

5.0 CUMULATIVE EFFECTS

Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) require that the cumulative impacts of a proposed action be assessed. A cumulative impact is defined as the following:

“...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 Code of Federal Regulations [CFR] § 1508.7)

CEQ’s guidance for considering cumulative effects states that NEPA documents “should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant” (CEQ 1997). The first step in assessing cumulative effects therefore, involves identifying and defining the scope of other actions and determining their interrelationship with the proposed action. The scope must consider whether other projects coincide with the location and timetable of the proposed action and other actions. Past, present, and reasonably foreseeable future actions are examined, including both military actions in the region as well as other federal and non-federal actions to determine if they interact with the Proposed Action Alternative. After examining these actions, the analysis determined the nature of the interaction. An analysis of how the impacts of the defined actions might affect or be affected by those resulting from the action are discussed in this Environmental Impact Study (EIS).

To ensure a rigorous assessment of potential cumulative impacts, this analysis sought information on military actions, other federal actions, and non-federal actions in the Fairbanks North Star Borough (FNSB). Public documents prepared by federal, state, and local governments formed the primary source for defining actions. Scoping also provided an opportunity to gain insight into such actions. Documents used to define these other actions included notices of intent, EISs, and environmental assessments, management and land use plans, ordinances, other NEPA studies, and economic and demographic projections.

At Eielson Air Force Base (AFB), information was gathered from base planners, environmental managers, and operations staff. Community representatives and state and federal land managers provided information on actions outside the base in the surrounding areas. For the ranges and airspace, primary sources of information consisted of the managing and scheduling entities, as well as federal and state agencies with lands underlying the Joint Pacific Alaska Range Complex (JPARC) airspace.

Eielson AFB is an active military installation that undergoes changes in missions and training requirements in response to defense policies, current threats, and tactical and technological advances. The base, like any other major institution (e.g., university, industrial complex), requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs. In addition, tenant organizations may occupy portions of the base, conduct aircraft operations, and maintain facilities. All of these actions (i.e., mission changes, facility improvements, and tenant use) would continue to occur before, during, and after the Proposed Action Alternative is implemented. For purposes of this analysis, the timeframe bounding the cumulative analysis spans from 2016 (when facility construction supporting

the F-35A beddown would begin) and ends in 2021, when both F-35A squadrons would be fully operational.

5.1 Past and Present Actions Relevant to the Proposed Action Alternative

This EIS provides decision makers with the cumulative effects of the Proposed Action Alternative; as well as, the incremental contribution of past, present, and reasonably foreseeable actions. Recent past and ongoing military action in the region were considered as part of the baseline or existing conditions in Chapter 3. As they impacted the F-35 Beddown at Eielson AFB, these actions were analyzed in Chapter 4.

5.1.1 Department of Defense Actions

Several military actions that could affect the F-35 beddown analysis are listed in Table 5.1-1. A past action included adding the 50th Engineer Battalion to the 1st Stryker Brigade Team, 25th Infantry Division at Fort Wainwright in late 2014 (Fairbanks News Miner 2014). This brought an estimated 550 more personnel to the Fort. Future actions include the Infrastructure and Operational Support for the 25th Aviation Regiment Company D Unmanned Aircraft System (or Gray Eagle), Army Force Structure Realignment at Fort Wainwright, establishment of the Long Range Discrimination Radar at Clear Air Force Station (Department of Defense [DoD] 2015), and the addition of six interceptor missiles at Fort Greely (Defense Industry Daily 2015).

Table 5.1-1. DoD Past, Present, and Reasonably Foreseeable Actions

<i>Project Name/Description</i>	<i>Planned Year of Implementation</i>	<i>Resources Potentially Affected</i>	<i>Magnitude of Impact</i>
50th Engineer Battalion	2014	Socioeconomics	Not Significant
Long Range Discrimination Radar at Clear Air Force Station	2015-2020	Air Quality, Socioeconomics	Not Significant
Six Interceptor Missiles Added at Fort Greely	2015-2020	Air Quality, Socioeconomics	Not Significant
Army Force Structure Realignment at Fort Wainwright	2016-2018	Air Quality, Socioeconomics	Not Significant
Infrastructure and Operational Support for the 25th Aviation Division	2017-2019	Airfield and Airspace Operations and Management, Acoustic Environment, Air Quality	Not Significant

The Army evaluated two alternatives for operating the Gray Eagle Unmanned Aerial Vehicles (UAVs): operate them permanently out of Fort Wainwright or out of Eielson AFB. The proposed action would bring about 130 military personnel to the area and operate UAVs in the local special use airspace. Construction activities would take place between Fiscal Year 2017 (FY17) and FY19 (United States [U.S.] Army 2015). The Finding of No Significant Impact (FONSI) announced that Fort Wainwright was the preferred alternative (U.S. Army 2015).

In early July 2015, the Army announced troop reductions at Fort Wainwright, which were substantially less than estimates of 5,800 military personnel reduction made in 2014. The July announcement identified only 73 military positions would be eliminated (Army Times 2015).

To date, no environmental documentation is associated with the Long Range Discrimination Radar at Clear Air Force Station and expansion of the Missile Defense System at Fort Greely. According to articles, the Long Range Discrimination Radar would be constructed at Clear Air Force Station, about

100 miles to the southwest of Eielson AFB, and be operational by 2020 (mostlymissiledefense.com 2015). The missile expansion involves construction at Fort Greely, about 80 miles east of Eielson AFB, roughly during the same time as construction for the Proposed Action Alternative.

5.1.2 Non-Department of Defense Actions

The cities of Fairbanks and North Pole have three reasonably foreseeable infrastructure projects that are planned or underway in the local area, with impacts that would only cumulatively affect air quality (Table 5.1-2). Please note that the Alaska Department of Transportation indicated that they would widen the road at the South Gate during the Richardson Highway improvements noted below. The entry and merge lanes into the South Gate are anticipated to be done by June 2017. However, none of these actions would change the analysis of impacts for the F-35 Beddown, or lead to significant cumulative impacts.

Table 5.1-2. Non-DoD Present and Reasonably Foreseeable Actions

<i>Project Name/Description</i>	<i>Planned Year of Implementation</i>	<i>Resources Potentially Affected</i>	<i>Magnitude of Impact</i>
Richardson Highway: MP 353-357, Safety/Access Improvements	2015-2020	Air Quality	Not Significant
Richardson Highway MP 359 Railroad Overpass	2015-2020	Air Quality	Not Significant
Plack Road Bike/Pedestrian Facility: North Pole	2015-2020	Air Quality	Not Significant

5.2 Analysis of Cumulative Effects

The following analysis first considered whether the actions could affect, or be affected by those resulting from the Proposed Action Alternative. Second, an evaluation was made to determine whether such a relationship would result in potentially additive impacts not identified when the Proposed Action Alternative is considered alone (i.e., Chapter 4, *Environmental Consequences*).

The additive or interactive cumulative effects of the Proposed Action Alternative, when considered together with the effects of other past, present, and reasonably foreseeable future actions in the greater FNSB region, are presented below by resource category. Please note that only those resources that were identified in Tables 5.1-1 and 5.1-2 were carried forward for cumulative analysis. Other resource categories, analyzed for the Proposed Action Alternative, would not be cumulatively affected by these past, present, or reasonably foreseeable actions.

5.2.1 Cumulative Impacts with Actions in the Region

5.2.1.1 *Airfield and Airspace Operations and Management*

Base

In its FONSI, the Army chose to permanently base and operate UAVs from Fort Wainwright (U.S. Army 2015). No adverse impacts would occur to the airfield environment at Eielson AFB when considered cumulatively. No other projects would cumulatively impact airfield operations and management when considered cumulatively.

Airspace

The Army UAV beddown at Fort Wainwright would increase the use of restricted airspace over Army training areas. Transit through civilian airspace would follow protocols set by FAA to maintain safety for

all pilots, both military and civilian. Sharing airfield operations could increase operations in the airspace, however, scheduling and adherence to local airspace rules and regulation would not introduce adverse impacts when considered cumulatively with this Proposed Action Alternative.

5.2.1.2 *Acoustic Environment*

Base

There would be no significant impacts at the base when all projects are considered cumulatively.

Airspace

Noise generated during operations of the UAVs should not appreciably change in northern JPARC airspace when this action is considered with other foreseeable actions. Fighter jet-generated noise would continue to dominate sound levels in the training airspace. No adverse cumulative impacts are anticipated when considered with the Proposed Action Alternative.

5.2.1.3 *Air Quality*

Base

It is not anticipated that any of the projects would generate emissions during construction to cumulatively effect FNSB due to their distance (i.e., the DoD actions) and/or short duration (i.e., non-DoD actions). Operationally, emissions generated by other foreseeable actions would not adversely impact FNSB regional air quality cumulatively, again because of their distance from the particulate matter up to 2.5 micrometers in size (PM_{2.5}) nonattainment and carbon monoxide (CO) maintenance areas around Fairbanks and North Pole.

Airspace

Under the Proposed Action Alternative, criteria pollutants cumulatively would not be adversely affected, as presented in Table 5.2-1. Criteria pollutants generated by UAV and F-35A operations would not exceed levels to deteriorate regional air quality in northern JPARC airspace.

Table 5.2-1. Cumulative Pollutant Emissions

<i>Pollutant of Concern</i>	<i>UAV Emissions¹</i>	<i>F-35 Emissions</i>	<i>Total</i>
Carbon Monoxide (CO)	13.61	236.1	249.71
Sulfur Dioxide (SO ₂)	0.26	12.3	12.56
Nitrogen Oxide (NO _x)	5.65	118.1	123.75
Particulate Matter 2.5 (PM _{2.5})	0.26	17.5	17.76

Note: ¹From Table 3-2 of the Gray Eagle EA (U.S. Army 2015).

5.2.1.4 *Socioeconomics*

For socioeconomics, the majority of impacts would occur in the FNSB regional area. In terms of population, there would be a short-term significant increase in the population due to the construction at Fort Wainwright and on area highways occurring within the same timeframe as the Proposed Action Alternative. Economically, the FNSB region, particularly Moose Creek and North Pole, would benefit from construction income in the short term and in the long term by increases in military personnel. For foreseeable actions at Fort Wainwright, socioeconomic impacts (e.g., economics, housing, education) primarily would affect Fairbanks and should not introduce cumulative adverse socioeconomic impacts when considered with this proposal. The same would be said of actions at Clear Air Force Station and

Fort Greely, their distance from Fairbanks and Eielson AFB would minimize the potential for adverse socioeconomic impacts (e.g., housing availability) when considered cumulatively with the Proposed Action Alternative.

In terms of transportation, the reopening of the South Gate and expanding the Richardson Highway for entry and merging purposes would actually benefit local traffic conditions. Allowing equipment and vehicles to use these new lanes would lessen the potential for traffic congestion at the gate during F-35A construction activities.

5.2.2 Cumulative Impacts with Actions outside of the Region

The only resource with potential for cumulative impacts outside the FNSB affected environment is air quality. The potential effects of proposed greenhouse gas (GHG) emissions are by nature global and cumulative. Individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when the Proposed Action Alternative GHG emissions combine with GHG emissions from other man-made activities on a global (i.e., extra-regional) scale.

Currently, there are no formally adopted or published NEPA thresholds of significance for GHG emissions. The computed carbon dioxide equivalent or CO₂(e) emissions after beddown of both F-35A squadrons are 31,704 metric tons, or 0.937 percent of the existing CO₂(e) emissions for the FNSB region. When considered cumulatively with the 1,562 metric tons per year of CO₂(e) generated by the UAV emissions (U.S. Army 2015), GHGs would be significantly lower than regional and global GHG emissions; thus, there would be no adverse impacts from increased cumulative GHG emissions from the Proposed Action Alternative and the UAV beddown.

Additionally, the high latitudes of the earth may experience an increase of 5 to 8 degrees Fahrenheit over the next century, with the projected climate change impact of an increase in aridity, as documented in Global Climate Change Impacts in the U.S. from the U.S. Global Climate Change Research Program (U.S. Global Change Research Program 2014). This report predicts that permafrost temperatures in Alaska are rising, producing a thawing trend that is expected to continue, causing multiple vulnerabilities through drier landscapes, more wildfire, altered wildlife habitat, increased cost of maintaining infrastructure, and the release of heat-trapping gases that increase climate warming. While operations at Eielson AFB have already adapted to higher temperatures and an increase in smoke from wildfires, exacerbation of climate conditions in the future may increase the cost of proposed operations and could impede operations during extreme events. Additional measures could be needed to mitigate such impacts over the operational life expectancy of the F-35A.

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