways. Within Fairbanks, Airport Way is the main east-west arterial accessing the Main Post. Traffic along roadways and at intersections on the Main Post is generally moderate, although noticeable congestion occurs on portions of some main roads and at some main intersections during peak hours. During the construction and demolition of aviation-related facilities, truck and construction-related vehicle traffic is expected to increase on the roadways serving the FWA Main Cantonment. The road system serving the south side of the airfield, originating primarily at the Main Gate on Gaffney Road, will be the most affected by the increased traffic from construction and demolition of aviation-related facilities.

In 2006, USKH, Inc. performed a traffic study on the Main Post for FWA's Directorate of Public Works (DPW) (USKH Inc., 2006). The study included an analysis of current AM and PM peak-hour traffic conditions, and an analysis of forecasted traffic conditions for the next 6 years. The forecasts assumed full development and occupancy of planned facilities as well as the anticipated intermittent return of personnel from abroad. The results of the analysis in the draft report indicated that all intersections on the Main Post currently operate at or above accepted DPW standards and that significant traffic increases would result from full occupancy and build-out of planned facilities and returning troops. Eleven roadway and intersection improvements were recommended in the draft report, and these improvements are expected to bring future forecasted traffic conditions within compliance with DPW and national industry standards (USKH Inc., 2006). Improvements to three of the 11 identified intersections were completed by December 2008, and continued implementation of the recommended traffic and pedestrian improvements will mitigate many of the direct impacts associated with any of the alternatives.

Impacts to FRA, Eielson AFB, and DTA traffic and transportation systems would be commensurate with the additional personnel associated with those Soldiers stationed at these location under Alternative 3. No adverse effects are expected to traffic and transportation systems under the No Action alternative or Alternative 2 because there would be no increase in personnel at these locations as part of these alternatives.

Roadway traffic and transportation systems could be affected by routine Soldier travel to and from installations and by convoys for training exercises or deployments. There were concerns raised during public scoping meetings about the affects of additional traffic on Fairbanks roadways and around FWA. Housing options on the Cantonment and military deployments reduce the significance of the potential impacts of Alternatives 2 or 3 on the road systems of Fairbanks and Anchorage. By continuing to implement current USARAK convoy procedures as well as proposed on-Post improvements, it is not anticipated that the

additional Soldiers resulting from either of the two action alternatives would have a significant impact on local and regional road networks. Because changes to roadway traffic would be minimal and can be absorbed by the existing infrastructure, additional baseline description or analysis for this VEC is not warranted.

3.1.2.2 Vegetation

Ground-disturbing activities that could affect vegetation on USARAK lands under the Proposed Action alternatives are limited primarily to construction activities. Under the Proposed Action, all construction would occur on FWA's Cantonment, and no construction would occur at FRA, Eielson AFB, or DTA. The FWA Cantonment consists of urban, landscaped vegetation or vegetation such as grasses that has re-grown in areas previously disturbed by military activity. No listed, proposed, or candidate species or threatened, unique, rare, or endangered species of plants are known to occur within the Cantonment. There were also no concerns about vegetation raised during public scoping meetings.

Most non-native plant populations in Alaska are small and largely restricted to areas of anthropogenic disturbance (Carlson et al., 2004). Invasive species occur on all three potentially affected installations in Alaska; however, relative to military installations and federal lands in the lower 48 states, the invasive problem is minimal. Nonetheless, USARAK is committed to taking a proactive approach to managing invasive species (U.S. Army Garrison Alaska [USAG-AK], 2007a). USAG FWA and FRA actively manage against noxious weeds by robust weed control programs as well as best management practices (BMPs) designed to reduce the overall spread of noxious weeds to/from military lands in Alaska.

Construction of facilities on FWA would require clearing and grading of vegetated land. Very few of the proposed construction sites are in forested areas of FWA; however, some tree clearing will be required. Disturbance to urban vegetation would be temporary, whereas clearing new parcels would be semi-permanent. The total area requiring clearance for the Proposed Action alternatives is approximately 38 acres, all of which are secondary forests and urban landscapes. Following construction activities and wherever appropriate, disturbed areas would be replanted and maintained with urban vegetation (ornamental trees, shrubs, and grasses) or reseeded with appropriate native vegetation.

The Army implements ongoing mitigation procedures to avoid or minimize impacts to vegetation. Ongoing mitigation measures have been included as part of the Proposed Action alternatives, and would continue. Vegetation mitigation measures:

- Follow AR 350-2, *Range Regulation* (U.S. Department of the Army, 2002), and AR 200-3, *Natural Resources-Land, Forest and Wildlife Management* (U.S. Department of the Army, 1995), which provide procedures for protecting vegetation
- Incorporate existing cleared areas into siting of new facilities
- Reseed areas directly affected by construction with native grass
- Continue implementation of *Integrated Natural Resources Management Plans* (INRMPs), with specific actions for management of vegetation, including invasive species monitoring and management

- Retain as much existing vegetation as possible to provide cover, concealment, and realism
- Conduct studies to assess impacts of recreational vehicles to vegetation
- Continue production of planning-level surveys, wetlands management, and revegetation plans

3.1.2.3 Wetlands

USARAK lands contain nearly 1 million acres of wetlands, with the majority occurring at FWA training areas including DTA. The U.S. Army Corp of Engineers (USACE) Waterways Experiment Station and Cold Region Research and Engineering Laboratory (CRREL) have delineated the wetlands on FWA and DTA. The Main Post of FWA contains approximately 5,974 acres of wetlands (USAG-AK, 2007), and wetlands occur within the Cantonment of FWA near some Proposed Action facilities. However, in accordance with Clean Water Act (CWA) Section 404(b)(1), facilities to be constructed at FWA for either Alternative 2 or Alternative 3 have been sited to avoid wetlands impacts. No new facility construction or demolition would occur at FRA, Eielson AFB, or DTA under either Alternative 2 or 3; thus, there would be no impact from construction or demolition at these areas for either of the Proposed Action alternatives.

Aviation unit training activities would be conducted in existing impact areas (IAs), firing points (FPs), drop zones (DZs), and other USARAK training facilities as shown in Figures 2.3.b through 2.3.e. No new wetlands impacts are expected to occur from military training under the Proposed Action alternatives because aviation units will train in existing training facilities. When aviation forces train in combination with the 1/25 Stryker Brigade Combat Team (SBCT), the combined wetland impact will be proportional to combined training exercises with ground vehicles. BMPs are in place for ground-based training activities from the 1/25 SBCT in or near wetlands, and are outlined in *Transformation of U.S. Army Alaska Final Environmental Impact Statement* (USARAK, 2004a).

Although no new impacts to wetlands are expected from the Proposed Action alternatives, the Army routinely implements BMPs to prevent or reduce environmental effects to wetlands. To continue to reduce environmental effects on wetlands, the Army would implement additional wetlands mitigation on a case-by-case basis to ensure compliance with wetland regulations and conservation of wetland resources. As necessary, the Army would continue acquisition of CWA Section 404 permits, continue to avoid and/or minimize impacts to the maximum extent possible, use silt fences and other construction techniques to prevent siltation into wetlands during construction, and stabilize all cuts, fills, and disturbed areas resulting from project construction using native vegetation to minimize erosion and subsequent sedimentation of wetlands and streams (USAG-AK, 2007a; USARAK, 2004a).

No concerns about wetlands were raised during public scoping meetings. The U.S. Environmental Protection Agency (EPA) commented during agency scoping and identified that wetland avoidance should remain the top priority when actions may affect wetlands. Given that all aspects of the Proposed Action alternatives have been developed to avoid wetlands, additional baseline description or analysis is not warranted.

3.1.2.4 Fire Management

Wildfires can start through natural events (e.g., lightning) or human activities, including weapons training and flight-related activities conducted by the USARAK. As part of its INRMP, USARAK implements a *Forest and Wildfire Management Plan* (USAG-AK, 2007a) that describes pre-suppression actions, fire surveillance, and suppression actions. These activities include procedures and conditions for evaluating the risk of certain training activities under various weather conditions, fuel management (e.g., prescribed burns and fire response and containment). Concerns regarding wildfires were not raised during the public scoping meetings.

The U.S. Bureau of Land Management (BLM) Alaska Fire Service (AFS) provides fire management services including pre-attack planning, hazard reduction, and fire response to USARAK. The AFS has a Reciprocal Fire Management Agreement with the Alaska Department of Natural Resources, Division of Forestry (Alaska Fire Service and State of Alaska, 1998), which applies to all lands under federal ownership in Alaska. The installation Wildland Fire Program Manager is responsible for developing the *Integrated Wildland Fire Management Plan* and reviews and approving burn plans for prescribed fires. The Joint Director of Military Support is responsible for deployment of military firefighters and equipment. Fire management plans are in place at each installation to reduce fire danger.

Fires are frequent in Interior Alaska and they play an important ecological role by making nutrients stored in undecayed, accumulated matter available to plants. Approximately 30 percent of FWA has burned since 1950 (Jorgenson et al., 1999), and a substantial portion of the area has burned more than once. Records of fire occurrences since 1950 indicate that approximately 1 percent of FWA has burned annually (Jorgenson et al., 1999). The average interval for fire recurrence on any given area at FWA varies from 100 to 150 years (USAG-AK, 2007a).

Although wildland fire is a concern at FRA, it is rarely a serious problem. Numerous fires have been recorded in the Matanuska-Susitna Valley to the north, but no major fires have occurred on FRA since 1950 (Jorgenson et al., 2002). Severe drought conditions occur about once every 20 years and, in normal years, there is an average of less than five wildland fires. These fires are usually mission-related, small, and easily contained. Fire management concerns are not expected to increase substantially under the Proposed Action at FRA, and existing management plans are expected to be sufficient to address the fire potential that may result from military training.

The two major causes of fires on USARAK lands are incendiary devices (e.g., flares) and lightning. Less common causes of fires include field burning, exhaust, recreation, trash burning, and warming fires (USAG-AK, 2007a). Vehicle and aircraft accidents could also start fires. From 1980 through 2000, 148 wildland fires have been reported from FWA. Thirty-one of these fires were attributed to natural causes and 117 were ascribed to human causes. Of the 117 fires resulting from human activities, 85 were attributed to military training activities (USAG-AK, 2007a).

USARAK, the AFS, and the State of Alaska employ the Canadian Forest Fire Danger Rating System, which classifies fire danger as low, moderate, high, or extreme depending on weather conditions and the potential for fires to start and spread. USARAK restricts military activities when certain thresholds are reached, as required by AR 350-2. For example, use of

pyrotechnics, smoke pots, and grenades is restricted when fire danger is high or extreme. Of the various fire danger indicators within the Canadian Forest Fire Danger Rating System, the fire weather indicator denotes fire intensity and spread potential. The USARAK Fire Chief disseminates the fire index rating (based on the fire weather indicator) information daily during the fire season (typically from early April to late August) so that the appropriate range restriction can be implemented. For example, between 1995 and 2005, DTA was rated as follows: low – 359; moderate – 330; high – 455, and extreme – 241 (USARAK, 2006a). Prescribed burns typically are conducted in May, between the snowmelt and the spring plant growth period; burns can also be conducted in the fall if weather conditions permit (USAG-AK, 2007a).

USARAK uses two categories of fuel modification treatments to reduce the threat of fire spread: prescribed burning and mechanical treatments (e.g., fuelbreaks) (USAG-AK, 2007a). The methods used vary because of terrain, acreage, and the shapes of the areas to be treated. In many situations, both of these treatments are implemented. Currently, USARAK does not employ chemical or biological treatments for fuel modification (USAG-AK, 2007a). In part, USARAK is reducing fuel under its land withdrawal responsibilities to prevent the spread of fires outside the installation boundaries. Additional BMPs being implemented include determining the need for and maintaining access and egress routes to enable quick and effective response by initial attack forces and evacuations, maintaining fuelbreaks (including the eastern edge of the Stuart Creek IA on YTA, which, while no longer maintained, is still functional), locating operational areas within hardwood forests (i.e., not in black spruce), and installing weather stations. The Army is currently in the planning stage of a hazardous fuel reduction project for the Stuart Creek IA. The Army is looking at removing hazardous fuels along North Beaver Creek, Skyline, and Brigadier roads, and also creating fuelbreaks from North Beaver Creek Road to the south fork of the Chena River and from Brigadier Road to Chena River's south fork. The Army is also in the planning stages of creating a fuelbreak around the Blair Lakes IA.

Stationing and training activities have the potential to increase wildfire danger on USARAK lands. Under the Proposed Action alternatives, there would be an increase in the amount of live-fire training on FWA. The types of training would be similar to the No Action alternative but would occur at an increased intensity and frequency. Additional missile training would use training missiles as opposed to live missiles, reducing the overall fire hazard. Kiowa helicopters would use tracer bullets and rockets, which can ignite fires.

Generally, the Tanana Flats Training Area (TFTA), YTA, and DTA have a large potential for fire spread because of the prevalent vegetation types, the terrain, and typical weather conditions. Under the Proposed Action, the following fire management and training activities would occur:

- The small-arms complex would be used at a greater frequency and intensity for personnel training. Current fire prevention and fire suppression methods have proven successful at preventing fires from spreading. These measures will continue to be implemented to reduce the potential for fire starts and fire spreads that could result from implementing the Proposed Action.
- At Blair Lakes IA (TFTA, see Figure 2.3.b), a fuelbreak has been created (by mowing) that would continue to be maintained under the Proposed Action. A fuelbreak will be

created and prescribed burns will be conducted to reduce the potential for fire starts and fire spreads, which could result from implementing the Proposed Action.

- At the Simpsonville Maneuver Range (adjacent to the Delta Creek IA in DTA, see Figure 2.3.c), combined arms live-fire training would be conducted with aerial support from either the Airborne Task Force or Combat Aviation Brigade (CAB). Current fire prevention and fire suppression methods will continue to be implemented to reduce the potential for fire starts and fire spreads, which could result from implementing the Proposed Action.
- Prescribed burns are currently implemented under a burn plan at the Oklahoma IA (DTA, see Figure 2.3.c). The burn plan would continue to be implemented under the Proposed Action.
- The Stuart Creek IA (YTA, see Figure 2.3.d) would be used for training at a greater frequency and intensity. Currently, fuel modification treatments are not implemented. To reduce the potential fire spread as a result of fires that inadvertently start during training activities associated with the Proposed Action, the ranges will be subdivided into smaller units in which both prescribed burning and construction of fuelbreaks will be implemented.

Should a fire ignite, fire suppression is implemented in accordance with the *Alaska Interagency Wildland Fire Management Plan* (Alaska Wildland Fire Coordinating Group, 1998), which establishes the following priorities for preparedness and suppression for land parcels:

- **Critical Management Option –** Fires occurring in or immediately threatening areas with this designation have priority over all other wildland fires. Critical sites receive maximum aerial or ground detection coverage based on the level of lightning activity and human use. Land managers are notified as soon as possible of the situation.
- **Full Management Option –** Areas receive maximum detection coverage as well as immediate and aggressive initial attack response. If the initial attack is successful, or the fire is controlled within the first burning period, special agency notification is not required. If the fire escapes and requires additional suppression, affected landowners/ managers are notified to develop further fire suppression strategies.
- **Modified Management Option –** This option provides a level of management equivalent to the Full or Limited Management Options, depending on conditions. The level of management is assigned each summer. A high degree of protection is provided during critical burn periods, but decreases as risks diminish. The initial attack action is based on the potential for damage, constraints on affected land, or discussions with the landowner/manager. Depending on conditions, routine surveillance to ensure that identified values are protected and that adjacent higher priority management areas are not compromised is a viable management strategy.
- **Limited Management Option –** This option is assigned to broad, landscape-scale areas where fire occurrence is essential to the biodiversity of the resource and the long-term ecological health of the land, and land use patterns allow fire to routinely function as a vital component of Alaskan ecosystems. This option is also assigned to areas where the cost of suppression might exceed the value of the resources to be protected or the

environmental impacts of fire suppression activities might have more negative impacts on the resources than the effects of the fire. Lands withdrawn for military use may be designated as Limited because of the presence of significant hazards to firefighting personnel, such as unexploded ordnance and hazardous materials. Limited Management areas receive detection efforts that are appropriate for the fire conditions and the availability of detection resources. The standard response to a fire occurring in these areas is periodic surveillance that continues for the duration of the fire to evaluate threats to sites assigned higher management levels and to assess the potential of the fire to spread into a different management area.

In addition, another fire management option category, Restricted Areas or Hot Zones, has been developed specifically for lands managed by USARAK. These areas include IAs and other locations where no "on-the-ground" firefighting can be accomplished because of the danger of unexploded ordnance (UXO). Impact areas with UXO are managed as Hot Zones with Limited Management. One small-arms range that extends onto withdrawal lands on FWA's YTA is listed as a Hot Zone. Fire in these areas is suppressed through backburning and aerial application of retardants (Alaska Wildland Fire Coordinating Group, 1998).

The presence of additional personnel could result in increased recreational use of USARAK lands, which has been linked to increased fire danger at some installations (USARAK, 2004a). A review of recreational records, however, shows that most recreational users are non-military, and the number of new military personnel recreating at installations would not likely be greater than historical use (USARAK, 2004a).

The potential for fire impacts associated with the increased military training is low. Continued application of ongoing mitigation and avoidance measures has proven effective for fire management on Army training lands. The Army will continue to adhere to the procedures documented in the *Forest and Wildfire Management Plan* (USAG-AK, 2007a). For these reasons, the Proposed Action will have little impact on existing conditions. Additional baseline description and impact analysis in this EIS is not warranted.

3.1.2.5 Geological Resources

FWA lies within the Tanana-Kuskokwim Lowland, which contains geologic materials inclusive of river deposits of sand, gravel, and fine silt. The northernmost FWA Cantonment is located in the foothills of the Yukon-Tanana Upland and consists of bedrock covered by water-saturated organic material/matter and loess (USAG-AK, 2007a).

FWA and Interior training lands, where the bulk of either action alternative would occur, is in a seismically active area influenced by the Denali Fault and other numerous smaller fault zones (USARAK, 1999). FWA specifically lies within the Salcha seismic zone, and has experienced numerous low magnitude and few high-magnitude earthquakes (USARAK, 1999). Building codes dictating earthquake protection measures are employed in facility design at FWA to reduce potential impacts of seismic activity.

The Army has conducted extensive evaluations of potential impacts to geological resources on USARAK lands (USARAK, 1999; USARAK, 2004a; USAG-AK, 2007a). These planning documents and studies have concluded that Army activities, including construction, training, and stationing activities contained in the Proposed Action alternatives, do not have a significant effect on geological resources. There were also no concerns about geological

resources raised during public scoping meetings. Because the potential for impacts to geological resources has been demonstrated in prior documents to be very low, additional baseline description or analysis in this EIS is not warranted. The Army will continue to implement existing BMPs to reduce environmental effects for geological resources.

3.1.2.6 Safety

USARAK determined that there are four primary concerns associated with human health and safety as a result of the Proposed Action alternatives. Human health and safety have the potential to be affected by contamination on military lands, traffic from military convoys on public highways during training exercises, operation of helicopters within airspace utilized by the general aviation (GA) population, and the potential for increased crime rates associated with the additional stationing of Soldiers. Concerns were raised during public scoping meetings about the potential for crime increases in Fairbanks due to the presence of additional troops at FWA.

Safety concerns regarding hazardous materials and wastes are addressed in detail in Sections 3.5 and 4.5, Hazardous Materials/Hazardous Waste. Hazardous materials and hazardous waste would continue to be managed and disposed of in accordance with relevant federal, State, and Army regulations and guidance governing such materials. Remediation programs for past contamination would remain in place under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) enforcement until environmental authorities assess adequate cleanup.

USARAK would continue to follow Army regulations and other practices to manage potential congestion on local roadways from convoys. The evaluation for traffic and transportation systems, including military convoys, is discussed in Subsection 3.1.2.1.

Safety concerns regarding helicopter operations within airspace utilized by the GA community in Alaska are addressed in detail in Sections 3.2 and 4.2, Airspace Management. USARAK has established procedures to maintain separation between its own aircraft, U.S. Air Force (USAF) traffic, and civilian traffic. USARAK will continue its program of coordination with local civilian aviation interests and the USAF to reduce potential conflicts in corridors used heavily by both military and civilian air traffic.

The Army population is reflective of the nation as a whole. As such, the propensity for serious criminal conduct by individuals is comparable to the population at large. Therefore, the addition of Soldiers as part of this aviation stationing action is not expected to change the relative occurrence of criminal conduct within the community. Army disciplinary measures provide sufficient deterrence for both minor and serious offenses to ensure that the increased military population will not result in any real increase in crime rate within any Alaska community. Therefore, additional analysis is not warranted in this EIS.

3.1.2.7 Land Use/Energy/Utilities

3.1.2.7.1 Land Use

Compatible land use for new development is guided by the Army's master planning process, and the alternatives evaluated in this EIS are compatible with that planning guidance. Site planning for existing and future development is coordinated to ensure compatibility among uses. New construction would occur in areas compatible with that

construction (e.g., hangars would be constructed near flight lines), but ultimately will reduce the amount of open space and/or suitable building areas within the FWA Cantonment. No additional land expansion areas would be acquired or considered in order to accommodate increased stationing associated with the implementation of the alternatives.

There would be no change in training activities or patterns, but increases in these activities are anticipated if either of the alternatives is implemented. No construction or significant change of land use is planned for DTA.

There were no issues raised about land use during public scoping meetings. The Army would continue to work with local communities surrounding USARAK installations to provide information about activities on USARAK installations and implement its existing master planning guidelines to keep aviation development at FWA compatible with existing development.

3.1.2.7.2 Energy/Utilities

On August 15, 2008, all utilities at both FRA and FWA were transferred to Doyon Utilities, LLC (DU), a private company charged with managing all aspects of FRA and FWA energy (heat and electricity) and water production, distribution, and disposal. In addition to the transfer of the real property associated with utility services, including the FWA Central Heat and Power Plant (CHPP), all air and water source permits were reissued to DU, which is responsible for all regulatory compliance associated with those permits. In general, DU will be responsible for obtaining and maintaining any and all licenses, permits, or certifications necessary to own, maintain, and operate its utility systems safely and reliably.

Water Supply, Distribution, and Disposal

All drinking water systems, wastewater treatment systems, and water discharge systems have been transferred to DU. Potable water is readily available to both Cantonments, and DU has assured FRA and FWA via contractual guarantees that improvements to efficiency and capacity of the potable water systems will continue. FRA has no wastewater treatment facilities on Post, and DU has coordinated with the City of Anchorage to continue to receive wastewater from FRA. Existing wastewater systems at FWA are functioning below capacity, and with planed improvements by DU, there is no indication that these systems would not be able to adequately remove wastewater or sewer system discharge as a result of the Proposed Action alternatives.

Fort Wainwright

Two wells in Building 3559 make up FWA's main potable water supply and together they produce up to 4.9 million gallons per day (mgd). The highest average daily potable water demand (during summer) is approximately 2.7 mgd (Davenport, 2007). Seven additional groundwater wells are used to augment potable water supply on the Main Post and provide water for other uses, including fire protection. With all nine wells, the overall combined supply is up to 9.3 mgd. Water from the seven supplementary wells is treated only with chlorine, and these wells are used mainly to supply potable water in emergencies. Potable water for general use is stored in a 325,000-gallon concrete tank.

The water treatment plant serving FWA's Main Post is housed in Building 3565 and has a hydraulic capacity of 3.5 mgd. At times during the summer, the peak water use can exceed the treatment plant's capacity to produce high-quality water; when this occurs, the

additional demand is met by adding unfiltered chlorinated water (Davenport, 2007). Treated water is distributed to Main Post buildings and hydrants through the network of utilidors (underground utility corridors). The residual heat from the steam lines that are collocated in the utilidor system prevents the water distribution lines from freezing during the winter. Fire protection for the FWA Main Post is provided through a network of about 350 hydrants distributed throughout the area, with water supplied from the system of wells described above (Davenport, 2007).

Sanitary wastewater generated on Main Post is collected by a system of gravity lines and lift stations, and is conveyed through a 24-inch force main to the Fairbanks wastewater treatment plant, owned and operated by Golden Heart Utilities. The FWA Main Post produces about 1.25 mgd of sanitary wastewater during winter and 2.0 mgd during summer. The hydraulic capacity of the Main Post wastewater collection system is 2.5 mgd, and the design capacity of the 24-inch conveyance main is 2.0 mgd (Davenport, 2007).

There are no underground storm drainage lines on FWA. Storm water runoff is managed by a series of shallow ditches and swales throughout the Main Post. The low-gradient system of ditches and swales promotes infiltration, generally following natural drainage courses to the Chena and Tanana rivers. During spring, water can collect in low areas, as the ground remains seasonally frozen. As temperatures rise and the ground thaws, the collected water seeps into the soil. While associated construction activities represent potential increase in storm water runoff pollution, management activities mandated by federal and State laws are sufficient to manage storm water pollution. Management practices required by installation storm water permits will ensure against runoff pollution from new facilities and parking lots added as a result of the Proposed Action.

Fort Richardson

There are no wastewater treatment facilities at FRA. There is one main line leaving FRA that carries wastewater, which is treated by the City-owned wastewater treatment plant. The City plant has historically been capable of handling a maximum capacity waste stream from FRA and Elmendorf AFB of 3.5 to 4.0 mgd (Elmendorf AFB accounts for approximately 60 percent of the waste stream). However, due to recent upgrades, the plant may be able to accommodate up to 6.0 mgd. DU is currently conducting a characterization study to determine the status of the system.

Energy Supply and Distribution

The energy supply and utilities infrastructure at FWA, FRA, Eielson AFB, and their respective training areas are sufficient to meet the demands as proposed in the alternatives evaluated in this EIS. However, DU is currently conducting a number of assessment studies to determine critical components of the utility infrastructure at FRA and FWA requiring upgrade or replacement. These upgrades are anticipated to be conducted from 2008 through 2013 at both installations and are not directly related to the stationing of aviation assets. As DU continues to upgrade power feeders and transmission lines, as well as implement new technology in power generation facilities, cleaner and more efficient use and distribution of power are ensured.

Fort Wainwright

Electrical power requirements on the Main Post are met primarily by electricity generated at the CHPP in Building 3595. The CHPP houses four 5-megawatt (MW) coal-fired steam-

driven turbine generators. Process water in the CHPP is cooled by air-cooled condensers. Supplemental electrical power is available as needed on FWA through a tie provided by Golden Valley Electric Association, a nonprofit cooperative in North Pole, Alaska. The current annual power requirements on the Main Post range from a high of 18 MW during winter to a low of 10 MW during summer (Davenport, 2007). Power generated at the CHPP is distributed to Main Post facilities on 10 radial three-phase circuits, with conductors primarily carried on overhead poles. The North Post area is served by three main circuits, while the South Post area (including family housing) is served by four different circuits (Davenport, 2007). In addition to the eight-circuit grid, 15 buildings on the Main Post have standby engine generator units that can augment electrical power supplies. The standby generators have design capacities ranging from 10 to 400 kilowatts (kW) (Davenport, 2007). DU plans to upgrade and increase the capacity of the electrical system serving FWA during a 5-year period that began in 2008. A new substation with 50 percent more capacity is planned to be completed in the summer of 2009. Moreover, all replacement electrical circuits and supply systems planned over the 5-year period will also be constructed, all with 50 percent more capacity (Doyon, 2008).

Heating requirements on the Main Post are met with steam generated at the FWA CHPP, with the steam distributed at 100 pounds per square inch through pipes within the network of underground utilidors and some buried pipelines. The CHPP produces steam using six Wickes coal-fired steam boilers, each rated at 150,000 pounds per hour of steam. Usually, at any one time, four boilers are operating, with one additional boiler kept on standby, and one boiler undergoing a cyclic maintenance program (Davenport, 2007). Distribution of steam within the Main Post is accomplished with four 16-inch main steam lines, three of which connect to a 24-inch main on the east side of the CHPP. The 24-inch main supplies the South Post area, while the fourth 16-inch lateral supplies the North Post area. A network of secondary steam distribution lines ranging from 1 inch to 20 inches in diameter complete the distribution to the South Post and the North Post buildings (Davenport, 2007).

The FWA CHPP as operated by DU burns approximately 220,000 tons of coal per year (3-year rolling average). The power plant is permitted to burn 336,000 tons, resulting in a substantial 52 percent available headspace in the permitted amount.

Fort Richardson

FRA is provided electric power by a regulated public utility, Anchorage Municipal Light and Power. Natural Gas at FRA is provided by Enstar Natural Gas Company, also a regulated public utility. All utility infrastructure on the installation is now owned and managed by DU, which will continue to coordinate with the Municipality of Anchorage and Enstar to provide safe and reliable heat, electricity, and natural gas. Based on the new UP paradigm, and the substantial improvements already completed and scheduled to be completed over the next 2 years, it is determined that the current energy supply and distribution infrastructure for electric power, steam, and natural gas has sufficient capacity to support the additional Soldiers and their families at FRA.

Summary

No additional expansion of facilities or potential reduction in service is anticipated from the Proposed Action alternatives. Utility infrastructure at the USARAK installations has sufficient capacity to supply new buildings and accommodate the slight increase in utility usage by additional personnel. All new Cantonment structures will be connected to the

existing steam and electric distribution system for heat and electric utilities, resulting in no new combustion sources. DU will manage, control, and perform operations, maintenance, repairs, replacements, and upgrades for all utilities and associated infrastructure as part of daily operations and in response to identified needs. If additional expansion of the utility infrastructure is needed, DU will be fully responsible and capable of that expansion to meet the needs of its customers, FRA and FWA, and would be responsible for any additional National Environmental Policy Act (NEPA) analysis and documentation as to the potential environmental effects of their actions.

DU identified several upgrades that will increase operating efficiency associated with electrical generation, and is anticipated to result in substantial reductions in emissions, thereby improving air quality. Identified improvements will allow for the service of additional heat and electric loads without increases in quantity of coal consumed or degradation of air quality. DU has already installed more than 7,000 secondary meters enabling early identification of usage trend and potential shortfalls at both installations. DU plans to construct two new substations (one at FRA and one at FWA) and rebuild failing electrical feeders with newer technology to improve system efficiency. Further, all electric facilities at FRA and FWA will be completely rebuilt with upgraded technology and equipment, thereby ensuring cleaner, more efficient use of utility infrastructure and ultimately resulting in an expansion of capacity before 2013.

There were no issues raised about energy or utilities during public scoping meetings. Because infrastructure is sufficient or to be upgraded by DU by 2013, no impacts to energy or utilities are anticipated from the Proposed Action alternatives, and this VEC is not analyzed further in the EIS. Note that impacts associated with energy use are addressed in Section 4.13, Irreversible or Irretrievable Commitment of Resources.

3.1.2.8 Environmental Justice

In 1994, Executive Order (E.O.) 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations* (FR, 1994), directed each federal agency to identify and address any disproportionately high and adverse environmental effects of its programs, policy, and activities on minority and low-income populations. Environmental effects include effects on human health, cultural resources, and socioeconomics. In particular, E.O. 12898 directs agencies to pay special attention to subsistence issues because minority and low-income populations often rely heavily on hunting, fishing, and gathering for their primary dietary/nutritional needs. Subsistence use and changes to the availability of military lands for subsistence activities are discussed in Subsection 3.1.2.2. In addition, E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (FR, 1997), requires the identification and assessment of environmental health and safety risks that may disproportionately affect children.

Minority communities are defined as populations where the percentage of minorities significantly exceeds the average for the State of Alaska. “Significantly exceeds” is interpreted here as exceeding the State average by 5 percent. Because the percentage of persons in Alaska identified as minority under U.S. Census guidelines is 30.7 percent, any community with a minority population of 35.7 percent or above is considered a minority community for purposes of this analysis. The same method is used to define low-income communities: 11.2 percent of Alaskans are considered low income, so any community where

the percentage of persons living below the poverty level is 16.2 percent or higher is a low-income community for the purposes of this environmental justice analysis.

The Final EIS for Transformation of U.S. Army Lands in Alaska (USARAK, 2004a) lists the following minority or low-income communities within the region potentially influenced by the Proposed Action: Minto, Nenana, Big Delta, Delta Junction, Dot Lake, Dry Creek, Fort Yukon, Healy Lake, Tanana, Buffalo Soapstone, Eklutna, Houston, Lowell Point, Meadow Lakes, Point MacKenzie, Trapper Creek, Tyonek, Willow, and Y. Some of these communities also have subsistence interests in FWA (to include DTA). Potential impacts to these communities under this Proposed Action are expected to be similar to those documented in that EIS (USARAK, 2004a).

Potential impacts to low-income populations related to housing shortages in Fairbanks and Anchorage are analyzed in Section 3.8, Socioeconomics. Potential impacts to subsistence uses, traffic and transportation systems, and public safety are assessed in Section 4.11 and Subsections 3.1.2.1 and 3.1.2.6, respectively.

No construction or training activities would take place near schools, day care facilities, or other areas with large populations of children under this Proposed Action. Therefore, no additional analysis is necessary. Because minority and low-income populations as well as areas with large populations of children are either not affected or not disproportionately affected by the Proposed Action, and because housing impacts of the alternatives are analyzed in Sections 3.8 and 4.8, Socioeconomics, the environmental justice topic is not analyzed further in this EIS.

While the Proposed Action is not expected to preferentially affect minority or low income communities (as defined above), comments were raised during review of the Draft EIS from an Alaska Native tribe regarding respect for Native cultures, values, and property. USARAK has an ongoing program of coordination with Alaska Native communities to address tribal concerns. For all alternatives considered in the EIS, the Army would continue full-time Native tribal coordination to address issues of importance to the Native community. This includes government-to-government relations with Alaska's Native tribes; fostering continued communication and coordination between the Army and the tribes; and working with relevant federal and state officials to protect subsistence resources in and around Army lands.

Specifically, the Army would also continue its program to educate Soldiers on Alaska Native cultural awareness and diversity. Incoming Soldiers to Fort Wainwright and Fort Richardson are given "Newcomer Briefs" upon arrival, in which the Army's Native Liaison participates. Soldiers are encouraged to have respect for subsistence-user resources and understand the value placed on the subsistence resources by the Alaska Native population. Soldiers are informed that tribes are concerned with the stress that increased military population numbers can place on resources. Soldiers are told what constitutes waste of hunting harvest in different cultures and are encouraged to donate excess harvest to tribal entities. Adherence to hunting and fishing regulations is emphasized. Soldiers are instructed on private land ownership including Native corporation lands and individual Native allotments. Resources are given to Soldiers to foster the researching of land ownership to avoid trespass.

3.2 Airspace Management

3.2.1 Introduction

Navigable airspace is a finite public resource that must be managed in the interests of private and commercial aircraft operators, users of commercial air services, and government agencies, including the U.S. Department of Defense (DoD). The Federal Aviation Administration (FAA) is responsible for managing the National Airspace System (NAS). The FAA provides management oversight to the structure of national and local airspace through its Air Traffic Airspace (ATA) Management division. The ATA has nine geographically based regional offices, including one in Anchorage. The Anchorage office provides guidance for the management and control of the airspace within the Alaska region.

3.2.1.1 USARAK Airspace Requirements

USARAK operations in and outside of training areas will continue to be governed by existing policies and doctrine, including:

- AR 95-1, *Aviation Flight Regulations*, April 2004 (U.S. Department of the Army, 2008a)
- *USARAK Airborne Standard Operating Procedures* (ASOP), April 2003 (USARAK, 2003a)
- USARAK 350-2, *Range Regulation*, July 2002 (U.S. Department of the Army, 2002)
- Army Pamphlet 385-63 and AR 385-63, which govern safety on ranges including aviation training and gunnery (U.S. Department of the Army, 2003)

In addition, USARAK will continue its program of coordination with local civilian aviation interests and the USAF to reduce potential conflicts in corridors used heavily by both military and civilian air traffic. Specific measures include the following:

- Use of the Notice to Airmen (NOTAM) system to alert civil and other military users of upcoming events, such as training exercises
- Participation in Alaska Civil Military Aviation Council (ACMAC) meetings, a forum for discussing aviation issues with the USAF and civilian aviation interests
- Quarterly USARAK Aviation Safety Standard Council meetings with the FAA, USAF, and GA representatives

The Army is currently evaluating its participation in the Special Use Airspace Information System (SUAIS) program. The SUAIS is primarily a USAF program to provide a recorded message to aviators after business hours. Currently, Army Range Control expands its firing desk operations to 24 hours when operations are ongoing, either aviation or ground centric. Range Control can advise personnel who utilize the Army's frequency (FREQ [FM] 38.30) as to operational ranges and areas to avoid. Recent Army communication suite upgrades have created the capability to monitor and transmit on very high frequency.

There were a number of comments made about airspace during public scoping meetings, including suggestions that the Army consider access and safety of shared airspace when conducting military training, and to continue to coordinate with the public and aviation

organizations on issues related to airspace. There were also concerns about increased use of airspace in the congested corridors around Fairbanks and Anchorage.

3.2.1.2 Airspace Definitions

The NAS comprises distinct categories of controlled and uncontrolled airspace. These categories accommodate a wide range of civil and military aviation activities, and maintain the safety and efficiency of aircraft operations. Airspace is defined in vertical and horizontal dimensions, and by time. The following list provides brief descriptions of these airspace categories:

- **Class A Airspace.** This airspace occurs from 18,000 to 60,000 feet above mean sea level (msl). All operations within Class A airspace must comply with instrument flight rule (IFR) requirements. This airspace is dominated by commercial aircraft, mostly using jet routes between 18,000 and 45,000 feet msl.

- **Class B Airspace.** This airspace occurs from the surface to 14,500 feet msl around the nation's busiest airports. Before operating in Class B airspace, pilots must contact controlling authorities and receive clearance to enter the airspace. Aircraft operating within Class B airspace must be equipped with specialized electronics that allow air traffic controllers to track aircraft speed, altitude, and position accurately.

- **Class C Airspace.** This airspace occurs from the surface to 4,000 feet above the airport elevation (charted in msl) surrounding those airports with an operational control tower that are serviced by a radar approach control and meet specified levels of IFR operations or passenger enplanements. Aircraft operating within Class C airspace must be equipped with a two-way radio and an operable radar beacon transponder with automatic altitude reporting equipment. Aircraft may not operate below 2,500 feet above the surface within 4 nautical miles of the primary airport of a Class C airspace area, and at an indicated airspeed of more than 200 knots or 230 miles per hour.

- **Class D Airspace.** For those airports that have a control tower, this airspace occurs from the surface to 2,500 feet above the airport elevation (charted in msl) encompassing a 5-statute-mile radius from the airport. Unless otherwise authorized by air traffic control (ATC), aircraft must be equipped with a two-way radio. Aircraft may not operate below 2,500 feet above the surface within 4 nautical miles of the primary airport of a Class D airspace area, and at an indicated airspeed of more than 200 knots or 230 miles per hour.

- **Class E Airspace.** This airspace is any controlled airspace not designated as Class A, B, C, or D airspace. It includes designated federal airways, portions of the jet route system, and area low routes. Federal airways have a width of 4 statute miles on either side of the airway centerline and occur between the altitudes of 700 feet above ground level (AGL) and 18,000 feet above msl. Class E Airspace may have a floor located at ground level at non-towered airfields. No specific equipment is required to operate within Class E airspace.

- **Class G Airspace.** Class G airspace (uncontrolled) is that portion of the airspace that has not been designated as Class A, B, C, D, or E airspace. ATC does not have authority over operations within uncontrolled airspace. Primary users of Class G airspace are visual flight rules (VFR) GA aircraft.

- **Terminal Radar Service Area (TRSA).** Defined airspace surrounding certain airports in which FAA ATC provides radar vectoring, sequencing, and separation for all IFR and participating VFR aircraft.

Special Use Airspace (SUA) is designated to accommodate activities that either must be confined because of their nature or require limitations on aircraft that are not part of those activities. The following list briefly describes individual SUA categories:

- **Prohibited Areas.** Areas requiring rulemaking action that are designated "in the best interest of national security and welfare." The Army uses these areas only in unusual circumstances.
- **Restricted Areas.** Areas requiring rulemaking action. They are established to confine or segregate activities incompatible with (or hazardous to) nonparticipating aircraft. Such areas, which normally extend upward from the surface to more than 45 meters, cover the following activities:
  - The firing of field artillery, air defense artillery, mortars, or small similar weapons
  - Drone or remotely piloted vehicle (RPV) operations
  - Certain types of aircraft ordnance delivery and test flights
  - Some types of laser activity
  - Electronic, chemical, and nuclear warfare measures
  - Various types of research and development efforts
- **Warning Areas.** Areas established in international airspace to contain activities potentially hazardous to nonparticipating aircraft.
- **Military Operations Areas (MOAs).** Volumes of airspace with specific vertical and lateral limits that are used to separate certain military aviation training from nonparticipating IFR traffic. MOAs are normally established to contain aircraft operating in excess of 250 knots below 10,000 feet msl. MOAs do not impose flight restrictions or communication requirements on nonparticipating aircraft operating under VFR.
- **Alert Areas.** Areas established, if requested, when a high volume of pilot training or unusual amount of aeronautical activity (more than 250,000 movements annually) is being conducted.
- **Controlled Firing Areas (CFAs).** Areas established to contain activities that, if uncontrolled, would be hazardous to nonparticipating aircraft.
- **Military Training Routes (MTRs).** Areas generally below 10,000 feet above msl used for high-speed navigation and tactical flight training.
- **Temporary Small-Arms Range Safety Areas (SARSA).** An Army-established and Army-managed area designed to contain small-arms range activities that, if not conducted in a controlled environment, would be hazardous to nonparticipating aircraft.

3.2.2 Scope

USARAK helicopters operating outside of installation boundaries use Alaska airspace also used by civil aviation. Some of this airspace is designated as SUA, either MOAs or Restricted Areas (Figures 3.2.a and 3.2.b). Although Restricted Areas effectively exclude civil aircraft, MOAs limit access to civil aircraft operating on IFR but do not restrict civil aircraft

operating under VFR. In such areas, pilots are responsible for seeing and avoiding other aircraft. Interaction with other airspace users, therefore, could occur in much of the airspace used by USARAK helicopters. As noted above, USARAK has a program of coordination with local civilian aviation interests and the USAF to reduce potential conflicts in corridors used heavily by both military and civilian air traffic. Alaskan airspace would experience increased levels of USARAK helicopter activity in the flight corridors associated with USARAK facilities as part of the Proposed Action. The scope of airspace analysis in this EIS is limited to those areas that may experience increased levels of USARAK helicopter activity. These areas include the FWA and Eielson AFB area, DTA, and the FRA area.

In addition, USARAK helicopters would typically travel among training areas along VFR corridors generally following the Glenn and Richardson highways. Federal low-altitude (i.e., Victor) IFR and VFR airways also follow these corridors. Civilian VFR aircraft traffic in these VFR corridors typically fly at 2,500 feet AGL or less. Because portions of the corridor follow low terrain between mountains of 7,000 to 9,000 feet, other aircraft transiting between Anchorage and Fairbanks are also likely to follow this corridor. This corridor contains most of the level terrain in the area, and numerous public and private airports are located along this corridor. In addition, recreational pilots may fly in and out of small, uncharted landing strips and water bodies, especially during hunting and fishing seasons. This corridor is generally Class E airspace, and follows the same general routes used by several Victor airways.

3.2.3 Affected Environment for Airspace Management

Since 1985, population growth in Alaska has averaged 1.1 percent annually, essentially the same rate of growth as that of the continental United States. The Anchorage Metropolitan Statistical Area (MSA), the State's largest urban area, grew at an annual rate of 1.4 percent over the same period. These population growth trends are forecast to continue through 2030 (Woods & Poole Economics, 2005, in HNTB Corporation, 2007). The Fairbanks MSA, Alaska's second largest urban area, grew at an annual rate of 1.6 percent over the same period (Census Bureau, 2007). Total operations at the Anchorage and Fairbanks airports in 2007 were 300,476 and 108,276, respectively (FAA, 2008). FAA statistics indicate that the number of GA aircraft in Alaska has remained relatively stable since 1998 (FAA, 2006). The baseline condition for airspace management is a result of past and ongoing GA and military actions. Several previous actions with the potential to affect airspace structure and/or activity levels have been identified. The *Alaska Military Operations Areas Environmental Impact Statement* (USAF, 1995) approved the conversion of temporary MOAs to permanent MOAs, the restructuring of MOAs, and the designation of new MOAs. In addition to providing increased operational flexibility for USAF training, these changes raised the minimum altitude of the FALCON and BIRCH MOAs, and established VFR corridors for civilian aircraft in the BUFFALO MOA along the Richardson and Alaska highway corridors. This effort also enhanced coordination among the Alaska airspace users by establishing the SUAIS and the ACMAC.

Seasonal changes in GA activity and topographic features can increase demands on local airspace. During hunting and fishing seasons, GA activity increases as aircraft are used to provide access to remote locations that are not readily accessible by other modes of transportation. In addition, the topographic features described in Subsection 3.2.2 tend to

concentrate both military and civilian aircraft in a limited number of VFR corridors. Table 3.2.a shows the current level of operations (takeoffs and landings) conducted by USARAK helicopters at FRA, FWA, and DTA in 2006. The numbers presented in Table 3.2.a for the existing operations also include Army National Guard helicopters stationed at FRA. The 4,800 annual operations noted in Table 3.2.a at FRA are all attributed to the Army National Guard.

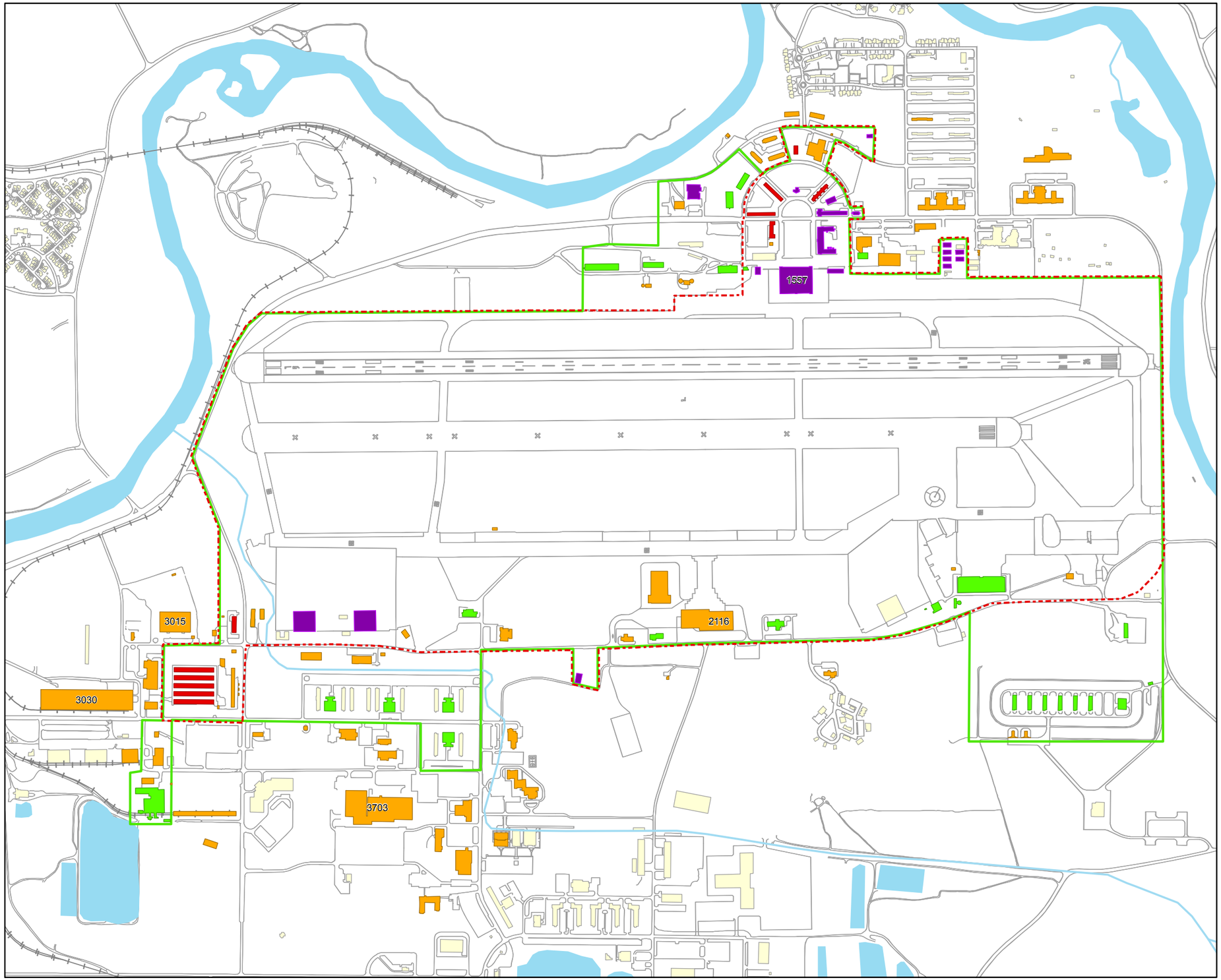
TABLE 3.2.a
USARAK Existing Airspace Usage: Based Helicopters and Airfield Activity
USARAK Aviation EIS

		Helicopter Operations[a]					
	USARAK Permanently Based	Average Day			Average Month	Peak Day	Annual
	Helicopters	Day	Night	Total	Total	Total[b]	Total
Fort Richardson – Bryant AAF[c]							
Blackhawk UH-60	0	17.5	2.5	20.0	400	64.0	4,800
Subtotals	**0**	**17.5**	**2.5**	**20.0**	**400**	**64.0**	**4,800**
Fort Wainwright – Ladd AAF[d]							
Chinook CH-47	12	2.2	0.6	2.8	56	2.8	672
Kiowa OH-58D	0	0	0	0	0	0	0
Blackhawk UH-60/HH-60	20	9.4	3.1	12.5	250	32.0	3,000
Subtotals	**32**	**11.6**	**3.7**	**15.3**	**306**	**34.8**	**3,672**
Donnelly Training Area – Allen AAF[e]							
Chinook CH-47	0	0.3	0.1	0.4	8	0.4	96
Blackhawk UH-60	0	0.3	0.1	0.4	8	1.0	92
Subtotals	**0**	**0.6**	**0.2**	**0.8**	**16**	**1.4**	**188**
Grand Total	**32**	**29.7**	**6.4**	**36.1**	**722**	**100.2**	**8,660**

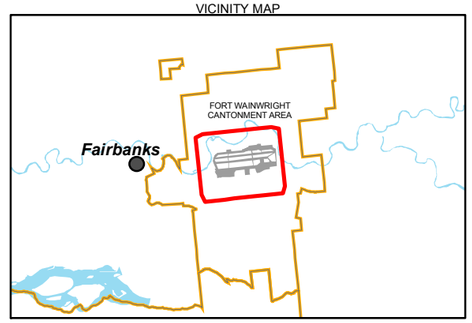
Notes and Data Sources:
[a] An operation is either one takeoff or one landing. Annual estimates based on the assumption that 1 year represents 12 average months; 1 average month equals 20 "average" days. Note that the average day represents a typical flying day, not an annual average day.
[b] Peak day represents activity during a training event. For this alternative, it is assumed that a peak day would coincide with one of the annual door gunnery exercises conducted at FRA (Reid, 2006).
[c] Helicopter activity at Bryant AAF consists entirely of Army National Guard training (CHPPM, 2007a; CHPPM, 2007b).
[d] CHPPM, 2007a; CHPPM, 2007b.
[e] Reid, 2006.

3.2.3.1 Fort Wainwright and Eielson AFB

The FWA and Eielson AFB areas include the Class D airspace of Fairbanks International Airport, Eielson AFB, and Ladd AAF. A TRSA encompasses all these airports. The TFTA and YTA are located generally south of Fairbanks on either side of the Tanana River. Several non-towered airports are also located in the vicinity of FWA. Figure 3.2.a shows the airspace surrounding FWA and Eielson AFB. Figure 3.2.a also shows the VFR corridors frequently used by civilian aircraft and the helicopter flight routes used by USARAK helicopters to transit between military airfields and training areas. Military helicopter flight routes do not follow the established VFR Corridor, but do cross it at several points. Military helicopters operating outside of installation boundaries fly at least 500 feet AGL. Once inside of installation boundaries, military aircraft may fly at lower altitudes as required for the training mission. Figure 3.2.b shows the VFR corridors through the SUA in greater detail.



VICINITY MAP



LEGEND

- Contributing Buildings to Ladd Field National Historic Landmark (NHL) (Surveyed 10/2007)
- Contributing Buildings to Cold War Historic District (HD) (Surveyed 10/2007)
- Contributing Buildings to NHL and Cold War HD (Surveyed 10/2007)
- Non-contributing Buildings (Surveyed 10/2007)
- Ladd Field National Historic Landmark Boundary
- Cold War HD Boundary
- Existing Buildings/Not Surveyed
- Railroad
- Stream

N

0 1,000
Feet

FIGURE 3.3.a
Ladd Field National Historic Landmark/ Cold War Historic District Boundary Analysis
USARAK Aviation EIS

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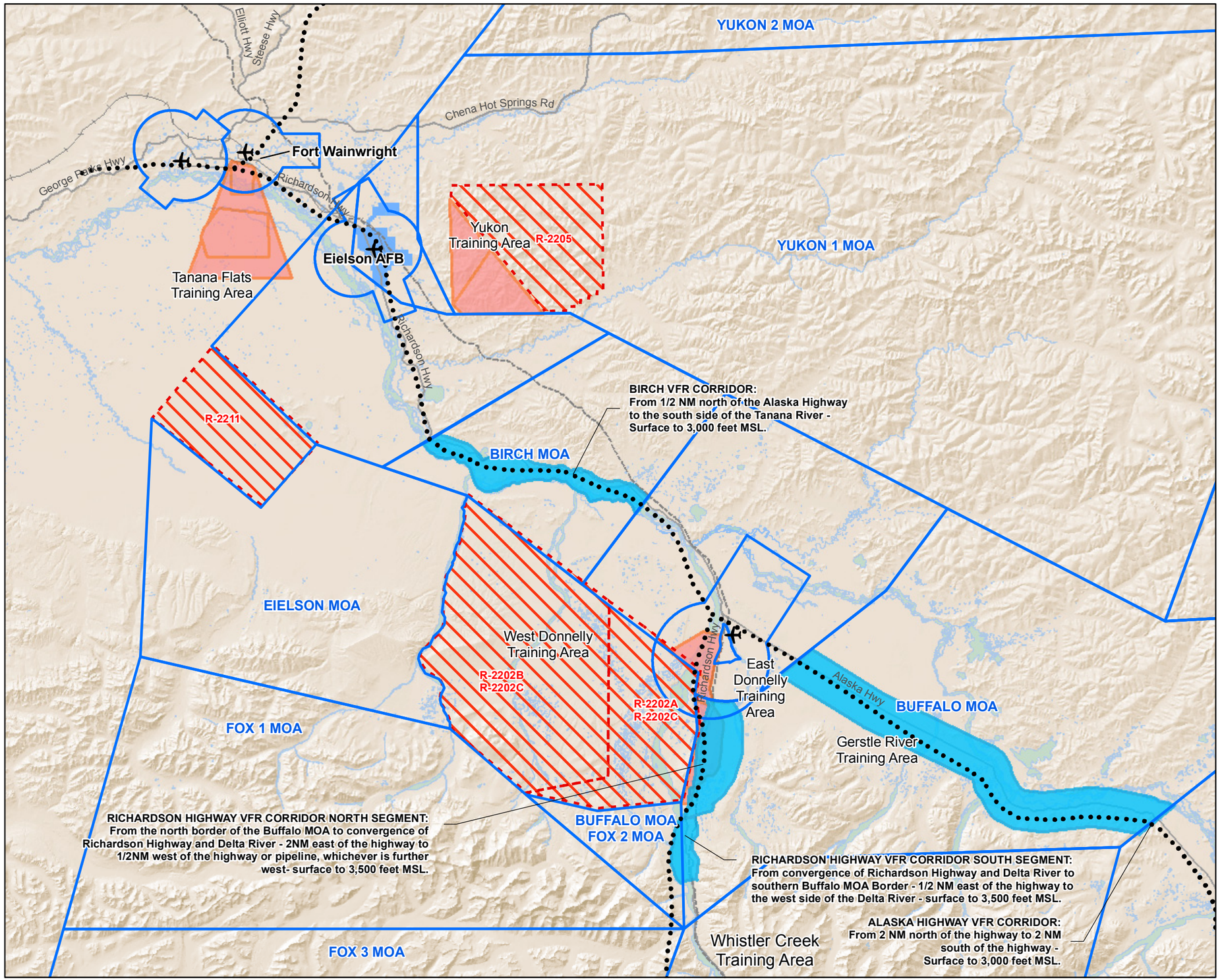
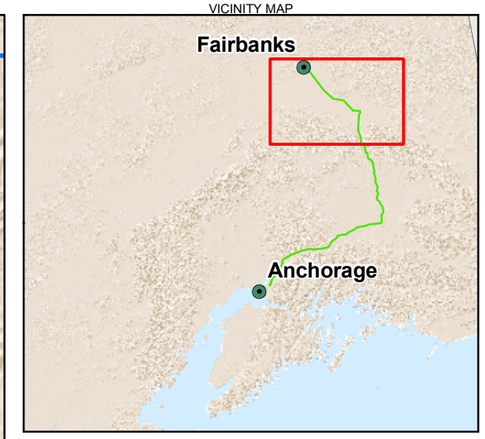


VICINITY MAP



LEGEND

- Airport with Associated Airspace
- Trans Alaska Pipeline
- VFR Corridor
- Railroad
- Major Road

Special Use Airspace Area

- No Overflight
- Birch and Buffalo VFR Corridor
- Restricted Area
- Military Operations Area
- Surface Water Body

SOURCE: Alaska Military Operations Areas (MOAs),
Special Use Airspace, 2008 Edition
11th Air Force, Elmendorf AFB, Alaska

N

0 5.5 11 22
Miles

FIGURE 3.2.b
Existing Special Use Airspace
USARAK Aviation EIS

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3.2.3.1.1 Existing General Aviation Airspace Use

The 2008 FAA Terminal Area Forecast (TAF) estimates that more than 88,000 non-local area operations in 2007 originated in the Fairbanks area, consisting of Fairbanks International Airport and Nenana Municipal Airport (FAA, 2008). This level of activity is forecast to exceed 103,000 by 2025. The TAF estimates that total aircraft activity will increase from 79,624 to 98,775 in 2025. Fairbanks International Airport has Class D airspace that adjoins Ladd AAF at FWA. Nenana Municipal Airport has Class E airspace. In addition, about eight other small, non-federal airfields are located in this area, which is generally Class E airspace. Figures 3.2.a and 3.2.b show that the VFR Corridor used by GA aircraft traverses this area, generally following Richardson Highway and the Tanana River.

3.2.3.1.2 Existing Military Airspace Use

Existing USARAK aviation activity occurs predominantly at Ladd AAF and at training areas associated with FWA. As described in Table 3.2.a, 32 USARAK helicopters are permanently based at FWA (Ladd AAF). Ladd AAF and FWA use Class D airspace. This area also includes numerous MOAs associated with the TFTA and YTA, as well as several Restricted Areas. Nearly half of YTA is covered by Restricted Area (R-2205). The most likely interaction with other air traffic would be with GA aircraft flying under VFR in Class E airspace. Habitual corridors used by the aviation units in this area include three from Ladd AAF and two between TFTA to YTA. Additionally, an air corridor from FWA to DTA is used by the aviations units. Figure 3.2.a shows that several military helicopter flight routes connecting TFTA and YTA with Ladd AAF and Eielson AFB intersect the VFR Corridor described above. These intersections represent points of potential interaction with VFR civilian aircraft that could be flying in the same altitudes as USARAK helicopters.

3.2.3.2 Fort Richardson

FRA is located in the northeast quadrant of the Anchorage Bowl. The greater Anchorage area contains two major civilian airports (Ted Stevens Anchorage International Airport and Merrill Field) and Elmendorf AFB. This area includes Class C and Class D airspace around these civil and military airfields. Several non-towered airports are also located in the vicinity of FRA. The area also includes a Restricted Area (R-2203C) encompassing the Eagle River Flats (ERF) IA shown in Figure 2.2.c.

3.2.3.2.1 Existing General Aviation Airspace Use

The aviation forecasts prepared as part of the ongoing *Ted Stevens Anchorage International Airport Master Plan* (HNTB Corporation, 2007) estimate that aircraft activity will increase at an annual rate of 0.8 percent. If this rate were realized, aircraft operations would increase from 92,728 to 110,530 by 2030. In contrast, GA operations at the Ted Stevens Anchorage International Airport are projected to grow by about 2.4 percent annually.

3.2.3.2.2 Existing Military Airspace Use

Under existing conditions, USARAK aviation assets do not use FRA (Bryant AAF) for training. Training activity at Bryant AAF (FRA) is primarily associated with the Army National Guard (see Table 3.2.b). FRA shares the airspace with a large number of civil aviation and other military users because it is located in the Anchorage area, which is the State's most heavily populated area. In addition to Bryant AAF, military airspace use in this

area also includes Elmendorf AFB. The FRA Training Area abuts Class C airspace associated with Ted Stevens Anchorage International Airport, and Class D airspace associated with Elmendorf AFB. The remainder of this area is Class E airspace. Much of the training conducted in this area occurs within restricted airspace and, therefore, involves little potential interaction with other users. Because USARAK helicopters operating outside of the installation boundaries fly between 500 and 1,000 feet AGL, limited interaction exists with commercial air traffic at Ted Stevens Anchorage International Airport and military aircraft operating out of Elmendorf AFB. Interaction with GA aircraft flying under VFR would be more likely. It should be noted that in Class E airspace, VFR traffic does not need to maintain radio contact with ATC.

3.2.3.3 Donnelly Training Area

The DTA includes DTA East and DTA West, Gerstle River Training Area (GRTA), and Black Rapids Training Area (BRTA), all of which are located near the city of Delta Junction. As shown in Figure 3.2.a, this area includes the Class D and E airspace of Allen AAF (located on DTA), and two Restricted Areas (R-2202A and R-2202B) covering the most of DTA West. Figures 3.2.a and 3.2.b also show the VFR corridors and helicopter flight routes used by civil aircraft and military helicopters in this area. Military helicopter flight routes generally follow the VFR Corridor east of the Restricted Areas covering DTA West. As noted above, military helicopters operating outside of installation boundaries fly at least 500 feet AGL. Once inside the installation boundaries, military aircraft may fly at lower altitudes as required for the training mission.

3.2.3.3.1 Existing General Aviation Airspace Use

The FAA estimates that 3,546 non-local area operations in 2006 originated from the Gulkana Airport south of the Alaska Range and DTA (FAA, 2008). In addition to the Delta Junction Airport, about five small and/or private airfields are located in the general area. The FAA does not generate forecasts for these airports.

3.2.3.3.2 Existing Military Airspace Use

Under existing conditions, USARAK aviation assets make very limited use of DTA (Allen AAF), although other military users utilize Allen AAF (see Table 3.2.b). USARAK helicopters training in the DTA typically stage out of Ladd AAF and numerous FOBs and forward area arming and refueling points (FAARPs) in the training area, normally in the vicinity of the Buffalo and Fox DZs. The area around Delta Junction includes the Class D airspace associated with Allen AAF. Otherwise, this area is mostly Class E airspace, which also includes numerous MOAs associated with the DTA. The most likely interaction with other air traffic would be with GA aircraft flying under VFR in Class E airspace.
Figures 3.2.a and 3.2.b show that both military helicopter flight routes intersect the VFR Corridor following the Richardson Highway at several points south of Delta Junction. These intersections represent points of potential interaction with VFR civilian aircraft that could be flying in the same altitudes as USARAK helicopters.

TABLE 3.2.b
Military Aircraft Activity in Restricted Areas (2005-2007)
USARAK Aviation EIS

		Restricted Area Utilization[a]		
Activities	**Aircraft**	**Average Total Usage Days/Year**	**Average Total Hours/Year**	**Average Total Sorties[b]**
Fort Wainwright – Ladd AAF[d]				
Close air support, aerial gunnery, rockets, bombing, tactical live fire, demolitions, and lasers	**Fixed Wing** *Tactical:* A-4, A-10, B-1, B-2, B-52, F-15, F-16 *Cargo*: C-130, C-141 *Refueling:* KC-135 *Unmanned Aircraft Systems (UAS)* **Rotary** *Helicopter:* CH-47 (Chinook), HH-60, UH-60 (Blackhawk), UH-1 (Huey), OH-58D (Kiowa)	258	2,450	3,775
Fort Richardson – Bryant AAF[c]				
Close air support, aerial gunnery, tactical live fire, demolitions, remotely piloted vehicle (RPV), laser	**Fixed Wing** *Cargo*: C-17, C-130, C-141 *Unmanned Aircraft Systems (UAS)* **Rotary** *Helicopter:* CH-47 (Chinook), UH-60 (Blackhawk)	328	962	1,763
DTA – Allen AAF[e]				
Close air support, air-to-ground missiles, aerial gunnery, rockets, bombing, test flights, air-to-air combat training, air-to-surface laser	**Fixed Wing** *Tactical*: A-4, A-10, B-1, B-2, EA-6, B-52, F-14, F-15, F-16, F/A-18, F-111 *Cargo*: C-5, C-17, C-130, C-141, CN-235 *Refueling:* KC-135 *Misc:* EC-130, E-3, JSTARS *Unmanned Aircraft Systems (UAS)* **Rotary** *Helicopter:* CH-47 (Chinook), AH-60, HH-60, UH-60 (Blackhawk), AH-64 (Apache), UH-1 (Huey), OH-58, OH-58D (Kiowa), BELL 206 **Rockets** GR-1, GR-3,GR-7, MRG F-1,	1,000	11,983	9,542
Grand Total		**1,586**	**15,395**	**15,080**

Notes and Data Sources:
[a] Data averaged from *Restricted Area Annual Utilization Reports,* 2005-2007.
[b] A sortie is one takeoff and one landing (an operation is either one takeoff or one landing).
[c] Restricted airspace R-2203A, B, C.
[d] Restricted airspace R-2205.
[e] Restricted airspace R-2202A, B, C, D.

3.3 Cultural and Visual Resources

3.3.1 Introduction

Cultural resources are protected by a number of statutes and regulations at all levels of government and must be taken into consideration during the NEPA process. The term "cultural resources" encompasses historic properties, archaeological sites and artifacts, and

Native American sites and artifacts. The National Historic Preservation Act (NHPA) (Title 36 of the Code of Federal Regulation [CFR] Part 8001.16 [36 CFR 8001.16]) was passed in 1966 as a reflection of the importance of those resources to our national, regional, and local culture.

Federally funded projects are required by law to consider the effect of projects on the quality and character of the landscape early in the planning process [NEPA 42 United States Code (U.S.C.) 4231-4335, Section 101(b)(2)]. NEPA requires that all actions "sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations such as impacts related to aesthetics and visual quality are given due weight in project decisionmaking." Visual resources (which for this assessment include aesthetics and visual quality) encompass elements from both the built and natural environments, and can include buildings, other visible infrastructure, trees, bodies of water, corridors, and entire landscapes. Because potential construction and demolition activities associated with this project would occur at FWA and the necessary visual analysis is closely associated with cultural resources, the discussion of visual resources is included in the cultural resources section of this EIS.

Several agencies and organizations expressed interest in cultural resources during the public scoping process, including concerns over the maintenance and appearance of affected historic buildings, and the consideration of viewsheds at FWA and Eielson AFB. Although a concern has been expressed on potential impacts to the viewshed at Eielson AFB, there is no construction or demolition planned at installations other than FWA under the Proposed Action. Therefore, there would be no visual impacts to resources at Eielson AFB.

3.3.1.1 Applicable Regulations for Cultural Resources

The foundation of broad legislation for preservation of cultural resources is the NHPA of 1966 and associated regulations (36 CFR 800). Two sections of the Act, Sections 106 and 110, define the processes federal agencies must follow to manage and protect cultural resources or "historic properties." Historic properties are defined under the NHPA 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).

Section 106 requires federal agencies to consider the effects of undertakings on historic properties. This process includes resource identification (inventory), significance evaluation, assessment of effects on significant historic properties, and resolution of adverse effects.

Section 110 of the NHPA requires federal agencies to institute programs to identify and evaluate NRHP-eligible historic properties under their care and to use, to the maximum extent feasible, historic properties available to the agency, prior to acquiring, constructing, or leasing properties for purposes of carrying out agency responsibilities. For a National Historic Landmark (NHL), the law states "the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark, and shall afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to review the undertaking."

There are a number of other federal statutes relevant to cultural resources:

- American Indian Religious Freedom Act (AIRFA) of 1978 and E.O. 13007, Sacred Sites, 1996
- The Antiquities Act of 1906
- Archaeological Resources Protection Act (ARPA) of 1979, as amended (Public Law 96-95; 16 U.S.C. 470 aa-mm)
- Native American Graves Protection and Repatriation Act (NAGPRA), of 1990, (25 U.S.C. 3001 et seq.; 43 CFR 10)
- Government-to-Government Tribal Consultation Policy (Office of the Attorney General, 1995)
- DoD American Indian and Alaska Native Policy (DoD, 1998)

As part of the Section 106 and NEPA process, local and State agencies, as well as non-profit organizations were invited to participate in the evaluation of historic properties that could be affected by the Proposed Action alternatives. Entities identified included: representatives of the Alaska State Historic Preservation Officer (SHPO), National Park Service (NPS), Tanana/Yukon Historical Society, Advisory Council on Historic Preservation (ACHP), and the Joint Fairbanks North Star Borough/City of Fairbanks Historic Preservation Commission. Local Anchorage-based historic preservation groups were invited to participate. These entities are referred to as Section 106 consulting parties in this EIS.

The Alaska Office of History and Archaeology implements the Alaska Historic Preservation Act (Alaska Statute 41.35.70) and works to preserve sites and buildings that reflect Alaska's heritage. Locally, the Joint Fairbanks North Star Borough/City of Fairbanks Historic Preservation Commission review major construction projects, which would include review of the construction projects at FWA addressed by this EIS.

Federally funded projects are required, according to NEPA, to consider the effect of projects on the quality and character of the visual landscape early in the planning process (NEPA; 42 U.S.C. 4231-4335, Section 101[b][2]). In addition, federal regulations related to the NHPA require that projects avoid, replace, or enhance vital visual resources, such as historic and recreational areas.

3.3.1.2 National Register of Historic Places

The NHPA defines historic properties as any prehistoric or historic district, site, building, structure, or object included in or eligible for the NRHP. Under NHPA, a property is significant if it meets the NRHP criteria listed in 36 CFR 60.4. The NRHP is a federally maintained list of districts, sites, buildings, structures, objects, and landscapes significant in American history, prehistory, architecture, archaeology, engineering, and/or culture. For this study, historic properties could be standing structures such as hangars, training facilities, communication structures and facilities, or research laboratories that could be historically significant for their contribution to the military and social history of the United States.

To be listed on the NRHP, a property must have historic significance and integrity, and generally be at least 50 years old. Certain properties less than 50 years old can be listed on the NRHP if they possess exceptional importance. Historic significance may be present in districts, sites, buildings, structures, and objects that possess integrity. Integrity is the ability of a property to convey its significance. The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association. To be eligible for the NHRP, a property of must meet at least one of the following criteria:

- Criterion A: Association with events that have made a significant contribution to the broad patterns of our history
- Criterion B: Association with the lives of persons significant in our past
- Criterion C: Embodiment of the distinctive characteristics of a type, period, or method of construction or representative of the work of a master, or possessing high artistic value, or representative of a significant and distinguishable entity whose components may lack individual distinction
- Criterion D: Yielding, or likely to yield, information important in prehistory or history

Historic significance is the importance of a property to a community, state, or the nation. In addition to the above criteria, significance is defined by the area of history to which the property made important contributions and by the period of time during which they were made (National Park Service, 1997). The major groupings of cultural resources are as follows:

- **Historic Properties.** The term "historic property" is defined in the NHPA as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register"; the term also includes "artifacts, records, and remains" that are related to any such district, site, building, structure, or object [16 U.S.C. Section 470(w)(5)]. A historic property need not be formally listed on the NRHP to receive NHPA protection, but needs only to meet the NRHP criteria (i.e., be eligible for listing in the National Register). The criteria for listing a property in the NHRP are described above and can be found at 36 CFR 60.
- **Archaeological Sites**. Archaeological sites are places where past peoples left physical evidence of their occupation. Sites may include ruins and foundations of historic-era buildings and structures. Or, they may be surface ruins and/or underground deposits of prehistoric or Native American occupation debris, such as artifacts, food remains (seeds, shells, and bones), and former dwelling structures. Important archaeological sites can qualify as "historic properties."
- **Native American Cultural Resources**. Native American cultural resources may include human skeletal remains, funerary and sacred items, and objects of cultural patrimony. Native American traditional resource procurement areas and culturally important regional landscapes are also considered Native American cultural resources. These resources may be traditional cultural properties (TCPs), thus, potential "historic properties" if they are places that define tribal identity and meet NRHP eligibility criteria.

- **Other Cultural Resources**. Other types of cultural resources include cultural institutions, lifeways, culturally valued viewsheds, places of cultural association, and other valued places and social institutions. Under the 1992 NHPA amendments, these types of TCPs can be eligible for inclusion in the NRHP because of their association with traditional beliefs of an Alaska Native group about its origins, cultural history, or the nature of the world. Other cultural resources include areas Alaska Native religious practitioners have historically used and are known or thought to use today to perform ceremonial activities in accordance with traditional cultural rules of practice. They can also include locations where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining historical identity (U.S. Department of the Interior, NPS, undated). TCPs are most often identified through consultation with Tribes that have knowledge of the geographical area of interest.

FWA has identified a Cold War Historic District that is eligible for the NRHP under Criterion A for its association with the strategic air reconnaissance, air defense, and Arctic research missions of the Cold War. The themes within these missions are Detect and Monitor, Communications, Intercept and Respond, Guard and Defend, Training and Readiness, Research, and Support and Logistics. The Cold War Historic District comprises 50 buildings and structures.

3.3.1.3 National Historic Landmarks

NHLs are buildings, sites, districts, structures, and objects that the Secretary of the Interior has determined to be nationally significant in American history and culture because of their association with events, persons, and architectural styles that have made a significant contribution to the nation's history. They must possess exceptional value and a high degree of integrity. NHLs are also listed in the NRHP, but are given a greater degree of significance and protection. As a comparison to illustrate the level of national significance of an NHL, there are more than 100,000 buildings, sites, districts, structures, and objects listed on the NRHP, but fewer than 2,500 NHLs. NHLs are the nation's best and most significant historic resources.

On February 4, 1985, Ladd at FWA was designated an NHL district. Ladd AAF is nationally significant for its association with the themes of *Expanding Science and Technology* and *the Changing Role of the United States in the World*. It was the first Army airfield in Alaska and was an essential part of the territory's defense buildup for World War II (WWII). The Post is also associated with the development of cold weather aviation technology and played a supporting role in the Aleutian Campaign of World War II (WWII) in the Pacific.

Ladd AAF ultimately included 185 properties. After WWII, fire destroyed a number of WWII-era buildings within the NHL district at FWA. Most of the temporary, wood-frame structures that were part of Ladd AAF's support facilities were approved for demolition as part of the DoD and ACHP nationwide Programmatic Agreement. Since 1945, 18 new buildings were constructed within the NHL district. The scale and massing of these buildings are similar to those that were constructed during WWII (National Park Service, 2000).

The NHL district comprises 34 buildings and three structures associated with WWII. The district includes commander's quarters, nurses' quarters, former Headquarters buildings, warehouses, Hangars 1, 2, and 3, and the runways.

No NHLs have been designated at FRA, Eielson AFB, or DTA.

3.3.2 Scope

The scope of the cultural resources baseline characterization (and impacts analysis in Chapter 4) includes an analysis of the existing conditions for archaeological and architectural resources within the Cantonment and FWA-associated training areas. The baseline also includes a discussion of potential auditory and visual impacts, and how they could affect the cultural resources at FWA.

An evaluation was conducted to determine the potential impacts to the NHL and to consider potential effects to the Cold War Historic District. The NHL and the Cold War Historic District have boundaries that overlap in several areas (see Figure 3.3.a); however, the impacts associated with the Proposed Action would result in different impacts to these two separate districts. The Proposed Action could adversely impact the NHL but would not impact the Cold War Historic District, even though their boundaries overlap. Because the NHL will be the historic resource that will experience the most significant impacts, the discussion in this section and in Chapter 4 will focus primarily on the NHL district resources.

All Proposed Action alternatives include additional aviation personnel and aviation assets, facility demolition and construction at FWA, and military training. Of these components of alternatives, facility demolition and construction have the greatest potential to affect resources within the NHL district. No construction or demolition is planned at installations other than FWA under the Proposed Action.

The scope of visual resource assessment is also limited to the NHL district at FWA. There is no discussion of visual resources for the FWA training areas or other installations addressed in this EIS because no impacts are expected to the visual environment of those areas. The scope of the visual resource assessment is consistent with the federal requirements for such analysis.

Thirteen previous archaeological surveys have been conducted in FWA's Cantonment. The surveys focused on areas with a high potential for finding archaeological resources or were related to construction projects. Survey sites included the southern slopes of Birch Hill, various barrow sources just south of the Cantonment, and small-arms ranges between Richardson Highway and the Tanana River. Six archaeological sites were found on FWA's Main Post. These are located north of the Chena River and along the southern slopes of Birch Hill, well outside the area of focus (AF) for the Proposed Action (defined in Subsection 3.3.2.1 and Figure 3.3.a). The probability of discovering unknown archaeological resources is low because a majority of construction occurring as part of the Proposed Action will be within areas previously disturbed by military activity. Construction within areas not previously disturbed would be surveyed for cultural resources prior to ground disturbance. Therefore, the likelihood of impacts to archaeological resources in the FWA Cantonment from the Proposed Action is considered very low.

The likelihood of impacts to cultural resources from the proposed training activities at FWA, YTA, TFTA, DTA, and FRA is anticipated to be very low because the training activities would be predominantly air-based and would utilize existing disturbed training areas and ranges where the potential for finding newly identified archaeological resources is very low. The increased USARAK helicopter takeoffs and landings included in the Proposed Action are not anticipated to impact cultural resources; these activities are consistent with the existing and historical use of the airfields at FWA, FRA, Eielson AFB, and DTA. The increased use of flight corridors between installations and training areas would also not affect cultural resources. Although existing known cultural resources and potential TCPs are located within the boundaries of USARAK training areas, existing agreements with the Army, Alaska SHPO, and Alaska Native Tribes define the areas where on-ground training is restricted. The Army is in the process of conducting culturally significant site surveys on lands used for training to detect the presence of any existing TCPs.

Auditory impacts associated with the Proposed Action alternatives would be those that would directly or indirectly affect the historic integrity of the NHL district and Cold War Historic District. The criteria for determining auditory impacts to historic properties differ from those used for the evaluation of noise impacts (Section 3.4). Auditory impacts to cultural resources are those that would diminish the integrity of the NHL's significant historic features including setting, feeling, and association. Noise impacts discussed in Section 3.4 are generally unwanted, undesirable noises affecting humans. Noise can be any sound interfering with communications or other human activities that is intense enough to damage hearing, or is otherwise annoying.

FWA is located in an open, flat plain that was once a remote section of Alaska. It is bounded by a river and wooded hills to the north and large, flat wooded areas to the east, west, and south. Since Ladd AAF was established, Fairbanks has grown up around it, reflecting the economic impact of a military installation to the local economy. Its location now is semi-rural, with the military mission (including training) generating the only significant auditory impacts to the area. The mission of Ladd AAF and now FWA includes auditory impacts resulting from aircraft takeoffs and landings, small- and large-caliber weapons training, and vehicular maneuver training. The intensity of impacts has changed as the mission has changed (USACE, 2002; USARAK, 2004a; USARAK, 2006a).

3.3.2.1 Definition of the Area of Focus

The Aviation EIS AF for cultural and visual resources includes historic properties and areas whose character could be directly altered by the Proposed Action. The FWA AF is shown on Figure 3.3.a and includes areas within and adjacent to the existing Ladd AAF NHL where construction and demolition would occur under the Proposed Action. As noted, the NHL and the Cold War Historic District have boundaries that overlap in several areas (Figure 3.3.a). Consequently, although the NHL will be the historic resource that will experience the most significant impacts because of the overlapping boundaries, the AF also includes the Cold War Historic District.

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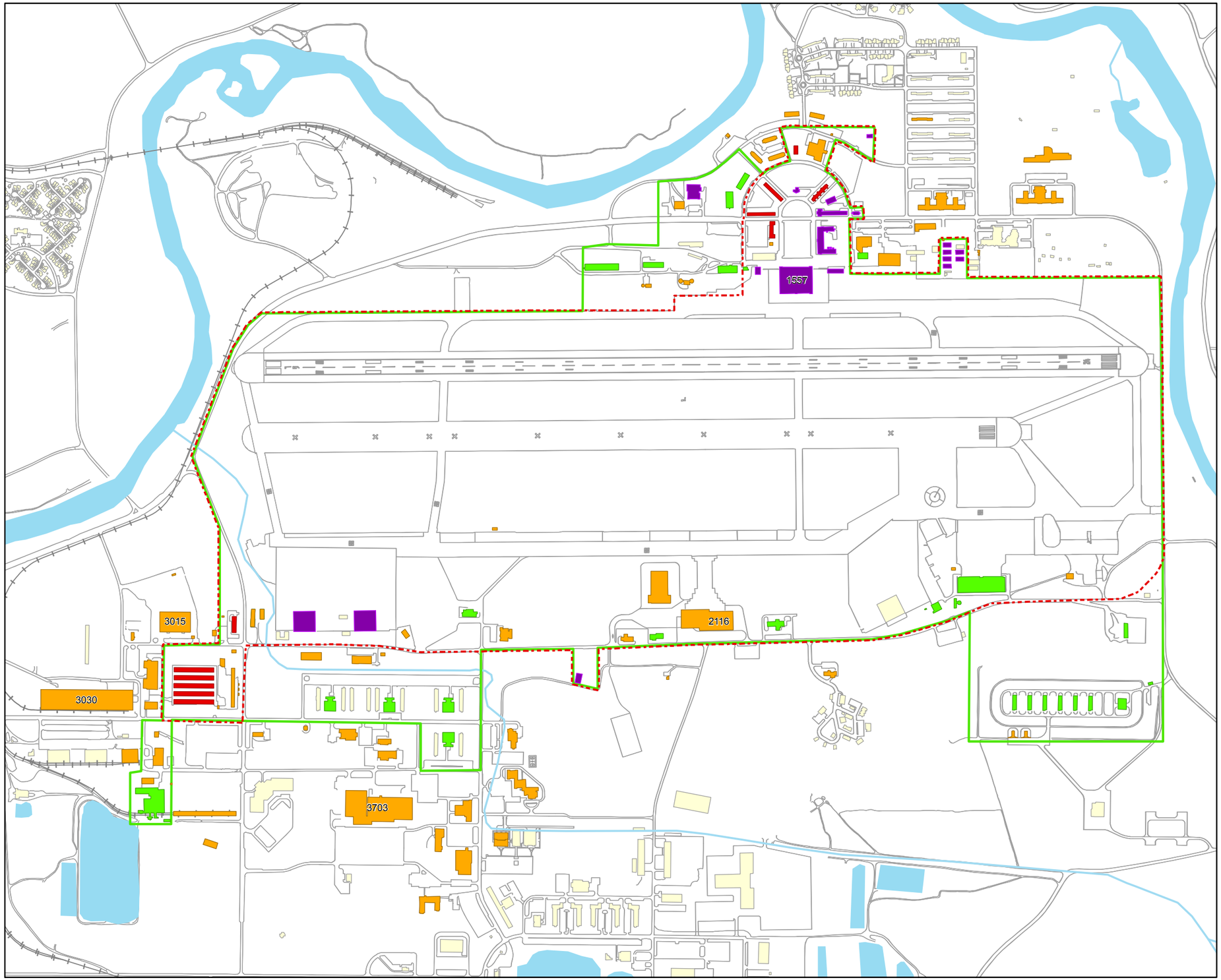
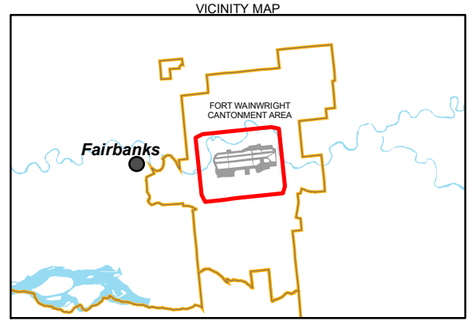


VICINITY MAP



LEGEND

- Contributing Buildings to Ladd Field National Historic Landmark (NHL) (Surveyed 10/2007)
- Contributing Buildings to Cold War Historic District (HD) (Surveyed 10/2007)
- Contributing Buildings to NHL and Cold War HD (Surveyed 10/2007)
- Non-contributing Buildings (Surveyed 10/2007)
- Ladd Field National Historic Landmark Boundary
- Cold War HD Boundary
- Existing Buildings/Not Surveyed
- Railroad
- Stream

N

0 1,000
Feet

FIGURE 3.3.a
Ladd Field National Historic Landmark/ Cold War Historic District Boundary Analysis
USARAK Aviation EIS

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The FWA AF includes the areas on both sides of the flight line, Hangar 1, and the buildings in the core of the NHL, the North Post. Physically, the AF boundary starts in northwest corner of the airstrip where Gaffney Road and the North Taxiway meet. The AF then follows the North Taxiway to Building 1595, north to Front Street, and east to the end of Building 1579. At Building 1579, the AF turns north to Apple Street, which it follows to Chena Road. The AF follows Chena Road southeast to Marks Road, and then follows along the NHL boundary east, then south along Ketcham Road and west along Montgomery Road. Directly after Hangar 6, the AF boundary proceeds southwest to Oak Avenue, and then turns west on Oak Avenue, north on Meridian Road, then west on Neely Road. At Neely Road, the AF follows the path line of the NHL up around several of the Butler buildings, proceeding toward Meridian Road, where the AF meets the starting location of Gaffney Road and the North Taxiway.

The AF shown on Figure 3.3.a is also appropriate for evaluating the primary potential adverse impacts of visual changes to cultural resources at FWA. The AF includes the viewshed from which physical changes associated with the Proposed Action (for example, the construction of new buildings) would be seen. The viewshed primarily includes the areas within the Ladd AAF NHL. The Ladd AAF portion of FWA is located within several miles of non-military-affiliated residential areas and several major highways and arterials (Richardson Highway, Steese Highway, and the western end of Airport Road). However, viewers in areas off FWA would not be able to see the changes to the existing landscape near Ladd AAF that would be associated with the Proposed Action alternatives. The relatively flat terrain and the presence of trees and buildings screen views of Ladd AAF from those in areas off FWA.

As outlined in Subsection 3.3.2, the focus of the cultural and visual resources investigations performed in the EIS is the area generally near or within the NHL district at FWA where construction and demolition would occur as part of the Proposed Action.

3.3.3 Affected Environment for Cultural and Visual Resources

3.3.3.1 Data Collection

To assist in defining the affected environment related to the Proposed Action, USARAK initiated a number of efforts to gather information needed to proceed with the evaluation and determination of effects for the EIS and the NHPA Section 106 process.

USARAK reviewed the existing conditions and boundaries of the NHL district, prepared a *National Historic Landmark Historic Context Summary, 1940-1945* and *Cold War Context Study* (CEMML, 2002), and reviewed the existing conditions and boundaries of the Cold War Historic District (*Cultural Resources Technical Report*). The boundary of the NHL was studied to understand how the installation was used during WWII and into the Cold War. No new boundaries for the NHL were suggested as a result of this study. An evaluation of the existing visual environment was also completed as part of the *Cultural Resources Technical Report*. The following sections summarize each of the cultural and visual resource investigations. Greater detail regarding these investigations can be found in the *Cultural Resources Technical Report*.

3.3.3.2 National Historic Landmark District

Ladd AAF is nationally significant for its association with the themes of *Expanding Science and Technology* and *the Changing Role of the United States in the World*. Construction began on the airfield in 1938. Ladd AAF was the first Army airfield in Alaska and key part of the region's defense buildup for WWII. Ladd AAF is associated with the development of cold weather aviation technology and played a supporting role in the Aleutian Campaign of WWII in the Pacific. Ladd AAF was also the Alaskan headquarters for the Alaska-Siberia (ALSIB) lend-lease route over which the United States sent thousands of military aircraft to the Soviet Union for use in the Eastern Front of the war in Europe. The number of aircraft ferried across the ALSIB route to the Union of Soviet Socialist Republics (USSR) exceeded the number of aircraft sent to the USSR by all other routes. The period of significance for the NHL district begins in 1940 when the airfield became operational and extends to late 1945 when WWII ended.

The Ladd AAF NHL was first nominated as an NHL in 1985. When the updated Draft Nomination Form was submitted in 2000, all buildings and structures associated with the period of NHL history through the end of WWII were older than 50 years. Thus, all of the NHL resources were potentially eligible for inclusion, assuming that they met other NRHP-eligibility criteria.

The Ladd AAF NHL district embodies the pre-WWII permanent military construction and WWII-era standardized military construction. The historic features that comprise the NHL include wood, concrete, and steel buildings with concrete foundations and wood, aluminum, and concrete roofs; concrete and cement runways, taxiways, and roadways; timber and steel-frame hangars; and associated utilities. The initial design and layout of the facility was developed in the late 1930s and early 1940s before America's entry into the war. Ladd AAF's initial, pre-war facilities were designed as permanent structures.

The airfield is the dominant visual and organizational element of the Ladd AAF NHL. It includes two runways, taxiways, and aprons surrounded by open spaces. The North Runway was completed in 1941 and the South Runway in 1943. Parking areas, taxiways, and 30 hardstands (paved areas for parking aircraft) also were constructed during the war years. None of the hardstands remains.

Directly north of the airfield is a collection of flight service facilities, housing, and administrative buildings known as North Post. A rectangular parade ground with a semi-circular park at the north end is the focal point for North Post. The parade ground and the distinctive street layout radiating from it remain as important visual and organization elements of the North Post area. In 1945, the North Post included approximately 185 buildings. Most of the North Post WWII-era buildings that were demolished were temporary warehouses and shops.

At the south edge of the parade ground is Hangar No. 1 (Building 1557, FAI-469), which was the tallest building on FWA during the 1940s. Completed in 1941, it served as the installation's headquarters and sheltered aircraft in the cold weather testing program. Later, half of Hangar No. 1 was used to prepare U.S. aircraft to be turned over to Soviet pilots in the lend-lease program. On either side of Hangar No. 1 and extending along the northern edge of the airfield are Ladd AAF's original flight service facilities. To the east, on the south

side of Montgomery Road, is one reinforced concrete Type 49 Ammo Igloo, Building 3203 (FAI-495).

Currently, the NHL district includes 37 properties. Although the overall historical integrity of the NHL remains intact, there have been changes over time. Several WWII-era buildings have new siding, roofs, doors, and windows. The changes to the doors and windows on the permanent buildings, such as the hangars, reflect the patterning of the historic door and window designs. A number of the temporary buildings, specifically Butler buildings, have been re-sided, covering many of the original doors and windows. The massing and scale of these buildings remains unchanged, preserving the qualities of design, setting, feeling, and association with the WWII era.

3.3.3.3 Cold War Historic Context Summary and FWA's Cold War History

The purpose of the *Cold War Context Study* (Context Study) was to develop a Cold War historic context of FWA to evaluate the potential historic significance of Cantonment properties based on the most comprehensive information available. It was not intended to function as a complete history of the installation during the Cold War. The context was used in conjunction with the NRHP criteria to re-evaluate the previously identified Cold War Historic District properties.

FWA and its predecessor, Ladd AFB, had multidimensional Cold War histories. The installation, located in the heart of Interior Alaska during a time when Alaska itself was a front line in the Cold War, played a role in that front-line defense. Ladd AFB was the scene of significant strategic aerial reconnaissance, air defense operations, and Arctic research. When the Army assumed control of the installation in 1961, FWA became devoted to Army Cold War missions such as aviation, training, and ground defense. As the Cold War neared its conclusion in the late 1980s, the Army added a worldwide deployment mission with the arrival of the 6th Infantry Division (Light) (6th LID). Although the tenure of the 6th LID at the installation was short-lived, the worldwide deployment mission continues.

The Context Study identified three primary USAF missions at Ladd AFB that have been determined to have national significance: Strategic Aerial Reconnaissance, Air Defense, and Arctic Research. These and the following themes specifically pertaining to FWA were described in the Context Study: Detect and Monitor; Intercept and Respond; Guard and Defend; Communicate; Training and Readiness; Research; and Support and Logistics. These themes and the property types identified in the context statement were used and will continue to be used to evaluate the eligibility of FWA properties as they reach the 50-year mark. Additional information regarding the *Cold War Context Study* and the Cold War history of FWA is provided in the *Cultural Resources Technical Report*.

3.3.3.4 Building Evaluations

FWA initiated a field survey to comply with NHPA Section 106 and Section 110 (36 CFR 800), which requires resource identification (survey and recordation), significance evaluation, assessment of adverse effects on significant historic properties, and resolution of adverse effects. The field survey documented the existing condition of the NHL district and the Cold War Historic District. The survey methodology was approved by USARAK and based on standards established by the NPS for survey and evaluation of historic properties (*National Register Bulletin 15*, "How to Apply the National Register Criteria for Evaluation";

and *National Register Bulletin 24*: "Guidelines for Local Surveys: A Basis for Preservation Planning"). Photographs were taken and information was gathered on properties that were more than 50 years old but had not been evaluated for eligibility for inclusion in the Cold War Historic District. The survey did not re-evaluate NHL district properties for continuing eligibility. Results of the survey were also used to describe the affected environment for the Aviation EIS. Figure 3.3.a illustrates the boundaries of the NHL district and the Cold War Historic District. In October 2006, a total of 132 properties were surveyed. Existing building conditions for those facilities that contribute to the NHL were documented. The survey did not re-evaluate the buildings' continuing eligibility to the NHL. Properties previously identified as Cold War properties also were documented. The survey included photographing the resources and completing building survey sheets.

After the evaluation of the 132 properties surveyed in October 2006, 31 were determined to be contributing properties to the Cold War Historic District. Constructed between 1946 and 1961, these structures were used to fulfill the Cold War missions at FWA. Nineteen structures constructed during WWII, and contributing buildings to the Ladd AAF NHL, were determined to contribute to the Cold War Historic District. Eleven properties surveyed were determined noncontributing to the Cold War Historic District but remained contributing to the NHL district, and 71 were determined not eligible to either the NHL district or the Cold War Historic District. A complete list of contributing and noncontributing structures is presented in the *Cultural Resources Technical Report*. Table 3.3.a details the number of properties contributing to the NHL, the Cold War Historic District, or both.

TABLE 3.3.a
Results of the Buildings Survey
USARAK Aviation EIS

Contributing Buildings/Structures	Number of Properties
Contribute to the Cold War Historic District	31
Contribute to both the NHL district and the Cold War Historic District	19
Contribute to the NHL district	11
Do not contribute to the NHL district or Cold War Historic District	71
Total	**132**

The field survey, research, a review of the NHL district nomination forms, the Cold War context, and the resulting buildings evaluation yielded the following conclusions:

- The existing Cold War Historic District boundaries should be changed slightly, removing two buildings (Building 3700 [Library] and Building 3701 [Main Exchange]) because they are not mission-related.
- The Cold War Historic District would include 50 properties.
- The Army does not propose any changes to the NHL district boundaries.
- The NHL district should be re-evaluated for historic integrity.

Continued consultation with the Alaska SHPO will be conducted prior to finalizing these findings concerning the Cold War Historic District.

Additional information regarding the FWA Buildings Evaluation is provided in the *Cultural Resources Technical Report*.

3.3.3.5 Determining the NHL and Cold War Historic District Boundaries

The *Cold War Context Study* and survey information were used to determine which buildings and structures contribute to the NHL district, the Cold War Historic District, or both. A map was created to illustrate these different groups of resources (Figure 3.3.a). Additional information regarding the methodology and a large-format map are provided in the *Cultural Resources Technical Report* (CH2M HILL, 2009). The survey and evaluation concluded that 50 properties contribute to the Cold War Historic District, including 19 that contribute to both the NHL district and the Cold War Historic District. A previous 2001 delineation of the Cold War Historic District included Building 3700 (the Library) and Building 3701 (the Main Exchange). A review of the *Cold War Context Study* (CEMML, 2002) indicated that these buildings are not eligible for the district because they are not mission-related. Therefore, a revised boundary for the Cold War Historic District does not include these properties. Continued consultation with the Alaska SHPO will be conducted prior to finalizing these findings relative to the Cold War Historic District.

3.3.3.6 Visual Resource Characterization

An initial visual characterization was performed to assess the potential visual effects of the Proposed Action alternatives. The AF shown on Figure 3.3.a is appropriate for assessing visual resources at FWA, and includes the viewshed from which physical changes associated with the Proposed Action (for example, the construction of new buildings) would be seen. The Proposed Action viewshed primarily includes Ladd AAF and the areas within the Ladd AAF NHL boundary and Cold War Historic District.

Figure 3.3.b shows three locations around Ladd AAF that were used for an initial visual characterization. These parts of FWA would potentially be most affected by the Proposed Action alternatives from a visual impact perspective. As mentioned previously, despite its relatively close proximity to potential viewers, Ladd AAF is not visible from many areas outside of FWA. Even views of Ladd AAF from within many parts of FWA are obscured by the trees and buildings that are scattered across the flat terrain. As viewers within FWA get closer to Ladd AAF, its openness and expansive views create a visual contrast to most areas developed surrounding the airfield. The runway and taxiway portions of Ladd AAF are approximately 0.6 mile (2 kilometers) wide by approximately 1.8 miles (4.75 kilometers) long. Even though the great expanse of the airfield facilities are visually dominant, the buildings and other structures and improvements that surround them help to visually define the boundaries of Ladd AAF, adding to its visual character. Figures 3.3.c, 3.3.d, and 3.3.e are photographs taken from each of the three initial characterization locations. In these photographs, labels of the visually and historically significant buildings are identified. Views from the west side of Ladd AAF (and changes to those views as a result of the Proposed Action alternatives) are depicted and analyzed in Section 4.3 of this EIS.

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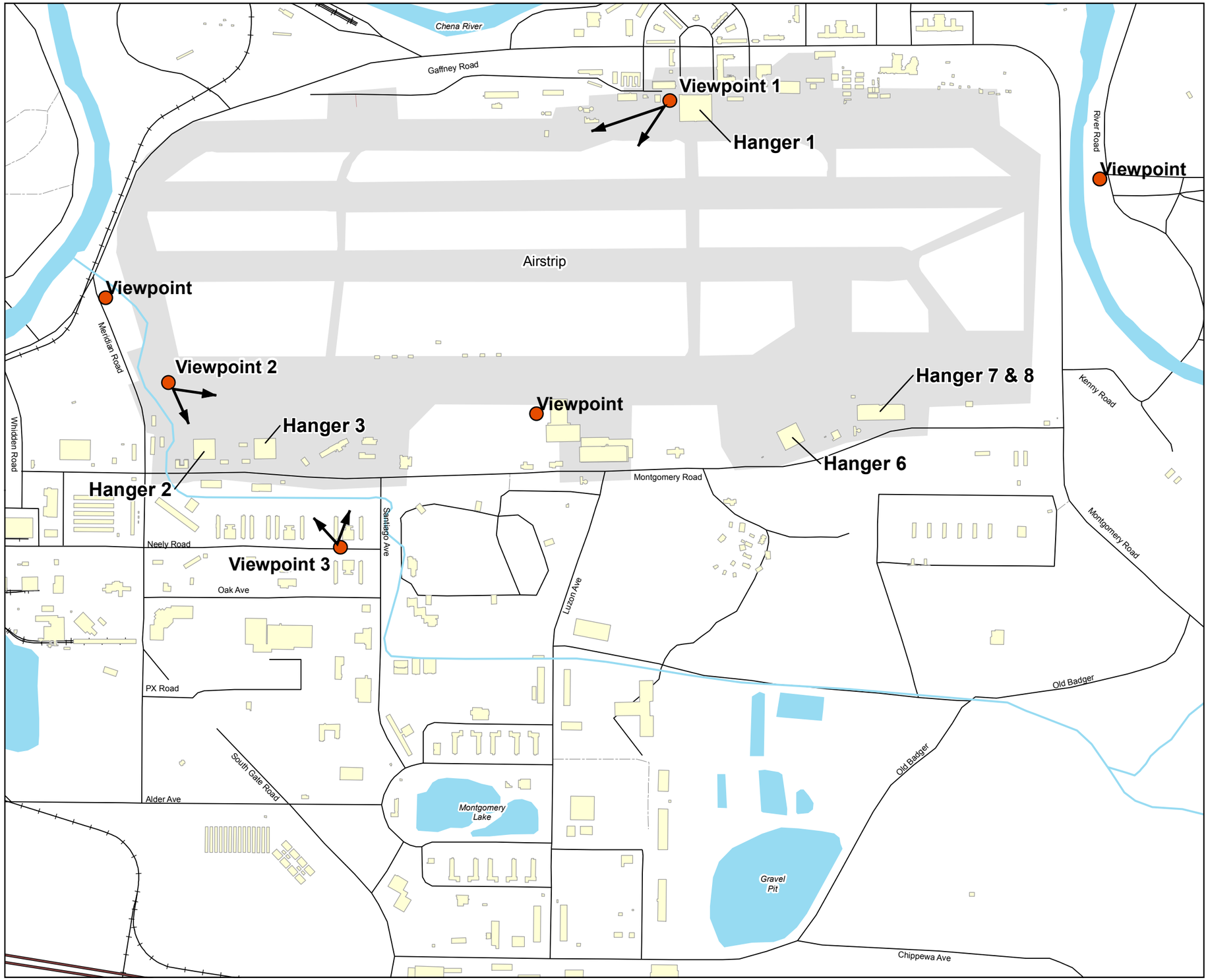
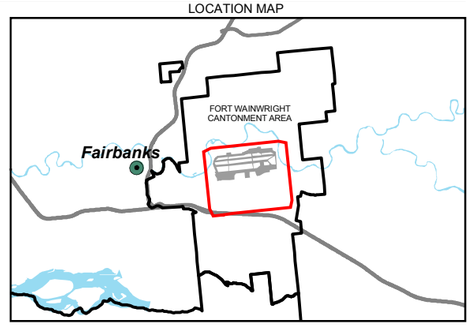


LOCATION MAP



LEGEND

- Viewpoint Location
- Town
- Stream
- Railroad
- Installation Boundary
- Existing Building
- Airfield Area

0 500 1,000 2,000 Feet

1" = 1,000 Feet

N

FIGURE 3.3.b
Locations of Representative Viewpoints at Fort Wainwright
USARAK Aviation EIS

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FIGURE 3.3c
Panoramic Characterization from East Side of Ladd Field
USARAK Aviation EIS

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FIGURE 3.3d
Characterization Photo from South Side of Ladd Field
USARAK Aviation EIS

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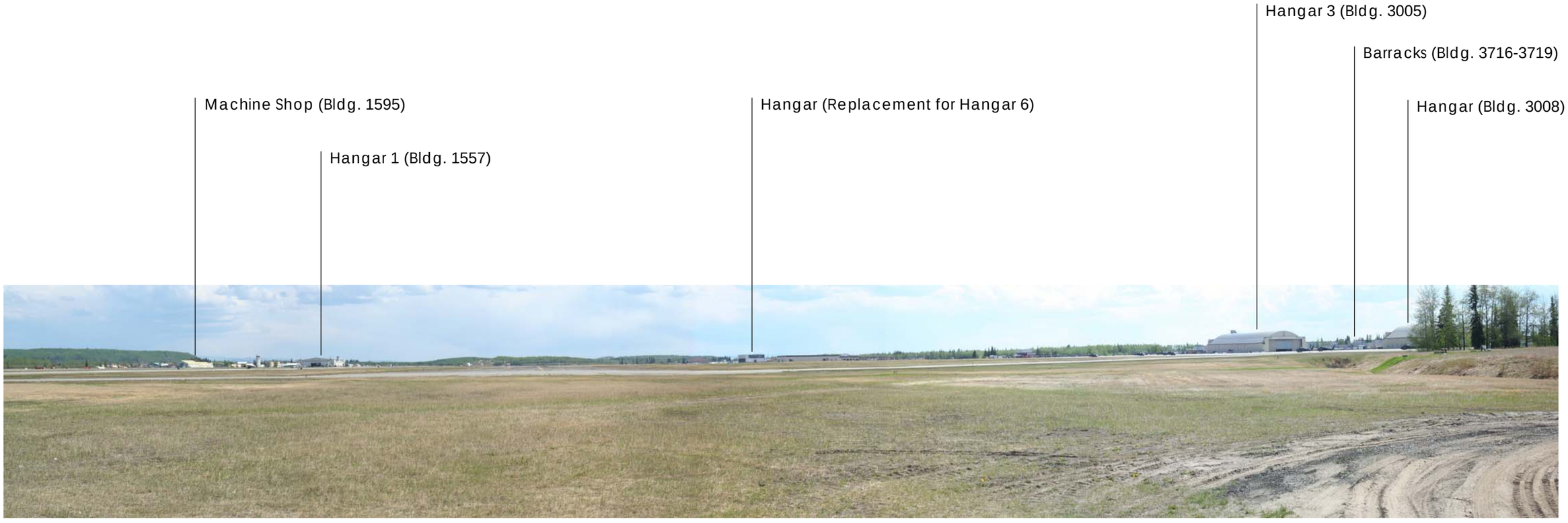

FIGURE 3.3e
Panoramic Characterization from West Side of Ladd Field
USARAK Aviation EIS

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3.3.3.6.1 Visual Characteristics of the Ladd AAF National Historic Landmark

The Ladd AAF NHL includes the airfield and areas near it. Several areas within the Ladd AAF NHL, in particular, contain concentrations of WWII-era buildings. The area that has the greatest concentration of WWII-era buildings and best retains its WWII visual character is north of Hangar 1 (Building 1557) and centered around the WWII-era parade ground. Gaffney Road and Marks Road pass through this area. The focal point for this area is the parade ground, and many of the WWII-era buildings are oriented around it. At the south end of the parade ground is Hangar 1, which serves as the visual terminus. The airfield can be seen on either side of the Hangar 1 area from many of the buildings surrounding the parade grounds. Views of the airfield from the Hangar 1 area are expansive. The main visual features within the Ladd AAF NHL that can be seen from this location include the following:

- The north taxiway and north runway in the foreground (within 0.25 mile of the viewer)
- Hangar 2 (Building 3005) and Hangar 3 (Building 3005) in the middle ground (between 0.25 mile and 4 miles) to the southeast

Other features of FWA not within the Ladd AAF NHL that can be seen from this location include the following:

- Cold War-era barracks (that are within the Cold War Historic District)
- Welcome center
- Hospital
- CHPP

Although Hangars 2 and 3 are the largest facilities on the south side of the Ladd AAF NHL that can be seen from this location, they are not dominant visual elements from this area. While both hangars are clearly seen, they rise up only slightly above the horizon.

A second group of buildings lies several hundred feet east of Hangar 1, on the north side of the Ladd AAF NHL. The area contains six WWII-era Butler buildings (Buildings 3018, 3019, 3020, 3021, 3022, and 3028). During WWII, cold-weather testing took place in these buildings. Views of the airfield and the rest of the Ladd AAF NHL from this area are similar to those near Hangar 1. However, the views from this area are focused more on the northern part of the north runway and taxiway. Hangars 2 and 3 can still be seen from this location, but are slightly less visually prominent than from near Hangar 1.

On the south side of the Ladd AAF NHL is a third grouping of WWII-era buildings that are clustered in two areas: the Hangars 2 and 3 area and the area between Montgomery Road and Neely Road. The most visually significant and dominant buildings in this part of the NHL and from nearby areas outside the NHL (and the entire NHL) are Hangars 2 and 3, which are located near the intersection of the south and east taxiways. Hangar 1 and other Cold War-era buildings (primarily Building 1595, which is a large, partially two-story machine shop) can also be seen to the northwest. However, at this middle-ground distance (between approximately 0.75 and 1 mile), neither building is a dominant visual feature.

A fourth area within the NHL that contains a cluster of WWII-era buildings is between Montgomery Road and Neely Road in the southeast part of the Ladd AAF NHL. This area contains five Butler warehouse buildings that are located away from the airfield and are

situated between more modern buildings (to the west and north) as well as parking lots (to the immediate south). Although Hangar 2 is quite visible from this area, the five Butler buildings are generally visually removed from most of the Ladd AAF NHL.

3.3.3.6.2 Visual Characteristics of the Cold War Historic District

Similar to the NHL, the Cold War Historic District is oriented around the runways and taxiways of Ladd AAF. This area contains Cold War-era buildings and facilities. The northern portion includes Cold War-era buildings that are located in the general area of the WWII buildings, which surround the parade ground. Except for Buildings 1595 (machine shop), 1579 (warehouse), 1565 (refueling maintenance shop), and 1541 (airways and air commission services), these Cold War-era buildings are not as closely situated to the airfield as the WWII-era buildings in the Ladd AAF NHL.

The group of buildings in the Cold War Historic District that has the closest physical association with the airfield is located near the southwest corner of the district. This group of buildings consists mostly of Cold War-era barracks and support buildings. These buildings, their grounds, and their parking lots have a strong visual relationship to the airfield and nearby Hangars 2 and 3.

Views into the Cold War Historic District from areas away from the airfield sometimes include views of the airfield. However, many of the Cold War-era buildings within the district that are situated away from the airfield are surrounded by other non-Cold War-era buildings. As a result, most are visually disconnected with the airfield.

3.4 Noise

3.4.1 Introduction

Noise is generally an unwanted, undesirable sound. It can be any sound interfering with communications or other human activities, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. The Noise Control Act of 1972, as amended by the Quiet Communities Act (42 U.S.C. 4901 et seq.), provides the controlling regulations.

The typical response of humans to noise is annoyance, a response that is remarkably complex and, considered on an individual basis, displays wide variability for any given noise level. Annoyance is the measured outcome of a community's response to survey questions on various environmental and other factors including noise exposure. Although individual annoyance is sometimes measured in the laboratory, field evaluations of community annoyance are most useful for predicting the consequences of actions involving highways, airports, road traffic, railroads, or other noise sources. Factors directly affecting annoyance from noise include interference with communication and sleep disturbance. Other less-direct effects include disruption of one's peace of mind, the enjoyment of one's property, and the enjoyment of solitude. The consequences of noise-induced annoyance are privately felt dissatisfaction, often publicly expressed as complaints to the installation or authorities.

3.4.1.1 Noise Measurements and Effects

Noise is expressed and analyzed in the following manner:

- **Unit of Measurement.** The unit of measurement used in sound measurement is the decibel (dB), and the unit of measurement used for noise is the dB on the A-weighted scale (dBA). The A-weighted scale most closely represents the response of the human ear to sound. The term "noise level" is used interchangeably with "sound level."
- **Common Metric.** The most widely used metric for noise is the day-night average sound level (DNL). The DNL represents energy-averaged sound levels measured by summation and averaging of sound exposure level (SEL) values during a 24-hour period. A penalty of 10 dB is assigned to noise events (including aircraft operations) occurring between 10 p.m. and 7 a.m. The 10-dB penalty compensates for generally lower background noise levels and increased annoyance associated with events occurring at night. DNL is a useful descriptor for noise in two respects. First, as it is an average, it fits intuitive concepts when dealing with continuous noise, such as that from a busy airfield. Second, because it is a summation of sound energy over a 24-hour period, it is a cumulative metric.
- **Metric for Noise from Transportation Sources.** Noise from transportation sources, such as vehicles and aircraft, and from continuous sources, such as generators, is assessed using the A-weighted DNL (ADNL). The ADNL significantly reduces the measured pressure level for low-frequency sounds while slightly increasing the measured pressure level for some high-frequency sounds. Noise from small-arms ranges is assessed using the ADNL.
- **Metric for Noise from Weapons.** Impulse noise resulting from mortar, artillery, and demolition activities is assessed in terms of the C-weighted DNL (CDNL). The CDNL is often used to characterize high-energy blast (or impulse) noise and other low-frequency sound capable of inducing vibrations in buildings or other structures. The C-weighted scale does not significantly reduce the measured pressure level for low-frequency components of a sound.

There is not one model that can combine all types of noise generated by the military (aircraft, small arms, and traffic) because of the differences in the types of noise produced (impulsive, steady-state) and how humans react to these differences. The noise of tank firing only reaches its peak level for a fraction of a second, whereas a helicopter flyover is considered a more "steady-state" sound. In previous studies, humans have been shown to react differently to these various stimuli.

Nonetheless, the furthest extent for each noise contour (how far the source will be heard) does represent a true picture of the combined impact. Given the logarithmic nature of noise, doubling of sound energy will increase noise levels by 3 dB. Therefore, when two sources of equal sound levels occur at the same time, the sound levels will not double but will only increase by 3 dB. Thus, if two tank rounds that measure 100 dB each were fired simultaneously, a sound level meter would record 103 dB. If two noise events with much different noise levels occur at the same time, their effects are not additive. If one source is 85 dB and the other is 100 dB, both occurring at the same time, a sound level meter would

register 100 dB. Therefore, when looking at the combined impact of noise, the loudest noise source can be used.

The NOISEMAP computer model is the official DoD model for military airfield noise. The required inputs to the program, obtained from airfield operational data, are the location of the flight tracks and the number of each type of aircraft using each flight track. A revised Army helicopter database was added to NOISEMAP in 1993. The maximum noise levels for military helicopters currently used at FWA, FRA and DTA are listed in Table 3.4.a.

TABLE 3.4.a
Maximum Overflight Noise Levels (dBA) of Rotary-Wing Aircraft Currently Used by USARAK
USARAK Aviation EIS

Distance Above Ground Level (feet)	CH-47D (Chinook)	OH-58D (Kiowa)	UH-60 (Blackhawk)
50	104	99	100
100	98	93	94
200	92	87	88
500	84	79	80

Notes: Aircraft flying at speed of 70 knots.
Source: USARAK, 2007.

These maximum levels may be compared with the levels listed in Table 3.4.b to determine the percent of the population that would consider itself highly annoyed from the noise levels generated by a single aircraft.

TABLE 3.4.b
Percentage of Population Highly Annoyed from Noise of a Single Aircraft
USARAK Aviation EIS

Maximum Level, dBA	Percentage of Population Highly Annoyed
70	5
75	13
80	20
85	28
90	35

Source: USARAK, 2007.

3.4.1.2 Noise Management

There are no federal laws prohibiting DoD training and testing from making noise. Nonetheless, the Army seeks to minimize the impact or annoyance of unwanted noise produced by military operations on communities surrounding its installations. Under its Environmental Noise Management Program (ENMP) (formerly known as the Installation Compatible Use Zone Program), which is described in AR 200-1 (U.S. Army, 2007), the Army evaluates the impact of noise that may be produced by ongoing and proposed Army actions and activities. To evaluate the potential effects of noise associated with military

operations, the Army conducts noise studies and generates noise contours. The following land planning and management tools are commonly used:

- **Noise Zones (NZ).** NZs are generated from ADNL or CDNL. The ENMP characterizes noise into three primary zones (NZs I-III) as shown in Table 3.4.c. NZ I is typically suitable for all types of land uses and is located the furthest from the noise source. NZ II and NZ III are generally considered incompatible for noise-sensitive land uses including, but not limited to, hospitals, housing and schools (Montgomery Watson Harza, 2001a).
- **Land Use Planning Zone (LUPZ).** The LUPZ provide the installation with adequate buffers for land use planning. LUPZ buffers are comprised of daily average contours of 60 to 65 dBA (decibel level for ADNL) for small-arms noise and 57 to 62 C-weighted decibels (dBC) (decibel level for CDNL) for impulse noise. Additionally, to reduce potential for noise conflicts, a 500-meter buffer zone is incorporated around these contours to determine land use compatibility (Montgomery Watson Harza, 2001a).
- **Peak Noise-Level Contours.** PK15(met) contours, which show the peak noise level that is expected to be exceeded by only 15 percent of the events, provide a more accurate assessment of the maximum noise level likely to be heard during training activities.

TABLE 3.4.c
Noise Zones
USARAK Aviation EIS

		Noise Limit			
Noise Zone	**Population Highly Annoyed[a]**	**Transportation (ADNL)**	**Large-Caliber Weapons (CDNL)**	**Small-Caliber Weapons (ADNL)**	**Small-Caliber Weapons (PK15[met])[b]**
LUPZ	9%-15%	60-65	57-62	60-65	NA
Zone I	<15%	<65	<62	<65	<87
Zone II	15%-39%	65-75	62-70	65-75	87-104
Zone III	>39%	>75	>70	>75	>104

Notes:
[a] The percentages are based on average noise levels rather than single aircraft; thus, values cannot be compared to data in Table 3.4.b.
[b] The PK15(met) for large-caliber weapons is not included because the Proposed Action alternatives do not change the use of large-caliber weapons.

Flight corridors may extend across military and non-military lands and may be included in NZs or LUPZs. They vary in width depending upon the type of aircraft and type of activity. The population living within or near helicopter flight corridors is subjected to periodic noise and might experience annoyance. Generally, aircraft follow the centerline of the flight corridor, but at times vary and fly anywhere within the corridor. Thus, to account for possible annoyance, the area of possible noise effect is expanded based on the potential aircraft location within the corridor. For example, if a flight corridor is 1 mile in width for a Blackhawk (UH-60 and HH-60) at 500 feet AGL, an annoyance buffer would be delineated that would account for flight activity anywhere within the corridor, not just along the center line.

The SelCalc Program (USAF, 2005) is used to estimate how far from the outer edges of the flight corridors the maximum noise levels would be above 70 dBA (or greater than 5 percent of population annoyed, see Table 3.4.b). The modeling takes into account the altitude, ground track distance, and slant distance of the aircraft. Because the annoyance buffers are based upon maximum sound levels of the individual aircraft, rather than a cumulative or average level, their size does not change with the number of aircraft in the corridor at any given time. The annoyance buffers does not account for any terrain features that may reduce levels due to absorption, deflection, reflection, or refraction.

3.4.2 Scope

A number of noise-related issues were raised during the public scoping process, including concern over the cumulative effects of noise on humans and wildlife populations within the Fairbanks and Anchorage areas, and the noise effects of increased helicopter activity. Additional information on the scoping process is included in the *Scoping Meeting Summary Report Revision 1* (CH2M HILL, 2007a), which will be included in the EIS Administrative Record and is available electronically upon request.

Noise-sensitive areas within the study area include Fairbanks (which is adjacent to FWA), Delta Junction (which is located north of the DTA), and Eagle River (which is adjacent to FRA). Anchorage was not identified as part of the study area for noise because additional helicopter noise from USARAK helicopters is not expected to extend into the Anchorage area. Noise-sensitive areas within the installations are primarily limited to the cantonment areas.

Existing sources of noise associated with FWA, FRA, Eielson AFB, and the DTA include operation of aircraft and use of both large- and small-caliber weapons for training. The primary sources of noise are associated with the Proposed Action include the operation of military aircraft and the firing of weapons.

Because none of the alternatives would change the use of large-caliber weapons used during training, noise from large-caliber weapons is not included in the following discussion.

3.4.3 Affected Environment for Noise

The existing noise environments for FWA, FRA, Eielson AFB, and the DTA are based on information provided in the following documents:

- *Final Installation Environmental Noise Management Plans* (ENMP) for FWA, FRA, and DTA (Montgomery Watson Harza, 2001a-c)
- *Transformation of U.S. Army Alaska Final Environmental Impact Statement* (USARAK, 2004a)
- *Eielson Air Force Base Infrastructure Development in Support of RED FLAG-Alaska Environmental Assessment* (Eielson AFB, 2007a)
- U.S. Army Center for Health Promotion and Preventative Medicine, Operational Noise Consultations (CHPPM, 2007a; CHPPM, 2007b)
- *Fairbanks North Star Borough Joint Land Use Study* (ASCG, 2006)

3.4.3.1 Fort Wainwright

The existing noise environment at FWA is documented in the *Final Installation Environmental Noise Management Plan, Fort Wainwright, Alaska* (Montgomery Watson Harza, 2001a). Primary noise sources include aircraft, and large- and small-caliber weapons. Minor secondary sources of noise include construction, traffic, and recreation. NZ III contours are all contained within the installation. NZ I and NZ II are limited to the Cantonment with the exception of Approach Hill and a small portion of the Richardson Highway Corridor near Ladd AAF. Figure 3.4.a shows the existing noise environment at FWA.

3.4.3.1.1 Cantonment /Ladd AAF

NZ contours exist for operations at Ladd AAF. The NZ II contour for Ladd AAF extends approximately 1 mile beyond the eastern boundary of the installation and contains a noise-sensitive area (a small civilian residential development) (see Subsection 3.4.3.1.4). The NZ III contour is restricted to the runway, does not leave the military installation boundary, and does not contain any incompatible land uses (see Figure 3.4.a).

There are five potentially sensitive noise areas in the FWA Cantonment: the North Post Barracks, the South Post Barracks, Birchwood Housing Area, the Main Gate area, and Chena Bend Golf Course. The North Post Barracks are subject to potential noise from aircraft operations at Ladd AAF. The South Post Barracks are subject to potential impulse (blast) noise from the artillery and small-arms weapons training. The Birchwood Housing Area is subject to potential noise from aircraft operations at Ladd AAF. The Main Gate area consists of the community hospital and associated barracks, and the Tanana Satellite School and is subject to potential noise from aircraft operations at Ladd AAF. Chena Bend Golf Course is subject to noise from aircraft operations at Ladd AAF and noise from artillery and small-arms weapons training occurring at the FWA Small-Arms Complex (Montgomery Watson Harza, 2001a).

3.4.3.1.2 Tanana Flats Training Area

Military training exercises generate the majority of noise on TFTA. Most training exercises result in individual short-term noise events and do not result in NZs. Existing operations that generate noise in the TFTA are primarily maneuver training, occasional large-caliber (larger than 22 mm) weapons fire, and demolition activity. Training noise is generally concentrated around the FPs and IAs, although vehicle maneuver training is unrestricted within the training area. Helicopter activities include air transport, air reconnaissance, close air support (hovering), and activities at 500 feet AGL and below. While these activities generate noise, they do not yield NZs.

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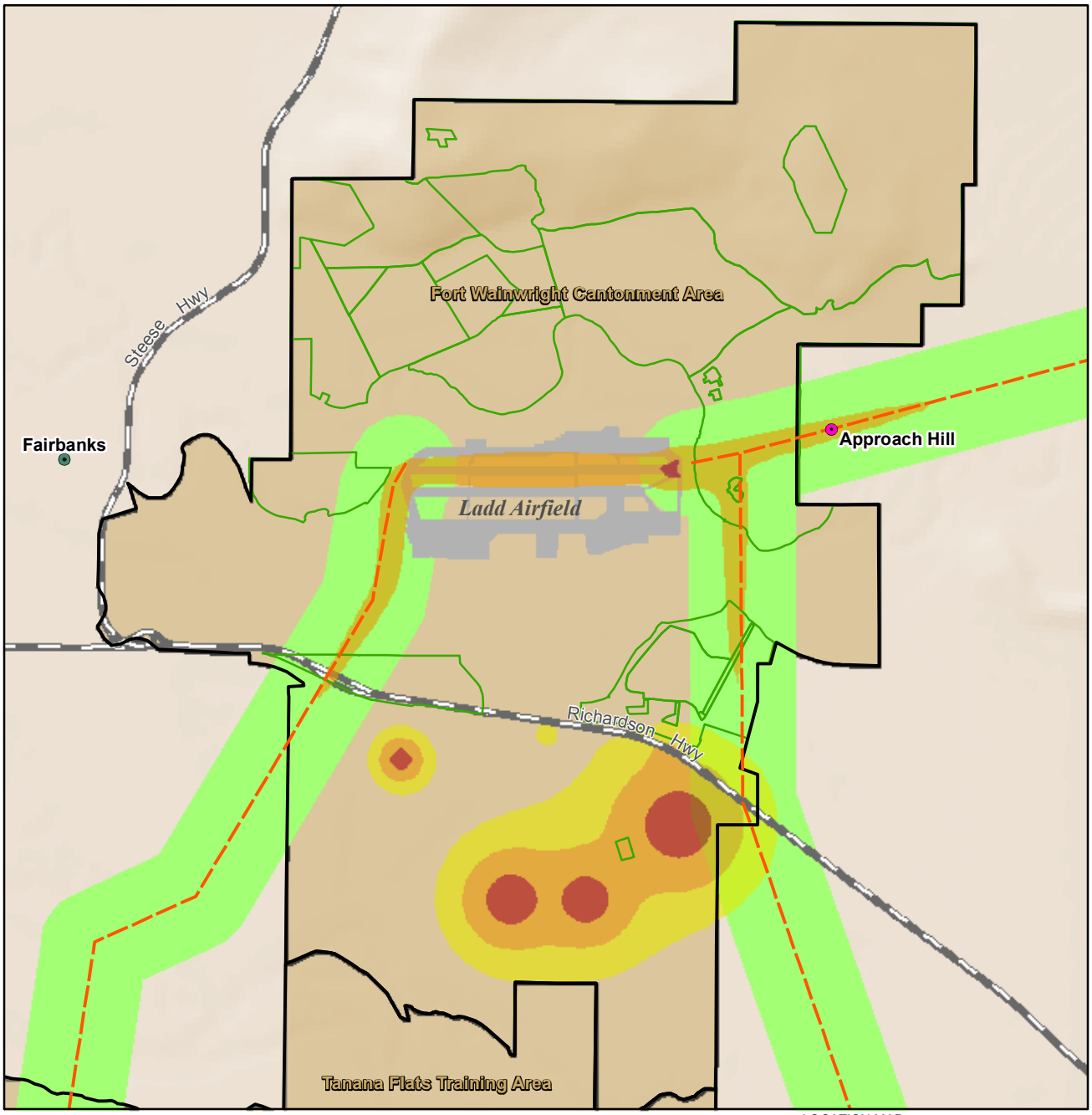
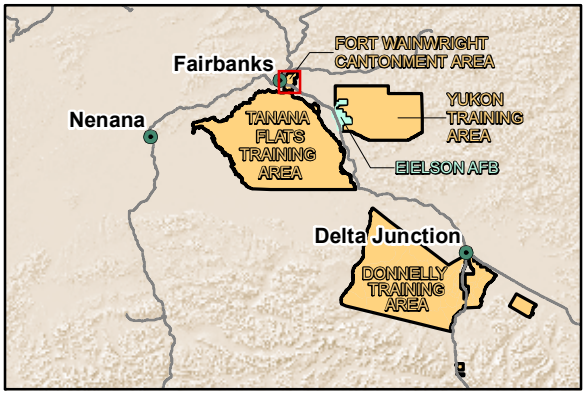


LOCATION MAP



LEGEND

- Town
- Neighborhood
- Major Roads
- Helicopter Flight Route
- Airfield Surface Area
- Training Area
- Helicopter Flight Corridor (1/3 mile Buffer)
- Army Installation

Noise Contours (see Table 3.4.c for Noise Zone Definitions)

- Zone I
- Zone II
- Zone III

N

0 0.5 1

Miles

FIGURE 3.4.a
Existing Noise Environment at Fort Wainwright Cantonment Area
USARAK Aviation EIS

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3.4.3.1.3 Areas Surrounding FWA

Approach Hill is an area off FWA directly east of Ladd AAF. As its name implies, this is an approach area for Ladd AAF. Noise sources in this area are due to aircraft operations. The general public, including residents of this development, is notified in advance of training events to lessen the noise impact to the population. Unfavorable weather conditions, such as winds, could result in negative impacts on residences in this location from noise created by helicopter flights.

Portions of the development at Approach Hill (east of Ladd AAF) are contained in NZ II. A good predictor of annoyance at airfields with less than 200 operations per day (as is the case at Ladd AAF; see Table 4.2.b) is the maximum level of the three nosiest events (Rylander, 1974; Rylander, 1988). Consequently, the maximum level of individual aircraft noise, rather than the cumulative or average level, determines annoyance. Table 3.4.a provides the maximum dBA noise levels for the helicopters. The loudest aircraft in the USARAK inventory, the Chinook CH-47, generates 84 dBA at a distance of 500 feet AGL, the minimum flight elevation over non-military lands. Based on these numbers and typical annoyance in response to noise levels (see Table 3.4.b), it is estimated that approximately 30 percent of the affected population is annoyed by aircraft operations.

The Richardson Highway Corridor at times experiences elevated noise because of impulse (blast) noise from an artillery training area south of Ladd AAF within the Small-Arms Complex. A small area lies within NZ II, and larger areas lie within NZ I and within FWA's LUPZ 500-meter noise buffer. Potential uses in the area may include residential, commercial, industrial, and institutional (see Figure 3.4.b). The general public, including residents of this development, is notified in advance of training events to lessen the noise impact to the population.

3.4.3.2 Fort Richardson

The existing noise environment at FRA is documented in the *Final Installation Environmental Noise Management Plan, Fort Richardson, Alaska* (Montgomery Watson Harza, 2001b). The plan concluded that no significant noise sources were associated with existing military operations. Primary noise sources on FRA include aircraft and small- and large-caliber weapons. Minor secondary noise sources include construction, traffic, and recreation. Generally, NZ I, NZ II, and NZ III are largely limited to the Cantonment and ERF IA FRA has adopted newer, quieter equipment and changed timing and location of training activities to reduce noise impact on the public (Montgomery Watson Harza, 2001b).

NZ II and III contours are generated by live-fire training at the small-arms ranges in the northwestern portion of FRA. These contours are contained within the boundary of FRA and Elmendorf AFB (see U.S. Army Engineer District 2001 for model details and maps). Small-arms noise is generally not a concern at FRA and very few noise complaints are generated as a result of this activity. The NZ contours for larger-caliber weapons are mostly contained within military lands at FRA or Elmendorf AFB. However, NZ II and NZ III contours for a few northern FPs may overlap a portion of the Cook Inlet near IRF IA.

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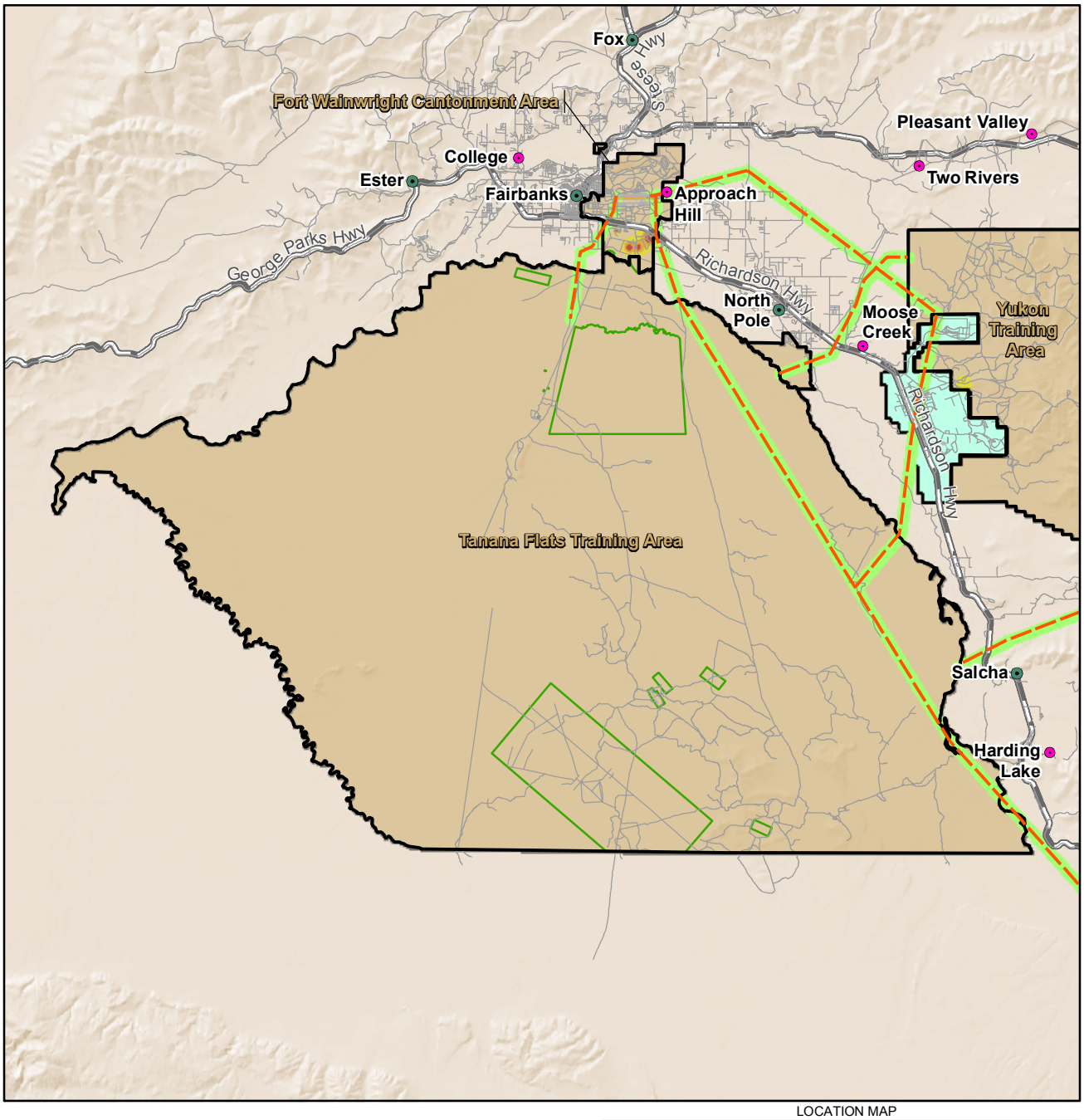

LEGEND

- Town
- Neighborhood
- Major Roads
- Helicopter Flight Route
- Airfield Surface Area
- Training Area
- Air Force Installation Area
- Helicopter Flight Corridor (1/3 mile Buffer)
- Army Installation

Noise Contours (see Table 3.4.c for Noise Zone Definitions)

- Zone I
- Zone II
- Zone III

N

0 4.25 8.5

Miles

LOCATION MAP

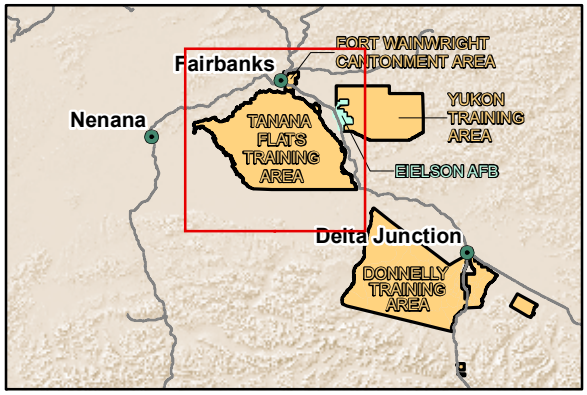

FIGURE 3.4.b
Existing Noise Environment at Fort Wainwright Tanana Flats Training Area
USARAK Aviation EIS

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3.4.3.2.1 Bryant Army Airfield

Existing noise contours resulting from aircraft activity at Bryant AAF do not extend beyond the installation boundary. Noise-sensitive areas adjacent to the installation currently do not experience noise impacts from operations at Bryant AAF (USARAK, 2004a).

Elmendorf AFB supports a variety of aircraft that conduct operations over FRA. The current suite of aircraft includes F-22, F-15, E-3, C-12, and C-17. Elmendorf AFB has developed baseline noise levels for aircraft operations using the NOISEMAP program. A detailed description of noise conditions associated with USAF operations is provided in the *F-22 Beddown Environmental Assessment* (Elmendorf AFB, 2006).

3.4.3.2.2 Eagle River Flats Impact Area

The existing noise NZ II contours for small-arms weapons training at FRA's ERF IA overlap a small portion of the ocean and onto Elmendorf AFB, but otherwise do not extend beyond the installation boundary (see Figure 3.4.d) (USARAK, 2004a).

Aircraft activity within the airspace above ERF IA is primarily associated with aerial door gunnery training from UH-60 and CH-47 helicopters operated by the Alaska Army National Guard and USARAK, respectively. These helicopters are also operated out of Bryant AAF with a primary flight corridor over FRA.

3.4.3.3 Eielson Air Force Base

The *Eielson Air Force Base Infrastructure Development in Support of RED FLAG-Alaska Environmental Assessment* (Eielson AFB, 2007a) was used to determine the existing noise conditions at Eielson AFB. Dominant noise sources on the Base are associated with aircraft and airfield operations. On-Base noise contours can exceed 80 dB in the vicinity of the flight line; however, the noise-level contours are 70 dB or lower (similar to NZ II) in the closest residential area, Moose Creek, just north of the Base (see Figure 3.4.c).

3.4.3.4 Donnelly Training Area

The primary noise-generating operations at the DTA involve fixed-wing and rotary-wing aircraft, mortar and artillery live-fire training, small-arms weapons training and ordnance (or bomb) detonation. Some of the noise reported on and off DTA is due to Air Force aircraft flying within airspace over DTA. The existing noise environment at the DTA is documented in the *Final Installation Environmental Noise Management Plan, Fort Greely, Alaska* (Montgomery Watson Harza, 2001c). Existing noise contours at the DTA all remain within the installation and noise-sensitive land areas on the installation are not within NZ II or NZ III, as shown in Figure 3.4.e. NZ II and III contours are generated by use of the collective training ranges, Battle Area Complex (BAX), Combined-Arms Collective Training Facility (CACTF), and impact areas in the southeastern corner of the installation.

USARAK receives relatively few environmental noise complaints each year from the surrounding community. Most calls are from people with questions or requests for information. The few recently logged complaints stem from noise of large-scale training

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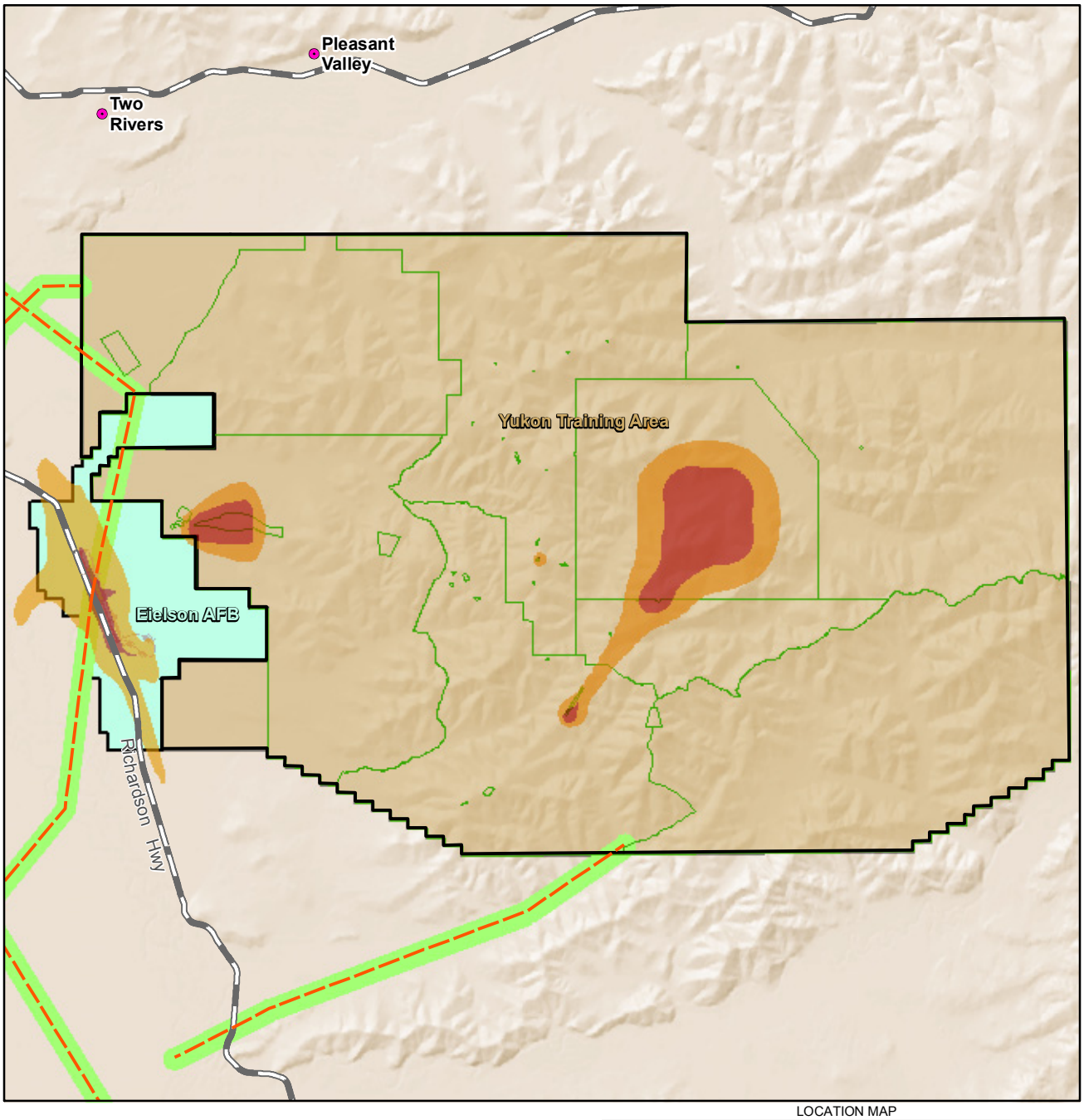

LEGEND

- Town
- Neighborhood
- Major Roads
- Helicopter Flight Route
- Airfield Surface Area
- Training Area
- Air Force Installation Area
- Helicopter Flight Corridor (1/3 mile Buffer)
- Army Installation

Noise Contours (see Table 3.4.c for Noise Zone Definitions)

- Zone II
- Zone III

N

0 2.25 4.5

Miles

LOCATION MAP

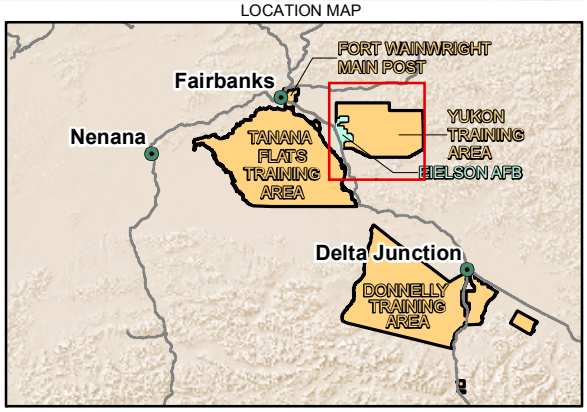

FIGURE 3.4.c
Existing Noise Environment at Fort Wainwright Yukon Training Area and Eielson AFB
USARAK Aviation EIS

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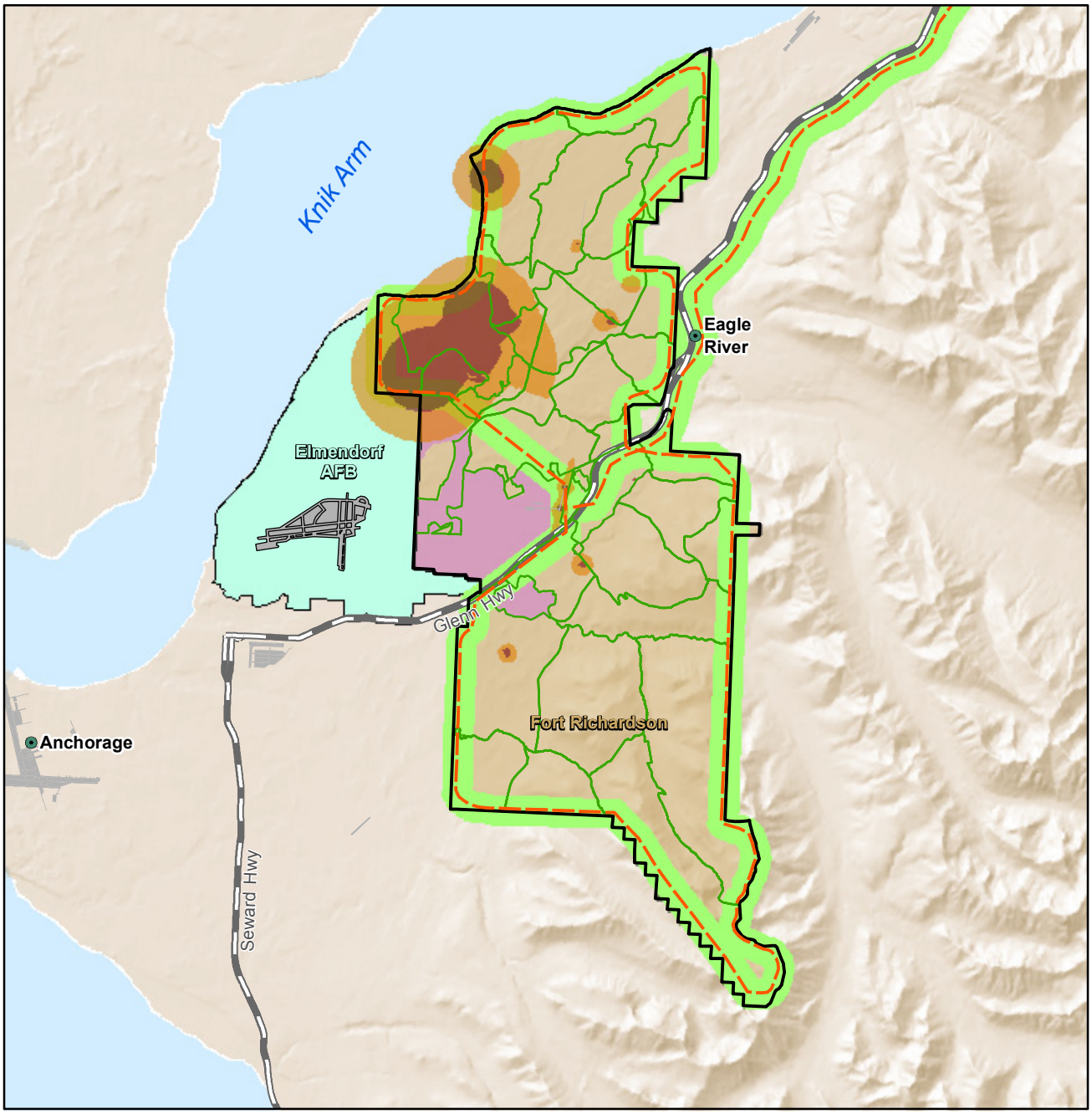

LEGEND

- Town
- Major Roads
- Helicopter Flight Route
- Airfield Surface Area
- Training Area
- Air Force Installation Area
- Helicopter Flight Corridor (1/3 mile Buffer)
- Fort Richardson Cantonment Area
- Army Installation

Noise Contours (see Table 3.4.c for Noise Zone Definitions)

- Zone II
- Zone III

N

0 1.75 3.5

Miles

LOCATION MAP

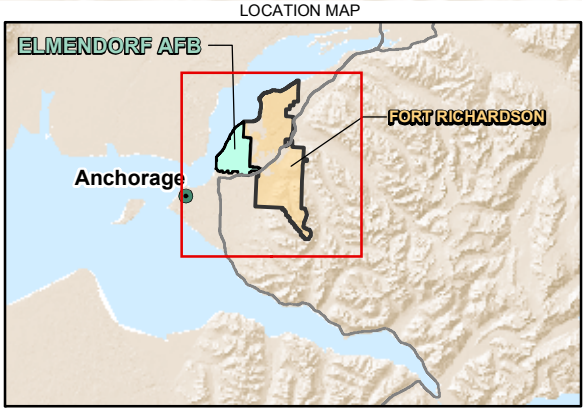

FIGURE 3.4.d
Existing Noise Environment at Fort Richardson
USARAK Aviation EIS

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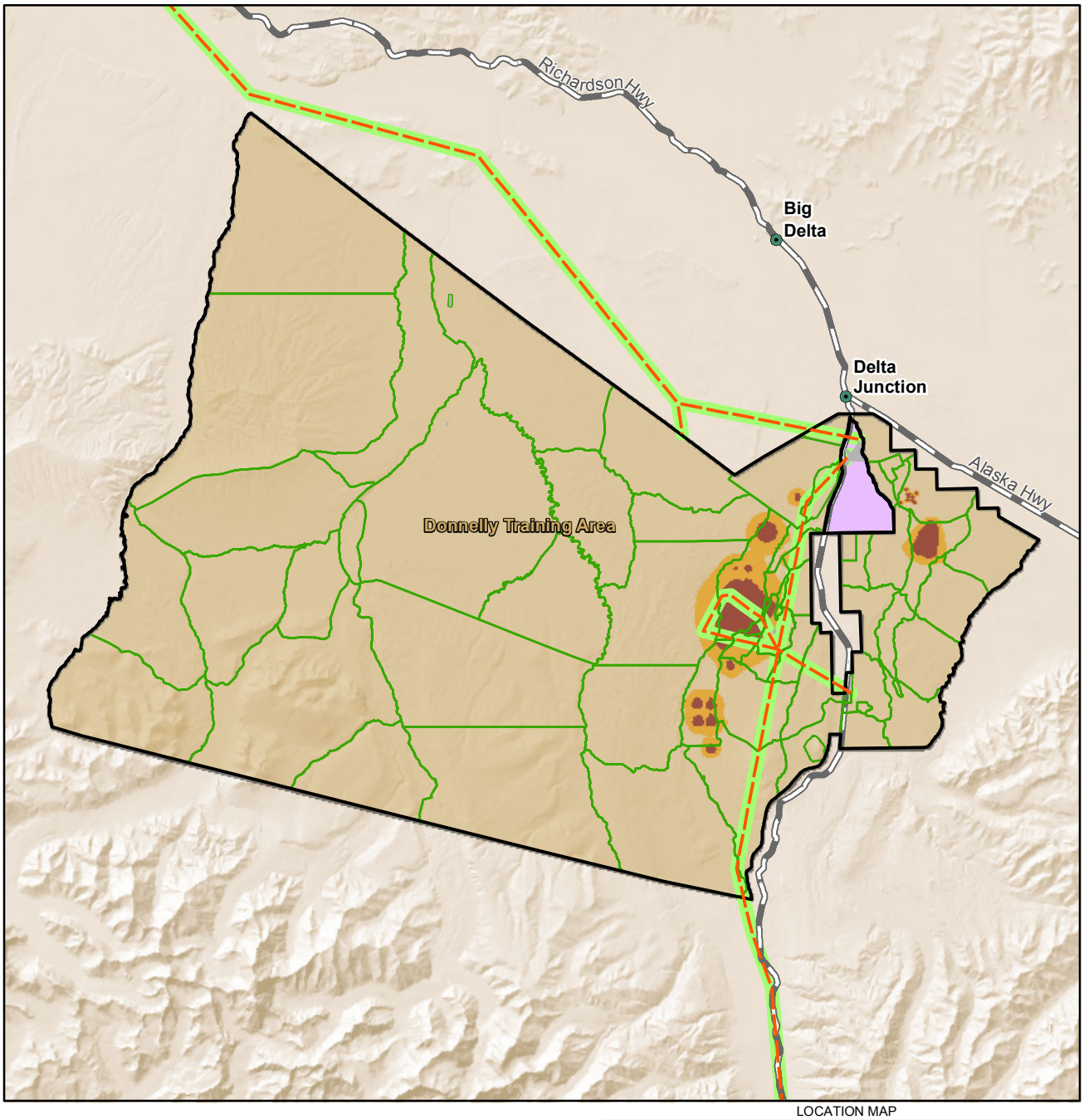
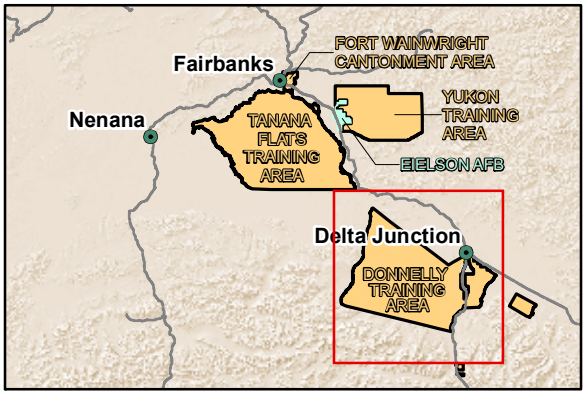


LOCATION MAP



LEGEND

- Town
- Major Roads
- Helicopter Flight Route
- Airfield Surface Area
- Training Area
- Army Installation
- Helicopter Flight Corridor (1/3 mile Buffer)
- Fort Greely Cantonment Area

Noise Contours (see Table 3.4.c for Noise Zone Definitions)

- Zone II
- Zone III

N

0 4 8

Miles

FIGURE 3.4.e
Existing Noise Environment at Donnelly Training Area
USARAK Aviation EIS

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activities such as Northern Edge and Cope Thunder (which is primarily a USAF training exercise). USARAK provides a 2-week notice to the public for noise generated during late firing training operations (between 10 p.m. and 7 a.m.) by publishing notices in the local newspapers. Notices are also intended as a safety measure to inform the public about areas to avoid during training events.

3.4.3.4.1 Allen Army Airfield

Aircraft activity takes place throughout the airspace above DTA East, with the highest concentration of aircraft operations in the immediate vicinity of Allen AAF. Aircraft operations include both fixed-wing and rotary-wing operations. The operational data for the airfield were modeled as part of the ENMP, but because contours are based on annual average, the level of operations was not enough to generate an NZ II or NZ III contour that extends beyond the runway. Noise-sensitive areas adjacent to the installation currently do not experience noise impacts from operations at Allen AAF (USARAK, 2004a).

Other existing aircraft noise is attributed to transient USAF operations. The USAF flies both fixed-wing and rotary-wing aircraft. The airspace above the western portion of DTA East and most of DTA West is Restricted Airspace R2202. Established MOAs, that have fixed minimum and maximum flight altitudes, are located above the southern portion of DTA East and adjacent to DTA West. Both R2202 and the adjacent MOAs are frequently used by the USAF for aircraft training exercises. The MOAs do not include the primarily developed portion of Delta Junction. When aircraft are flying out of the MOAs or restricted airspace, they must follow FAA guidelines. FAA guidelines state that aircraft must maintain a minimum flight altitude of 500 feet AGL. Because flights are dispersed in a large area, operations do not generate an NZ II or NZ III contour in the vicinity of DTA East.

Existing USAF operations in these areas are not enough to generate a NZ II. For routine daily training operations, the ADNL in the immediate vicinity of the existing impact areas to the west of the Delta River (those used by the USAF at DTA West) ranges from 60 to 63 dBA (below the 65 ADNL needed for NZ II) (no impact areas exist on DTA East.). Two to 3 miles away, the sound levels decrease to 55 dBA. During a major training exercise, the ADNL may increase from 62 to 65 dBA, but still drops to 55 dBA outside of the immediate target areas. This drop in noise levels stems from two factors: 1) when not participating directly with the impact areas, the flights are too dispersed throughout the MOAs to generate a NZ in a particular location; and 2) when not directly involved in the training exercise, aircraft fly at higher altitudes, reducing noise levels.

3.4.3.4.2 Flight Corridors

As discussed in Section 3.2, military helicopters operating outside of installation boundaries fly at least 500 feet AGL in existing flight corridors (see Figure 3.4.f). Once inside of installation boundaries, military aircraft may fly at lower altitudes as required for the training mission. The low number of helicopters using USARAK flight corridors does not generate ADNL NZs (i.e., meaningful estimates of average or cumulative noise) (CHPPM, 2007a; CHPPM, 2007b). While NZs are not generated, the population living within or near helicopter flight corridors is subjected to periodic noise and might experience annoyance.

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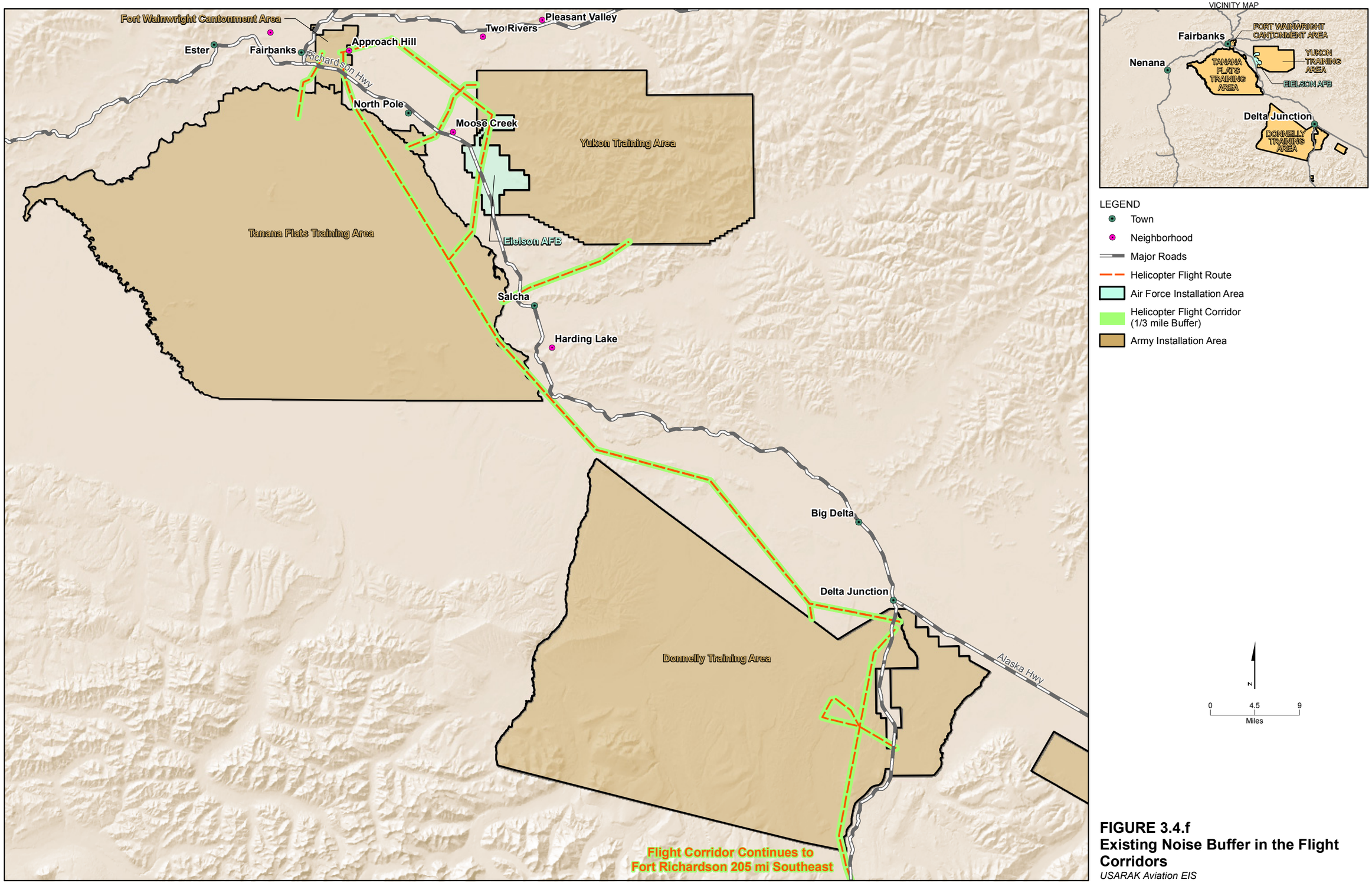

FIGURE 3.4.f
Existing Noise Buffer in the Flight Corridors
USARAK Aviation EIS

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The SelCalc Program (U.S. Air Force, 2005) was used to estimate annoyance buffers for areas outside the installation boundaries. Annoyance buffers were calculated based on the loudest aircraft in the USARAK inventory, the Chinook CH-47, which generates 84 dBA at a distance of 500 feet AGL. A 1/3-mile buffer area was added to each side of the flight corridor (see Figures 2.2.b and 2.2.c, and Figures 3.4.a through 3.4.f). A noise level of 84 dBA potentially annoys approximately 30 percent of the population directly under the corridors and buffers (see Table 3.4.b).

Table 3.2.a presents the current number of helicopter operations (i.e., take-offs and landings). On a flying day (defined in Table 3.2.a), approximately 36 helicopters operations, i.e., 18 flights, take place; three flights could occur at night. On a peak flying day, 100 operations, i.e., 50 flights, occur. Some of the flights follow the helicopter corridors over non-military lands. Few population areas are located within or near the corridors. These include outlying areas of Fairbanks (located between Ladd AAF and TFTA) and the city of North Pole (located between the YTA and TFTA) (see Figures 3.4.a and 3.4.b). Because helicopters mostly follow the centerline, the greatest effect is within the corridor. Closer to either edge of the corridor (i.e., in the annoyance buffer), the effects are infrequent because helicopters could be flying anywhere within the corridor.

Over urban areas, noise is generated from helicopters performing aerial reconnaissance training exercises within the cities of Fairbanks and North Pole, as described in Section 3.2. Helicopters typically fly at 500 to 1,000 feet AGL. Notifications are made to the public prior to all urban training activities. These training events occur up to 2 days per quarter and consist of four helicopters in the air at one time.

3.5 Hazardous Materials/Hazardous Waste

3.5.1 Introduction

This section establishes the baseline conditions related to hazardous materials and waste in each region of concern for the Proposed Action. There were some issues raised during the public scoping process regarding hazardous materials and waste, particularly concern about the increased use of hazardous materials on the installations and potential impacts from previously identified contaminated sites on the installations associated with the Proposed Action.

Federal, State, and Army regulations determine requirements for hazardous materials/ hazardous waste. These criteria differ based on the type and context of the material or waste examined. Stressors, which influence or control hazardous materials and hazardous waste, are also considered.

3.5.1.1 Federal Regulations

The following five federal regulations provide the overarching criteria for hazardous materials/hazardous waste on Army lands in Alaska:

- **Resource Conservation and Recovery Act (RCRA)**. RCRA (42 U.S.C. 6901 et seq.) pertains to the management of hazardous waste from its point of generation through its disposal. The RCRA requirements include tracking and storage of hazardous waste and enforcement of safe management practices. For example, the Underground Storage Tank

(UST) Program is managed by RCRA. The ultimate goal of RCRA is to prevent the creation of new contamination sites from hazardous waste (EPA, 2007a).

- **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)**. For existing contaminated sites, CERCLA (commonly known as Superfund) (42 U.S.C. 9601 et seq.) acts as the governing regulation of remediation. CERCLA oversees long- and short-term remediation actions for contaminated or potentially threatened contaminated sites by requiring investigation, assessment, and development of remediation programs to contain contamination. CERCLA also requires an extensive review process to examine if the programs adequately remediate the site. CERCLA includes removal of hazardous materials for emergency response and long-term monitoring of contamination levels at affected sites (EPA, 2006a). The Superfund Amendments and Reauthorization Act (SARA) of 1986 (42 U.S.C. §§ 9601-9675) amended CERCLA to reflect "lessons learned" during the first 6 years of CERCLA implementation by the EPA. Most significant of these amendments are the provisions to include mandatory cleanup standards, settlement provisions, and State and public participation.
- **Toxic Substances Control Act (TSCA)**. TSCA (15 U.S.C. §2601 et seq.), enacted in 1976, enforces management of harmful or potentially harmful substances. TSCA requires the testing of chemicals that could be harmful to humans or the environment, imposes limits of availability of certain substances, and reviews known and unknown chemicals to develop safe management programs (EPA, 2007b).
- **Asbestos Hazard Emergency Response Act (AHERA)**. AHERA (15 U.S.C. 2651) regulates hazardous asbestos, including the inspection, abatement-process transport, disposal, and post-remediation surveillance of asbestos activity (EPA, 2007c).
- **Spill Prevention, Control and Countermeasure (SPCC) Rule**. Petroleum-based hazardous materials and waste are regulated by the SPCC Rule (40 CFR 112). This rule oversees management practices and contamination response programs to limit contact and exposure of the environment, wildlife, and humans to petroleum (EPA, 2007d).

3.5.1.2 State Regulations

Title 18, Environmental Conservation, of the Alaska Administrative Code (AAC) contains the criteria for management, generation, transport, and disposal of hazardous materials and waste (Alaska Department of Environmental Conservation [ADEC], 2007a). In addition to authorities of the State under Title 18, the State of Alaska is charged with oversight of DoD CERCLA sites. The State of Alaska and DoD entered into a Defense State Memorandum of Agreement (DSMOA) in 1991, which provides the basis for cooperative cleanup of contaminated sites. ADEC regulations include the following:

- Oil and Other Hazardous Substances Pollution Control (18 AAC 75)
- Soil Cleanup Levels; Tables (18 AAC 75.341)
- Best Available Technology Review (18 AAC 75.445[k])
- USTs (18 AAC 78)

3.5.1.3 Army Regulations

AR 200-1, *Environmental Protection and Enhancement* (U.S. Army, 2007), governs how military or civilian personnel, installation tenants, and contractors at Army facilities deal with hazardous materials and manage regulated waste. This regulation includes, but is not limited to, policies related to the following topics:

- Oil and hazardous substances spills
- Hazardous materials management
- Hazardous and solid waste management
- Lead-based paint (LBP) management
- Asbestos management
- Radon reduction program
- Installation Restoration Program (IRP)

Additional regulations and policies outside the bounds of AR 200-1 also are implemented on USAG-AK lands to address areas of known or suspected contamination. These policies and programs are not designed to supersede AR 200-1, but to work in complement with AR 200-1 established policies and procedures. These policies include:

- Military Munitions Response Program (MMRP)
- Institutional Controls (ICs)
- FWA and FRA *Lead-Based Paint Management Plans* (LBPMPs) (Fort Richardson, 1999a)
- FWA and FRA *Asbestos Management Plans* (AMPs) (Fort Wainwright, 2007; Fort Richardson, 1999b)
- FWA and FRA *Integrated Pest Management Plans* (IPMPs) (EPA, 2009)

In 2012, the responsibilities associated with the IRP will be transferred to the MMRP. MMRP is a subset of the Defense Environmental Restoration Program (DERP), and will be the primary program responsible for the restoration of contaminated sites after the 2012 transfer. The MMRP was established to better reflect the statutory program goals established by the DoD in its Environmental Restoration Program. The MMRP addresses the potential explosives safety, health, and environmental issues caused by past DoD munitions-related activities.

Additionally, all operations involving hazardous waste would be accomplished in accordance with USARAK Pamphlet 200-1, *Hazardous Materials and Regulated Waste Management* (USARAK, 2000).

3.5.2 Scope

The following hazardous materials/hazardous waste regions are of concern for the Proposed Action, and are discussed in the affected environment section that follows:

- FWA (to include TFTA and YTA)
- FRA
- Eielson AFB
- DTA

3.5.3 Affected Environment for Hazardous Materials/Hazardous Waste

For the purpose of this analysis, the terms hazardous waste, hazardous materials, and toxic substances include those substances defined as hazardous by the CERCLA, RCRA, or the TSCA. In general, they include substances that, because of their quantity, concentration, or physical, chemical, or toxic characteristics, may present substantial danger to public health or welfare or the environment when released.

National Priorities List – The National Priorities List (NPL) (i.e., Superfund sites) specifies national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. Primarily, its intent is to guide the EPA in determining which sites warrant further investigation (EPA, 2007e). FWA, Eielson AFB, and FRA are on the NPL. Specific environmental statutes, regulations, and regulatory programs govern hazardous material and hazardous waste management activities at FWA, FRA, Eielson AFB, and DTA to reduce the threat to human health and decrease the environmental risk exposure associated with known contaminants.

Hazardous Waste Management – USARAK actively works to substitute products that pose environmental risk and has developed and implemented plans to eliminate or reduce hazardous waste, hazardous substances, pollutants, and contaminants. The Army recycles metal, fuel, oil, batteries, and antifreeze. According to USARAK personnel, between 95 and 99 percent of hazardous waste generated by USARAK is recycled for sale, resulting in nearly limitless capacity (Gray, 2009, personal communication). Hazardous waste is collected in approved containers at waste accumulation points throughout the installations. In the training areas, hazardous waste generation is predicated by training activities and there are no established accumulation points. Emergency 90-day accumulation areas are established, as needed, within 50 feet of the road for collection. Due to the continued efforts of USAG-FRA and USAG-FWA, 15 percent reductions in hazardous waste generation have been achieved during the past few years, and existing practices are expected to improve health and safety impacts from the use, storage, or disposal of hazardous materials.

Institutional Controls – ICs in place on all Garrison-controlled Army lands in Alaska serve as a guide for conducting work in and around sites of known contamination. ICs are administrative, procedural, and regulatory measures to control human access to and usage of property. ICs have been agreed upon by the Army, EPA, and the ADEC in accordance with CERCLA as amended by SARA. Records of Decision (RODs) and other decision documents negotiated with EPA and ADEC mandate the implementation of ICs. ICs also apply to remedial actions agreed upon under Two-Party Compliance Agreements between USAG-AK and ADEC addressing petroleum, oil, and lubricant (POL)-contaminated sites. All work conducted on USAG-AK lands by any entity is subject to the USAG-AK IC policy. A copy of the FWA ICs is included in the EIS Administrative Record and is supplied to all parties performing work on USAG-AK lands. Failure to comply with the agreed-upon ICs may violate the Army's Federal Facility Agreement (FFA) and may result in stipulated fines and penalties beyond those costs associated with required corrective actions.

Lead-Based Paint Management – The objective of the FWA and FRA LBPMPs is to identify, evaluate, control, and eliminate existing LBP hazards. Current Army policy calls for controlling LBP by managing it in place, rather than using mandated removal procedures.

In-place management prevents deterioration over time of those surfaces likely to contain LBP, followed by replacement, as necessary. Maintenance staff are given instructions on routine cleaning procedures to capture LBP fragments from suspected locations. Under U.S. Army Engineering and Housing Support Center Technical Note 420-70-2, *Lead-Based Paint: Hazard Identification and Abatement*, the demolition and removal of architectural components require that LBP be characterized and disposed of in accordance with applicable federal, State, county, and municipal laws, ordinances, and regulations for solid waste management. If discovered, LBP would be encapsulated and removed in accordance with Army, U.S. Department of Housing and Urban Development (HUD), and U.S. Occupational Safety and Health Administration (OSHA) guidelines, which cover contractor training, notification requirements, use of personal protective equipment, and approved disposal methods. Non-demolition-related abatement is performed when in-place management will not control the hazard effectively or when it is cost effective to incorporate during normal facility renovation or upgrade programs.

Additional lead exposure is reduced with standard operating procedures (SOPs) and BMPs addressing lead management at training locations. At direct-fire ranges, much of the targets are constructed of heavy rubber material that is capable of withstanding a considerable amount of direct fire. The blocks are frequently rotated to minimize disruption of the material. When the material is beyond its life expectancy, the blocks are properly disposed of as lead-contaminated debris. The Garrisons also have a robust recycling program, which includes waste stream materials such as light bulbs, glycols, batteries, POLs, and brass from shell casings (USAG, 2008).

Asbestos Management – The intent of both the FWA and FRA AMPs is to monitor existing asbestos-containing material (ACM) on both FWA and FRA, and to establish management and organizational responsibilities that ensure compliance with AR 200-1, effectively establishing that no personnel that live or work in installation facilities are exposed to hazardous levels of airborne asbestos fibers. Asbestos is typically managed in place at both installations in accordance with the EPA's guidance manual, 2OT-2003 (July 1990). If discovered, any damaged friable ACM is repaired or removed immediately upon discovery before it can become airborne and present a health hazard.

Remediation for ACM is regulated by the EPA and OSHA. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the Clean Air Act (CAA), which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). These standards address the demolition or renovation of buildings with ACM. Two categories are used to describe ACM: friable and nonfriable. Friable ACM is defined as any material containing more than 1 percent asbestos (as determined by polarized light microscopy) that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable ACM is material that contains more than 1 percent asbestos and does not meet the criteria for Friable.

Pest Management – FWA and FRA have IPMPs that include the specific procedures for health and environmental safety, pest identification, pest management, and pesticide use, storage, transportation, and disposal (FWA, 2004). The *Installation Pest Management Plan* (IPMP) defines a framework for integrated pest management, which is a sustainable approach to pest management that aims to reduce reliance on chemical pest controls by integrating biological, cultural, and physical pest control measures. All federal agencies are

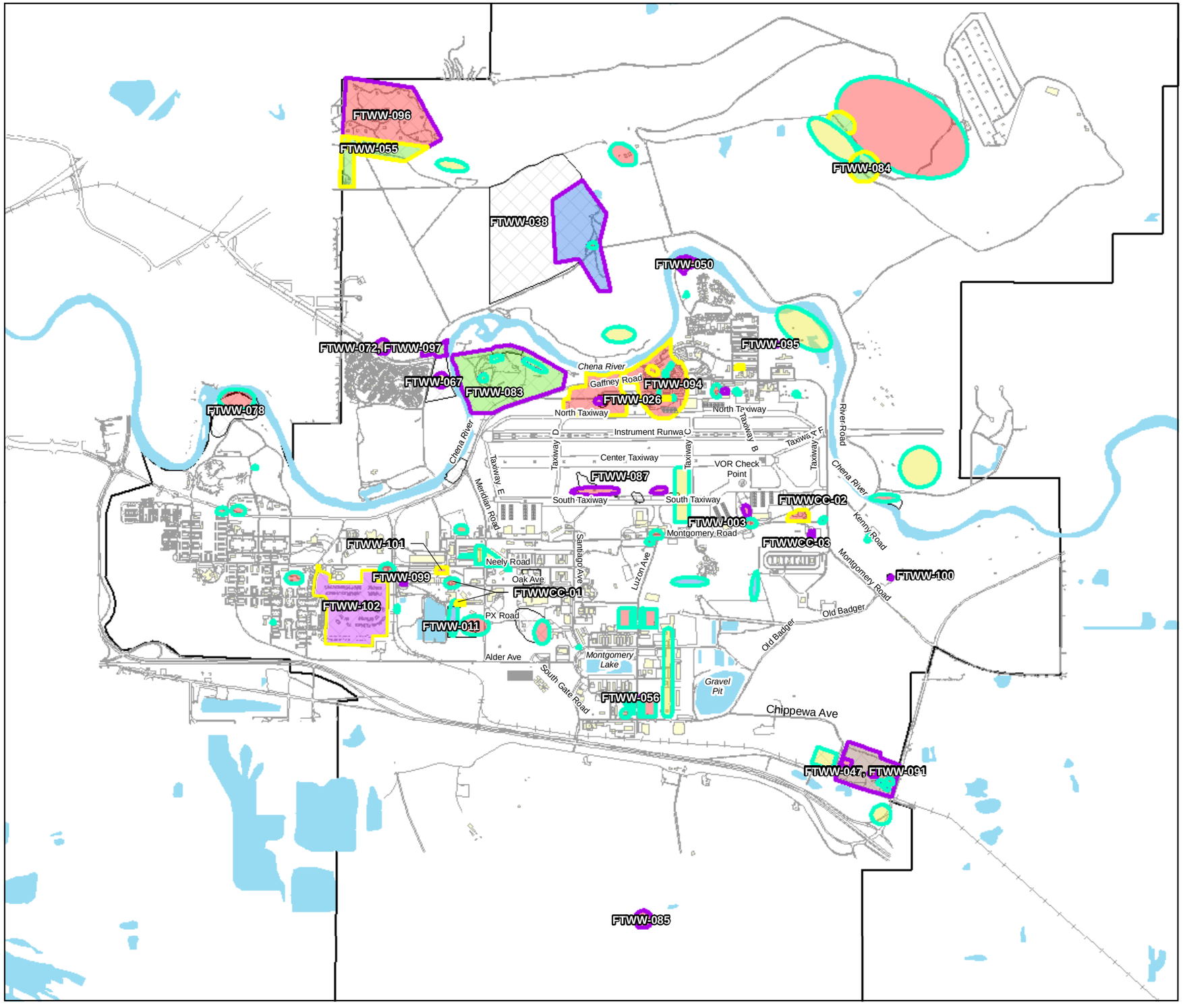
mandated to use integrated pest management by Section 136r of Title 7, U.S.C., Federal Insecticide, Fungicide and Rodenticide Act, as amended.

The following subsections provide information about past and present actions in the study area along with a baseline evaluation.

3.5.3.1 Fort Wainwright

FWA was listed on the NPL in 1990 after contamination was discovered at the installation. This designation addresses all of FWA, and all activities on the installation must comply with the relevant guidelines for work within a CERCLA site. An FFA between EPA Region 10, ADEC, and the Army is also in place (USARAK and ADEC, 1991). The FFA sets deadlines, objectives, responsibilities, and procedural framework for implementing an IRP. The IRP and *Installation Action Plan* (IAP) are used to track sites with past, present, or ongoing environmental activities across the entire installation. Thirty-two of the 51 eligible CERCLA sites identified in the FFA were placed into five operable units (OUs). A new OU was added in 2007. Figure 3.5.a shows the location of the OUs at FWA. FWA currently has 22 active restoration and compliance cleanup sites. Long-term monitoring is under way at eight of sites; remedial action construction is under way at one site; remedial action operation is occurring at 10 sites; one site is in the remedial investigation/feasibility phase; and one site is not currently undergoing investigation, remedial action, or monitoring. ICs have also been established at several locations at FWA (Figure 3.5.a). The ICs provide measures to control human access to and usage of property. Contaminants of concern include chlorinated solvents, pesticides, POL, ethylene dibromide, dichloroacetic acid, lead, polychlorinated biphenyls (PCBs), and munitions or explosives of concern (MEC) (FWA, 2008). Media of concern include soil, sediment, and groundwater (FWA, 2008). The sites include landfills, contaminated buildings, contaminated fill and sediment, spill sites, oil/water separators, explosive ordnance disposal areas, unexploded ordnance (UXO), surface disposal areas, storage areas, fire/crash training areas, POL lines, and UST and aboveground storage tank (AST) sites (FWA, 2008).

Through the CERCLA regulatory programs and State UST regulation (18 AAC 78), numerous contaminated areas have been remediated. The cleanup response actions are considered complete. The responses are in place for the balance of the remaining environmental response sites, which are undergoing long-term operations and monitoring. FWA maintains an inventory of USTs/ASTs regulated by ADEC, and follows all management guidelines as set forth in the FFA and 18 AAC 78.



LEGEND

Active Restoration Site Summaries

FTWW-003 AIRCRAFT MAIN (BUILDING 2077)
CONTAMINANTS OF CONCERN: DRO
MEDIA OF CONCERN: Soil, Groundwater

FTWW-038 FT. WAINWRIGHT LANDFILL PLUME
CONTAMINANTS OF CONCERN: Solvents
MEDIA OF CONCERN: Groundwater

FTWW-047 DRMO SALVAGE YARD
CONTAMINANTS OF CONCERN: TCE, PCE, POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-050 NORTH POST SITE
CONTAMINANTS OF CONCERN: Benzene, POL Components
MEDIA OF CONCERN: Soil, Groundwater

FTWW-055 FAIRBANKS FUEL TERMINAL
CONTAMINANTS OF CONCERN:Benzene, Free Product, Solvents, EDB; 1,2 DCA
MEDIA OF CONCERN: Soil, Groundwater

FTWW-067 801 DRUM BURIAL SITE
CONTAMINANTS OF CONCERN: Pesticides
MEDIA OF CONCERN: Soil, Groundwater

FTWW-072 OIL WATER SEPARATOR AT BLDG 1168
CONTAMINANTS OF CONCERN: DRO, Benzene
MEDIA OF CONCERN: Soil, Groundwater

FTWW-083 RAILROAD OFF-LOADING FACILITY
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-084 FAIRBANKS EIELSON PIPELINE SPILLS
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-085 UST, BLDG 5110
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-087 UST, BLDG 2111 & 2112
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-094 FORMER QUARTERMASTERS FUELING SYSTEM EAST/WEST
CONTAMINANTS OF CONCERN: POL, Benzene, 1,2DCA, EDB
MEDIA OF CONCERN: Soil, Groundwater

FTWW-095 UST, BLDG 1002
CONTAMINANTS OF CONCERN: Benzene
MEDIA OF CONCERN: Groundwater

FTWW-096 BIRCH HILL ASTS
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Soil

FTWW-097 UST, BLDG 1168
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-099 UST, BLDG 3564 (UST 283, 284)
CONTAMINANTS OF CONCERN:Benzene, DRO
MEDIA OF CONCERN: Soil, Groundwater

FTWW-100 UST, BLDG 2250
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWW-101 NEELY ROAD POL POINT
CONTAMINANTS OF CONCERN: Benzene, DRO, GRO, BTEX
MEDIA OF CONCERN: Soil, Groundwater

FTWW-102 COMMUNICATION SITE (TAKU GARDENS)
CONTAMINANTS OF CONCERN (PRELIMINARY): PCBs, Benzene, DRO, GRO, BTEX
MEDIA OF CONCERN: Soil, Groundwater

Compliance Clean-Up Site Summaries

FTWWCC-01 BLDG 3598/3595 SITE
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWWCC-02 FORWARD AIR REFUELING POINT (FARP)
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

FTWWCC-03 VET CLINIC/BOAT SHOP (BLDGS 2062/2063)
CONTAMINANTS OF CONCERN: POL
MEDIA OF CONCERN: Soil, Groundwater

SOURCE: ASAG-AK GIS Restoration Sites on Fort Wainwright, Alaska, (May 23, 2007)

Operable Units
OU1
OU2
OU3
OU4
OU5
OU6

Operable Unit Status
All remedial actions in place
Contamination still being defined
No further action

0 2,750 5,500 Feet
1 inch = 2,750 feet

N

FIGURE 3.5.a
Restoration Sites at Fort Wainwright
USARAK Aviation EIS

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FWA is a large-quantity hazardous waste generator, as defined under RCRA. Known waste streams originate from training, aircraft, vehicles, and maintenance, and generally consist of POLs, solvents, paints, and adhesives. During fiscal year (FY) 2008, non-aviation units at FWA generated 689,439 pounds of hazardous materials and hazardous waste. Of that total, 686,064 pounds were recycled for sale as hazardous materials, resulting in 3,375 pounds disposed as hazardous waste. The Army has existing contracts in place for sale and disposition of hazardous materials and hazardous wastes, and these contracts are used by DoD organizations throughout Alaska (including FRA, DTA, and Eielson AFB). There are no identified constraints or maximum limits for the existing hazardous materials and hazardous waste disposition program (Gray, 2009, personal communication).

The Environmental Resource Office of the DPW oversees the management of hazardous wastes at FWA, following guidance provided in U.S. Army Pamphlet 200-1, *Environmental Protection and Enhancement* (U.S. Army, 2007). To protect against fire, explosion, spills, threats to health, and other serious consequences of improper hazardous materials/ regulated waste management, Pamphlet 200-1 provides strict procedures for identifying, labeling, storing, and using hazardous materials/regulated wastes, as well as for training waste management personnel in these procedures.

Pesticide application is minimized due to the limitations of the FWA IPMP; however, some chemical applications are still used. Soil sterilizing agents may be applied to railroad tracks, electrical transformer sites, and the airfield (FWA, 2004). Pesticide application is forbidden on playgrounds, wetlands, and surface water bodies, and is kept to a minimum in other sensitive areas (FWA, 2004). Herbicides and other pesticides that target outdoor pests are generally applied only from mid-April through mid-October; cold temperatures serve as a natural control for outdoor pests during the remainder of the year (FWA, 2004). Indoor pests, including cockroaches, earwigs, silverfish, spiders, fleas, wasps, rodents, carpenter ants, wood-destroying fungi, and invertebrates, are treated on an as-needed basis throughout the year (FWA, 2004). Chlorinated hydrocarbon pesticides have not been used at FWA (Gray, 2009).

3.5.3.2 Fort Richardson

The Army's investigation of contaminated sites at FRA began in 1988 because of known or suspected releases of hazardous chemicals. EPA placed FRA on the NPL in 1994. Eighty-one contaminated sites were identified. Contaminants at FRA included volatile organic compounds (VOCs), PCBs, POLs, metals, and polynuclear aromatic hydrocarbons (PAHs) (PAHs are commonly used in wood preservatives and are a part of combustion products found in vehicle exhaust or incomplete burning). All areas of concern have been identified and cleanup actions and/or long-term monitoring programs are under way. Remedial responses have been completed at several sites. The Army has undertaken an extensive remediation effort at ERF, substantially reducing the occurrence of white phosphorous in the sediments. Remediation has been completed, and long-term monitoring of the site is ongoing.

FRA implements a separate agreement between the Army and the State of Alaska for installation and management (inventory, upgrading or closure, testing, site assessment, release reporting, release investigation, and corrective action) of USTs as a potential POL release hazard on the FRA Main Cantonment. All responsibilities of the Army and ADEC

under this agreement will remain in place through the course of any alternative chosen as part of this EIS.

FRA is a large-quantity hazardous waste generator, as defined under RCRA. Known waste streams originate from training, aircraft, vehicles, and maintenance, and generally consist of POLs, solvents, paints, and adhesives. On average, hazardous waste generated at FRA is less than 100,000 pounds per year. The Environmental Resource Office of the DPW oversees the management of hazardous wastes at FRA, following guidance provided in U.S. Army Pamphlet 200-1, *Environmental Protection and Enhancement* (U.S. Army, 2007). To protect against fire, explosion, spills, threats to health, and other serious consequences of improper hazardous materials/regulated waste management, Pamphlet 200-1 provides strict procedures for identifying, labeling, storing, and using hazardous materials/regulated wastes, as well as for training waste management personnel in these procedures.

Pesticide application is minimized due to the limitations of the FRA IPMP; however, some chemical applications are still utilized. Soil sterilizing agents may be applied to railroad tracks and electrical transformer sites. Pesticide application is forbidden on playgrounds, wetlands, and surface water bodies, and is kept to a minimum in other sensitive areas. Herbicides and other pesticides that target outdoor pests are generally applied only from mid-April through mid-October; cold temperatures serve as a natural control for outdoor pests during the remainder of the year. Indoor pests, including cockroaches, earwigs, silverfish, spiders, fleas, wasps, rodents, carpenter ants, wood-destroying fungi, and invertebrates, are treated on an as-needed basis throughout the year. The Army has existing contracts in place for sale and disposition of hazardous materials and hazardous wastes, and these contracts are used by DoD organizations throughout Alaska (including FWA, DTA, and Eielson AFB). There are no identified constraints or maximum limits for the existing hazardous materials and hazardous waste disposition program (Gray, 2009, personal communication).

3.5.3.3 Eielson Air Force Base

Eielson AFB was listed on the NPL by the EPA in November 1989. The *Remedial Investigation and Feasibility Study for Eielson AFB* identified 66 source areas of possible contamination, including groundwater contamination (lead and VOCs) and soils (used oils, solvents, and fuel) (USAF, 1994). Most of the identified areas of concern have been remediated, and the cleanup response actions are considered complete. As with FWA, however, several sites are undergoing long-term operations and monitoring.

The existing hazardous material and hazardous waste generation for Eielson AFB are not known. However, the DoD in Alaska has existing contracts in place for sale and disposition of hazardous materials and hazardous wastes, and these contracts are used by DoD organizations throughout Alaska (including FWA, FRA, and DTA). There are no identified constraints or maximum limits for the existing hazardous materials and hazardous waste disposition program (Gray, 2009, personal communication).

3.5.3.4 Donnelly Training Area

The DTA is not on the NPL. Historically, the Army used the DTA as an Arctic training and test installation area under Fort Greely (FGA). In 2001, when FGA closed, ownership of the DTA was transferred to FWA. No new construction is scheduled for DTA and no units will

be stationed there; however, FWA continues to conduct training missions in the DTA approximately 26 times per year (USARAK, 2006a).

The Army has existing contracts in place for sale and disposition of hazardous materials and hazardous wastes, and these contracts are used by DoD organizations throughout Alaska (including FWA, FRA, and Eielson AFB). There are no identified constraints or maximum limits for the existing hazardous materials and hazardous waste disposition program (Gray, 2009, personal communication).

3.6 Wildlife and Fisheries

3.6.1 Introduction

Wildlife populations on Army lands in Alaska have been managed for multiple uses, including recreation, subsistence, supporting self-sustaining populations, and maintaining biodiversity. The Army has developed an INRMP that summarizes natural resources, including wildlife, on Army lands and details management procedures and protocols to maintain natural diversity on lands will still fulfilling the Army's mission (USAG-AK, 2007a). On Army lands, wildlife management responsibilities are shared by the Alaska Department of Fish and Game (ADF&G), the U.S. Fish and Wildlife Service (USFWS), and the BLM. The Army works with State and federal wildlife agencies under the existing "Memorandum of Understanding among the U.S. Department of Defense and the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies (IAFWA) for a Cooperative Integrated Natural Resource Management Program on Military Installations" (DoD, USFWS, and IAFWA, 2006).

Federal regulations and State laws dictate the evaluation criteria for wildlife and fisheries. Table 3.6.a below presents the relevant regulations.

TABLE 3.6.a
Pertinent Environmental and Regulatory Requirements for Wildlife and Fisheries
USARAK Aviation EIS

Title	Citation
Endangered Species Act (ESA) of 1973	7 U.S.C. 136; 16 U.S.C. 460 et seq.
Endangered Species	5 AAC 93.020
Marine Mammal Protection Act of 1972	16 U.S.C. 1361 et seq. as amended through 1997
Bald and Golden Eagle Protection Act	16 U.S.C. 668 et seq.
Migratory Bird Treaty Act	16 U.S.C. 703–712 as amended
Essential Fish Habitat Provisions of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.)	50 CFR 600
Fish and Game	AS 16
Protection of Fish and Game	AS 16.05.870
Waters Important to Anadromous Fish	5 AAC 95.010

In addition to these regulations, a comment received during scoping for this EIS requested that the current quality and potential capacity of habitat, its use by fish, marine mammals, and terrestrial wildlife should be described. In addition, a request was made to describe known corridors, migration routes, areas of seasonal congregation, and the effects to the animal and plant species from habitat removal. Other scoping comments requested that the

EIS discuss potential conflicts with wildlife, bird migration, and Cook Inlet marine mammals and time-sensitive aerial wildlife surveys.

The EIS provides analysis of wildlife and habitat based on the currently existing data and information. Information on known migration corridors and seasonal concentrations for potentially affected wildlife species is provided in Section 3.6 and the effects of project alternatives on these species are discussed in Section 4.6. Habitat removal required for the Proposed Action is almost entirely within the developed cantonments, and is discussed in Section 4.6. Potential conflicts with wildlife, bird migration, and Cook Inlet marine mammals are also discussed in Section 4.6.

3.6.1.1 Threatened or Endangered Species and Species of Concern

No terrestrial threatened or endangered species listed under the ESA (USFWS, 2002) or by the State of Alaska (ADF&G, 1998) occur on Army lands in Alaska (USARAK, 2002a; USARAK, 2002b; USARAK, 2002c). One marine mammal species, the Cook Inlet population of beluga whale, is known to occur in near-shore and estuarine waters of FRA and is listed as endangered under the ESA. The Distinct Population Segment (DPS) of the beluga whale found in Cook Inlet was listed as endangered, effective December 2008 (NOAA, 2008). The National Marine Fisheries Service (NMFS) will propose to designate critical habitat for the Cook Inlet beluga whale in a future rulemaking. Only Alternative 3 involves the use of FRA training lands. If Alternative 3 is identified as the Army's decision, the Army will consult with NMFS in compliance with the requirements of the ESA and Marine Mammal Protection Act (MMPA) prior to implementation of the Proposed Action.

The State of Alaska maintains a list of species of concern for around the State. A species of concern is any species or subspecies of fish or wildlife or population of mammal or bird native to Alaska that has entered a long-term decline in abundance or is vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance. Table 3.6.b presents the birds and mammals on the Alaska species of concern list that occur on USARAK training lands.

TABLE 3.6.b
List of Species of Special Concern that are Known to Occur on USARAK Lands
USARAK Aviation EIS

Common Name	Scientific Name	USAG-AK Lands[a]
Birds		
American peregrine falcon	*Falco pereginus anatum*	FRA, FWA, DTA
Arctic peregrine falcon	*Falco pereginus tundrius*	FWA, DTA
Northern goshawk (southeast population)	*Accipter gentilis laingi*	FRA
Olive-sided flycatcher	*Contopus cooperi*	FRA, FWA, DTA
Gray-cheeked thrush	*Catharus minimus*	FRA, FWA, DTA
Townsend's warbler	*Dendroica townsendii*	FRA, FWA, DTA
Blackpoll warbler	*Dendroica striata*	FRA, FWA, DTA
Mammals		
Brown bear (Kenai Peninsula population)	*Ursus arctos horribilis*	DTA
Harbor seal	*Phoca vitulina*	DTA

[a] FRA = Fort Richardson, FWA = Fort Wainwright, DTA = Donnelly Training Area (USARAK, 2007).

Source: ADF&G, 1998 (online at http://www.wc.adfg.state.ak.us/index.cfm?adfg=concern.main)

USAG-AK has an *Ecosystem Management Plan* (Schick, et al., 2003) that guides the management of rare, threatened, or endangered species on Army lands in the State and

ensures that species and their habitats are managed on a sustainable basis. Because no listed threatened or endangered species occur on Army lands, the focus of management is on rare, uncommon, or priority species, as well as species of concern. The Army also has a policy to proactively manage "Species at Risk," which are species that are official candidates for ESA listing, classified by *NatureServe* as critically imperiled or imperiled on a global scale, and/or a concern for ESA listing in the foreseeable future. Three species (two plants, one bird) are Army Species at Risk for Alaska: Alaska starwort (*Stellaria alaskana*), *Oxytropis tananensis*, and rusty blackbird, *Euphagus carolinus*. Only the rusty blackbird will be discussed in the wildlife sections to follow.

Following protocols in the *Ecosystem Management Plan*, USAG-AK also has developed lists of Priority Management Species for FRA, FWA (including YTA and TFTA), and FRA (Table 3.6.c).

TABLE 3.6.c
List of U.S. Army Species of Concern and Priority Management Species within Alaska
USARAK Aviation EIS

Common Name	Scientific Name	USAG-AK Lands[a]
Birds		
Common loon	*Gavia immer*	FRA, FWA
Trumpeter swan	*Cygnus buccinator*	FRA, TFTA, DTA
White-winged scoter	*Melanitta fusca*	TFTA, YTA
Barrow's goldeneye	*Bucephala islandica*	YTA
Bald eagle	*Haliaeetus leucocephalus*	FRA, TFTA, DTA
Northern goshawk	*Accipter gentilis*	FRA, FWA, DTA
Peregrine falcon	*Falco peregrinus*	DTA
Golden eagle	*Aquila chrysaetos*	FRA
Sharp-tailed grouse	*Tympanuchus phasianellus*	DTA, YTA, TFTA
Ruffed grouse	*Bonasa umbellus*	FWA, DTA
Spruce grouse	*Falcipennis canadensis*	DTA
White-tailed ptarmigan	*Lagopus leucura*	DTA
Sandhill crane	*Grus canadensis*	FRA, TFTA, DTA
Upland sandpiper	*Bartramia longicauda*	DTA
Surfbird	*Aphriza virgata*	DTA
Wilson's snipe	*Gallinago delicata*	DTA
Great horned owl	*Bubo virginianus*	YTA
Boreal owl	*Aegolius funereus*	FRA, FWA, DTA
Great gray owl	*Strix nebulosa*	YTA, TFTA
Yellow-bellied sapsucker	*Sphyrapicus varius*	TFTA, YTA
Olive-sided flycatcher	*Contopus cooperi*	FRA, FWA, DTA
Blackpoll warbler	*Dendroica striata*	FWA, YTA, TFTA, DTA
Western wood-pewee	*Contopus sordidulus*	TFTA, YTA
Red-winged blackbird	*Agelaius phoeniceus*	TFTA

TABLE 3.6.c
List of U.S. Army Species of Concern and Priority Management Species within Alaska
USARAK Aviation EIS

Common Name	Scientific Name	USAG-AK Lands[a]
Rusty blackbird	*Euphagus carolinus*	FRA, TFTA, FWA, DTA
Mammals		
Little brown bat	*Myotis lucifugus*	FRA, FWA, DTA
Snowshoe hare	*Lepus americanus*	FRA
Meadow jumping mouse	*Zapus hudsonicus*	FRA, FWA, DTA
Gray wolf	*Canis lupus*	FRA, FWA, DTA
Black bear	*Ursus americanus*	FRA, FWA, DTA
Brown bear	*Ursus arctos*	FRA, FWA, DTA
Marten	*Martes americana*	FRA, FWA, DTA
Wolverine	*Gulo gulo*	FRA, FWA, DTA
Lynx	*Lynx canadensis*	FRA, FWA, DTA
Moose	*Alces alces*	FRA, FWA, DTA
Caribou	*Rangifer tarandus*	DTA
Bison	*Bison bison bison*	DTA
Dall sheep	*Ovis dalli*	FRA, DTA
Beluga whale	*Delphinapterus leucas*	FRA
Amphibian		
Wood frog	*Rana sylvatica*	FRA
Fish		
Chinook salmon	*Oncorhynchus tshawytscha*	FWA
Chum salmon	*Oncorhynchus keta*	FWA
Arctic grayling	*Thymallus arcticus*	FWA, DTA

[a] FRA = Fort Richardson, FWA = Fort Wainwright, YTA = Yukon Training Area, TFTA = Tanana Flats Training Area, DTA = Donnelly Training Area (USAG-AK, 2007a).

Sources: USAG-AK, 2007-2011 INRMP (USAG-AK, 2007a); C. McEnteer, 2009, personal communication, USAG-AK, 2004, Appendix E; USAG-AK, 2007a, Appendix F.

Bald and golden eagles are afforded special protection by federal law under the Bald and Golden Eagle Protection Act (see Table 3.6.a). The USFWS has developed *National Bald Eagle Management Guidelines* (USFWS, 2007a) that provide guidance "…to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities…The Guidelines are intended to help people minimize impacts to bald eagles, particularly where they may constitute 'disturbance,' which is prohibited by the Eagle Act." Recently, the USFWS published a final ruling that defined the term "disturb" as it relates to the Bald and Golden Eagle Protection Act, to mean "…to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially

interfering with normal breeding, feeding, or sheltering behavior" (USFWS, 2007b). Although the *National Bald Eagle Management Guidelines* are not legal regulations, they do provide the USFWS recommendations to avoid violation of the Bald and Golden Eagle Protection Act. The management guidelines make the following recommendations for avoiding disturbance of nesting bald eagles by activities that would occur under the Army's Proposed Alternatives (i.e., helicopter overflights and use of munitions): 1) "Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity"; and 2) "Avoid blasting and other activities that produce extremely loud noises within 1/2 mile of active nests, unless greater tolerance to the activity (or similar activity) has been demonstrated by the eagles in the nesting area…" (USFWS, 2007a:14). Similar guidelines are recommended to avoid disturbance at eagle foraging and communal roost sites: "…do not use explosives within 1/2 mile (or within 1 mile in open areas) of communal roosts when eagles are congregating, without prior coordination with the USFWS and your state wildlife agency" and "locate aircraft corridors no closer than 1,000 feet vertical or horizontal distance from communal roost sites."

The Army is implementing the following BMPs to reduce environmental effects on this VEC:

- Conduct planning for the endangered species program; implement an inventory and monitoring program to identify the location and distribution of any rare, uncommon, or priority species; and protect habitats of these species.
- Continue to extract information regarding threatened or endangered species from other ongoing surveys.
- Surveys for threatened or endangered species are currently incorporated into other surveys.
- Develop [and implement] management guidelines with USFWS and ADF&G to address threatened and endangered species, if found on USARAK lands.
- The USARAK ecosystem management program also monitors species of concern.
- USARAK's policies for management of endangered species are outlined in the INRMPs for FWA and FRA. Endangered species management goals and objectives include protection and conservation of endangered or threatened species found on USARAK installations; identification and delineation of species and their habitats; and compliance with Section 7 of the ESA.

3.6.1.2 Wildlife Special Interest Areas

As part of the *Ecosystem Management Plan*, USAG-AK has designated special interest areas that are important or fragile natural areas that contain natural resources that warrant special conservation efforts (USAG-AK, 2007a). Management of these areas includes protection through regulations, map overlays showing restrictions, and actual barriers. USARAK Regulation 350-2, *Range Regulation*, has general provisions to protect environmental resources, including special interest areas. Several areas have been designated in the FWA,

DTA, and FRA that are pertinent to wildlife resources (others not listed below protect cultural or vegetation resources).

3.6.1.2.1 Fort Wainwright

The Tanana Flats Migratory Bird Special Interest Area is located within the TFTA between Crooked Creek and Willow Creek. This area supports undisturbed fen wetlands and significant migratory bird nesting areas. Recreational activities are not permitted in this area from May 1 through July 15 annually.

3.6.1.2.2 Donnelly Training Area

Within a portion of DTA, three special interest management areas have been identified, one for management of the Delta bison herd, one for management of the Delta caribou herd, and the final area for management of migrating sandhill cranes (primarily roost sites). ADF&G conducts surveys of the Delta bison and Delta caribou herds with support from USARAK.

The *Delta Bison Area* was designated by a cooperative agreement with ADF&G (Bonito, 1980) and encompasses important bison calving and summer range on DTA West and late summer and early winter range on DTA East. A subsequent agreement (1986) also identifies bison calving and summer range. USAG-AK has imposed restrictions to limit disturbance to bison calving areas from April 15 through June 15, if bison are present. Range activities are limited when animals are present in these areas to reduce disturbance when they are present on the training lands.

The *Delta Caribou Calving and Post-calving Area* was designated under a cooperative agreement with ADF&G in 1986 and identifies 12 parcels on the DTA as important calving and post-calving areas for caribou. Under the agreement, the Army agreed to suspend activities or operations that would adversely affect these areas from May 15 through May 31, without consultation with ADF&G. Restrictions in these parcels are in effect only when caribou are present. Additionally, all development and military actions in the caribou calving grounds will be conducted under winter conditions when sufficient snow cover is present and the ground is adequately frozen to minimize damage to vegetation and soils.

The *Sandhill Crane Roosting Area* was designated under a 1986 agreement with ADF&G, which identified several areas along the Delta River as important for migrating sandhill cranes. A later consultation (1998) identified additional areas along Delta Creek near the Delta Creek Assault Landing Strip as important for migrating cranes. The agreement limits disturbance in designated sandhill crane areas each from April 25 to May 1 and from September 1 to September 30, when sandhill cranes are present. The Army can conduct military activities in these areas if they first consult with ADF&G.

3.6.1.2.3 Fort Richardson

Two areas in the FRA have been designated special interest management areas: the Ship Creek Riparian Area and the ERF.

The Ship Creek Riparian Area was designated a special management area because its riparian habitats are important and sensitive areas of FRA that required protection to insure the health and natural function of the ecosystem. This area supports many of the moose found within FRA and is an important recreation fish stream in Anchorage. Future

development (other than the golf course, which has already been approved) will not occur in the riparian area and tree cutting is prohibited.

ERF is an estuarine salt marsh located at the mouth of Eagle River on FRA. The river is glacially fed and flows through the flats before discharging into Eagle Bay in the Knik Arm of Upper Cook Inlet. ERF supports a high diversity of wetland and estuarine habitats that support important staging areas for migrating birds (primarily waterfowl) in spring and fall. A portion of the Eagle River within the flats is used occasionally by the federally listed beluga whale.

An analysis of impacts to terrestrial threatened or endangered species is not included in this EIS because 1) no listed threatened or endangered species occur on USARAK lands, and 2) an analysis of potential impacts to sensitive species listed in Table 3.6.b is included in Section 4.6, Wildlife and Fisheries, of this EIS. In addition, no concerns were raised about threatened and endangered species during public scoping meetings.

Because of the provisions of the Bald and Golden Eagle Protection Act, prior to selecting construction areas, Army natural resource managers will survey the general area to determine whether bald eagle nests are present, and if so, will consult with USFWS to determine what measures are needed to prevent activity that would disturb nesting eagles or their nests.

3.6.2 Scope

The study area for wildlife and fisheries encompasses the Cantonment and training areas for the Proposed Action at FWA, DTA, FRA, Eielson AFB, and the flight corridors between FWA and DTA and between DTA and FRA. The wildlife and fisheries sections are divided into the following major categories: mammals, birds, and amphibians and fish.

On the basis of regulatory management requirements, Army wildlife management goals, and in consideration of the scoping comments, several wildlife species serve as indicators for these issues of concern to address potential impacts of the Proposed Action. This list has been further condensed from Table 3.6.c.

The following list identifies the species selected as indicator species (VECs) and the rationale for their selection:

- **Caribou.** Large mammal, found in medium-to-large herds in project area; known sensitivity to aircraft overflight disturbance; important subsistence and sport hunting species, listed by Army as species of concern or priority management species; regulated by the State. Project area supports important populations (herds).
- **Moose.** Large mammal, found in scattered small groups or as single animals; widely dispersed; important subsistence and sport hunting species, listed by Army as species of concern or priority management species; regulated by the State. Project area supports important populations (herds).
- **Dall Sheep.** Large mammal, found in small groups in restricted habitats in project area; known sensitivity to aircraft overflight disturbance; listed by Army as species of concern or priority management species; important sport hunting species, regulated by the State.

- **Bison.** Large mammal; small herd of plains (American) bison (*Bison bison bison*) in DTA; unknown sensitivity to aircraft overflight disturbance; important sport hunting species, listed by Army as species of concern or priority management species; regulated by the State. Project area supports one of only four populations in the State.
- **Brown and Black Bears.** Large predatory mammal; found in suitable habitats within the project area; nuisance bears are an issue at FRA; winter dens occur in TFTA, YTA, DTA, and FRA; unknown sensitivity to aircraft overflight disturbance; important sport hunting species; listed by Army as species of concern or priority management species; regulated by the State.
- **Beluga Whale.** Marine mammal, the Cook Inlet DPS is listed as endangered by the NMFS; restricted habitats; found at FRA; decreasing population; vulnerable to disturbance or contaminants; important subsistence species; some sensitivity to aircraft overflight disturbance (visual and noise).
- **Migratory Waterbirds.** Includes swans, geese, ducks, gulls, shorebirds, and terns; large seasonal movements and major migratory corridors in the project area, and nesting area for trumpeter swans, geese, shorebirds, and gulls; important subsistence and sport hunting species, regulated by federal and State agencies; species listed by Army as species of concern or priority management species; known sensitivity to aircraft overflight disturbance; possible aircraft collision hazard.
- **Raptors.** Includes bald eagle, golden eagle, peregrine falcon, osprey, northern goshawk, red-tailed hawk, sharp-shinned hawk, American kestrel, merlin, northern harrier, and owls (great horned, gray, boreal, short-eared, and northern hawk owls); migratory corridors in the project area; nesting sites in the project area; known sensitivity of nesting raptors to overflight disturbance; regulated by federal and State agencies; species listed by Army as species of concern or priority management species; possible aircraft collision hazard.
- **Sandhill Crane.** Large seasonal movements and major migratory corridors in the project area; subsistence and sport hunting species, regulated by federal and State agencies; listed by Army as species of concern or priority management species known sensitivity to aircraft overflight disturbance; possible aircraft collision hazard.
- **Neotropical Birds and Other Sensitive Species.** Species listed on federal and State lists of species of concern; species listed by Army as species of concern or priority management species, population levels for some species declining; breeding habitats in project area; unknown sensitivity to aircraft overflight disturbance; possible aircraft collision hazard (migration only).

3.6.3 Affected Environment for Wildlife and Fisheries

3.6.3.1 Fort Wainwright

The following discussion of wildlife and fisheries encompasses the FWA area including the Cantonment and the two major training areas: YTA and TFTA. Although the areas share some similarities in habitats, the abundance and diversity of wildlife varies somewhat among the areas. For example, the FWA and YTA include upland forested areas, whereas

the TFTA contains primarily lowland riparian forests, shrub habitats, fens, and wetlands adjacent to the near the Tanana River, with smaller patches of upland forests at higher elevations on the flats.

3.6.3.1.1 Mammals

FWA supports diverse populations of small- and large-mammal species that are representative of wildlife species found in Interior Alaska. Large mammals include black and grizzly bears, moose, and caribou. Furbearers (animals with commercially valuable fur) occurring in the TFTA and YTA include wolverines, coyotes, lynx, red fox, pine marten, wolves, muskrat, and beaver. River otters are uncommon but can be found in some areas (USARAK, 2002c; USARAK, 2004a). Other small mammals include snowshoe hare, red and flying squirrels, weasels (four species), mice (four species), voles (five species), lemmings (two species), shrews (four species), woodchuck, and bats (one species). Two introduced species of mammals occur within the Cantonment (house mouse and Norway rat).

Moose are found not only within the FWA Main Post, but also in the YTA and TFTA. The TFTA supports one of the State's largest moose populations and provides readily accessible hunting opportunities for local residents. With funding support from USARAK, ADF&G conducts moose surveys during the winter and the calving season. The most recent estimate of the moose population in the area (Game Management Unit [GMU] 20A) is 12,537 animals (Young, 2009, personal communication). The Interior Alaska moose population has fluctuated in recent years, depending on winter weather conditions, effects of hunting, and predation by wolves and bears (Young, 2006). Moose use large portions of the TFTA during calving from mid-May to mid-June, specifically from May 12 through June 15. Three areas of higher-density moose calving have been identified in Interior Alaska: the Tanana Flats (not exclusively within the TFTA), the broad corridor between the Delta River and Delta Creek bounded on the south by the foothills of the Alaska Range and on the north by the Tanana River, and the Tatlanika River flats west of the Wood River (Young, 2009, personal communication). The TFTA supports both resident moose (remain on the flats all year) and migratory moose that calve and summer in the TFTA, but move into the hills to the south or north during late fall through spring (Kellie, 2005). Moose, unlike caribou, do not calve in groups within traditional, core calving grounds, but instead cow moose give birth alone in suitable habitats, such as riparian willow shrubs and open lowland forests. Recent telemetry work has shown, however, that on the Tanana Flats some female moose do return to the same general area where they gave birth the previous year (Kellie, 2005). Higher densities areas for moose in the TFTA include Salchaket Slough, the 1957 burn area, the 1980 Blair Lakes burn area, Japan Hills, and the foothills of the Alaska Range east to Dry Creek, and upper 100 Mile Creek (USARAK, 2004a). High use areas for moose in the YTA include Moose Creek and the Chena River floodplain, the Chena River South Fork drainage, the Little Salcha River drainage where it enters the YTA, and Beaver, Ninety-Eight Mile, Hunts, and Horner creeks (USARAK, 2004a).

Caribou are not common in the FWA area, except during years when animals from the Fortymile and Delta herds move into this part of Interior Alaska (USARAK, 2002c; USARAK, 2004a; Gross, 2005). The Delta and Macomb herds are discussed in more detail in Subsection 3.6.3.2, Donnelly Training Area.

Both brown and black bears occur in habitats within the TFTA, YTA, and DTA, and bears occasionally are present within the Cantonment at FWA. Brown bears are relatively uncommon at FWA and the TFTA, but may occur more often in the uplands within the YTA (USAG-AK, 2007a). ADF&G has classified the TFTA as low-density brown bear habitat (~6.5 bears/1,000 square miles) but the higher elevations within the YTA are medium-density (13-26 bears/1,000 square miles) habitat for brown bears (Young, 2007). Brown bears are more prevalent in the upper elevations of Game Management Area (GMU) 20D south of the Tanana River (estimated population of 76–86 bears), which includes the Eastern DTA (DuBois, 2007a). Black bears are relatively common in the forests and lowlands in the FWA area, and the TFTA is considered a high-density black bear area (Seaton, 2005). Black bears in the TFTA den in a variety of habitat types, including alder-willow shrub, spruce forest, mixed birch and aspen forest, and heath meadows (USAG-AK, 2007a). Population levels are in the range of 750-1,000 black bears in FWA area (including YTA/ TFTA) and about 250 black bears south of the Tanana River in and near DTA (DuBois, 2005c; Seaton, 2005).

3.6.3.1.2 Birds

FWA and the training areas support a wide diversity of avian species because of the broad range of available habitats, including upland forest, lowland bogs, cliffs, and ponds and lakes (USARAK, 2002c). Game species occurring in the area include upland game birds (spruce, sharp-tailed, and ruffed grouse, willow ptarmigan), waterfowl (ducks, geese, swans), and the sandhill crane. Grouse are hunted in the TFTA, YTA and on the Main Post, and waterfowl hunting occurs in the fall on the TFTA.

The lower Tanana River area, which encompasses the TFTA, was surveyed for trumpeter swans in 2005. The 2005 survey showed a 25 percent increase in the population since the previous survey in 2000 (6,185 and 4,942 swans, respectively; Conant et al., 2007). The trumpeter swan population has increased since 2000 throughout Alaska, continuing a slowly increasing trend and expansion of breeding range in suitable areas of the State (Conant et al., 2007).

The bald eagle is the most prominent tree-nesting raptor in the TFTA, where it nests in riparian forests along the Tanana River and its tributaries. Although no bald eagle nests were recorded in the YTA during a survey in 1998 (Anderson et al., 2000), bald eagles do nest along the Tanana and Salcha rivers adjacent to the YTA (Ritchie and Rose, 1998). During the 1998 survey, no nests of cliff-nesting raptors were observed and no suitable nesting habitat for golden eagles or gyrfalcons was identified, but peregrine falcon nests do occur along the lower Salcha River, at several nearby sites along the Tanana River, and along the lower Chena River near the Flood Control Project (Anderson et al., 2000). Although no tree-nesting raptors were observed during the 1998 survey in the YTA, suitable habitats are present that could support nesting woodland raptors and owls (northern goshawks, great horned owls, and red-tailed hawks) (Anderson et al., 2000).

Sandhill cranes migrate through the Tanana River valley each spring and fall following the Tanana River and the foothills of the Alaska Range (Kessel, 1984; Anderson et al., 2000). Although most cranes migrate past FWA, TFTA, and YTA to nesting areas in western Alaska and Russia, small numbers of cranes do nest locally in suitable riparian areas in the Fairbanks area, including within the TFTA (Kessel, 1984).

Non-game birds are relatively abundant in the YTA and TFTA, as well as on the Main Post. During a 1998 survey, Benson (1999) recorded 61 species of birds in the TFTA and 36 species (including six species not seen in the TFTA) in the YTA. She also recorded several Priority Species for Conservation (Boreal Partners in Flight Working Group, 1999) during this survey, but did not record any threatened or endangered species. Priority species recorded in the TFTA and YTA included boreal owl (TFTA only), olive-sided flycatcher, western wood-peewee (TFTA only), Hammond's flycatcher, varied thrush, gray-cheeked thrush (YTA only), bohemian waxwing, blackpoll warbler (TFTA only), Townsend's warbler (YTA only), and rusty blackbird (TFTA only). Matsuoka et al. (2008) recently completed surveys for rusty blackbirds on the TFTA and found the area was of particular importance because of the large area of suitable breeding habitats for this priority species, which is experiencing severe population declines. Boreal owls and rusty blackbirds were heard during surveys on YTA and Townsend's warblers were heard during surveys in the TFTA (Amal Ajmi, 2009, personal communication).

Other non-game birds that have been observed on FWA lands include woodpeckers (six species), rock pigeon (on the Main Post), rufous hummingbird, swallows (four species), and belted kingfisher. Waterbird species that occur in the areas include waterfowl (about 25 species of ducks, geese, and swans), shorebirds (26 species), gulls and terns (four species), loons (four species), and grebes (two species). Up to 20 species of raptors (eagles, falcons, hawks, and owls) have been recorded on FWA (USARAK, 2002c; USAG-AK, 2007a).

Approximately 3 miles west of FWA is the Creamer's Field Migratory Waterfowl Refuge, a State refuge managed by ADF&G. It comprises approximately 1,800 acres of forest, wetlands, and fields, and is situated at the northern edge of the city of Fairbanks. It is a staging area for waterfowl and other birds during spring and fall migration. USARAK supports the refuge to attract birds to it and divert them from areas closer to Ladd AAF, where they could interfere with aircraft operations. The refuge is located outside the designated flight corridors for helicopters.

3.6.3.1.3 Amphibians and Fish

Only one amphibian, the wood frog, has been found at FWA; no reptiles exist in Alaska USAG-AK, 2007a). Fish populations are not resident in most ponds or lakes on FWA, but some of these waters are stocked during summer to provide recreational fishing opportunities. The Tanana River supports seasonal populations of the most common fishes found in Interior Alaska, including many that are harvested by local residents: Arctic grayling, salmon (king and chum), sheefish, northern pike (in clear, flowing tributaries), and whitefish (humpback and round). The Chena and Salcha rivers also support these same species, and are important spawning areas for summer runs of chum and king salmon. Northern pike occur naturally in Horseshoe Lake, which is located in the northwest corner of the YTA. Small streams on the YTA have not been documented to contain sport fish or non-sport fish.

3.6.3.2 Donnelly Training Area and Adjacent Lands

3.6.3.2.1 Mammals

The large mammals found in the DTA area include grizzly and black bears, moose, Dall sheep, caribou, and bison (USARAK, 2002a; USAG-AK, 2007a). Wolves are relatively

common, with three to four packs using the DTA. Furbearers occurring on DTA are the same species that are found on FWA lands. A small mammal survey conducted in the DTA area found 11 species of small mammals, including voles, mice, and shrews (Anderson et al., 2000).

Caribou in the Delta/DTA area are primarily from the Delta herd, but animals from the Macomb herd also range into the area around Jarvis Creek and in the DTA (USARAK, 2002a; USARAK, 2006a; Dubois, 2005a). The Delta caribou herd currently is estimated at about 2,500 animals (Young, 2005a). The Delta herd has declined from a peak of 11,000 animals in 1989 due to a combination of the effects of adverse weather and predation. Although rebounding slightly in the mid 1990s, the herd is again exhibiting a declining population trend. Traditional calving areas for the Delta herd occurred between the Delta and Little Delta rivers; however, during the peak in the population, other areas also were used for calving (foothills between Dry Creek and the Delta River, upper Wood River, upper Nenana and Susitna drainages) (DuBois, 2005a). The Delta herd spends most of the summer and fall along the northern foothills of the Alaska Range between the Delta and Nenana rivers. During fall and winter in recent years, however, most Delta herd caribou have been found east of the Delta River in the Donnelly Dome/Flats area (Young, 2005a). The Macomb herd is estimated to consist of 1,000-1,100 animals (DuBois, 2009, personal communication). Although caribou in the Macomb herd have occasionally used the southern end of the DTA in winter, they are not known to calve in the DTA (USARAK, 2006a).

Moose populations in the area are within GMUs 20A (includes most of DTA) and 20D (eastern portion of DTA near Richardson Highway); population numbers are described in Subsection 3.6.3.1, Fort Wainwright. The DTA is important habitat for moose during the fall, particularly the far southern end of DTA East and the south-central and northeast sections of DTA West (USARAK, 2002a). DTA West supports most spring calving moose and high summer densities, particularly in the north-central section. During the winter, more moose are found in the northeastern section of DTA West and the northern half of DTA East. Accurate moose population levels for the DTA have not been recorded annually, but older estimates from 1985 showed a population of about 1,000 animals (USARAK, 2002a).

Bison are an important resident species in the DTA area (USARAK, 2002a; USARAK, 2006a). The current population of the bison herd is approximately 500, although its numbers had been declining somewhat in recent years, the numbers have rebounded since 2004 and now meet the current management target population number of 360 individuals during pre-calving (DuBois, 2008; USARAK, 2006a). Calving areas for the bison are primarily along the braided gravel channels and river terraces of the Delta River, Texas Range, Washington Range, Mississippi IA, Washington IA, and the Bolio Lake area in the DTA (USARAK, 2002a; USARAK, 2006a); however, bison with calves have been seen as far south as the Black Rapids glacier in recent years (DuBois, 2004a; USARAK, 2006a). By mid-summer, most bison have moved back across the Richardson Highway into the Delta Agricultural Project near the Alaska Highway. The primary wintering areas used by bison are the eastern and northeastern portions of the DTA, the Delta Bison Range, and the Delta Agricultural Project area (USARAK, 2006a).

In 1980, a cooperative agreement between USAG-AK and the ADF&G designated areas important to bison calving and summer range on the DTA West, and important late summer

and early winter ranges on DTA East. An additional agreement was signed in 1986 that identified additional bison calving areas and summer ranges. USAG-FWA has imposed restrictions to limit disturbance to bison calving areas from April 15 to June 15, if bison are present.

The DTA supports populations of both brown and black bears. Brown bears are more prevalent in the upper elevations of GMU 20D south of the Tanana River (estimated population of 76–86 bears), which includes DTA East as well as in the foothills of the Alaska Range in DTA West (DuBois, 2007a). Black bears in the DTA West use similar habitats to those found in the adjacent Tanana Flats, including alder-willow shrub, spruce forest, mixed birch and aspen forest, and heath meadows (USAG-AK, 2007a). Population levels within GMU 20A (which includes the DTA West) are in the range of 750-1,000 black bears and about 250 black bears occur south of the Tanana River in and near the DTA East (DuBois, 2005c; Seaton, 2005).

Small numbers of Dall sheep (about 150 animals) can be found in a few areas along the southern and southwestern sections of the DTA, including Molybdenum Ridge (Spiers and Heimer, 1990; USARAK, 2002a). Historical population trends are difficult to determine because this area has not been consistently surveyed for sheep. Spiers and Heimer (1990) followed a small number of Dall sheep outfitted with radio-transmitters and found that about 50 ewes and lambs overwintered on the Molybdenum Ridge and upwards of 100 animals used the west side of the East Fork of the Little Delta River (DTA/East Fork Training Area) during both summer and winter. This species is generally found in the foothills of the Alaska Range and only rarely ventures out into the flats elsewhere in the DTA.

3.6.3.2.2 Birds

Several upland game species are found on the DTA, including three species of both ptarmigan and grouse. Sharp-tailed grouse also have several mating lek (areas where males group together to display for females) in the DZs near Jarvis Creek. Sharp-tailed grouse leks are located on Texas Range with one of the largest-known lek sites in Alaska occurring near Sally DZ. Breeding songbirds are abundant throughout the DTA and are typical of the diverse bird community found in Interior Alaska (Spindler and Kessel, 1980; Anderson et al., 2000). All of the priority species of concern, except the boreal owl, were detected either in the DTA or along the road system in the adjacent Fort Greely area during point-count surveys in 1998 (Anderson et al., 2000). The boreal owl nested at Bolio Lake on the DTA in 2008 and 2009 (Haddix, 2009, personal communication).

Bald eagles, golden eagles, and peregrine falcons are known to nest on DTA (Haddix, 2009, personal communication). Aerial surveys for cliff-nesting and tree-nesting raptors were conducted in the DTA in 1998 and one active golden eagle nest was found in the Donnelly Dome area and two inactive nests were located in the Molybdenum Ridge/Ptarmigan Creek area; no peregrine falcon or gyrfalcon nests were located (Anderson et al., 2000). A later survey (Ajimi and Payne, 2006 in USAG-AK, 2007a) located an active golden eagle nest on a bluff above the Delta River. No bald eagle nests were observed in the DTA during the aerial surveys, but several large stick nests were observed; however, the large poplar and spruce trees regularly used by nesting bald eagles in Interior Alaska are limited along the drainages in the DTA, which reduces the likelihood of bald eagle nesting there (Anderson et al., 2000).

Eight species of raptors were recorded in the DTA and adjacent Fort Greely during point counts in 1998: northern harrier, sharp-shinned hawk, northern goshawk, red-tailed hawk, golden eagle, great horned owl, northern hawk owl, and short-eared owl (Anderson et al., 2000).

About 30 species of waterbirds (ducks, geese, swans, gulls) have been recorded in the DTA area (USARAK, 2002a; USAG-AK, 2007a). The major importance of the DTA/Delta Junction area is as a major migratory corridor for raptors, waterfowl (including both trumpeter and tundra swans), and, in particular, sandhill cranes.

An estimated 300,000 to 500,000 sandhill cranes pass through the DTA/Delta Junction area during spring (late April to mid-May) and fall (September) migration, respectively (Kessel, 1984; Cooper et al., 1991; USAG-AK, 2007a). Sandhill cranes also have been found roosting on the braided riverbeds of the Delta and Little Delta rivers, in upland shrubby habitats in the southern portion of the DTA, and on the agricultural fields in the Delta Barley Project (Kessel, 1984; Anderson et al., 2000; USARAK, 2006a).

A number of species of waterbirds breed in the DTA, including trumpeter swans, which have been increasing in numbers in the lower Tanana survey area that encompasses the DTA (USARAK, 2006a; Conant et al., 2007). Broods of trumpeter swans were observed in small lakes and ponds in the DTA west of the Delta River during aerial surveys in July 1998 (Anderson et al., 2000). Large mixed flocks of trumpeter and tundra swans also migrate through the area during the spring and fall, moving along the Tanana River Valley and often crossing directly over the DTA (Cooper and Ritchie, 1988). Other nesting waterbirds in the area include mew and herring gulls, arctic terns, ducks, and possibly some geese in suitable wetlands in the DTA.

3.6.3.2.3 Amphibians and Fish

Wood frogs are the only amphibians occurring in the DTA. Sixteen lakes are stocked with fish in the DTA. These lakes range in size from 3 to 320 acres (USAG-AK, 2007a). Some lakes in the DTA also support natural populations of lake chub, northern pike, sculpin, and northern long-nose sucker. The Delta and Little Delta rivers and Jarvis Creek are not major fish streams because they are glacially fed and have high silt loads. However, the Tanana River, downstream from Delta, supports resident and migratory fish species and the mouth of the Delta River is an important habitat for chum salmon (USARAK, 2006a). Grayling migrate through these glacial streams in the DTA to clear tributaries where they spawn. In addition, a few clear streams provide summer habitat for grayling (USARAK, 2006a; USAG-AK, 2007a).

3.6.3.3 Fort Richardson

3.6.3.3.1 Mammals

The variety of wildlife habitats on FRA, ranging from estuarine areas in the ERF to alpine areas to the south, allows the installation to support a wide diversity of mammal species. Populations of several large mammal species, including black and grizzly bears, wolf, moose, and Dall sheep, can be found within FRA's boundaries (USARAK, 2002b; USAG-AK, 2007a). Both small game and furbearing species also are resident at FRA: coyote, lynx, red squirrel, snowshoe hare, hoary marmot, pine marten, beaver, river otter, wolverine, red fox,

porcupine, mink, beaver, muskrat, and weasels (ermine or short-tailed). Two wolf packs have been observed in the area of FRA, one on the east side of the Glenn Highway and, possibly, a second pack west of the highway near the ERF (USAG-AK, 2007a).

Moose are one of the most important mammals occurring on FRA, both as a source of recreational hunting and as a major component of the ecosystem (USARAK, 2002b; USAG-AK, 2007a). Moose numbers in the area encompassed by FRA, Elmendorf AFB, and Ship Creek have remained relatively stable at about 600 animals (USARAK, 2002b). Recent counts put the subpopulation of moose along Ship Creek at about 450 animals (Sinnott, 2007, personal communication) and moose numbers within GMU 14C, which encompasses FRA, are currently estimated at 2,000 animals (Sinnott, 2006).

The FRA supports both brown and black bears, but brown bears are responsible for most of the human interactions on the installation. A recent study of brown bears at the FRA area included radio-telemetry monitoring of nine bears and determined that bears used travel corridors between den sites in the Chugach Mountains through military lands to salmon spawning areas within both developed and undeveloped areas, often close to lands used for military training and other human activities (Griese et al., 2006; Farley, 2008). Up to 15 individual bears were identified as using FRA based on DNA analysis of hair samples (Farley, 2008). Availability of salmon spawning habitats in the urban Anchorage area was a key component in determining movements and abundance of brown bears and the likelihood of human-bear interactions.

Dall sheep occur in the alpine areas of the Chugach Mountains at the eastern and southern areas of FRA (USARAK, 2002b; USAG-AK, 2007a). The Dall sheep population in GMU 14C, which encompasses FRA, is estimated at 1,800 to 2,000 animals (Coltrane, 2005). The sheep population in the Chugach Mountains has reached an apparent plateau, with population increases constrained by high winter mortality for lambs and old ewes and crowded winter ranges.

Cook Inlet beluga whales use the waters of upper Cook Inlet (Knik Arm, Susitna River mouth) during June to October. There they feed on anadromous and marine fish, including salmon (Hobbs et al., 2006). Use of the area declines in winter, but some beluga whales have been observed in Knik Arm in February and March, even during heavy (90 percent) ice cover conditions (Hobbs et al., 2006). At FRA, beluga whales have been observed in the adjacent near-shore waters of Cook Inlet and in the Eagle River, where some whales also have been observed as much as 1.25 miles upstream (USAG-AK, 2007a). The most recent (2008) survey estimates that 375 beluga whales comprise the Cook Inlet population (NOAA, 2008).

3.6.3.3.2 Birds

FRA supports a diverse bird community because of the wide range of habitats available, which include estuarine wetlands, coniferous and deciduous forests, and sub-alpine and alpine tundra. Bird surveys have identified more than 120 species of birds, including waterfowl (24 species), grouse (three species), passerines (40 species), and raptors (six species) (USARAK, 2002b; USAG-AK, 2007a). Four bird species listed as "Priority Species for Conservation" (Boreal Partners in Flight Working Group, 1999) occur on FRA:

northern shrike, varied thrush, blackpoll warbler, and golden-crowned sparrow (USAG-AK, 2007a).

3.6.3.3.3 Amphibians and Fish

One species of amphibian, the wood frog, is commonly found in bogs, freshwater and saltwater marshes, and lake margins on FRA; no reptiles occur. The streams, rivers, and lakes on FRA support 10 species of fish, including natural runs of salmon in Ship Creek (USARAK, 2002b; USAG-AK, 2007a). Four lakes on FRA (Clunie, Gwen, Otter, and Walden) are stocked with game fish (USARAK, 2002b).

3.6.3.4 Eielson Air Force Base

3.6.3.4.1 Mammals

Mammal populations at Eielson AFB are similar to those found in the adjacent YTA and TFTA, which encompass similar habitats. Those areas are described above for FWA (Subsection 3.6.3.1.1, Mammals). Most of the Cantonment is heavily urbanized, but moose and bears are known to use the Base and the adjacent hills to the east. The Eielson AFB INRMP indicates that much of Eielson AFB is within the floodplains of the Tanana River and, therefore, the primary vegetation types are riparian forests, shrub willow and alder, and wet meadows (USAF, 2003) The Eielson AFB INRMP lists the major mammal species occurring in these habitats: moose, black bear, brown bear, furbearers (beaver, marten, muskrat, and mink), lynx, snowshoe hare, and small mammals (red squirrel, voles, and mice).

3.6.3.4.2 Birds

Bird populations at Eielson AFB share similarities with those found in the TFTA, as well as those in the adjacent YTA (as described in Subsection 3.6.3.1.2, Birds). That portion of Eielson AFB that encompasses the Tanana River and adjacent riparian habitats supports the same bird species as found elsewhere in the Tanana Flats, particularly those species nesting in riparian forests along the river and adjacent wet meadows and shrub habitats (USAF, 2003). The Eielson INRMP lists the most common birds observed on Eielson AFB lands as spruce and ruffed grouse, rock and willow ptarmigan, raptors (northern goshawk, great horned owl, red-tailed hawk, sharp-shinned hawk, and American kestrel), and waterfowl (geese, ducks, loons, grebes). Recent studies of birds at Eielson AFB during migration and point counts recorded more than 80 species, including eight priority species (western wood-pewee, Hammond's flycatcher, gray-cheeked thrush, varied thrush, Bohemian waxwing, Townsend's warbler, blackpoll warbler, and rusty blackbird) (Rozell, 2003; Shaw, 2008).

3.6.3.4.3 Amphibians and Fish

Amphibian and fish populations are similar to those described for FWA in Subsection 3.6.3.1.3, Amphibians and Fish. ADF&G stocks seven lakes and one stream on Eielson AFB with rainbow trout, arctic grayling, arctic char, and chinook salmon (USAF, 2003). This stocking program provides recreational fishing opportunities to Eielson and local residents.

3.6.3.5 Fort Wainwright to DTA and TFTA Flight Corridors

The proposed flight corridor for helicopter travel between FWA and DTA would follow along the western side of the Tanana River within the TFTA, fly along the Tanana River between Quartz and Birch lakes, then turns southward skirting the northern edge of the DTA until it reaches Allen AAF. Flight corridors between FWA and TFTA cross over the Tanana River from the Cantonment and then disperse to training sites within the TFTA and between the TFTA and YTA. Wildlife populations within the TFTA/YTA have been described above for the FWA area (Subsection 3.6.3.1), but the moose population is of greatest importance because of the high density of calving moose that use the TFTA during summer. One of the FWA-to-TFTA corridors (see Figure 2.2.b) passes relatively close to the Fairbanks landfill, which could present potential bird-aircraft collision hazards, if the landfill were attracting large numbers of birds. The Fairbanks North Star Borough has management practices in place at the landfill, such as prompt burial of garbage, which reduces this potential hazard to helicopters using this flight corridor.

The flight corridor between FWA and DTA roughly parallels the Tanana River, while still remaining in the TFTA. Although that section of the corridor does not directly fly over the riparian forests and braided river bars of the Tanana River, the mid-section of the corridor (near Quartz and Birch lakes) and the connecting corridors to YTA and FWA do cross over the river where nesting bald eagles are relatively common. That section of the FWA-DTA flight corridor between Quartz and Birch lakes also is the closest approach of the flight corridor to areas where peregrine falcon nests are known to occur in the bluffs adjacent to the Tanana River (Prichard and Ritchie, 2007; Ritchie, 2009, personal communication).

3.6.3.6 Fort Richardson to Donnelly Training Area Flight Corridor

The proposed flight corridor for helicopter travel between FRA and DTA would follow the Glenn Highway from Anchorage to Glennallen before continuing north following the Richardson Highway to the training area near Delta Junction. The geographic scope of this area is too large to allow detailed descriptions of wildlife populations throughout the route. Therefore, the following discussion focuses on the primary species previously identified as VECs that are likely to be affected by the proposed activities (e.g., aircraft overflights and noise). These mammal species include moose, caribou, brown and black bears, and Dall sheep. Major migratory corridors for birds are also described, as avoidance of large groups of migrating birds would be an important safety concern. Wildlife populations and habitats for the Richardson Highway portion of the flight corridor were previously summarized in the *Final Environmental Impact Statement: Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way* (BLM, 2002) and the supporting *Environmental Report for Trans Alaska Pipeline System Right-of-Way Renewal* (Trans Alaska Pipeline System [TAPS] Owners, 2001).

3.6.3.6.1 Mammals

The FRA-DTA flight corridor either crosses through or is adjacent to GMU's 11, 13A, 13B, 14A, 14C, 20A, and 20D. Table 3.6.d summarizes population levels for moose, brown and black bears, Dall sheep, caribou, and mountain goats in those areas. Dall sheep and mountain goats occur sporadically in mountainous areas along the route, including the Chugach Mountains and Alaska Range. Most Dall Sheep, however, are outside the flight corridor (Talkeetna Mountains), except a small population in the Delta Controlled Use Area

on the north side of the Alaska Range near DTA. Moose and caribou are the large-mammal species most likely to occur within the flight corridor, as they regularly cross the highway system. Moose are distributed along the corridor in suitable habitats. The major caribou herds along the flight corridor include the Nelchina, Macomb, and Delta herds, with the Nelchina herd being the largest. Nelchina caribou could be encountered along the flight corridor adjacent to both the Glenn and Richardson highways. Distribution of the Macomb and Delta herds was discussed in Subsection 3.6.3.2. Brown and black bears are found in suitable forest and upland habitats, respectively, along the flight corridor, with the higher densities of brown bears occurring in the upper elevation habitats within the Alaska Range and adjacent foothills. Population estimates for bears along the flight corridor are available for only a few of the GMUs within the corridor (Table 3.6.d).

TABLE 3.6.d
Populations of Large Mammals in Game Management Units Traversed by the Proposed Helicopter Flight Corridor between Fort Richardson and Donnelly Training Area, Alaska
USARAK Aviation EIS

		Population Estimates (Number of Animals)				
Section of Flight Corridor (South to North)	**GMU**	**Moose**	**Caribou**	**Brown/Black Bears**	**Dall Sheep**	**Mountain Goat**
Fort Richardson to Glennallen						
Fort Richardson to Eklutna	14C	2,200	--	na/530-1,080	1,800–2,000	619[a]
Eklutna to Chickaloon	14A	6,564	--		900–1,000[b]	115
North of Glenn Highway	13A	4,009[c]	36,428	na/1,300	--[d]	--
South of Glenn Highway	13D				1,500–2,000	120
Glennallen to DTA						
Glennallen to Gulkana, east of Richardson Highway	11	na	--	na/na	--	--
West of Richardson Highway	20A	16,018	2,211	na/500-700	~2,000	--
East of Richardson Highway	20D	5,553	569–857	76-86/225	<2,000[e]	--

[a] Most mountain goats in GMU 14C are along Turnagin Arm and in the Chugach Mountains (few if any occur along the flight corridor).
[b] Number is population estimate for Chugach Mountains section of GMU 14A.
[c] Number is total count of moose in 2003–2004 surveys, not a population estimate; estimated mean density of moose in GMU 13 was 1.3 moose/per square mile.
[d] Population estimates for the Talkeetna Mts/Watana Hills area, well outside the flight corridor.
[e] No population estimates for the Delta Controlled Use Area, but harvest in 2004 was 53 rams (DuBois, 2005b).
na = not available
-- species does not occur there

Sources:
Moose: 2003 estimate for GMU 14C (Sinnott, 2006), 2003-2004 estimate for GMU 14A (Peltier, 2006), 2005 estimate for GMU 20D (DuBois, 2006), 2005 estimate for GMU 13 (Tobey and Kelleyhouse, 2006) and GMU 20A (Young, 2004).
Caribou: 2006 estimates for GMU 20D (DuBois, 2007b), GMU 13 (Tobey and Kelleyhouse, 2007), 2004 estimate for GMU 20A (Young, 2005a).
Bears: brown bear estimate for GMU 20D (DuBois, 2007a), black bear estimates for GMU 14 (Kavalkok, 2007), GMU 13 (Tobey, 2005).
Dall Sheep: 2003 estimate for GMU 14A, 14C (Coltrane, 2005), 2004 estimate for 13D (Coltrane, 2005), circa 1990 estimate for GMU 20A (Young, 2005b).
Mountain Goat: 2002 estimate for GMU 13D (Chugach Mts.), 1999 estimate for GMU 14A, 1994 estimate for GMU 14C (Coltrane, 2002a). No complete surveys have been conducted in recent years (Coltrane, 2008).

3.6.3.6.2 Birds

The FRA-DTA flight corridor follows the broad valley between the Alaska and Chugach mountain ranges, which is a major migratory route for some waterfowl and other birds that are moving west and southwest into western Alaska and Russia. Although this migratory route does not support the large numbers of migrating birds seen north of the Alaska Range, moderate numbers of trumpeter swans have been observed in spring moving

westward between Gulkana and Chickaloon (Cooper et al., 1991; TAPS Owners, 2001). A smaller migratory route for birds occurs along the Copper River and brings birds from the southern coast northward into the Interior, with some movements northward through Isabel Pass in the Alaska Range (a portion of the same route for the FRA-DTA flight corridor). Trumpeter swans also nest in suitable habitats along the FRA-DTA flight corridor between Gulkana and the Palmer area, and populations have shown an increasing trend (Conant et al., 2007). Breeding-bird communities in habitats along the flight corridor are typical of those found in the southern Interior and upper Tanana River valley (Spindler and Kessel, 1980; Kessel, 1998; Anderson et al., 2000).

3.7 Air Quality

3.7.1 Introduction

Air quality is federally regulated through the CAA of 1970 as amended (42 U.S.C. 7401 et seq.). Stationary, mobile, and area sources are all contributors to air quality and fall under the CAA. Air quality was a determined to be a secondary area of focus through VEC ranking and the public scoping process as described in Section 1.8 and Subsection 1.4.2. Issues included emissions in the Cantonment and in flight corridors.

Air quality standards are enforced through ambient air quality standards and enforcement of emission limits for individual sources of air pollution. The CAA requires the EPA to identify National Ambient Air Quality Standards (NAAQS) required to protect the public health and welfare. The following seven pollutants have been determined by EPA to influence ambient air quality:

- Carbon monoxide (CO)
- Lead (Pb)
- Nitrogen oxides (NO_x)
- Particulate matter equal to or less than 10 microns in diameter (PM_{10})
- Particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$)
- Ground-level ozone (O_3)
- Sulfur dioxide (SO_2)

The EPA has established atmospheric concentration limits for these seven pollutants (Table 3.7.a). When atmospheric concentrations are below the limits for the pollutants for a defined period, an area is defined as in attainment. If atmospheric concentrations are above any of the standards for that defined period, the area is designated nonattainment.

TABLE 3.7.a
National Ambient Air Quality Standards
USARAK Aviation EIS

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide (CO)	9 ppm (10 mg/m^3)	8-hour[a]	None
	35 ppm (40 mg/m^3)	1-hour[a]	None
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Oxides (NO_x)	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary

TABLE 3.7.a
National Ambient Air Quality Standards
USARAK Aviation EIS

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Particulate Matter (PM_{10})	Revoked[b]	Annual (Arithmetic Mean)	------
	150 µg/m^3	24-hour[c]	Same as Primary
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual[d] (Arithmetic Mean)	Same as Primary
	35 µg/m^3	24-hour[e]	Same as Primary
Ozone (O_3)	0.08 ppm	8-hour[f]	Same as Primary
	0.12 ppm	1-hour[g] (Applies only in limited areas)	Same as Primary
Sulfur Oxides (SO_x)	0.03 ppm	Annual (Arithmetic Mean)	-------
	0.14 ppm	24-hour[a]	-------
	-------	3-hour[a]	0.5 ppm (1,300 µg/m^3)

[a] Not to be exceeded more than once per year.

[b] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).

[c] Not to be exceeded more than once per year on average over 3 years.

[d] To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

[e] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

[f] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

[g] (i) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than 1.

(ii) As of June 15, 2005, EPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

Notes:
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in aerodynamic diameter
PM_{10} = particulate matter less than 10 micrometers in aerodynamic diameter
ppm = parts per million

Source: EPA, 2006.

USARAK's primary strategy for achieving and maintaining the NAAQS is controlling emissions of EPA-listed pollutants. However, USARAK has modified its pollution control efforts to better suit site-specific conditions and still meet NAAQS. Emissions of the following criteria pollutants are controlled at USARAK installations:

- CO
- Pb
- NO_x
- PM_{10}
- $PM_{2.5}$
- Volatile organic compounds (VOCs)
- SO_2

Due to the elimination of lead in gasoline and the absence of lead-emitting sources in the Anchorage and Fairbanks airsheds (such as copper and lead mines or processing operations), lead emissions are not a factor in this assessment.

Ground-level O_3 is not directly emitted to the air. Rather, O_3 is a product of the chemical reaction of NO_x and/or VOCs and sunlight. Because emissions of NO_x and VOCs lead to the formation of ground-level O_3, NO_x and VOCs are referred to as O_3 precursors (EPA, 2009). As a result, USARAK controls O_3 by controlling emissions of NO_x and VOCs.

Because NAAQS and criteria pollutants are the primary standards used by EPA for evaluating and improving air quality in the United States, these standards are used to describe the affected environment and any environmental consequences resulting from the implementation of the Proposed Action.

In addition to compliance with the NAAQS, stationary sources constructed at FWA for the Proposed Action would be subject to the regulations in the current Title V of the CAA air quality operating permits (Title V permits) held by DU (the utility contractor for FWA) and FWA. The FWA and DU operating permits are classified as a Prevention of Significant Deterioration (PSD) Major Facility because of the potential to emit regulated air pollutants at rates exceeding 250 tons per year (tpy). DU's permit is also classified as a Hazardous Air Pollutant (HAP) Major Facility because the CHPP has the potential to emit more than 25 tpy of hazardous air contaminants. Even though FWA's current potential emissions are below the major HAP threshold, FWA is also considered a HAP Major Facility due to the shared property line with the DU-controlled CHPP. In addition, both FWA and DU are classified as a Nonattainment Area Major Facilities because they have the potential to emit more than 100 tpy of a regulated air contaminant (CO) in an area classified as nonattainment for that contaminant. As a result, the proposed stationary source construction at FWA will be subject to PSD, nonattainment, and NESHAP regulations imposed by FWA's operating permit. Additional heating and power requirements would be subject to PSD, nonattainment, and NESHAP regulations imposed by DU's operating permit.

Additional training and stationing locations defined in the Proposed Action will have no new stationary sources constructed under these action alternatives. PSD, nonattainment, and NESHAP regulation requirements for new sources would not be applicable without the addition of new stationary sources. However, any requirements under these regulations would be applicable for locations with existing stationary source operating permits at which aviation personnel would be trained or stationed.

3.7.2 Scope

The air quality regions defined and listed below are of concern for the Proposed Action:

- Fairbanks North Star Borough (inclusive of FWA and Eielson AFB)
- Interior training locations (Allen AAF, BRTA, Eielson AFB, DTA, GRTA, TFTA, and YTA)
- Anchorage (inclusive of FRA, Eagle River IA, and Elmendorf AFB)
- Flight Corridors

Two types of air emissions are analyzed in this scope: stationary and mobile. Both are present in the Fairbanks, Interior training areas, and Anchorage air quality regions and along the flight corridors. Examples of stationary sources are power plants and boiler-controlled buildings. Examples of mobile sources are mobile generators, privately and government-owned vehicles, and aircraft. Air emissions in the flight corridors result primarily from aircraft, although land vehicles also contribute via highway travel.

The NAAQS are the baseline against which the Proposed Action is measured for these air quality regions. Each air quality region has its own history of complying with the NAAQS. The following subsections present information about each region.

3.7.3 Affected Environment for Air Quality

3.7.3.1 Fairbanks North Star Borough (FWA and Eielson AFB) Air Quality Region

Fairbanks North Star Borough is located in Interior Alaska and is far removed from the moderating influence of Alaskan coastal waters. As a result, the area has a continental climate that is characterized by large daily and annual temperature ranges, low humidity, and relatively light and irregular precipitation as compared to coastal Alaskan communities. Because of its low elevations, the Fairbanks area experiences extreme cold in the winter and high summertime temperatures.

The average annual water equivalent precipitation reported at Fairbanks International Airport over the period between September 1949 and December 2006 was 10.5 inches. Average annual snowfall during the same period was 66.7 inches. The average winter temperature experienced was -6.4°F, and the average summer temperature was 59.6°F. The highest monthly average maximum temperature of 72.2°F occurred in July and the lowest monthly average minimum temperature of -18.7°F occurred in January (Western Regional Climate Center [WRCC], 2007). Extremes in temperature are documented to range down to -50°F and below during winter months and up to 80°F and above in summer months in Interior locations. In addition, temperature inversions are frequent in winter. These inversions generally occur under clear skies, light winds, and extremely low surface temperatures. However, locations only a few hundred feet above the surface can be significantly warmer (Alaska Climate Research Center, Geophysical Institute, University of Alaska Fairbanks, 2008). Wintertime inversions over Fairbanks, in combination with the region's low-lying terrain, result in periods of stagnant air during which air pollutants from vehicles and woodstoves are trapped. Consequently, Fairbanks experiences periods of diminished air quality during the winter.

Prevailing airflow is from the north and consistent. Localized topographic features can produce channeling effects and result in accelerated wind speeds. Surface winds change to a westerly flow during summer months.

During summers, Fairbanks occasionally experiences smoky periods caused by wildfires in the surrounding region. The smoky periods range from less than a day to several weeks, with their duration and severity depending on the characteristics and locations of the wildfires as well as on prevailing winds and precipitation. Smoke increases levels of particulate matter, CO, and O_3 precursors such as NO_x and VOCs that can severely affect air quality.

3.7.3.1.1 Emissions

Prior to 1999, the Fairbanks urban area (which includes FWA) typically had violations of the CO NAAQS during long winter inversions and was considered a nonattainment area for CO. On June 21, 2004, after emission levels of CO had met the NAAQS for approximately 5 years, the State submitted a CO maintenance plan for the Fairbanks nonattainment area and simultaneously requested designation to attainment for CO.

On July 27, 2004, EPA promulgated a direct final rule approving the maintenance plan and the designation of the Fairbanks urban area as attainment for CO effective September 27, 2004 (69 FR 44601). An area designated as attaining the standard while under an approved maintenance plan is called a maintenance area. A maintenance area is subject to many of the same federal requirements as a nonattainment area until it is shown that the area will remain in attainment status. The Fairbanks urban area, which has not recorded a violation of the primary or secondary CO NAAQS since 1999, is in attainment of the NAAQS for all other criteria pollutants except $PM_{2.5}$, which is discussed in Subsection 3.7.3.1.2.

FWA, as a major source for air contaminants, is required to obtain a Title V permit. Currently, FWA operates under ADEC Title V Permit #AQ0236TVP02, which was renewed on December 5, 2008, and expires on December 4, 2013. This permit replaced FWA's previous Title V permit that expired May 13, 2008. That permit excluded the CHPP because this source was privatized. The CHPP is now managed by DU and is operating under Permit #AQ1121TVP01, which was issued on December 5, 2008, and expires December 4, 2103. The two permitted facilities, FWA and CHPP, would be combined for any potential permit modeling analysis. In addition, FWA has obtained an ADEC air quality construction permit, 0031-AC059, issued February 1, 2001, to avoid significant modification classification under PSD and nonattainment regulations. As with the original Title V permit, this construction permit was also separated into two permits, #AQ0236MSS02 for FWA and #AQ1121MSS01 for DU, with the privatization of the CHPP facility. These construction permits were developed to limit potential emissions to prevent exceedance of the NAAQS for the Fairbanks air quality region.

The Proposed Action calls for installing new stationary sources at FWA. Potential emissions from stationary sources at FWA and DU were estimated for 2008. Stationary sources at FWA include maintenance facilities, fuel storage and dispensing facilities, hangars, administration buildings, painting facilities, the hospital, and remediation activities. Criteria pollutant potential emission calculations are primarily associated with fuel combustion from boilers and generators associated with the hospital. Potential HAP emissions are from a combination of fuel combustion, fuel storage, solvents, paints, and remediation activities. DU criteria and HAP potential emissions are based on the combustion products of coal for the boilers at the CHPP. The significant HAP emissions for coal combustion are hydrogen chloride (HCL) and hydrogen fluoride (HF). Potential emissions estimates assume that a given piece of equipment was operated at its maximum capacity for 24 hours a day, 365 days a year, if its operation is not limited by a permit condition or regulation. Because these assumptions are very conservative, they often overstate the pollutants a facility actually emits. In addition, emission control devices such as the bag houses installed on the boiler exhaust streams also provide reduced actual emissions. The potential emissions from FWA and DU in 2008 are presented in Table 3.7.b.

TABLE 3.7.b
Potential Criteria Pollutant Emissions from FWA and DU in 2008
USARAK Aviation EIS

Pollutant	NO_x	CO	PM_{10}	SO_2	VOC	HAPs
FWA	91	86	23	162	66	4
DU	804	847	39	2,354	12	31
Combined	895	933	62	2,516	78	35

Note: All amounts in tons per year.
HAPs = Hazardous Air Pollutants; FWA sources include remediation activities, fuel tanks, and paints; DU sources are primarily the CHPP boilers.

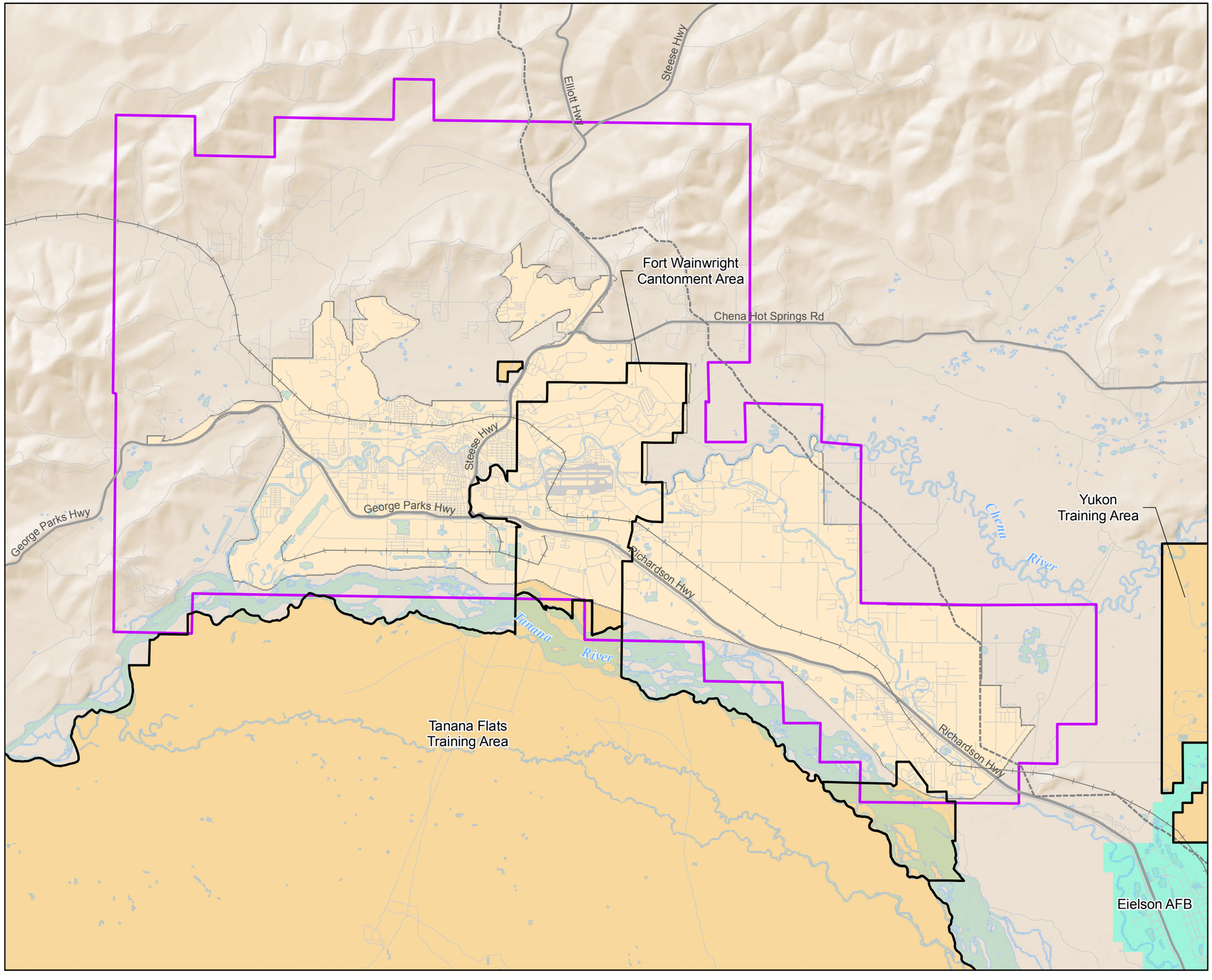
Source: ADEC, 2008a, Tables C, D, and E

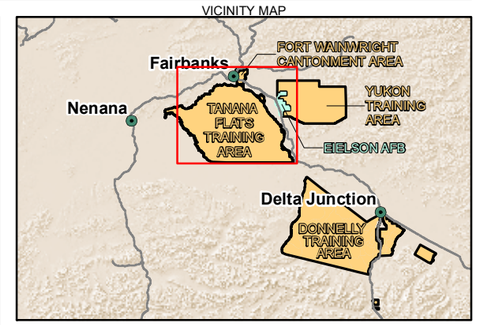
3.7.3.1.2 Fairbanks $PM_{2.5}$ Designation

In 1997, the NAAQS $PM_{2.5}$ 24-hour average standard was designated as 65 micrograms per cubic meters ($\mu g/m^3$). The EPA determined that Fairbanks was in attainment for the 65-$\mu g/m^3$ $PM_{2.5}$ standard until 2006 when the 24-hour NAAQS standard for $PM_{2.5}$ was reduced to 35 $\mu g/m^3$. The new standard caused the City of Fairbanks to exceed the 24-hour limit, especially during the winter months when inversions are present.

In December 2007, the State of Alaska requested EPA to designate a portion of the Fairbanks North Star Borough as nonattainment for the $PM_{2.5}$ 24-hour limit. EPA responded in August 2008 with its intended $PM_{2.5}$ nonattainment boundary. The State of Alaska responded to the EPA in October 2008 with requests to amend the intended EPA boundary. A final designated $PM_{2.5}$ nonattainment boundary was promulgated by EPA in December 2008. The nonattainment boundary consists of a portion of the Fairbanks North Star Borough, urban Fairbanks, and FWA, and excludes Eielson AFB, TFTA, and YTA. Figure 3.7.a provides the boundary map as defined by EPA. The State of Alaska is to provide an attainment demonstration plan to include in the State Implementation Plan (SIP) for air quality control. Inventories of $PM_{2.5}$-emitting sources and accurate measuring techniques are in the preliminary stages, thus making this pollutant difficult to quantify.

In May 2008, New Source Review Provisions for $PM_{2.5}$ were implemented. These rules would be evaluated during the permitting process for the construction and operation of affected stationary sources.





LEGEND

- Road
- Trans Alaska Pipeline
- Railroad
- Major Road
- Installation Boundary
- EPA PM25 Nonattainment Boundary
- Metropolitan Planning Organization Boundary
- Air Force Installation Area
- Training Area
- Surface Water Body

Source: Fairbanks North Star Borough Department of Community Planning

N

0 2.5
Miles

FIGURE 3.7.a
Fairbanks North Star Borough Designated PM 2.5 Nonattainment Boundary
USARAK Aviation EIS

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The FNSB is implementing measures and coordinating efforts to reduce $PM_{2.5}$ emissions. For example, the FNSB is:

- Preparing a Draft $PM_{2.5}$ Ordinance that would restrict emissions of particles from point sources that do not meet EPA standards.
- Encouraging use of tax advantages for upgrades to home heating appliances and energy-efficiency improvements.
- Coordinating with the Cold Climate Housing Research Center and the University of Alaska Geophysical Institute for modeling studies.
- Implementing an MOU with ADEC adopted in April 2008, which outlines the division of responsibilities between the two agencies. Under the MOU, ADEC is responsible for federal installations such as FWA and Eielson AFB.
- Coordinating with the Fairbanks Economic Development Corporation and the Alaska Gasline Port Authority to bring natural gas to Fairbanks to replace burning of oil, coal, and wood as heating materials and associated particle emissions (Whitaker, 2009).

3.7.3.2 Interior Training Locations Air Quality Region

3.7.3.2.1 YTA and TFTA Air Quality Regions

The climate in the YTA and TFTA regions are similar to that of the Fairbanks region (se Subsection 3.7.3.1). These Interior training locations meet both the primary and secondary NAAQS for all pollutants and for all periods because no known violations have been reported.

3.7.3.2.2 DTA, BRTA, GRTA, and Allen AAF Regions

The Big Delta region is representative of the continental zone of Interior Alaska, with large daily and annual temperature ranges, low humidity, and relatively light and irregular precipitation. Mean annual water equivalent precipitation is less than 12 inches (WRCC, 2007). The average annual snowfall is 44 inches. The average summer air temperature is 57.5°F and the average winter air temperature is -0.2°F (WRCC, 2007). Because of the large land mass of the continental zone, the climate is conditioned primarily by the large changes in solar heat received by the area during the year. The Alaska Range and the Brooks Range isolate Interior Alaska, contributing to temperature and precipitation trends. This isolation accounts for the high temperatures in the summer, low temperatures in the winter, and the relatively low precipitation. Surface winds follow a normal pattern of strongest speeds in the winter and lightest speeds in the summer. Wind direction is east-southeast and follows the Tanana Valley from early fall to spring. Summer wind directions follow the Delta River, southwest. High wind speeds may occur in the Delta River and Tanana valleys due to the venturi effect (when winds funnel through a valley and pick up speed).

This Interior training location's air quality region meets both the primary and secondary NAAQS for all pollutants and for all periods because no known violations have been reported.

3.7.3.3 Anchorage Air Quality Region

For Anchorage, the average summer air temperature is 56.6°F and the average winter air temperature is 14.8°F (WRCC, 2007). Mean annual water equivalent precipitation is around 16 inches, and average annual snowfall is 77 inches (WRCC, 2007).

The combined influences of Cook Inlet and the surrounding mountainous topography provide Anchorage with a transitional climate. Prevailing airflow in Anchorage is from the southeast and southwest, depending on the season. From September to April, surface winds are predominately from the north. Winds in the Anchorage area can vary, depending on the topographic features that produce localized channeling effects, which can accelerate wind speeds. Because of the moderating effects of both maritime and continental climates, extreme weather conditions are not usually experienced in Anchorage.

3.7.3.3.1 Emissions

The Anchorage air quality region presently meets both the primary and secondary NAAQS standards for all pollutants. The CO 8-hour standard of 9 parts per million (ppm) within the Municipality of Anchorage was first exceeded in 1978 and caused a nonattainment designation for CO. CO concentrations are highest during the months of November through February. As a high-latitude community with long winter nights and weak daytime solar isolation, Anchorage frequently experiences strong and persistent temperature inversions that trap CO close to the ground (HHS, 2006a).

Because no violations of the CO NAAQS in the Municipality of Anchorage area have been recorded since 1996, EPA redesignated the Municipality of Anchorage as a maintenance area. Redesignation requires a maintenance plan for attainment status of CO. This means that, even though the Municipality of Anchorage has achieved attainment with the NAAQS for CO, EPA will require a continuing demonstration that the area can maintain attainment status. Assuming no future violations or significant new stationary emission sources, designation as a maintenance area would continue for an undetermined length of time before the Municipality of Anchorage would officially be designated as an attainment area for CO.

The Municipality of Anchorage operates its power generation plant under ADEC Title V Permits #AQ202TVP01 and #AQ203TVP01. This plant provides the electricity that powers FRA and Elmendorf AFB as well as the Municipality of Anchorage. Many additional stationary sources within the Municipality of Anchorage, FRA, and Elmendorf AFB are permitted separately under ADEC Title V and Minor Source operating permits, and do not adversely affect the ambient air quality in this region. No stationary sources are scheduled to be installed at FRA or Elmendorf AFB under the Proposed Action.

Elmendorf AFB, FRA, and its training facilities are located outside of the Municipality of Anchorage and outside the CO maintenance boundary, but within the Anchorage basin, and on the edge of the Anchorage air quality region. The southern boundary of Elmendorf AFB forms the northern boundary of the CO maintenance area but is not included in the CO maintenance area. Elmendorf AFB's northern boundary is shared with FRA. It should be noted that the northernmost CO monitoring station in the Municipality of Anchorage, located near the southern boundary of Elmendorf AFB, had not recorded a CO exceedance since 1990. Therefore, CO monitoring at this station was discontinued after 1995.

3.7.3.4 Flight Corridors

Flight corridors are located in both the Interior and coastal zones and transverse both. Climate in the Interior Alaskan airspace is similar to that of the Interior training air region. Climate in the coastal area airspace is similar to that of the Anchorage air region. Flight training operations are expected to occur in both climatic areas. The flight corridors meet both the primary and secondary NAAQS for all pollutants and for all periods because no known violations have been reported.

3.8 Socioeconomics

3.8.1 Introduction

Stationing additional military assets in an area can cause changes in the local workforce and residential population, which in turn, can create demand for housing and community services as well as increasing employment and spending in the local economy. Most of the scoping comments received in 2007 regarding socioeconomic effects of Army growth were positive, with only a few expressing specific socioeconomic concerns, indicating that socioeconomic issues are not a major concern to the surrounding communities affected by this project (CH2M HILL, 2007).

However, given the changes to the economic health in the United States, one scoping comment received from the public regarding effects of Army growth on housing demand in the Fairbanks area, and the fact that the Proposed Action includes a personnel increase that closely follows an increase in 2005-2006 when the Stryker Brigade was formed, this EIS assesses socioeconomic resources as a secondary concern. The discussion focuses primarily on FWA, where most of the new aviation personnel would be stationed, and on the surrounding Fairbanks area.

This section describes the socioeconomic regions of influence, the present socioeconomic conditions in each region, and criteria by which impacts to these regions will be evaluated in Section 4.8 to include population, economic activity, housing, and public services.

3.8.2 Scope

The following subsections provide information about past and present levels of population, economic activity, and community services at the potential project locations where socioeconomic changes would occur. The region of influence (ROI) established for socioeconomics for FWA and Eielson AFB is the Fairbanks North Star Borough (FNSB). The ROI for FRA is the Anchorage metropolitan area.

A few scoping comments were received from the Delta Junction area noting the loss of FGA's former contribution to the local economy and supporting increases in military personnel in the region. However, the DTA and Delta Junction ROI, Southeast Fairbanks Census Area, are not considered part of the affected environment because there is no proposed change in population, construction of facilities at FGA or DTA, or anticipated change to the socioeconomics of the DTA and Delta Junction ROI. The proposed increase of training flights to and from Allen AAF is minimal and the DTA will primarily be used for daily training events or one to two large brigade-size exercises (see the description of proposed training activities in Subsection 2.3.4). In addition, closing military lands to

recreational activity during training events is expected to cause only minor indirect socioeconomic effects to the population surrounding DTA.

Doyon, Ltd. is the regional Alaska Native for-profit corporation for the area, under the Alaska Native Claims Settlement Act. The *Final EIS for Transformation of U.S. Army Alaska*, Volume 2, Appendix E (USARAK, 2004a) lists the village corporations within the Doyon region. Several communities off the road system are not analyzed for socioeconomic impacts. Due to the subsistence-oriented nature of these communities, they effectively fall outside the social and economic ROIs for military activities (USARAK, 2006a).

3.8.3 Affected Environment for Socioeconomics

3.8.3.1 Fort Wainwright

FWA is located east of the primary population area of Fairbanks, within the FNSB (also known as the Fairbanks MSA), which includes the cities of Fairbanks and North Pole.

Population

Since its establishment as Ladd Field in 1939 with a handful of personnel, FWA grew to 5,400 personnel by 1950 because of its strategic location in WWII and the Cold War. From 1950 to year-end 2007, the number of military personnel at FWA grew more than two-fold to approximately 14,998 (U.S. Department of the Army, 2008b).

As of January 2009, the population associated with FWA included 7,214 military personnel, 11,940 dependents (3,676 living in FWA housing), and 1,333 civilians (civil service and [Non-Appropriated Fund [NAF] personnel) (FWA Plans, Analysis and Integration Office [PAIO], 2009a). Since 2004, population at FWA has increased by more than 1,000 military personnel, 1,400 family members, and 400 civilian personnel due to Army Transformation. Another 400 military, 600 dependents, and 180 civilians are anticipated as a result of the Grow the Army initiative (USARAK, 2008).

Economic Activity

An estimated two, indirect/secondary jobs are created in the ROI, in businesses supplying the Post and military households, for every job on FWA (USARAK, 2004a). The total operating and maintenance funding at FWA for fiscal year (FY) 2006 was $150.1 million (FWA Fact Sheet, n.d.). More recent data are unavailable.

Housing and Public Services

Family Housing. FWA has been renovating and demolishing/replacing much of its housing inventory over the last decade. In 2005, the Army identified a need to construct 400 new units of family housing to accommodate Stryker Brigade Soldiers and their families that were transferred to FWA in 2006. The last of these military construction (MILCON) projects are nearing completion. The lease for a small housing development in Fairbanks will expire in 2009. As of December 2008, FWA had 1,640 family housing units available for Soldiers and their families.

The Army's Residential Communities Initiative transfers responsibility for constructing, operating, and maintaining all family housing on an installation to a partnership between the Army and a private entity. In April 2009, a total of 1,640 existing Army family housing units on FWA will be conveyed to North Haven Communities, the partnership established

at FWA and FGA. An additional 100 units currently under MILCON will be conveyed to the partnership upon completion in July 2009 and the final 110 units currently under MILCON will be conveyed upon approval by EPA and the Alaska Department of Environmental Conservation (ADEC). At that time, the Residential Communities Initiative (RCI) starting inventory will be 1,850 units.

During the 5-year RCI *Initial Development Plan*, North Haven Communities plans to construct 524 new units, demolish 685 older units, revitalize 321 units, and construct a new Community Center/Welcome Center. In approximately 2014, FWA will have 1,689 family housing units on the installation. This will be an increase of 149 units from the December 2008 inventory (prior to completion of the MILCON projects), but a net decrease of 161 units when compared to the mid-2009 RCI starting inventory of 1,850 units (USACE, 2008; Larson, 2009, personal communication).

Waiting lists for family housing currently range from about 2 months to a year or more (Military Homefront website, March 2009). Over the next several years, waiting lists could grow due to this ongoing construction, demolition, and renovation and to ongoing fluctuations in personnel strength. A new Housing Requirements Market Analysis is underway at FWA (Larson, 2009, personal communication).

Typically, more than one-third of families assigned to FWA reside off the installation in Fairbanks or North Pole for at least part of their tour of duty. Due to seasonal housing demand in Alaska, rental rates in the summer can be high and rental units can be harder to find. The Preferred Tenant Program, available through the FWA Housing Services Office, offers military personnel a 3 percent below-market rate for rentals. It is available for Soldiers who need to reside off FWA for a period of 1 year or more while waiting for quarters, or who would prefer to reside off the installation permanently (Military Homefront website, 2009).

The current surplus or deficit of family housing units is difficult to assess, due to recent growth in the military population, which was not included in the last Housing Market Analysis (Niehaus, 2005), complicated by ongoing deployments. Another Housing Market Analysis study is currently underway (Larson, 2009, personal communication).

Unaccompanied Personnel Housing. As of January 2009, FWA had 2,798 barracks spaces available for unaccompanied Soldiers and nearly 340 temporary spaces in relocatable units. Like family housing, it is difficult to quantify the deficit in unaccompanied housing due to ongoing growth and deployment of the various units assigned to FWA.

Table 3.8.a presents an overview of FWA socioeconomic baseline.

TABLE 3.8.a
Socioeconomic Overview of Installations
USARAK Aviation EIS

	Fort Wainwright	Fort Richardson	Eielson AFB [g]
Military Personnel (2009)	7,214	6,100	2,442
Civilians (2009) [a]	1,333	1,179	789
Contractors (2009)	666	n/a	n/a
Family Members (2009)	11,940	7,647	n/a
Family Members Living at the Installation (2009)	3,671	n/a	3,200
Family Housing Units (2008)	1,640	1,024 [b]	1,176

TABLE 3.8.a
Socioeconomic Overview of Installations
USARAK Aviation EIS

	Fort Wainwright	Fort Richardson	Eielson AFB [g]
Projected Family Housing (2014)	1,689	1,245	n/a
Estimated Family Housing Unit (Deficit) or Surplus (2010-12)	none	260 [c]	400
Unaccompanied Housing Beds (2007-2009)	2,798	892 [d]	618
Temporary Relocatable Barracks Beds	336	n/a	
Estimated Unaccompanied Housing (Deficit) or Surplus (2012)	n/a	(417) [e]	n/a
Enrollment at Installation Schools (2008) [f]	643 elementary school 615 middle school 844 high school	643 elementary school 615 middle school 844 high school	591 elementary school 513 junior/senior high school
Capacity at Installation Schools (2008)	82% elementary school 69% middle school 83% high school	76% elementary school 94% middle school 93% high school	64 % elementary school 83 % junior/senior high school
Operation and Maintenance Budget (FY2006)	$150.1 million	$104.1 million	$200.1 million payroll, $29 million local contracts

Sources:
Fort Wainwright Fact Sheet (undated, provided 2007); *Fort Richardson Fact Sheet* (undated, provided 2007); *Eielson AFB Housing Fact Sheet*, 2009; *Eielson AFB Economic Impact Brochure*, 2007; ASIP, 2009; FNSB School District, 2008; Anchorage School District, 2008; FWA School Liaison Service FAQ (website), 2009; FRA and Elmendorf AFB Joint Housing Requirements and Market Analysis (HRMA), 2007; *FWA Residential Communities Initiative EA* (USACE, 2008); FWA Demographics 1stQ2009 (PAIO, 2009a); FRA Demographics 1stQ2009 (PAIO, 2009b); FWA Housing Office personal communication (Layton, 2009)

Notes:
n/a: data not available
[a] Civilians include Civil Service and NAF.
[b] 2007 family housing inventory for FRA alone. An additional 2,022 units are available at Elmendorf AFB.
[c] Combined, in 2012: surplus of 875 billets at Elmendorf AFB and a deficit of 615 units at FRA equates to a 260-unit surplus.
[d] 2007 unaccompanied housing billets for FRA alone. Another 892 are available at Elmendorf AFB.
[e] Combined, in 2012: deficits of 381 unaccompanied billets at Elmendorf AFB and 417 billets at FRA.
[f] "Installation schools" data in this table include schools located off of military installations attended by children living on military installations; only the FWA elementary schools are physically located on the installation. All schools are operated by the FNSB or Anchorage School Districts.
[g] Eielson AFB data are from 2007. More recent data were not available.

3.8.3.1.1 Fairbanks North Star Borough

Population

Fairbanks has been the demographic and economic hub of the Alaska Interior since the early 1900s. In 1910, the official population of Fairbanks was about 3,500 residents, in addition to more than 6,000 miners living on their claims outside the town (Fairbanks CIS, 2007). In 1950, the FNSB population was approximately 17,600. The discovery of oil on the North Slope in the late 1960s and construction of the Trans-Alaska oil pipeline in the 1970s led to rapid growth. The borough grew 31 percent from 1960 to 1980, 54 percent from 1980 to 2000, and at an average annual rate of 0.6 percent from 1990 to 2000, with a population totaling nearly 83,000 as of the 2000 Census (Fairbanks North Star Borough website 2006; Niehaus, 2005).

In March 2008, the U.S. Census Bureau revised its 2006 population estimate from 86,754 to 94,803, which is still 2,000 people less than the Alaska Department of Commerce, Community and Economic Development (DCCED)-certified June 2007 population estimate of 96,888 (U.S. Census Bureau, 2008a; FNSB Community Research Center, 2009). The DCCED certified population of Fairbanks city was 30,552 in 2007, nearly 3,000 less than the

Census estimate of 34,540 (FNSB Community Research Center, 2009). The military and its dependents represent about 20 percent of the borough's population.

Table 3.8.b contains summaries of socioeconomic indicators for the ROI including baseline population estimates using census data from the U.S. Census Bureau's 2008 annual population estimates and the 2005-2007 Census American Community Survey.

According to census data, population increases in FNSB were about half of the State of Alaska increase from the 1990 to 2000 censuses, but nearly double the statewide increase from 2000 to 2006. Proportionately, the increase in the Anchorage MSA was more than double the statewide increase from 1990 to 2000 and many times higher than in FNSB. From 2000-2006, Anchorage's growth was somewhat higher than the State's growth but similar to that of the FNSB. The borough and the Anchorage MSA account for 67 percent of the total population of Alaska.

TABLE 3.8.b
Socioeconomic Summary of Surrounding Area
USARAK Aviation EIS

	Fairbanks North Star Borough	Anchorage MSA	State of Alaska
Population Estimate 2006 [a]	94,803 [b]	359,460	676,301
Change from 2000 to 2006	14.4%	12.5%	7.9%
Change from 1990 to 2000	6.6%	41.2%	14.0%
Total Employed 2006 [c]	42,824	189,411	326,852
Unemployment Rate (Civilian) [c]	5.6%	5.7%	6.5%
Median Household Income 2006 [d]	$63,044	$66,244	$59,393
Housing Units 2006 [d]	34,175	138,654	276,590
Percent Change from 2000	2.7%	38.1%	6.0%
1-bedroom units	17.6%	11.8%	14.3%
2-bedroom units	25.9%	26.7%	26.4%
3- to 5-bedroom units	52.6% [e]	57.8%	54.0%
Vacancy Rates–Rental (Percent)	13.4%	5.4%	7.5%
Median Home Value	$182,700	$238,900	$213,200
Median Gross Rent	$844	$920	$883

Notes:
[a] U.S. Census Bureau, 2008. Table 1: Annual Estimates of the Population for Counties of Alaska: April 1, 2000, to July 1, 2007 [CO-EST2007-01-02.xls]. Released March 20, 2008.
[b] Previously estimated at 86,754. In March 2008, the census population estimates for FNSB in 2001-2006 were adjusted upward from the annual estimates released through March 22, 2007, and the 2005 American Community Survey). The estimate for 2006 still differs by 2,085 from the DCCED-certified population estimate of 96,888. DCCED estimates result from the population estimate appeal process, which is available to incorporated communities on a yearly basis. Adjustments to other Alaska communities were much less.
[c] Bureau of Labor Statistics, Local Area Unemployment Statistics for 2006, seasonally adjusted.
[d] U.S. Census Bureau. 2006b. American Community Survey for 2006. FNSB did not agree with the census estimate, providing an estimate of 38,598 housing units in 2006. The discrepancy was reportedly due to the fact that housing construction permits are not required outside the municipal limits of Fairbanks and North Pole, where the majority of new construction has occurred (GTA EA, 2008).
[e] According to local survey data, as of summer 2008, 295 housing units with three or more bedrooms were available for rent in FNSB.

Economic Activity

Fairbanks, with its diverse economy, is still the regional service and supply center for Interior Alaska. The primary industrial sectors are government services (over one-third of total employment, including FWA and Eielson AFB), transportation, communication, manufacturing, financial, and regional medical services. Tourism is also important to the regional economy, with approximately 325,000 tourists visiting the area annually. Mining has declined in job share, but remains important to the economy (Fairbanks CIS, 2007; USARAK, 2004b). Active duty military comprised about 17 percent of the borough's workforce and Fairbanks' unemployment rate is lower than the statewide average (Table 3.8.a). Population, housing, and economy in the FNSB are greatly influenced by FWA and Eielson AFB.

Housing and Public Services

Housing. In 2006, the Fairbanks MSA had an estimated 34,175 housing units. The homeowner (for sale) vacancy rate was 1.0 percent and the rental vacancy rate was 13.4 percent, with an overall vacancy rate[1] of 18.1 percent. It should be noted that the borough did not agree with the census estimate, and provided an estimate of 38,598 housing units (U.S. Census Bureau, 2006b; GTA EA, 2008; FNSB Community Research Center, 2008).

Due to record-low interest rates, Alaska (like the rest of the nation) experienced a brisk housing market from 2003 to 2005, while the formerly high cost of housing materials in FNSB decreased (Laurent and Kreiger, 2006). Annual new housing construction hit a 10-year high in 2004, then declined slightly. Between 1996 and 2004, annual new housing construction increased by 36 percent (from 666 units to 903 units). Between 2005 and 2008 new housing construction declined by about 18 percent, to 732 units built in 2008. Most of that activity was single-family homes, the majority of which were built outside of the cities of Fairbanks and North Pole. Overall, the FNSB housing market remains strong, although houses are taking longer to sell and foreclosures have risen somewhat (FNSB Community Research Center, 2008).

The FNSB Community Research Center's most recent survey data[2], from the second quarter of 2008, show housing inventory up by 22 percent compared to the same period in 2007, while housing sales slowed from a second quarter average of 127 in 2007 to 104 in 2008 (FNSB Community Research Center, 2008). As of June 2008, there were 549 available rental-housing units in FNSB. Of these, 54 were houses with three or more bedrooms and 241 were apartments with three or more bedrooms (FNSB Community Research Center, 2008). The rental stock includes the 400-unit Birchwood Apartments, which were formerly leased by the Army and came onto the market in May 2007. An additional 150 units formerly leased in the Walden Apartments will come onto the market in 2010. Because they were built to meet Army family needs (20 years ago), these developments include many units with three or more bedrooms (Dodge, 2009, personal communication).

Vacancy rates in apartment and multiplex developments have ranged from a low of 2.5 percent in June 2004 to a high of 12.2 percent in December 2007. The local economic development agency attributes current housing market conditions largely to the Stryker

[1] Including seasonal, rented/sold but not yet occupied, and boarded-up units.

[2] In this survey, rental housing data only includes the units rented by owners with property management certificates (Dodge, 2009, personal communication).

Brigade's deployment to Iraq in fall 2005 to winter 2006 and to the 685 Soldiers that were relocated from Anchorage (FNSB Community Research Center, 2009). The housing market in FNSB currently does have the capacity to absorb the growth in demand for community housing by military families in the near term (Dodge, 2009, personal communication; Davison, 2009, personal communication).

Schools. Total enrollment in FNSB School District schools for the 2008-2009 school year was nearly 13,200 students, 29 percent of whom were in the elementary schools attended by children living on FWA and Eielson AFB (FNSB School District, 2008).

Elementary school students living on FWA attend either Arctic Light Elementary School located on FWA, Ticasuk Brown Elementary School located in North Pole, or Ladd Elementary School located in Fairbanks (FWA School Liaison website, 2009). The combined enrollment at these schools is 84 percent of their combined capacity, with space for an additional 310 students. Children living on FWA attend Tanana Middle School and Lathrop High School, predominantly civilian schools that are currently at 89 percent capacity (172 spaces available) and 83 percent capacity (236 spaces available), respectively. Other FNSB schools located near FWA, where military families living off FWA are most likely to reside, include Denali, Hunter, Joy, Nordale (all elementary schools) and Barnette (Kindergarten-8th grade), which currently have space for an additional 409 students (FNSB School District, 2008; FWA website School FAQ, 2009).

On-Base public schools at Eielson AFB are Anderson Elementary and Crawford Elementary, with a combined total enrollment of 591 students, and Ben Eielson Junior/Senior High School, with an enrollment of 513 students in the 2008-2009 school year. The estimated capacity for these schools is an additional 218 students. The enrollment at these elementary and junior/senior high schools is currently at 64 and 83 percent of their capacity, respectively (FNSB, 2008).

Medical. Emergency services in Fairbanks include the Airport and University Fire Departments, as well as Chena Goldstream Fire and Rescue (Fairbanks CIS, 2007).

3.8.3.2 Fort Richardson

FRA is located in the Anchorage MSA, which includes the Borough of Matanuska-Susitna as well as the city of Anchorage. Since its establishment in the early 1940s, FRA has grown to 5,163 military personnel (FRA Fact Sheet, n.d.). Other installation figures are located in Table 3.8.a.

As of December 2007, the population associated with FRA included 6,100 military personnel, 7,647 dependents, and 1,179 civilians (civil service and NAF personnel) (FWA PAIO, 2009a).

Since 2004, population at FRA has increased by more than 300 military personnel, 440 family members, and 200 civilian personnel due to Army Transformation. More than 2,100 additional military, 2,900 dependents, and 950 civilians are anticipated as a result of the Grow the Army initiative (USARAK, 2008).

FRA has renovated nearly 20 percent of its family housing inventory over the last decade and renovations are continuing. Family housing at FRA has not yet been privatized under the RCI program. At the adjoining Elmendorf AFB, where family housing has been

privatized, about 250 units are set aside for Army families. In October 2007, 165 Army families lived in Elmendorf AFB housing.

The 2007 *Joint Housing Market Analysis for Fort Richardson and Elmendorf AFB* determined that, based on current inventories and suitable housing projected through 2012, there will be an overall surplus of family housing units in the community to accommodate military growth in the Anchorage area. Elmendorf AFB had a surplus of approximately 875 housing units, while FRA had a deficit of 615 units, for an overall surplus of 260 housing units (Air Force Center for Engineering and the Environment [AFCEE], 2007).

That study also projected a deficit of 798 unaccompanied housing billets for FRA and Elmendorf AFB combined. FRA's projected deficit alone was 417 billets, despite the 200 additional billets expected to be available by 2012.

3.8.3.2.1 Anchorage

The discovery of gold in 1887 and in the Interior in 1922 sparked development in the Anchorage area. The City of Anchorage was incorporated in 1920, and the Matanuska Valley, now part of the Anchorage MSA, was settled by homesteaders in the 1930s. From 1939 to 1957, major military facilities and government construction of roads, airports, and harbors throughout Alaska contributed to the growth of Anchorage. During the 1970s, the Anchorage metropolitan area saw rapid growth as the result of the development of the Prudhoe Bay oil fields and construction of the Trans-Alaska Pipeline.

Population

At 1,698 square miles, Anchorage is Alaska's largest urban area and home to more than 360,000 people, or 53 percent of the State's population (Table 3.8.b). The population density is 161.4 people per square mile, which far exceeds the Alaska average of 1.1 people per square mile (Census, 2006; Anchorage CIS, 2007). The population of Anchorage has grown at an average rate of 1.5 percent annually from 1991 to 2006. According to census data, the rate of population growth in Anchorage from the 1990 to 2000 and from 2000 to 2006 was nearly double the State of Alaska.

Economic Activity

Anchorage is the center of commerce for the State. Oil and gas industries, finance and real estate, transportation, communications, and government agencies are headquartered in Anchorage. Anchorage's economic base now includes more retail trade and a larger service sector based on tourism. Numerous visitor and tourist facilities and services are available in the metropolitan area. Military personnel stationed at FRA and Elmendorf AFB comprise about 2 percent of the total labor force. Seasonal factors contribute to a fluctuating unemployment rate, which was 5.7 percent in 2006 (Anchorage CIS, 2007; BLS, 2006).

Housing and Public Services

Housing. In 2006, there were nearly 138,654 housing units in the Anchorage MSA, with a homeowner vacancy rate (for sale) of 1.4 percent and a rental vacancy rate (units for rent) of 5.4 percent (U.S. Census Bureau, 2006b). According to the 2007 Joint Housing Market Analysis for FRA and Elmendorf AFB, rental vacancies for 2010 are estimated at 5.1 percent, and 75 percent of available housing in Anchorage is projected to be suitable by 2010 (AFCEE, 2007).

Schools. The schools serving students who live on FRA are Ursa Minor and Ursa Major Elementary Schools, Gruening Middle School, and Eagle River High School, with a combined total enrollment (including military and civilian students) of more than 2,000. These schools are currently at 76 percent capacity (202 spaces available), 94 percent capacity (40 spaces available), and 93 percent capacity (64 spaces available), respectively (Anchorage School District, 2008; Cox, 2009, personal communication). The estimated capacity for the schools serving students on FRA is an additional 845 students.

Medical. Acute-care hospitals include Elmendorf AFB Hospital, Alaska Regional Hospital, and several others. There are also numerous public and private medical facilities in Anchorage that provide a full spectrum of patient care (*Fort Richardson Installation Fact Sheet*).

3.8.3.3 Eielson Air Force Base

Eielson AFB is located in the FNSB (Fairbanks MSA), southeast of FWA, and the primary populated areas of Fairbanks.

Population

Since its establishment in 1944, Eielson AFB's resident population has grown from 6,149 in 1970 to 5,400 in 2000. In 2005, 2,442 military personnel were stationed at the Base (Eielson AFB, 2006; Eielson AFB CIS, 2007).

As shown in Table 3.8.a, there were 2,442 active duty military personnel and 551 Air National Guard stationed at Eielson AFB as of FY 2005. These military personnel were accompanied by more than 3,000 family members. The Base employed approximately 800 DA, NAF, and Base Exchange civilian personnel in 2006 (Eielson AFB, 2005). More recent data are unavailable.

Economic Activity

Total military payroll for FY 2005 was more than $166 million ($133 million of which was active duty payroll), while the total civilian payroll (including private business on the Base) totaled nearly $35 million. Other operational expenditures at Eielson AFB added up to more than $29 million in local contracts. Eielson AFB employment and expenditures created an estimated 1,119 indirect/secondary jobs (in businesses supplying the Base and military households), with a dollar value of more than $41 million (Eielson AFB, 2005).

Housing and Public Services

Housing. On-Base housing at Eielson AFB in 2006 included nearly 1,200 family housing units and more than 600 dormitory bed spaces for enlisted personnel (Eielson AFB, 2005; *Eielson AFB Housing Fact Sheet*, 2009). Approximately 3,200 active duty and family members lived on Base, while about 1,800 active duty, Reserve, Guard, and family members resided off Base (Eielson AFB, 2006).

3.9 Soils and Permafrost

3.9.1 Introduction

The following section addresses the baseline conditions of soils and permafrost for the Proposed Action. This subsection evaluates the soil types and presence of permafrost

located in the study area, and focuses on evaluating the soils and permafrost resources that could potentially be adversely affected as a result of implementing the Proposed Action. Soils and permafrost were not an issue of concern during the public scoping process.

3.9.2 Scope

The scope of the soil and permafrost baseline characterization focused on summarizing readily available information for FWA, FRA, Eielson AFB, and the DTA.

All three proposed alternatives include facility construction and demolition at the FWA Main Cantonment, which has the most potential to impact soils and permafrost. No new construction would occur at FRA, Eielson AFB, or on training lands. The proposed training activities are anticipated to have minimal impacts to soils and permafrost because the training activity will be predominantly air-based and will utilize existing training areas and ranges. Because FWA will be the most impacted by all three alternatives due to construction, the scope of this soil and permafrost information primarily focuses on characterizing resources at that installation.

3.9.3 Affected Environment for Soils and Permafrost

3.9.3.1 Fort Wainwright

Parent materials of the soils on FWA generally consist of alluvium, wind-deposited loess, and bedrock (USAG-AK, 2007a). Soils on the Main Post of FWA are primarily Chena alluvium, which is formed in unconsolidated silt-gravel mixed with discontinuous permafrost at variable depths. Organic matter accumulation, oxidation and reduction of iron, and cryoturbation are the major soil-forming processes in the FWA vicinity. Nearly all soils on FWA have an organic layer on the uppermost surface, except where that layer has been removed by flooding or fire events or human disturbance. Swale deposits are located in southern portions of the FWA Main Post, along parts of the Richardson Highway, and generally have high ice content and freeze perennially. The northern portions of FWA, in the foothills of the Yukon Tanana uplands, consist of bedrock that is generally covered by peaty organic material and loess (USAG-AK, 2007a).

Areas where the permafrost layer lies just beneath the soil surface result in soils that have a high-bearing strength when frozen, but are subject to sliding, and difficult to compact when thawed. On FWA, permafrost is present in the lowland areas, on lower slopes of hills, and on north-facing slopes of hills. There is the possibility that permafrost is located in areas of proposed project construction on FWA.

Soils units identified in the Greater Fairbanks Soil Survey (NRCS, 2007), as located within the Brigade and Task Force project footprints (see Figure 2.5.c), consist of urbanized land, Tanana silt loam, and the Salchaket-Typic Cryorthents complex (see Ping et al., 2005). Tanana silt loam has a depth to permafrost of approximately 16 to 47 inches, is poorly drained, has a water table ranging from zero (April-May) to 6-12 inches (June-September) and, therefore, may experience frequent ponding. The Salchaket-Typic Cryorthents complex may also have frequent ponding. Detailed information on soil resources at FWA can be found within the Greater Fairbanks soil survey (NRCS, 2007) and through the FWA Range and Training Lands Assessment program, which surveys Army range lands for training impacts to soils and vegetation.

Other areas of FWA include the TFTA and YTA. These training areas consist of soils that range from coarse gravel to sand and silt. Permafrost (both continuous and discontinuous) is common at the TFTA in areas where there is an absence of circulating groundwater and generally is not present beneath rivers and lakes. The permafrost layer at TFTA is very susceptible to disturbance and subsequent thermokarst; thus, training activities at TFTA tend to be limited to winter months and aerial maneuvers. The YTA maintains soil characteristics of both the DTA region as well as FWA. Permafrost is typically found on the north-facing slopes and in poorly drained low-lying areas, and is generally regarded as discontinuous at YTA. South-facing slopes are well drained and "thin," and do not tend to be underlain with permafrost (USAG-AK, 2007a).

3.9.3.2 Fort Richardson

Soils at FRA are generally shallow, immature, and deficient in the primary plant nutrients of nitrogen and phosphorous. Coarse gravels and larger rock fragments are present in all soil horizons; as a result, these soils often have low water-retention capability. FRA consists of less than 1 percent permafrost. Permafrost at FRA occurs primarily in patches of forested bogs near Muldoon Road, with some persisting at high elevations (USARAK, 2004a). No portion of the Proposed Action has the possibility of impacting soils or permafrost at FRA.

3.9.3.3 Eielson Air Force Base

Eielson AFB lies within the Tanana River Valley. Soils in this area consist of unconsolidated silty sands and gravels, organic and sandy silts, and clays. Discontinuous permafrost covers approximately two-thirds of Eielson AFB. A large percentage of vegetated wetlands occur on Eielson AFB due to the prevalence of permafrost (Eielson AFB, 2007). Eielson AFB is immediately adjacent to the YTA, and the installations share many soil resource functions and incompatibilities to aviation training activities.

3.9.3.4 Donnelly Training Area

DTA soils are generally derived from glacial actions and have been modified by streams, wind, and the presence of discontinuous permafrost. Soils at DTA range from thin to moderately thick wind-blown loess underlain by gravelly silts and sands, to soils in outwash plain areas that have a moderately thick to very thick loess mantle underlain by sands and gravels. Heavy sediment loads of silt, sand, and gravel are often found deposited in braided stream channels and floodplains, as most flowing waterways are fed via glacial runoff. Silty soils tend to inhibit drainage and cause level land areas to hold moisture and develop thick organic mats, which subsequently lower the soil temperature and favor permafrost formation (USARAK, 2006). Permafrost on DTA is highly patchy and irregular, especially in areas with abrupt slope changes. Permafrost prediction is difficult because of the highly variable sediment types, topography, and microclimates found on DTA (USARAK, 2004a).

3.10 Water Resources

3.10.1 Introduction

Topics discussed in this section include surface water and groundwater resources, and their associated quality and quantity aspects. Water quality at the installations listed under the Proposed Action is regulated according to the following State and federal standards:

- CWA of 1977 (33 U.S.C. 1251 et seq.)
- Protection of Wetlands, E.O. 11990 (White House, 1977)
- Floodplain Management, E.O. 11988 (42 FR 26951, 3 CFR, 1977)
- Alaska Water Quality Standards (18 AAC 70)
- Safe Drinking Water Act (SWDA) (42 U.S.C. 300f et seq.)
- State of Alaska Drinking Water Standards (18 AAC 80)
- Storm Water Discharges Associated with Industrial Activity [40 CFR 122.26(b)(14)(ii)]
- National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges From Construction Activities [40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15)]

Impacts to water resources were not raised as a topic of concern during the public scoping process.

3.10.2 Scope

The scope of the water resources (surface water and groundwater) baseline characterization focused on summarizing readily available information for FWA (to include DTA), FRA, and Eielson AFB. Both action alternatives include facility construction and demolition at FWA, which has the most potential to impact water quality and floodplains. Minimal impacts to water resources are anticipated from the proposed training activities because the training activity will be predominantly air-based and will utilize existing training areas and ranges. Because FWA to include DTA will be the most utilized installation by the incoming aviation unit, the scope of this water resources characterization is primarily focused on defining resources for FWA. Floodplain characterization is included solely for FWA because the only activities included as part of the Proposed Action that could affect floodplains would occur at FWA.

3.10.3 Affected Environment for Water Resources

3.10.3.1 Fort Wainwright

A majority of FWA's Main Post lies within the Chena River watershed. The Chena River and its major tributary, Chena Slough, are the primary receiving water bodies for surface water drainage from the Cantonment. All designated uses apply to the Chena River and its tributaries within FWA. These beneficial uses include water supply (drinking, agriculture, aquaculture, and industrial), water recreation, and growth and propagation of aquatic life

and wildlife (ADEC, 2006a). A portion of the Chena River, specifically the reach from the confluence of the Chena River and Chena Slough to the confluence of Chena River and Tanana River, is use-protected for all designated uses with the exception of drinking water supply (ADEC, 2006a). Approximately 15 miles of the Chena River, which runs through FWA and Fairbanks, have been on the Section 303(d) list of impaired waters since 1990. The primary pollutants of concern in the Chena River are petroleum hydrocarbons, oil and grease, and sediment from urban runoff sources (ADEC, 2006b). ADEC is currently reviewing data in order to determine a total maximum daily load (TMDL) for the Chena River and expects to complete a TMDL for the Chena River in 2010 (Giller, 2009).

Surface water flow at FWA fluctuates seasonally. From October to May, flow is generally limited to seepage of groundwater from aquifers to the streams. Surface water flow is greatest in June and July, as a result of snowmelt that typically begins in March and April. During August and September, water flows are generally sustained by rainfall (USAG-AK, 2007a). Water from the Chena River is not used as a source of drinking water. Its primary use is for recreation and fishing activities (USAG-AK, 2007a).

The TFTA is located immediately south of FWA and it occupies the land between the Tanana and Wood rivers. The Tanana River and its several tributaries drain the north, northeast, and southern portion of the TFTA. The western portion of the TFTA drains primarily to the Tanana River, and some drainage flows west to the Wood River. All designated uses apply for the Tanana and Wood rivers within the TFTA. ADEC has limited information on the receiving water bodies for the TFTA to make an attainment or impairment determination at this time (ADEC, 2008b).

The western boundary of YTA adjoins the eastern boundary of Eielson AFB and is bordered on the north by the Chena River State Recreation Area. The north and northeast portions of the YTA are drained by the Chena River and its several tributaries. The southern portion of the YTA is drained by Ninety-Eight Creek and several small tributaries that feed into Salcha River, which eventually flows into the Tanana River. The western portion of the YTA drains into the Little Salcha River, French Creek, and Moose Creek then flows west to the Tanana River. All designated uses apply for the Tanana and Wood rivers within the YTA. ADEC has limited information on the receiving water bodies for the YTA to make an attainment or impairment determination at this time (ADEC, 2008b).

FWA's Main Post and the TFTA have permeable soils and shallow groundwater that readily interact with surface water. Main Post is underlain by an alluvial aquifer that is recharged by the Tanana River. Groundwater potential is best along the alluvial banks of the Tanana River, where, at less than 200 feet in depth, wells may yield 3,000 gallons per minute (gpm). Groundwater potential in the hills of the YTA is much lower, where wells may yield 50 gpm at the same depth. High metal concentrations of naturally occurring iron and arsenic have been found in the groundwater at FWA. High arsenic levels are prevalent in the upland areas. With the exception of high levels of metals, groundwater quality is good in the Main Post area of FWA (USAG-AK, 2007a). Fairbanks and FWA obtain 100 percent of public-supply water from groundwater sources. Of the water withdrawn in Fairbanks, two-thirds is suitable for domestic use, and the other one-third is for thermoelectric power use. There is generally a spike in water usage during the summer months, which is probably due to increased commercial and industrial activity and seasonal climatic effects (Meyer, et al., 2004).

Historical industrial operations related to Army activities at the FWA Main Post have resulted in groundwater pollution. This pollution is generally associated with USTs, chemical storage facilities, and chemical pollution that occurred in the early days of the installation. There are no indications of deep groundwater pollution, and the recent trend of restoration projects has served to mitigate past damage to groundwater quality (USAG-AK, 2007a).

Water resource management is a major priority for USARAK. FWA conducts regular planning-level surface water surveys as well as annual surface and groundwater monitoring. FWA is up to date on all SDWA and CWA permits, and has received no Notice of Violations (NOVs) in the recent past. FWA prepared a *Storm Water Pollution Prevention Plan* (SWPPP) (USAG-AK, 2000) and an addendum thereto in 2009 in compliance with its Storm Water Multi-Sector General Permit for Industrial Activities (hereafter called the Multi-Sector General Permit or MSGP). The current permit became effective on July 12, 2001, and is expired. FWA filed a Notice of Intent to update and renew its MSGP and, until issuance of the new permit by EPA Region 10, operates under the most recent permit (personal communication, Adams, 2009). The SWPPP and addendum include requirements for storm water sampling and analysis as well as regular facility inspections. To address the impairment of water quality in the Chena River, FWA will sample and analyze annually for petroleum hydrocarbons and oil and grease at appropriate outfalls if the initial analysis during the first year of the new permit shows that these pollutants are present above natural background levels.

The MSGP lists the major activities conducted at FWA that have the potential to generate storm water pollutants as well as the BMPs that are being implemented to avoid or minimize the potential for storm water pollution. FWA industrial facilities fall under five sectors described in the MSGP: Sector J (Non-Metallic Mineral Mining and Dressing); Sector K (Hazardous Waste Treatment, Storage, or Disposal); Sector L (Landfills, Land Application Sites, and Open Dumps); Sector S (Air Transportation); and Sector X (Printing and Publishing). Typical BMPs include maintaining an organized inventory of material used; draining all parts or containers of fluids prior to disposal; prohibiting the practice of hosing down the apron or hangar floor; and using dry cleanup methods.

FWA is regulated as a small municipal separate storm sewer system (MS4). As part of the MS4 permit application, FWA prepared a draft *Storm Water Management Plan* (SWMP) (USAG FWA, 2008). As a small MS4, FWA is required to design, implement, and enforce a storm water management program to reduce the discharge of pollutants to its storm sewer system to the maximum extent practicable for the protection of the Chena River and other waters of the United States. The SWMP describes the actions and activities FWA has already implemented and those that FWA intends to implement to meet this goal. After the MS4 permit is issued, the draft SWMP will be modified to reflect permit requirements. Existing and planned storm water programs at FWA include the following:

- Installation of oil-water separators (OWS) and wash water treatment/recycling systems at a variety of facilities. Interior floor drains and facility wash racks connect to the OWS which direct collected oil to storage tanks. Collected oil is periodically pumped and properly disposed. The OWS direct the treated water to the sanitary sewer. Increasingly, vehicle maintenance is conducted indoors where spills and leaks are contained and directed toward OWS to avoid contact with storm water.

- FWA is developing a *Storm Water Pollution Prevention Guidance for Construction Activity Manual* and plans its release during the spring of 2010. This manual will contain detailed guidance for contractors that design and construct projects at FWA. It will assist with the selection of erosion control measures and BMPs used during construction as well as for permanent storm water management at FWA, such as vegetated buffers for runoff dispersion, vegetated swales, and storm water wetlands. The Army requires that construction contractors obtain the necessary state permits.

E.O. 11988, *Floodplain Management*, was established in 1977 "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." All federal and federally supported activities are required to comply with E.O. 11988.

Drainage channels at FWA were created as part of the Chena River Flood Control Project to control flooding along the Chena River. The Chena River Flood Control Project was begun after a 1967 flood, when unusually heavy rains swelled the Chena River and its tributaries 6 feet above their flood stage. The project protects Fairbanks and adjacent areas, including FWA, from recurring flood damage from the Chena and Tanana rivers. The project is made up of a dam and a levee system 20 miles east of Fairbanks, which includes concrete outlet works and flood gates. During normal fluctuations of the Chena River, the outlet works remain open, allowing the natural flow of water. At periods of high water, the floodgates are lowered, directing excess water to the Tanana River (USACE, 2008). Flood Channel B was created as part of the flood control effort, connecting the floodplains of the Chena and Tanana rivers. Clear Creek flows to the west within developed portions of the Main Post through a channelized ditch and ultimately empties into the Chena River.

3.10.3.2 Fort Richardson

Surface water resources on FRA consist of numerous streams, lakes, ponds, a saltwater tidal bay, and two freshwater aquifers. The South and North Fork of Campbell Creek, Ship Creek, Eagle River, Chester Creek, McVeigh Creek, and Clunie Creek traverse the FRA and flow west into the Knik Arm. Drainages to the Knik Arm are protected for all designated uses. These beneficial uses include water supply (drinking, agriculture, aquaculture, and industrial), water recreation, and, growth and propagation of aquatic life and wildlife (ADEC, 2006a).

Ship Creek (from the Glenn Highway Bridge to the mouth) is listed as a Category 4a water body by ADEC, which means it is an impaired water with an EPA-approved total maximum daily load (TMDL). A TMDL for fecal coliform bacteria impairment on Ship Creek was developed and approved by EPA in March 2004. Ship Creek remains on the Category 5/ Section 303(d) list due to petroleum product impairment (ADEC, 2008b). According to ADEC studies, most of the pollutants entered Ship Creek as non-point sources from surface water runoff and groundwater downstream of FRA, where the watershed is increasingly urbanized. The upper portions of Ship Creek, above the dam on FRA, are considered pristine (USARAK, 2004a).

Eagle River has never been Section 303(d) listed, but a TMDL for ammonia and metals was completed by EPA on April 12, 1995. This was done to support the NPDES permit for the

wastewater treatment facility that discharges to the river. The USGS measured Eagle River water quality upstream of the FRA boundary until 1981. Based on water quality parameters, Eagle River was found to be typical of a pristine glacial-fed stream in Alaska (USARAK, 2004a).

The Municipality of Anchorage operates the Eagle River Wastewater Treatment Facility, a publicly owned treatment works in Eagle River, Alaska. The facility provides secondary treatment prior to discharging the effluent into Eagle River approximately 1.5 river miles west of Glenn Highway and upstream from ERF. The plant receives primarily domestic wastewater from local residents and commercial establishments in Eagle River (EPA, 2005). The Eagle River facility has been operating under the NPDES permit program since 1974.

In conjunction with the NPDES permit process, TMDLs were established for copper, lead, silver, ammonia, and chlorine in Eagle River. The Eagle River facility has reported compliance with effluent limitations for the past 8 years. The facility collected background data in accordance with the 1995 permit to determine whether TMDLs for metals should be changed based on the ambient metals concentrations in the receiving water. The initial study completed in 1998 included the analysis of copper, lead, silver, and zinc as required by the permit. Total recoverable concentrations of all four metals were found to be directly correlated to Eagle River's suspended sediment concentrations and flow, with the highest concentrations occurring during the summer glacial-melt period and the lowest concentrations occurring during the winter months. Dissolved concentrations of all four metals were found to be very low when compared to EPA water quality criteria. Total recoverable concentrations of copper and lead were found to be elevated with respect to the State of Alaska total recoverable criteria during the summer months as a result of the naturally high suspended sediment loads (EPA, 2005).

The upper Ship Creek watershed serves as a source of drinking water for FRA as well as Elmendorf AFB and the Municipality of Anchorage. The FRA dam creates a reservoir behind Ship Creek that holds a maximum capacity of 5 million gallons of water.

Two freshwater aquifers underlie most of FRA. The upper aquifer lies in well-bedded and well-sorted gravel, approximately 30 to 100 feet from the surface. The upper aquifer generally can be accessed at less than 50 feet.

Industrial activities associated with USARAK's use of FRA have had some effects on groundwater. Monitoring has found pollution associated with USTs, chemical storage facilities, and chemical dumpsites. FRA has been identified as a CERCLA site. Specific areas are currently monitored intensively, and no indication of deep groundwater pollution has been detected. Pollution has been minor and localized, and no significant risks to human health have been found. Water quality has improved recently due to Army restoration projects to mitigate previous damage to the groundwater quality (USARAK, 2004a).

3.10.3.3 Eielson Air Force Base

Surface water on Eielson AFB includes streams, wetlands, and lakes. Most of the ponds and lakes on Eielson AFB are manmade. Lilly Lake is the only natural lake on the installation. Five streams drain the main Base and discharge via the Garrison Slough and Piledriver Slough to the Tanana River (Eielson AFB, 2007). The Piledriver Slough and Tanana River are protected for all designated uses. These beneficial uses include water supply (drinking,

agriculture, aquaculture, and industrial), water recreation, and growth and propagation of aquatic life and wildlife (ADEC, 2006). ADEC has limited information on the receiving water bodies for Eielson AFB to make an attainment or impairment determination at this time (ADEC, 2008).

An aquifer, greater than 250 feet thick, extends under Eielson AFB. Water in the aquifer has a gradient of approximately 5 feet per mile, and flows to the north and northwest. The water table varies from approximately 10 feet below the ground surface to the surface. The aquifer is used as the source of drinking water on Base. Eielson AFB has eight water wells, five of which supply potable water. Although the overall quality of groundwater is good, contaminants have been identified beneath the industrial areas. Monitoring of groundwater at Eielson AFB is included in the Base IRP (Eielson AFB, 2007).

3.10.3.4 Donnelly Training Area

The DTA includes DTA West, DTA East, and two outlying parcels: GRTA and BRTA. Surface water resources on the DTA consist of numerous rivers, streams, ponds, and lakes. The training area lies entirely within the Tanana River drainage basin. DTA West is drained by three major tributaries to the Tanana River: Little Delta River, Delta Creek, and Delta River. DTA East is drained primarily by Jarvis Creek, which flows northwest into the Delta River eventually flowing into the Tanana River. The Black Rapids Training Area is located south of DTA West, and is drained by several small tributaries to the Delta River. Sawmill Creek and several small tributaries, which flow northeast to the Tanana River, primarily drain the GRTA. Drainages within the DTA are protected for all designated uses. These beneficial uses include water supply (drinking, agriculture, aquaculture, and industrial), water recreation, and growth and propagation of aquatic life and wildlife (ADEC, 2006a). ADEC has limited information on the receiving water bodies within the DTA to make an attainment or impairment determination at this time.

The volume of stream flow fluctuates dramatically by season. From October to May, flow is limited to groundwater seepage from aquifers into streams, and many small streams freeze solid (zero discharge). In particular, Jarvis Creek ceases to flow at the Richardson Highway during the winter. Stream flow further upstream is converted to winter river icing or "aufeis." Aufeis is an ice sheet that forms on a floodplain in winter (as the normal channels freeze solid or are otherwise dammed so that water spreads out over the surface and also freezes). Aufeis can accumulate to several meters in thickness over a winter and cover large areas of the active floodplain in braided streams such as the Delta River and Jarvis Creek. Snowmelt typically begins in May and reaches its peak in June, followed by the peak melting of glaciers in July. After July, most of the snow has melted at higher elevations, and rainfall sustains a steady flow during August and September.

The principal groundwater aquifer of DTA and the Delta Junction area is in the permeable sands and gravels of the broad coalescing alluvial fan or outwash plains that run from the Alaska Range north to the Tanana River. The alluvial aquifer system is recharged from streams and from infiltration of precipitation. Most recharge occurs in late spring and early summer, when ground thawing permits penetration of melt water and flow increases in surface streams. Most surface water bodies of DTA, including Jarvis Creek and the Delta River, lie above the aquifer, and a considerable portion of their flow infiltrates from the streambeds to the groundwater table.

The water table slopes north at gradients ranging from 1 to 25 feet per mile, a lower gradient than the slope of the ground surface. Consequently, the depth to the water table decreases down slope from nearly 400 feet near the mountains to 180 feet in the vicinity of Fort Greely to 80 feet at Delta Junction and to 10 feet at Big Delta at the Tanana River. Annual fluctuations of the water table depth ranges from 50 to 60 feet in the Fort Greely area to 2 to 3 feet at Big Delta. Data from the northern portion of DTA indicate that groundwater levels are lowest in late May or early June, after which recharge from surface waters reaches the aquifer. The groundwater levels rise through the summer and peak in October after which the rivers freeze and recharge ceases (Wilcox, 1980). The thick sand and gravel alluvium result in high transmissivity for the aquifer.

Well yields at DTA are as high as 1,500 gallons per minute (Wilcox, 1980). In the northern, western, and eastern portions of DTA, as the aquifer approaches the surface and the Tanana River, water is discharged from the alluvial aquifer system to the surface water system, often as springs. Clearwater River and Clearwater Lake are almost entirely spring fed. This is substantiated by the fact that these areas remain unfrozen during the winter months because of the inflow of relatively warm (40° F) groundwater. Springs are also present near the mouth of the Delta River (Wilcox, 1980).

Although surface water is abundant in the Tanana River Basin, most of DTA's potable water is obtained from groundwater wells. The largest potential groundwater supply is in the floodplain alluvium along the Little Delta River, Delta River, Delta Creek, and Jarvis Creek, and in alluvial fans extending along northern flanks of the Alaska Range. The surface to groundwater depth at DTA is between 100 and 210 feet, and most DTA wells draw water from unconfined aquifers in unconsolidated alluvial deposits. Groundwater recharge seeps from glacier-fed streams.

Population density near DTA is sparse. Few wells have been drilled on the installation, and data for groundwater quality are limited to areas in the immediate vicinity of the Fort Greely Main Post. Most of the available groundwater quality data were obtained during the early 1950s through the 1970s, and appear to provide a reasonable estimate of the region's natural groundwater quality. Available data indicate that groundwater quality is good at DTA. All measurements were below concentrations recommended by the Alaska Drinking Water Standards.

3.11 Subsistence and Recreation

3.11.1 Introduction

The following section addresses the baseline conditions of subsistence and recreation for the Proposed Action. This subsection evaluates the availability and accessibility of customary useful subsistence and recreation resources in the study area, and focuses on evaluating the subsistence and recreation resources that could potentially be adversely affected as a result of implementing the Proposed Action. Subsistence and recreation were identified as resources to be evaluated during the public scoping process.

Subsistence entails the customary and traditional use of regional natural resources needed to meet the requirements of a rural existence. Subsistence is prevalent in many parts of rural Alaska and involves harvesting resources, such as fish, animals, plants, and wood, for direct

consumption rather than obtaining those goods through commercial markets. Title VIII of Alaska National Interest Lands Conservation Act (ANILCA) obligates federal agencies to manage their lands so as to provide procedural requirements designed to perpetuate customary and traditional subsistence activities on federal land and by giving rural Alaskans preference in the taking of fish and wildlife on federal lands, particularly when resources are scarce (16 U.S.C. 3114).

Subsistence use of fish and game is an important social and economic value in rural Alaska, and the Army has provided subsistence access on most USARAK lands. USARAK (2002a) provides a detailed discussion of subsistence requirements and implementation on USARAK lands.

USARAK lands in Alaska also support a number of outdoor recreational activities, including fishing, hunting, hiking, and riding off-road recreational vehicles. USARAK recognizes the valuable resource the military lands have to offer for outdoor recreation and the quality of life for the stationed military personnel. USARAK, therefore, allows Soldier and public access to military lands for recreational purposes under specific conditions, including obtaining a Recreational Access Permit and following military rules and regulations while visiting military lands. USARAK (2002a) provides a detailed discussion of recreational use requirements and implementation on USARAK lands.

USARAK has a primary mission to maintain and enhance the combat readiness of its Soldiers. However, within the military mission priority, USARAK strives to allow public access to military lands, providing both civilians and military personnel with subsistence and recreational opportunities. Approximately 9 percent of Army lands are closed to hunting and fishing because of IA hazards. The remaining 91 percent of lands are open to recreational and subsistence use (USARAK, 1999) when the Army is not conducting military training.

3.11.2 Scope

The scope of the subsistence and recreation baseline characterization focused on summarizing readily available subsistence and recreation information for FWA, outside the Cantonment; YTA; TFTA; DTA East; DTA West; FRA, outside the Cantonment; Elmendorf AFB, outside the Cantonment; and adjacent areas accessed by roads across the military lands that may be closed due to the Proposed Action.

Both FRA and FWA are situated in urban areas and, therefore, are not subject to ANILCA subsistence requirements. For safety and availability reasons, outdoor recreation (e.g., fishing, hunting, and hiking) does not occur within the cantonment areas of these two installations. Additionally, use of helicopters would not affect access to or directly affect the abundance of subsistence or outdoor recreation resources within the flight routes. Therefore, cantonment areas and helicopter flight routes are not addressed in this evaluation.

The potential presence of additional aviation personnel (Soldiers, dependents, and civilians) and military training activities were considered in the evaluation of potential impacts to subsistence and outdoor recreation resources. Additionally, the presence of aviation assets and facilities construction and demolition that would occur outside of the Cantonments and flight routes were considered in this evaluation.

3.11.3 Affected Environment for Subsistence and Recreation

Regional rural populations with recognized subsistence interests on USARAK lands include the Native Village of Eklutna, Nenana, Healy Lake, Delta Junction, Big Delta, Dry Creek, Dot Lake, Cantwell, Monto, Tanana, McKinley Village, and Fort Yukon. Gathering information regarding subsistence activities on and around USARAK lands is an ongoing process (USARAK, 2004a).

Because of security and safety concerns, all public access onto Army-managed property is controlled. The public is required to obtain a Recreational Access Permit (RAP) before entering military lands. With a permit, private citizens may access Army training lands through the U.S. Army Recreational Tracking (USARTRAK) automated phone system. Individuals can call to learn which areas are open for public use, and to inform military officials which areas they will be accessing. When individuals use USARTRAK to check in, the latest information on closures can be obtained. Closure information is also listed in weekly bulletins and provided in radio announcements. More information on USARTRAK may be found in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

Subsistence resources are readily available on FWA, YTA, TFTA, DTA West, and DTA East. Due to the size and relatively remote location of these areas, natural resources and wildlife populations are fairly well preserved (USARAK, 2004a).

USARAK lands are also available for a variety of recreational uses, such as hunting, fishing, trapping, off-road recreational vehicle use, camping, hiking, picnics, berry picking, bird watching, skiing, and dog sledding. Due to their acreage, condition, and proximity to population centers, Army lands are popular recreational destinations for Alaska residents. A full description of recreation opportunities of USARAK lands is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

USARAK lands can be accessed by ground vehicles, which are the most popular mode of access and are allowed on maintained roadways. Ground vehicles must obey all Army rules and regulations, and are not allowed in Restricted Areas. Boat access is allowed in some areas of the USARAK, but boats may not be operated in Restricted Areas. Off-road recreational vehicles (ORRV) include those motorized vehicles that do not require maintained roads (e.g., snowmobiles, all-terrain vehicles, and airboats). ORRV use is allowed on maintained roadways and trails in designated areas, but ORRVs may not be used to gain access to Restricted Areas. Aerial access is allowed over USARAK lands, subject to restricted airspace and closures. Aerial vehicles are prohibited from landing in Restricted Areas on USARAK lands. Illegal entry onto USARAK is the most common form of trespass. Crossing the installation boundary or the internal boundary of an off-limits area without approval constitutes trespass. USARAK (2004a) provides a detailed discussion of access on USARAK lands.

Public use is limited on some areas of Army lands in Alaska, including temporary recreational use restrictions. These closures are due primarily to military training exercises, but may include recreational use closure, or seasonal closures, on those properties that could result in a possible increased risk of accidental injury. Information about closures is available through the USARTRAK automated check-in phone system (USARAK, 2004a).

USARAK has defined five primary categories of use areas on its lands: Open Use, Modified Use, Limited Use, and Off-Limits Areas. All of these recreational categories are subject to periodic change or restrictions. The four general categories of Off-Limits Areas affecting public access are 1) Urban Areas, 2) Training Areas and Non-Firing Facilities, 3) Firing Ranges, Surface Danger Zones, and Non-dudded IAs, and 4) Duded IAs. The military is required to post warning signs near all permanently closed and/or dangerous areas. A more detailed description of USARAK lands access is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

3.11.3.1 Fort Wainwright

3.11.3.1.1 Subsistence

FWA training areas (YTA and TFTA) fall in the traditional lands of Tanana and Tanacross Athabaskans. Fish and moose continue to play a primary role in subsistence preparations for winter, and plant gathering continues to be a focus in the spring, summer, and fall for these native groups (USARAK, 2004a).

Subsistence users may access FWA under USARAK's current recreational use policy. FWA training areas host a variety of hunting and trapping activities. Customary traditional use has been determined for the following species: brown bear, moose, beaver, coyote, red fox, hare, lynx, marten, min and weasel, muskrat, otter, wolf, wolverine, grouse, and ptarmigan. Subsistence permits can be obtained for the take of these species. Additional information regarding proximity, access, resource availability, and seasonal restrictions for FWA subsistence activities are provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

3.11.3.1.2 Recreation

Access is allowed on many parts of the FWA Main Post, and roads and trails are plentiful. Access to TFTA is more difficult, which is bordered by the Tanana and Wood rivers. There are no bridges to TFTA. Summer access is by boat or plane and winter access is by ground vehicles over constructed ice bridges. YTA is readily accessible from the ground; access is primarily available via Manchu Road and additional access is possible via Johnson Road. Areas on the FWA Main Post, TFTA, and YTA are off-limits to public access and use (USARAK, 2004a). A more detailed description of access and restrictions is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

The following recreation activities are allowed on the FWA Main Post, TFTA, and YTA (USARAK, 2004a):

FWA Main Post:

- Hunting
- Fishing
- Trail Use

TFTA:

- Hunting
- Trapping

- Fishing
- Trail Use

YTA:

- Hunting
- Trapping
- Fishing
- Trail Use

A more detailed description of the outdoor recreation activities on the FWA Main Post, TFTA, and YTA is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

3.11.3.2 Donnelly Training Area

3.11.3.2.1 Subsistence

Healy Lake residents live a subsistence lifestyle. The towns of Delta Junction and Big Delta are rural and, therefore, qualify for subsistence preference under current law. Additionally, a number of residents of Dry Creek can be characterized as subsistence hunters/trappers, and some residents of Dot Lake travel the extra distance to hunt on DTA (USARAK, 2004a). Areas on DTA are off-limits to public access and use (USARAK, 2004a). A more detailed description of access and restrictions is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

Subsistence users may access FWA under USARAK's current recreational use policy. DTA annually hosts a variety of hunting activities based on access and available big game populations. Customary and traditional use have been determined for the following species: brown bear, moose, beaver, coyote, red fox, hare, lynx, marten, mink and weasel, muskrat, otter, wolf, wolverine, grouse, and ptarmigan. Subsistence permits can be obtained for the take of these species. Anadromous fish stocks are not available on the training areas, but other freshwater fish can be harvested. Additional information regarding proximity, access, resource availability, and seasonal restrictions for DTA subsistence activities are provided in the *Final for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

3.11.3.2.2 Recreation

Access is readily available to DTA, especially on and around eastern DTA. Meadows Road, Dome Road, Old Richardson Highway, and Fleet Street, as well as additional access available through the DTA Cantonment, have been historically available. Aerial and ORRV access is also available to much of the DTA. DTA West is only accessible in the winter when the Delta River is frozen over, or by air or boat (USARAK, 2004a). Areas on DTA are off-limits to public access and use (USARAK, 2004a). A more detailed description of access and restrictions is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

The following recreation activities are allowed on DTA (USARAK, 2004a):

- Hunting
- Trapping

- Fishing
- Trail Use

A more detailed description of the outdoor recreation activities on DTA is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

3.11.3.3 Fort Richardson

3.11.3.3.1 Subsistence

FRA lies within the traditional lands of the Dena'ina, northern Athabaskan Tribes of Cook Inlet. The only Dena'ina village remaining in the vicinity of FRA is the Native Village of Eklutna. However, the Native Village of Knik and other communities from further up the Knik Arm traditionally traveled to the Anchorage area with the June king salmon runs. It is known that many communities in the Cook Inlet region traditionally used a variety of subsistence resources that are present today on the FRA. Contemporary communities extend through kinship ties into Eagle River and Anchorage, for example. It is hoped that a better understanding of subsistence use and traditional use areas on FRA will be gained through ongoing coordination efforts (USARAK, 2004a).

The Federal Subsistence Board has delineated an FRA and Elmendorf AFB Management Area (consisting of FRA and Elmendorf military reservations). Under the "special provisions" for Management Unit 14, the FRA and Elmendorf Management Area are closed to subsistence taking of wildlife (Subsistence Management Regulations 2002-2003). Subsistence take under the customary and traditional use determinations are permitted for areas in Management Unit 14C other than FRA and Elmendorf AFB. Hunting on FRA is permitted under State of Alaska regulations. Additional information regarding proximity, access, resource availability, and seasonal restrictions for DTA subsistence activities are provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

3.11.3.3.2 Recreation

Access is available on much of FRA and Elmendorf AFB. In addition, USARAK allows non-commercial rafting by permit along Eagle River to enter FRA (USARAK, 2004a). Areas on FRA are off-limits to public access and use (USARAK, 2004a). A more detailed description of access and restrictions is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

The following recreation activities are allowed on FRA (USARAK, 2004a):

- Hunting
- Fishing
- Trail Use

A more detailed description of the outdoor recreation activities on FRA is provided in the *Final EIS for Transformation of the U.S. Army Alaska* (USARAK, 2004a).

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