APPENDIX D

Air Quality General Conformity Review

General Conformity Review, USARAK Aviation EIS, Fairbanks, Alaska

PREPARED FOR: U.S. Army Alaska

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The construction of new facilities and increase in personnel proposed in the USARAK Aviation Environmental Impact Statement (EIS) will be located at Fort Wainwright (FWA) in the Fairbanks carbon monoxide (CO) maintenance area and the Fairbanks recently designated nonattainment area for particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$). Furthermore, the additional troops commuting to and from Fort Richardson (FRA) under Alternative 3 will be in the Municipality of Anchorage CO maintenance area. As a result, the general conformity rule applies to FWA and FRA for CO and to FWA for $PM_{2.5}$. This general conformity review demonstrates that the proposed action conforms to the State Implementation Plan (SIP) (Title 40 of the Code of Federal Regulations [CFR] Part 51, Subpart B, and Title 18 of the Alaska Administrative Code [AAC], Chapter 50, Section 725 [18 AAC 50.725]) for CO. The state attainment demonstration plan for $PM_{2.5}$ is currently being developed. The general conformity rule applies to all federal actions not addressed by the transportation conformity rule.

The general conformity rule first involves a conformity analysis to determine if the proposed action is exempt. The quantity of the nonattainment or maintenance area pollutant released during the highest emission year is compared to the exempt thresholds for that pollutant. If the threshold is exceeded, further analysis is required through a conformity determination. The analyses must consider both construction year(s) and operating years, and include the total direct emissions as well as indirect emissions as a result of the proposed action. The exempt thresholds considered for this analysis are as follows:

- 100 tpy CO for the Fairbanks and the Municipality of Anchorage CO maintenance areas.
- 100 tpy $PM_{2.5}$ and 100 tpy for the $PM_{2.5}$ precursor pollutants nitrogen oxide (NO_x), sulfur dioxide (SO_2), and volatile organic compounds (VOCs) for the designated Fairbanks $PM_{2.5}$ nonattainment area.

Methodology

Three alternative actions are presented in the USARAK Aviation EIS. The general conformity analysis uses the worst-case alternative to estimate emissions. Alternate 3, Combat Aviation Brigade (CAB), was selected as the worst-case scenario. This alternative action proposes the largest increase in facility construction and personnel additions.

Alternative 3 involves constructing 20 buildings and six parking and storage areas on 73.3 acres of FWA property and adding 2,360 Soldiers and 1,035 civilian employees distributed between the FWA, FRA, and Eielson AFB. Alternative 2 was not chosen because it would result in less emissions from decreased construction and fewer personnel when compared to Alternative 3. Alternative 1, the No Action alternative, would not cause an increase in new emission sources.

Emissions as a result of constructing the proposed facilities at FWA are expected to occur in the 2010 through 2015 construction seasons. Site preparation and actual construction are assumed to be typical for the Fairbanks area with no unique aspects relative to the release of CO, $PM_{2.5}$, NO_x, SO_2, and VOCs. Pollutants will be released by construction equipment and vehicles, as well as from vehicles transporting workers to and from the site.

Emissions of CO, $PM_{2.5}$, NO_x, SO_2, and VOCs as a result of operations at FWA will include emissions from potential emergency generator testing, helicopter training exercises, support activities for the helicopters, and vehicles transporting Soldiers and civilian employees to and from FWA.

Emissions of CO as a result of operations at FRA will include vehicle emissions of commuters from within the Municipality of Anchorage to FRA. FRA facilities are not in the designated CO maintenance area and, therefore, are not included in the conformity review calculations. In addition, there are no new facilities proposed at FRA in the Proposed Action.

Construction Emissions

Equipment emissions for building and site preparation were calculated using the U.S. Environmental Protection Agency's (EPA) NONROAD Emissions program with the following assumptions:

- Construction beginning in 2010 and lasting through 2015. A 10-month working season is assumed.
- The estimated equipment and hours of usage are based on the type and scope of the project.
- A 100 percent load was used as the worst-case assumption.

On-road hauling vehicle emission calculations estimated the number and length of trips from the estimated amount of materials to be moved onsite and offsite. Each load was assumed to be 20 cubic yards. It was assumed that the material hauling offsite and the material hauling onsite would be independent of each other as the worst-case scenario.

Emissions as a result of workers commuting were calculated using MOBILE6 emissions with current emission factors and the following assumptions:

- 300 construction workers
- Working 22 days per month for 10 months
- 10-mile round-trip commute

Asphalt emission calculations assumed 5 acres would be paved per year and used the California Air Resource Board URBEMIS program emissions factor.

Total estimated annual emissions for one construction season as a result of constructing the new buildings are presented in the table below. Emissions are conservatively estimated to be equal for each remaining construction season, as the pace of construction would decrease and future fuel and engine regulations would reduce emissions.

Total Construction Emissions for a Construction Season (ton/year)

	Carbon Monoxide (CO)	Oxides of Nitrogen (NO_X)	Volatile Organic Compounds (VOCs)	Sulfur Dioxide (SO_2)	Particulate Matter ($PM_{10}/PM_{2.5}$)
Equipment Emissions - Building and Site Preparation	7.4	16.3	1.3	0.01	1.1
On-Road Hauling Vehicle Emissions	0.7	0.3	0.3	0.3	0.3
Worker Commute Emissions	12.2	1.0	0.5	0.01	0.02
Site Grading Fugitive Dust Emissions					4.0
Asphalt Emissions			0.01		
TOTAL	**20.3**	**17.6**	**2.1**	**0.32**	**5.4**

Note: $PM_{2.5}$ assumed to be equal to PM_{10} as a conservative approach.

Operation Emissions

Operation of new facilities at FWA will result in the release of CO, $PM_{2.5}$, NO_x, SO_2, and VOCs from emergency generator testing, helicopter training exercises, support activities for the helicopters, and vehicles transporting Soldiers and civilian employees to and from FWA and FRA. It was assumed that the new buildings will be placed on the existing Central Heat and Power Plant (CHPP) grid. The increased demand is expected to be absorbed by the CHPP without affecting coal consumption or increasing any NAAQS-compliant emission limits currently regulated by Doyon Utilities, LLC (DU) Title V air operating permit[1]. DU is responsible for the operation of the CHPP and for supplying heat and power to sustain the mission of FWA. DU is also responsible for the Title V operating permit and the federal requirements within the permit. Current emissions rates are expected to be reduced and the overall CHPP capacity increased with improvement projects planned, as outlined in Subsection 3.1.2.9.2 of the USARAK Aviation EIS. The increased load would not cause a significant increase to the current emissions from the CHPP. In addition to the regulatory requirements for the CHPP, any requirements for the new emergency generators would fall under the permit responsibility of DU.

[1] Personal communication with FWA Air Quality officials, March 6, 2009. NAAQS-compliant emission rates are premised on a maximum coal consumption of 336,000 tons per consecutive 12-month period based on DU's #AQ1121TVP01 permit. Current 3-year average usage is approximately 220,000 tons per year.

Generator sizes were estimated from similar-size facilities currently located at FWA. It was assumed that three buildings (two new hangars and deluge well house) would require an emergency generator, and would potentially operate for 500 non-emergency hours per year as the worst-case scenario. Emissions from the generators were estimated using EPA's AP-42 emission factors.

Emissions as a result of employees commuting were estimated using MOBILE6 emission factors for 2013, the first expected year of operation. Miles traveled on Post and emissions from parking were included in the review. This resulted in a conservative estimate of FRA emissions because the installation is located outside the Anchorage CO maintenance boundary. The review uses the following assumptions:

- FWA
  - 2,121 Soldiers and civilian employees
  - 240 working days per year
  - 52 percent of the Soldiers and all civilians live off Post
  - 10 percent of off-Post Soldiers and civilian employees live in North Pole
- FRA
  - 634 Soldiers and civilian employees
  - 240 working days per year
  - 80 percent of the Soldiers and all civilian employees live off Post
  - 33 percent of off-Post personnel live in Eagle River

Helicopter emissions and support activities were estimated using Emission Dispersion and Modeling System 4.5 (EDMS). This tool was developed by the Federal Aviation Administration (FAA) to estimate emissions related to mobile sources on airports. Modeling assumes typical ground support equipment for 50 percent of the operations and that one takeoff is an operation and one landing is an operation. The following assumptions were made for helicopter operations, which are based on Tables 2.5.a, 4.2.b, and 4.2.d of the EIS:

30 additional Kiowa OH-58D helicopters stationed at FWA
10 additional Blackhawk HH-60s helicopters stationed at FWA
20 additional Blackhawk UH-60s helicopters stationed at FRA
4,800 additional operations of Kiowa OH-58D helicopters at FWA
1,500 additional operations of Blackhawk HH-60s helicopters stationed at FWA
4,792 additional operations of Blackhawk UH-60s helicopters at FRA

Estimates of painting operations were assumed to be comparable to similar sources currently in operation.

Estimated emissions as a result of operations at FWA and FRA are presented below:

Total Operating Emissions FWA (tons/year)					
	Carbon Monoxide (CO)	**Oxides of Nitrogen (NO_X)**	**Volatile Organic Compounds (VOCs)**	**Sulfur Dioxide (SO_2)**	**Particulate Matter ($PM_{10}/PM_{2.5}$)**
Emergency Generators	1.0	4.7	0.4	0.3	0.3
Vehicles and Parking	29.3	2.9	1.6	0.04	0.1
Helicopter Operations	3.1	1.7	1.4	0.5	0.2
Paint Booths			1.0		
TOTAL	**33.4**	**9.3**	**4.4**	**0.84**	**0.6**

Notes:

$PM_{2.5}$ emission rates are assumed to be equal to PM_{10} as a conservative approach and because emission factors are limited for $PM_{2.5}$.

PM emission rates are assumed to be equal to SO_2 emission rates for helicopter emissions because EDMS is not equipped with emission factors for PM on some military engines.

Total Operating Emissions FRA (tons/year)					
	Carbon Monoxide (CO)	**Oxides of Nitrogen (NO_X)**	**Volatile Organic Compounds (VOCs)**	**Sulfur Dioxide (SO_2)**	**Particulate Matter ($PM_{10}/PM_{2.5}$)**
Vehicles and Parking	21.0	2.2	1.4	0.02	0.04
Helicopter Operations	7.0	6.1	6.1	0.9	0.9
TOTAL	**28.0**	**8.3**	**7.5**	**0.9**	**0.9**

Notes:

$PM_{2.5}$ emission rates are assumed to be equal to PM_{10} as a conservative approach and because emission factors are limited for $PM_{2.5}$.

PM emission rates are assumed to be equal to SO_2 emission rates for helicopter emissions because EDMS is not equipped with emission factors for PM on some military engines.

Conclusion

FWA CO Maintenance Area and $PM_{2.5}$ Nonattainment Area

The worst-case year for emissions at FWA is expected to be the first year of operation, while construction is in progress. The estimated releases of CO, $PM_{2.5}$, NO_x, SO_2, and VOCs during this worst–case year, 2013, are given below. These emissions are below the general conformity thresholds of 100 tons per year; therefore, no further action is required.

Total Worst-Case Emissions FWA (tons/year)					
	Carbon Monoxide (CO)	**Oxides of Nitrogen (NO_X)**	**Volatile Organic Compounds (VOCs)**	**Sulfur Dioxide (SO_2)**	**Particulate Matter ($PM_{10}/PM_{2.5}$)**
Emissions from Construction, 2013	20.3	17.6	2.1	0.32	5.4
Emission from Operations, 2013	33.4	9.3	4.4	0.84	0.6
TOTAL	**53.7**	**26.9**	**6.5**	**1.16**	**6.0**

Municipality of Anchorage CO Maintenance Area

Indirect emissions of CO into the Municipality of Anchorage maintenance area are estimated to be 28.0 tons per year from FRA. This is below the CO threshold of 100 tons per year; therefore, no further action is required by general conformity regulation.

USARAK Aviation EIS
Potential-to-Emit (PTE) Calculations
General Conformity Emission Summaries

Construction Emissions - Alternative 3 Worst-Case Scenario

Total Construction Emissions (ton/year)						
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOCs)	Oxides of Nitrogen (NO_X)	Sulfur Dioxide (SO_2)	Particulate Matter (PM-10)	Particulate Matter (PM-2.5)
Equipment Emissions - Building and Site Preparation	7.4	1.3	16.3	0.01	1.1	1.1
On-Road Hauling Vehicle Emissions	0.7	0.3	0.3	0.3	0.3	0.3
Site Grading Fugitive Dust Emissions					4.0	4.0
Worker Commute Emissions	12.2	0.5	1.0	0.01	0.02	0.02
Asphalt Emissions		0.01				
TOTAL	**20.3**	**2.1**	**17.6**	**0.32**	**5.4**	**5.4**

Operating Emissions (PTE) - Alternative 3 Worst-Case Scenario

Total Operating Emissions FWA (tons/year)						
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOCs)	Oxides of Nitrogen (NO_X)	Sulfur Dioxide (SO_2)	Particulate Matter (PM-10)	Particulate Matter (PM-2.5)
Emergency Generators	1.0	0.4	4.7	0.3	0.3	0.3
Helicopter Operations	3.1	1.4	1.7	0.5	0.2	0.2
Paint Booths		1.0				
Worker Commute Emissions	29.3	1.6	2.9	0.04	0.12	0.06
Total	**33.4**	**4.4**	**9.3**	**0.84**	**0.50**	**0.5**

Total Operating Emissions FRA (tons/year)						
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOCs)	Oxides of Nitrogen (NO_X)	Sulfur Dioxide (SO_2)	Particulate Matter (PM-10)	Particulate Matter (PM-2.5)
Helicopter Operations	7.0	6.1	6.1	0.9	0.9	0.9
Worker Commute Emissions	21.0	1.4	2.2	0.02	0.08	0.04
Total	**28.0**	**7.5**	**8.3**	**0.9**	**1.0**	**0.9**

USARAK Aviation EIS - Alternative 3
Potential-to-Emit (PTE) Calculations
Air Quality Emissions During Construction

Start	May-10	Year/Month	
End	Oct-15	Year/Month	
Duration	6	years	
Work Schedule	12 Hr/Day	22 Days/Month	10 Month/year
Excavation	**500,000**	cy	
Pavement Size	5.0	acres	
Pavement Type (Asphalt/Cement)	Asphalt		

Acres worked/ Graded	22				
Number of Workers	300	Total Worker Trips	66,000	Miles Traveled per Trip	10

Calendar Year	Avg. Speed *
YEAR**** Emissions Factors	45

Equipment Emissions - Building and Site Preparation

Equipment Classifications for NONROAD emission factors										Emission Factors grams/operating hour					Emissions (tons)				
SCC	Equipment Type	Definition	Load Factor(%)	Fuel (diesel/gas)	Days per year	Hours per Day	# of equipment	Total Hours	CO	VOC	NOx	SOx **	PM10	CO	VOC	NOx	SOx	PM10
2270002015	Rollers	Rollers include smooth and knobby (such as used in landfills and called “compactors” not to be confused with smaller Plate Compacters) self-propelled rollers	100%	Diesel	22	8	3	528	142.60	24.65	273.62	0.28	22.93	0.08	0.01	0.16	0.00	0.01
2270002021	Paving Equipment	Various equipment types used to smooth and distributing paving material including vibrators and finishers to support the work of the pavers	100%	Diesel	22	8	3	528	117.89	21.00	220.06	0.21	18.76	0.07	0.01	0.13	0.00	0.01
2270002039	Concrete/Industrial Saws	Handheld and large engine powered saws for stone cutting.	100%	Diesel	30	2	7	420	111.00	17.49	147.31	0.15	17.41	0.05	0.01	0.07	0.00	0.01
2270002051	Off-highway Trucks	Large off-highway dump trucks not certified for highway use	100%	Diesel	66	8	4	2,112	765.22	130.92	2350.96	2.27	105.95	1.78	0.30	5.47	0.01	0.25
2270002057	Rough Terrain Forklifts	Rough terrain forklifts (RTF) can be confused with typical forklifts but have larger knobby off-road wheels and can be confused with rubber-tire loaders, but are specifically designed for handling palettes. RTFs include telescoping lift trucks called teles.	100%	Diesel	66	4	10	2,640	188.89	31.09	302.72	0.30	29.59	0.55	0.09	0.88	0.00	0.09
2270002060	Rubber Tire Loaders	Bucket loaders or front-end loaders with a front mounted bucket for scooping though other attachments can be used instead of a bucket	100%	Diesel	22	8	20	3,520	315.77	55.01	761.30	0.71	48.21	1.23	0.21	2.95	0.00	0.19
2270002066	Tractors/Loaders/Backhoes	Common and ubiquitous multipurpose equipment type that is most often referred to as a “backhoe” but include the combined functions of loading and a backhoe in one unit. Agricultural tractors with alternative attachments may used for similar purposes	100%	Diesel	66	8	10	5,280	130.27	29.87	138.89	0.12	20.19	0.76	0.17	0.81	0.00	0.12
2270002081	Other Construction Equipment	Miscellaneous category for equipment not categorized above	100%	Diesel	132	5	7	4,620	568.74	85.57	1146.80	0.96	77.82	2.90	0.44	5.84	0.00	0.40
		Total Emission Totals											Tons/yr	7.41	1.25	16.31	0.01	1.07

USARAK Aviation EIS - Alternative 3
Potential-to-Emit (PTE) Calculations
Air Quality Emissions During Construction

SOX Calculated from SO2 Emissions Factors

On-Road Hauling Vehicle Emissions

	Project 2 way trips	Miles Traveled per trip	Assumptions
Materials to site	1000	10	
Permafrost removal	25,000	10	
New Fill brought to site	25,000	10	

Vehicle Emission Factors (GR/Mile)						
Calendar Year	Avg. Speed *	CO	NOx	VOC	PM10	Sox
YEAR**** Emissions Factors	45	1.182	5.836	0.271	0.2174	0.0105

	CO	NOx	VOC	PM10	Sox
Emissions (TPY)	0.65	0.33	0.33	0.33	0.33

Vehicle emission factor source: Modeled Emission factors from MOBILE6.2 from Assumed HDDV8b Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)

Site Grading Fugitive Dust Emissions

	PM Tons/Acer-month	**Acres worked**	**Months**	**Emissions Red**	**Emissions (PM)**
Average Conditions	0.11	18.0	4	0.5	3.96
				0	

Assumed this number included Demolition Emissions

Algorithm: Acres of Area Graded *Months of Grading*Control reduction* EF = Emissions from Grading

Worker Commute Emissions

	Number of Workers	Trips	Miles Traveled
Worker Commute	300	66,000	10

by project: # workers x days/wk x wk/month x month/yr

Vehicle Emission Factors (GR/Mile)						
Calendar Year	Avg. Speed *	CO	NOx	VOC	PM10	Sox
YEAR**** Emission Factors	45	16.836	1.415	0.723	0.03	0.0093

* Used 2007 Emissions Factors as the worst case From Mobile 6, Run November 2006

Worker Commute Emissions					
	CO	NOx	VOC	PM10	Sox
LBS	24,497.24	2,058.90	1,052.00	41.91	13.53
TONS	12.25	1.03	0.53	0.02	0.01

Asphalt Emissions

Acres to be paved	5.0	
Emissions Factor *	2.62	lbs VOC/acre
Emissions from asphalt paving	**13.1**	**lbs VOC**
	0.00655	**Tons VOC**

* Emissions Factor from the CARB URBEMIS program guidance page a-12

*We did not use the equation in AP-42, Section 4.5 because we did not know the thickness of the asphalt

USARAK Aviation EIS - Alternative 3
Potential-to-Emit Calculations
New Emergency Back-up Generators at FWA

Assumptions

Assume each back up generator is 150 kW or 201 hp (based off of like source at FWA)

Number of Buildings 3
Hours of Operation 500 hr/yr USEPA default for potential-to-emit hours of operation for back-up generators

hp-hr per year 301,500 hp-hr/yr

Criteria Pollutant Calculations

Pollutant	Emission Factors	Potential Emissions
NO_x	3.10E-02	4.67
CO	6.68E-03	1.01
SO_2	2.05E-03	0.31
PM10	2.20E-03	0.33
VOC	2.51E-03	0.38

Hazardous Air Pollutant Calculations

Pollutant	Cas. NO.	Emission Factors (lb/hp-hr)	Potential Emissions (ton/yr)
Benzene	71-43-2	6.53E-06	9.85E-04
Toluene	108-88-3	2.86E-06	4.32E-04
Xylenes	1330-20-7	2.00E-06	3.01E-04
Propylene	75-56-9	1.81E-05	2.72E-03
1,3-Butadiene	106-99-0	2.74E-07	4.13E-05
Formaldehyde	50-00-0	8.26E-06	1.25E-03
Acetaldehyde	75-07-0	5.37E-06	8.09E-04
Acrolein	107-02-8	6.48E-07	9.76E-05
Napthalene	91-20-3	5.94E-07	8.95E-05
		Total HAP	**6.72E-03**

USARAK Aviation EIS - Alternative 3
Potential-to-Emit (PTE) Calculations
Helicopter Training Missions

Assumptions:

General
50% operational ground support for helicopters stationed at base
Like engines used for specific engines not found in EDMS software
One operations is a takeoff or a landing.
Increases from the no action alternative were derived from Airfield and Airspace Activity

Fort Wainwright - Fairbanks
30 additional Kiowa OH-58D helicopters stationed at FWA
10 additional Blackhawk HH-60 helicopters stationed at FWA
4,800 addition operations of the Kiowa OH-58D helicopters
1,500 addition operations of the Blackhawk UH-60 helicopters

Fort Richardson - Anchorage
20 additional Blackhawk UH-60 helicopters at FRA
4,792 additional operations of the Blackhawk UH-60

Eielson Air Force Base
24 additional Apache AH-64 helicopters at EAFB
960 operations of the Apache AH-64

Donnelly Training Area - Allen AAF
34 additonal operations of the Apache AH-64
586 additional operations of the Chinook CH-47
718 additional operations of the Blackhawk UH-60

USARAK Aviation EIS - Alternative 3
Potential-to-Emit (PTE) Calculations
Helicopter Training Missions

Criteria Pollutant Summary

	FWA Potential Emissions (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Helicopters	3.04	1.40	1.33	0.11	0.11	0.11
GSE	0.07	0.01	0.39	0.38	0.11	0.11
Total	**3.11**	**1.40**	**1.72**	**0.49**	**0.22**	**0.22**

	FRA Potential Emissions (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Helicopters	6.12	5.80	2.70	0.21	0.21	0.21
GSE	0.89	0.27	3.43	0.66	0.66	0.66
Total	**7.01**	**6.07**	**6.13**	**0.87**	**0.87**	**0.87**

	EAFB Potential Emissions (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Helicopters	1.11	1.03	0.54	0.04	0.04	0.04
GSE	0.16	0.05	0.61	0.12	0.05	0.047
Total	**1.27**	**1.08**	**1.14**	**0.16**	**0.09**	**0.09**

	DTA Potential Emissions (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Helicopters	0.89	0.14	0.87	0.06	0.06	0.06
GSE	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.89**	**0.14**	**0.87**	**0.06**	**0.06**	**0.06**

Notes:
All calculations using EDMS 4.5 with helicopter operation assumptions from Table 2.5.a, Table 4.2.c, and Table 4.2.d proposed in the February 2009 Draft Aviation EIS.
Final EIS emissions were adjusted based on the percent increase of operations for FWA (107%) and FRA (26%).
DTA used increase activity not shown in Table 4.2.c and 4.2.d to consevatively estimate training emissions.

USARAK Aviation EIS - Alternative 3
Potential-to-Emit (PTE) Calculations
Vehicle Trips to FWA and FRA

Assumptions

Fort Wainwright - Fairbanks

Assume 80% of personnel assigned to FWA	2121	new employees (including civil servants)		
Assume 52% of soldiers and all civilians live off base	1103			
Assume 10% would live in North Pole	110			
Average round trip to North Pole off-base	28	miles	@ 65 MPH	
Average round trip Fairbanks off-base	6	miles	@ 45 MPH	
Average round trip distance to place of work on-base	2	miles	@ 25 MPH	
Working Days	240			
Yearly average temperature	26.95	degrees F		
Parking activities	509,040		@ 10 MPH	2 Min idle

Fort Richardson - Anchorage

Assume 10% of personnel to FRA	637			
Assume 80% live off base	510			
Assume 1/3 lives in Eagle River	170			
Average round trip to MOA off-base	10	miles	@ 35 mph	
Average round trip to Eagle River off-base	28	miles	@ 65 mph	
Average round trip distance to place of work on-base	2	miles	@ 25 mph	
Working days	240			
Yearly average temperature	36.15	degrees F		
Parking activities	152,880		@ 10 MPH	2 Min idle

Eielson Air Force Base

Assume 10% of personnel to FRA	637			
Assume 80% live off base	510			
Assume 50% live in Fairbanks				
Assume 50% live in Northpole	255			
Average round trip to Fairbanks	60	miles	@65 mph	
Average round trip to Northpole	20	miles	@65 mph	

USARAK Aviation EIS - Alternative 3
Potential-to-Emit (PTE) Calculations
Vehicle Trips to FWA and FRA

Average round trip distance to place of work on-base	2 miles	@ 25 mph	
Working Days	240		
Yearly average temperature	26.95 degrees F		
Parking activities	152,880	@ 10 MPH	2 Min idle

Emission Calculations (EPA Mobile 6)

	Potential Emissions FWA (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Vehicle	27.72	1.47	2.73	0.03	0.11	0.06
Parking	1.58	0.14	0.12	0.001	0.005	0.002
Total	**29.30**	**1.61**	**2.85**	**0.04**	**0.12**	**0.06**

	Potential Emissions FRA (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Vehicle	20.40	1.27	2.12	0.02	0.08	0.04
Parking	0.62	0.08	0.05	0.00	0.00	0.00
Total	**21.02**	**1.35**	**2.17**	**0.02**	**0.08**	**0.04**

	Potential Emissions EAFB (ton/yr)					
Activity	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Vehicle	60.46	3.31	6.43	0.05	0.21	0.12
Parking	0.64	0.08	0.05	0.00	0.00	0.00
Total	**61.10**	**3.39**	**6.48**	**0.05**	**0.21**	**0.12**