



**APPENDIX F**

**AIR QUALITY**



# Appendix F

## Air Quality

### Introduction

Appendix F contains information used to support the technical air quality analysis in the Environmental Impact Statement (EIS). Specifically this appendix includes the Record of Non-Applicability (RONA) for Clean Air Conformity and calculations associated with military aircraft operations within the each of the existing and proposed Military Operations Areas (MOAs). Additionally, this appendix includes greenhouse gas (GHG) emissions to support analysis consistent with Council on Environmental Quality (CEQ) Draft Guidance (2014) on Considering Climate Change in NEPA Reviews, which provides federal agencies with direction on when and how to consider the effects of GHG emissions and climate change in their evaluations of proposed federal actions.

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**RECORD OF NON-APPLICABILITY (RONA)  
FOR CLEAN AIR CONFORMITY  
PROPOSED ESTABLISHMENT AND MODIFICATION  
OF OREGON MILITARY TRAINING AIRSPACE**

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA. The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans: Final Rule*, in the 30 November 1993, Federal Register (40 Code of Federal Regulations [CFR] Parts 6, 51, and 93). The U.S. Air Force (USAF) published the *United States Air Force Conformity Guide*, dated August 2010. These publications provide implementing guidance to document Clean Air Act Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

Federal action may be exempt from conformity determinations if they do not exceed designated *de minimis* levels for criteria pollutants (40 CFR Part 51.853[b]). Federal actions may also be exempt from conformity determinations if they would result in no emissions increase or an increase in emissions that is clearly *de minimis*, including the routine movement of mobile assets, such as ships and aircraft, in home port reassignments and stations (when no new support facilities or personnel are required) to perform as operational groups and/or for repair or overhaul (Oregon State Implementation Plan [SIP] 340-250-0020[4][b][H]). The Proposed Action, described below, involves the proposed establishment and modification of military training airspace for use by the 142d Fighter Wing (142 FW) and 173d Fighter Wing (173 FW) of the Oregon Air National Guard (ANG).

**Table 1. *De minimis* Threshold Levels for Criteria Pollutants Pursuant to 40 CFR Part 51.853**

<b>Criteria Pollutant</b>	<b>Attainment Status</b>	<b><i>De minimis</i> Threshold (tons/year)</b>
Ozone (VOC or NO <sub>x</sub> )	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO <sub>x</sub> )	Marginal and moderate nonattainment inside an ozone	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon monoxide (CO), sulfur dioxide (SO <sub>2</sub> ), and nitrogen dioxide (NO <sub>2</sub> )	All nonattainment & maintenance	100
PM <sub>10</sub>	Serious nonattainment	70
	Moderate nonattainment & maintenance	100
Lead (Pb)	All nonattainment & maintenance	25

**PROPOSED ACTION**

**Action Proponent:** Oregon ANG

**Action Title:** Establishment and Modification of Oregon Military Training Airspace

**Action Location:** The affected and proposed airspace included in the Proposed Action would be located over coastal, Central, and Eastern Oregon as well as the Pacific Ocean. In addition, small portions of the proposed airspace included in the Proposed Action would be located above northwestern Nevada and the southwestern-most corner of Washington State.

Of the counties underlying the proposed airspaces, only Polk County, OR and Washoe County, NV are in a *nonattainment* or *maintenance* status for one or more criteria pollutants. Polk County, underlying a small portion of the proposed Eel D MOA is in *nonattainment* for CO and *maintenance* for O<sub>3</sub>. Additionally, Washoe County, underlying a portion of the proposed Hart E MOA and Hart F MOA is in *nonattainment* for PM<sub>10</sub> and *maintenance* for CO and O<sub>3</sub>.

**Anticipated Date and Duration of Proposed Action:** The Proposed Action would result in the establishment of Special Use Airspace (SUA) for as military training airspace over the foreseeable future. The proposed airspace would be established upon completion of the National Environmental Policy Act (NEPA) planning and review process and approval of the airspace proposal by the Federal Aviation Administration (FAA), anticipated in Calendar Year (CY) 2014.

**Proposed Action:** The Proposed Action includes the modification and establishment of SUA including Air Traffic Control Assigned Airspaces (ATCAAs) and Military Operations Areas (MOAs). The proposed airspace improvements would be used by the 142 FW and the 173 FW of the Oregon ANG, to conduct F-15 training exercises.

Under the Proposed Action, the vertical limits and lateral configuration of Warning Area (W)-570, Bass ATCAA, and Bass South ATCAA would be modified within their existing external boundaries to meet training requirements of the 142 FW. The floors of Bass ATCAA and Bass South ATCAA would be lowered to 1,000 feet above mean sea level (MSL), and a new segment to be named W-570C, with a floor of 11,000 feet MSL, would be established adjacent to the west of the existing W-570 airspace. These airspace areas are located over the Pacific Ocean with the western boundary of W-570C paralleling the coastline at a distance of 12 nautical miles (NM).

The establishment of the Eel MOAs (A-D) and Eel High ATCAA would occur over western Oregon and would be partially located over the Pacific Ocean and coastal Oregon. The Eel proposed MOAs would have a floor of 11,000 feet MSL, while the floor of Eel High ATCAA would be established at the ceiling of existing Eel ATCAA, at 27,000 feet MSL.

The expansion of the Juniper/Hart MOA Complex in Eastern Oregon would include the establishment of Juniper MOAs C and D as well as Hart MOAs C, D, E, and F

adjacent and to the east of the existing MOA complex. These MOAs would be established with floors of 11,000 feet MSL. Additionally, the proposed Juniper East Low MOA would be established with a floor of 500 feet AGL adjacent and to the east of the existing Juniper Low MOA beneath Juniper C and the majority of the Juniper D.

The proposed Redhawk MOA Complex would be established with a ceiling at 11,000 feet MSL above Central Oregon.

#### **EMISSIONS SUMMARY:**

The Proposed Action does not include any changes to the existing inventories of F-15 aircraft at the 142 FW and 173 FW and implementation would not result in any increases to total annual flight hour or sortie authorizations for either unit. Further, the Proposed Action would not include any ground disturbance or the development or construction of any support facilities. Additionally, the Proposed Action would not result in any changes to manpower levels at either unit.

Training hours within the proposed Eel MOA/ATCAA and W-570 would increase slightly due to decreased transit time associated with the modification of existing airspace and establishment of new airspace; however, the concentration of each pollutant within the existing Eel ATCAA would decrease as training operations would be distributed throughout the airspace utilizing newly available altitude blocks and diluting emissions. Total training hours within the existing Juniper/Hart MOA Complex would be reduced as these operations would be redistributed within the proposed airspaces (i.e., Redhawk MOA Complex), reducing total emissions within the existing Juniper/Hart MOA Complex. Therefore, overall aircraft operational emissions would not be expected to change substantially. Establishment of the Redhawk MOA Complex would introduce new air-to-air F-15 training operations to the area. While establishment of the Redhawk MOA Complex would introduce new military aircraft related criteria pollutant emissions, the Proposed Action would not be expected to substantially increase pollutant emissions or alter relative pollutant concentrations in the airspace. Table 2 below illustrates the total anticipated annual mobile emissions associated with the modification and establishment of the proposed airspaces.

## EMISSIONS EVALUATION AND CONCLUSION:

With respect to the General Conformity Rule, effects on air quality would be considered significant if a proposed action would result in emissions that exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual pollutants in *nonattainment* or maintenance areas.

As described above, only Polk County, OR and Washoe County, NV are in *nonattainment* or *maintenance* for at least one criteria pollutant. However, the proposed airspace above these counties would be established at 11,000 feet MSL under the Proposed Action. The Federal Aviation Administration (FAA) conducted a study of ground level concentrations caused by elevated aircraft emissions released above ground level (AGL) using USEPA-approved models and conservative assumptions. The study concluded that aircraft operations at or above the average mixing height of 3,000 feet AGL have a very small effect on ground level concentrations and could not directly result in a violation of the Nation Ambient Air Quality Standards (NAAQS) in a local area. Therefore, USEPA's final rule (40 CFR 93.153) exempts as *de minimis* aircraft emissions above the 3,000 foot AGL mixing height, including the subject mobile aircraft emissions resulting from the implementation of the Proposed Action. All other proposed airspaces would be established over counties that are in *attainment* for all criteria pollutants. Consequently, a General Conformity Determination would not be needed.

General Conformity under the Clean Air Act (CAA), Section 176, has been evaluated for the Proposed Action according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to the Proposed Action because mobile aircraft emissions above 3,000 feet AGL are exempted as *de minimis* under USEPA's final rule 40 CFR 93.153. Therefore, the General Conformity Rule Determination procedures are not required, resulting in this RONA.

W-570: Existing emissions and emission concentrations from generated from military flights within the airspace.			
Pollutant	lbs/year	tpy	Existing concentration of pollutant (µg/m3)
CO	24599.68	12.30	0.047115124
VOC	2739.04	1.37	0.005246012
Nox	738145.44	369.07	1.413750673
SOx	27338.72	13.67	0.052361136
PM	9302.4	4.65	0.017816644
HAPs	1051.305568	0.53	0.002013538

Juniper & Hart: Existing emissions and emission concentrations from generated from military flights within the airspace.			
Pollutant	lbs/year	tpy	Existing concentration of pollutant (µg/m3)
CO	45258.08	22.63	0.179021844
VOC	5039.24	2.52	0.019933104
Nox	1358027.64	679.01	5.371783609
SOx	50297.32	25.15	0.198954948
PM	17114.4	8.56	0.067697336
HAPs	3046.507776	1.52	0.012050698

Redhawk: Existing emissions and emission concentrations from generated from military flights within the airspace.			
Pollutant	lbs/year	tpy	Existing concentration of pollutant (µg/m3)
CO	0	0	0
VOC	0	0	0
Nox	0	0	0
SOx	0	0	0
PM	0	0	0
HAPs	0	0	0

Existing			
Installation	Airspace Clusters	Time in Airspace Clusters (hr/yr)	Total
142	W-570	900	1976
	Juniper and Hart	1076	
	Redhawk	0	
173	Juniper and Hart	1301	1301

		142	173
<b>Class A</b>	1.88	<b>0.058148</b>	<b>0.0457592</b>
hours	100000	3093	2434
<b>Class B</b>	4.97	<b>0.153722</b>	<b>0.1209698</b>
hours	100000	3093	2434

W-570 & Eel MOAs: Proposed emissions and emission concentrations from generated from military flights within the airspace.			
Pollutant	lbs/year	tpy	Proposed concentration of pollutant (µg/m3)
CO	22848.00	11.42	0.040114454
VOC	2544.00	1.27	0.004466525
Nox	685584.00	342.79	1.20368645
SOx	25392.00	12.70	0.04458098
PM	8640.00	4.32	0.015169331
HAPs	1505.35	0.75	0.002642962

Juniper & Hart: Proposed emissions and emission concentrations from generated from military flights within the airspace.			
Pollutant	lbs/year	tpy	Proposed concentration of pollutant (µg/m3)
CO	34443.36	17.22	0.107495148
VOC	3835.08	1.92	0.011968998
Nox	1033517.88	516.76	3.225531918
SOx	38278.44	19.14	0.119464145
PM	13024.8	6.51	0.040649426
HAPs	2585.137608	1.29	0.008068021

Redhawk: Proposed emissions and emission concentrations from generated from military flights within the airspace.			
Pollutant	lbs/year	tpy	Proposed concentration of pollutant (µg/m3)
CO	6987.68	3.49	0.015795117
VOC	778.04	0.39	0.0017587
Nox	209674.44	104.84	0.473953058
SOx	7765.72	3.88	0.017553817
PM	2642.40	1.32	0.005972943
HAPs	406.85	0.20	0.000919658

Proposed			
Installation	Airspace Clusters	Time in Airspace Clusters (hr/yr)	Total
142	W-570 and Eel MOAs	1200	2076
	Juniper and Hart	509	
	Redhawk	367	
173	Juniper and Hart	1300	1300

Eel W570 hours	
Existing	900
Proposed	1200

Juni/Hart hours	
Existing	2377
Proposed	1809

Redhawk hours	
Existing	0
Proposed	367

Existing	3277
Proposed	3376

<b>Airspace</b>	<b>Change in GHG Emissions (proposed - existing) (tons/yr)</b>
W-570 and Bass/Bass South ATCAA	4727
Eel ATCAA	5699
Juniper/Hart MOA Complex	-10595
Total change in GHG Emissions	-168

Engine Type	Power Setting	Fuel Flow Rate (lb/hr)	Emission Factor (lb/1000lb fuel)
F100-PW-220	Military	9679	3252.46
F100-PW-229	Military	11490	3252.46

Airspace	Existing		Proposed Action		Difference (proposed - existing) tons/yr
	Annual Usage	GHG Emissions (tons/yr)	Annual Usage	GHG Emissions (tons/yr)	
<b>W-570</b>	900 hrs	16817	900 hrs	16817	0
(surface to FL 500)	1,800 ops		1,800 ops		
<b>Bass ATCAA</b>	42 hrs	785	100 hrs	1869	1084
(FL 180 to FL 500)	250 ops		600 ops		
<b>Bass South ATCAA</b>	17 hrs	318	142 hrs	2653	2336
(FL 180 to FL 270)	100 ops		700 ops		
<b>W-570 C</b>	N/A		70 hrs	1308	1308
(11,000 MSL to FL 500)			550 ops		

**Total difference (Proposed - Existing)**

<b>4727</b>
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Assumed all engines types are F100-PW-229  
Emission Factor and fuel usage rate from "Air Emissions Guide for Air Force Mobile Sources", August 2012

Engine Type	Power Setting	Fuel Flow Rate (lb/hr)	Emission Factor (lb/1000lb fuel)
F100-PW-220	Military	9679	3252.46
F100-PW-229	Military	11490	3252.46

Airspace	Existing		Proposed Action		Difference (proposed - existing) tons/yr
	Annual Usage	GHG Emissions (tons/yr)	Annual Usage	GHG Emissions (tons/yr)	
<b>Eel MOA A</b>	N/A	0	60 hrs	1121	1121
(11,000 MSL to FL 180)		0	180 ops		
<b>Eel MOA B</b>		0	90 hrs	1682	1682
(11,000 MSL to FL 180)		0	270 ops		
<b>Eel MOA C</b>		0	90 hrs	1682	1682
(11,000 MSL to FL 180)		0	270 ops		
<b>Eel MOA D</b>		0	60 hrs	1121	1121
(11,000 MSL to FL 180)	0	180 ops			
<b>Eel ATCAA A</b>	333 hrs	6222	60 hrs	1121	-5101
(FL 180 to FL 270)	4,000 ops		720 ops		
<b>Eel ATCAA B</b>		0	90 hrs	1682	1682
(FL 180 to FL 270)			1,080 ops		
<b>Eel ATCAA C</b>		0	90 hrs	1682	1682
(FL 180 to FL 270)			1,080 ops		
<b>Eel ATCAA D</b>		0	60 hrs	1121	1121
(FL 180 to FL 270)			720 ops		
<b>Eel High ATCAA A</b>	N/A	0	7.6 hrs	142	142
(FL 270 to FL 500)			90 ops		
<b>Eel High ATCAA B</b>		0	11.4 hrs	213	213
(FL 270 to FL 500)			135 ops		
<b>Eel High ATCAA C</b>		0	11.4 hrs	213	213
(FL 270 to FL 500)			135 ops		
<b>Eel High ATCAA D</b>		0	7.6 hrs	142	142
(FL 270 to FL 500)			90 ops		
<b>Total difference (Proposed - Existing)</b>					<b>5699</b>

Assumed all engines types are F100-PW-229

Emission Factor and fuel usage rate from "Air Emissions Guide for Air Force Mobile Sources", August 2012

Engine Type	Power Setting	Fuel Flow Rate (lb/hr)	Emission Factor (lb/1000lb fuel)
F100-PW-220	Military	9679	3252.46
F100-PW-229	Military	11490	3252.46

Airspace	Baseline		Proposed Action		Difference (proposed - existing) tons/yr
	Annual Usage	GHG Emissions (tons/yr)	Annual Usage	GHG Emissions (tons/yr)	
<b>Juniper Low MOA</b> (300 AGL to 11,000 MSL)	243 hrs 1,260 ops	4541	204 hrs 1,200 ops	3812	-729
<b>Juniper North MOA</b> (11,000 MSL to FL 180)	286 hrs 1,119 ops	5344	188 hrs 919 ops	3513	-1831
<b>Juniper South MOA</b> (11,000 MSL to FL 180)	1,278 hrs 4,755 ops	23880	624 hrs 3,755 ops	11660	-12220
<b>Hart North MOA</b> (11,000 MSL to FL 180)	205 hrs 2,811 ops	3831	188 hrs 2,711 ops	3513	-318
<b>Hart South MOA</b> (11,000 MSL to FL 180)	365 hrs 2,040 ops	6820	281.5 hrs 1,990 ops	5260	-1560
<b>Juniper East Low MOA</b> (500 AGL to 11,000 MSL)	--		45 hrs 485 ops	841	841
<b>Juniper C MOA</b> (11,000 MSL to FL 180)	--		56 hrs 1,199 ops	1046	1046
<b>Juniper D MOA</b> (11,000 MSL to FL 180)	--		59 hrs 1,171 ops	1102	1102
<b>Hart ATCAA F</b> (FL 180 to FL 280)	--		58.5 hrs 1,125 ops	1093	1093
<b>Hart ATCAA F</b> (FL 180 to FL 280)	--		56 hrs 1,095 ops	1046	1046
<b>Hart ATCAA F</b> (FL 180 to FL 280)	--		32 hrs 708 ops	598	598
<b>Hart ATCAA F</b> (FL 180 to FL 280)	--		18 hrs 708 ops	336	336
<b>Juniper ATCAA</b> (FL 180 to FL 510)	1,000 hrs 4,500 ops	18685	1,000 hrs 4,500 ops	18685	0
<b>Hart ATCAA</b> (FL 180 to FL 510)	367 hrs 2,000 ops	6858	330 hrs 1,800 ops	6166	-691
<b>Hart ATCAA F</b> (FL 180 to FL 280)	--		37 hrs 200 ops	691	691

**Total difference (Proposed - Existing)**

**-10595**

Assumed all engines types are F100-PW-229

Emission Factor and fuel usage rate from "Air Emissions Guide for Air Force Mobile Sources", August 2012