Crude Oil Storage Tanks

The Facility includes six 360,000-bbl capacity crude oil storage tanks, each with a working capacity of approximately 340,000 bbl These tanks are subject to an NSPS that applies to storage vessels for petroleum liquids (40 CFR Part 60 Subpart Kb). The Facility will comply with Subpart Kb by incorporating the option identified in §60.112b(a)(1): A fixed roof in combination with an internal floating roof that floats on the liquid surface. The tanks will feature an internal floating-roof design with a pontoon-style internal deck. The storage tanks may emit VOCs as fugitive emissions. The most effective and feasible control options for the storage tanks are determined in the BACT analysis, attached in Section 5.1, Attachment 1. Fugitive emissions from the tanks are more specifically addressed in Section 5.1.

Marine Vapor Combustion Unit

Vessels will arrive at the Facility with on-board tanks filled with inert gas with oxygen levels below eight percent. The inert gas consists of cleaned exhaust from dedicated on-board inert gas generators (engines burning ultra-low sulfur distillate). Note that the inert gas is added to the tanks as the cargo is discharged – not at the Facility, which is a loading facility.

When the vessel tanks are filled with crude oil, the vapors from the cargo tanks, made up of hydrocarbon and inert gases, is displaced to a MVCU, which will combust the hydrocarbons in the vapors. In order to ensure adequate destruction of hydrocarbons by the MVCU, the vapor stream must consist of at least approximately 20 percent hydrocarbon. Natural gas will be added if needed to the displaced vapors at the MVCU as an "assist gas" to increase the heating value of the vapors, and ensure adequate destruction.

The MVCU is expected to achieve a least 99.8 percent destruction of the hydrocarbons in the delivered vapors. MVCU emissions are more specifically addressed in Section 5.1.

Emergency Diesel Fire Water Pump Engines

Emergency fire water pumps powered by diesel engines will be used in the event that water is needed to fight a fire within the Facility. Each of the engines will be 225 horsepower (hp) or smaller, and, while specific makes and models have not been selected, emission rates were calculated using emission factors for a 225 hp fire water pump engine that is representative of the units that will be installed. All three engines will be fueled with ultra-low sulfur diesel (ULSD). Planned operation of the units will be limited to half an hour a week for readiness testing and one 8-hour test per year, as specified by the National Fire Protection Association's NFPA 25. Emission rate calculations are detailed in Section 5.1, Attachment 2.

Fugitive Component Leaks

VOC emissions associated with minute vapor leakage from valve seals, pump seals, pressure relief valves, flanges, and similar equipment will occur at the Facility. Emissions from leaks are limited by procedures addressed in the BACT analysis, attached in Section 5.1, Attachment 1. The emission rate calculations for the Facility fugitive component leaks are summarized in Section 5.1, Attachment 2.

Locomotive and Marine Vessel Emissions

Crude oil will be delivered to the Facility by rail for transport by marine vessel. Emissions from locomotives and vessels are not included in the Facility emissions inventory or dispersion modeling because they are mobile sources powered by off-road engines, and these sources of emissions are specifically exempted from pre-construction permitting.[7]

Odor

Emissions from the boiler units are expected not to cause any significant offensive odors at the Facility or adjacent properties. Odor impacts from natural-gas combustion units are not typically observed, since the methyl mercaptan that gives the gas its odor is destroyed during combustion.

Vessel gases vented to the vapor combustor contain hydrocarbons and reduced sulfur compounds which could contribute to periods of offensive odor if not oxidized in the vapor combustor. The NAAQS for sulfur dioxide (75 ppb) is sufficiently lower than the average detection threshold for sulfur dioxide of 670 – 4,750ppb[8]. Conservative air quality modeling of vapor combustor emissions, included in Section 5.1, demonstrate that the maximum sulfur dioxide concentrations attributable to MVCU emissions do not exceed the odor threshold for sulfur dioxide at any location outside the property boundaries.

Other minor transient odor impacts attributable to diesel-fueled locomotives may occur during operation. These impacts likely will not extend beyond the boundaries of the property and be indiscernible from unrelated industrial and vehicle operations in the vicinity of the Port.

Dust

Fugitive dust emissions during operation are expected to be insignificant because all Facility roads, parking lots, and storage platforms will be ~~paved~~concrete or asphalted.

Summary

The projected annual emissions of criteria pollutants from the project units identified in this section are summarized in Table 2.12-1. GHG emissions, discussed in more detail in Section 2.12.4, are included in Table 2.12-1 GHG emissions exceed the PSD threshold of 100,000 tons per year, therefore requiring that the project Facility be designated as a major source for GHGs. Annual emissions of other pollutants relevant to PSD would be emitted at rates below the PSD thresholds, so they are addressed in a minor source permit process.

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[7] See, e.g., WAC 173-400-030(79) ("Secondary emissions do not include any emissions which come directly from a mobile source such as emissions from the tailpipe of a motor vehicle, from a train, or from a vessel."); In re Cardinal FG Company, EPA Environmental Appeals Board PSD Appeal 04-04 (2005) (holding that Ecology correctly concluded that emissions from a captive on-site locomotive are not attributable to the stationary source); Letter from EPA to Ken Waid (Jan. 8, 1990) stating that "to and fro" vessel emissions are not attributable to a stationary source and that when determining PSD applicability you do not consider those emissions "which result from activities which do not directly serve the purposes of the terminal and are not under the control of the terminal owner or operator.")

[8] U.S. EPA Sulfur Dioxide Final Acute Exposure Guideline Levels, May, 2008

Table 2.12-1. Projected Annual Emissions (tons)

	NO_x	CO		SO_2	PM	VOC	CO2e
Area 300~~Storage area~~ boilers	0.60	1.97		0.20	0.41	0.27	6,415
~~Unloading~~ Area 600 boilers	5.95	19.47		1.99	4.06	2.70	63,284
MVCU	13.26	5.76		7.02	4.30	8.64	80,191
Components	--	--		--	--	0.82	12
Tanks	--	--		--	--	23.58	261
Firewater pumps	0.01	0.03		0.01	0.00	0.01	14
Total:	19.82	27.24		9.22	8.77	36.02	150,176
PSD threshold[1]	100	100		100	100	100	100,000
PSD SER[2]	40	100		40	10	40	75,000
NOC exemption[4]	2.0	5.0		2.0	0.5	2.0	Does not apply

[1]PSD criteria pollutant threshold of 100 tons for 28 source category exception as defined in 40 CFR 52.21.

[2]PSD Significant emission rates: PSD review required for pollutant emissions from a major source with emissions exceeding the SER

[4]Notice-Of-Construction (NOC) Exemption levels for new or modified stationary sources (WAC 173-400-110 Table 110(5))

2.12.3 Toxic Air Pollutants

The industrial emissions of almost 400 TAPs are regulated under WAC 173-460, and WAC 173-400-110 requires that increases in TAP emissions attributable to the entire project must be reviewed during the preconstruction permitting process. To comply with WAC 173-460, an inventory of TAPs associated with project emission units has been developed. Any TAP expected to have a pre-control emission rate increase as a result of the project that exceeds the *de minimis* level defined for that TAP in WAC 173-460-150 is subject to NSR.

The impact attributable to the emission increase of a given TAP that is subject to the NSR requirements of WAC 173-460 is determined to be insignificant if it can be shown that the total emission rate increase of that TAP, after the application of BACT, is less than the SQER prescribed in WAC 173-460-150. If the expected emission increase of a TAP exceeds the prescribed SQER, a dispersion modeling analysis is required to demonstrate that the ambient impact of the aggregate emission increase of that TAP does not exceed the acceptable source impact level assigned to that TAP in WAC 173-460-150.

In addition to Washington’s TAP regulations, under the provisions of Section 112 of the 1990 Clean Air Act Amendments, the EPA is required to regulate emissions of a total of 187 HAPs from stationary sources. EPA does this by specific industry categories to tailor the controls to the major sources of emissions and the HAPs of concern from that industry. The rules promulgated under Section 112 generally specify the maximum achievable control technology (MACT) that must be applied for a given industry category. Consequently, these rules are often called MACT standards.

MACT standards can require facility owners/operators to meet emission limits, install emission control technologies, monitor emissions and/or operating parameters, and use specified work practices. In addition, the standards typically include recordkeeping and reporting provisions. MACT standards are codified in 40 CFR Parts 61 and 63.

There are two types of HAP sources: major and area sources of HAP emissions. Major sources have a potential to emit more than 10 tons of a single HAP, or 25 tons of all HAPs combined. Area sources are facilities that are not a major source.

The Facility's annual potential emissions of all HAPs will not exceed EPA's combined 25 ton per year or single 10 ton per year major source threshold. Therefore, the Facility is categorized as an area source of HAPs, and the MACT standards for area sources of HAP apply to it.

Construction

Temporary emissions of small amounts of TAPs and HAPs are likely from the operation of construction vehicles and equipment during the construction phase. Emissions from mobile sources are regulated under federal standards for mobile sources. Additional site air permits are not required for the temporary deployment of mobile sources on the site, as indicated under WAC 173-400-020.

Operation

The proposed Facility will contain several potential sources of TAPs and HAPs. The rail car ~~unloading area~~ Area 600 and ~~storage area~~ Area 300 boilers will combust natural gas to produce steam, and the MVCU will combust both natural gas and the displaced vapors from the vessels. Combustion exhaust contains small quantities of compounds identified in regulations as TAPs and/or HAPs. Similarly, fugitive emissions associated with the transfer and storage of crude oil at the Facility will include TAPs and/or HAPs. The calculated emission rates of TAPs and HAPs are presented in Table 2.12-2. Further details concerning the calculated TAPs emission rates from each unit are available in Section 5.1, Attachment 2.

Table 2.12-2. Facility-wide TAPs/HAPs emissions

Compound	CAS	HAP?[1]	WA TAP Averaging Period	Emission Rate	SQER[2]	Model?[3]
				lb/avg per	lb/avg per	
Acetaldehyde	75-07-0	Yes	Annual	4.23E-02	71	No
Acrolein	107-02-8	Yes	24-Hour	1.50E-04	0.00789	No
Arsenic	7440-38-2	Yes	Annual	4.31E-01	0.0581	Yes
Benzene	71-43-2	Yes	Annual	1.06E+02	6.62	Yes
Benzo(a)anthracene	56-55-3	No	Annual	3.98E-03	1.74	No
Benzo(a)pyrene	50-32-8	No	Annual	2.60E-03	0.174	No
Benzo(b)fluoranthene	205-99-2	No	Annual	3.89E-03	1.74	No
Benzo(k)fluoranthene	207-08-9	No	Annual	3.89E-03	1.74	No
Beryllium	7440-41-7	Yes	Annual	2.59E-02	0.08	No
1,3-Butadiene	106-99-0	Yes	Annual	2.16E-03	1.13	No
Cadmium	7440-43-9	Yes	Annual	2.37E+00	0.0457	Yes
Carbon monoxide	630-08-0	No	1-Hour	1.19E+01 ~~9.23E+00~~	50.4	No
Chromium, (hexavalent)	18540-29-9	No	Annual	1.21E-01	0.00128	Yes
Chrysene	218-01-9	No	Annual	3.90E-03	17.4	No
Cobalt	7440-48-4	Yes	24-Hour	8.39E-04 ~~4.96E-04~~	0.013	No
Copper	7440-50-8	No	1-Hour	3.57E-04 ~~2.94E-04~~	0.219	No
Cyclohexane	110-82-7	No	24-Hour	5.10E-01 ~~1.05E-01~~	789	No
Dibenzo(a,h)anthracene	53-70-3	No	Annual	2.62E-03	0.16	No
Diesel Engine Particulate	DEP	No	Annual	6.41E+00	0.639	Yes

7,12-Dimethylbenz(a)anthracene	57-97-6	No	Annual	3.45E-02	0.00271	Yes
Ethylbenzene	100-41-4	Yes	Annual	4.53E+01	76.8	No
Fluorene	86-73-7	No	24-Hour	4.73E-05	1.71	No
Formaldehyde	50-00-0	Yes	Annual	2.43E+01	32	No
Hexane	110-54-3	Yes	24-Hour	1.97E+01~~1.10E+01~~	92	No
Hydrogen Sulfide	7783-06-4	No	24-Hour	9.45E-03	0.263	No
Indeno(1,2,3-cd)pyrene	193-39-5	No	Annual	3.90E-03	1.74	No
Isopropyl benzene	98-82-8	Yes	24-Hour	1.58E-02~~3.38E-03~~	52.6	No
Manganese	7439-96-5	Yes	24-Hour	3.79E-03~~2.25E-03~~	0.00526	No
Mercury	7439-97-6	Yes	24-Hour	2.60E-03~~1.54E-03~~	0.0118	No
3-Methylchloranthrene	56-49-5	No	Annual	3.88E-03	0.0305	No
Naphthalene	91-20-3	Yes	Annual	1.32E+00	5.64	No
Nitrogen dioxide	10102-44-0	No	1-Hour	8.57E+00~~7.75E+00~~	1.03	Yes
Propylene	115-07-1	No	24-Hour	4.18E-04	394	No
Selenium	7782-49-2	Yes	24-Hour	2.40E-04~~1.42E-04~~	2.63	No
Sulfur dioxide	7446-09-5	No	1-Hour	4.77E+00~~4.81E+00~~	1.45	Yes
Toluene	108-88-3	Yes	24-Hour	4.30E-01~~1.03E-01~~	657	No
Vanadium	7440-62-2	No	24-Hour	2.30E-02~~1.36E-02~~	0.0263	No
Xylene (-m)	108-38-3	Yes	24-Hour	4.19E-01~~8.85E-02~~	29	No
Xylene (-o)	95-47-6	Yes	24-Hour	1.10E-02~~2.27E-02~~	29	No
Xylene (-p)	106-42-3	Yes	24-Hour	1.22E-01~~2.53E-02~~	29	No

Notes:

[1] TAP: Washington toxic air pollutants listed in WAC 173-460-150; HAP: federal hazardous air pollutants listed in Section 112b of the Clean Air Act.

[2,3] Small Quantity Emission Rate as defined in WAC 173-460-150 – emission rates. TAPs with project emission rates greater than the SQER require an air quality modeling analysis to demonstrate compliance with the Washington State ASILs.

As indicated in Table 2.12-2, eight TAPs were identified whose emission rates exceed the SQER. Air quality modeling is required to demonstrate that the ambient concentrations of these TAPs are below the associated ASILs. Section 5.1 includes the local air quality modeling analysis that demonstrates that TAPs concentrations are all below the associated ASIL for each of the eight TAPs.

Also shown in Table 2.12-2, the Facility's annual potential emissions of all HAPs combined does not exceed EPA's 25 ton per year major source threshold and nor does the Facility's annual potential emissions of any individual HAP exceed EPA's 10 ton per year major source threshold. Therefore, the Facility is categorized as an area source of HAPs, and area source MACT standards apply to the proposed emission units as appropriate.

The MACT standards applicable to the project are discussed in detail in Section 5.1.3.1.2.

2.12.4 GHG Emissions

GHGs are those that absorb and emit terrestrial radiation within the thermal infrared range. Although these gases do not pose a direct threat to human health or property by inhalation or contact, the buildup of these gases in the atmosphere may contribute to anthropogenic climate change. On May 13, 2010 the EPA issued a final tailoring rule with the stated intent of establishing a "common sense approach" to addressing GHG emissions from stationary sources, by "tailoring" the major source applicability thresholds under the prevention of significant deterioration (PSD) and Title V air operating permit programs, and providing a phased implementation for GHG permitting requirements.[9] The tailoring rule defines GHGs as an aggregate of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Under the second phase of the tailoring rule, which began on July 1, 2011, a new source of GHG emissions with the potential to emit 100,000 tpy CO_2e or more is subject to PSD review for GHGs, even if the source will not increase the emissions of any other PSD pollutant significantly. Because there is no ambient standard or increment for GHGs, the only PSD requirement that applies to GHGs is that BACT must be employed to reduce GHG emissions from the proposed project.

The project has the potential to emit only three of the six gases that comprise the Tailoring Rule definition of GHGs: carbon dioxide, methane, and nitrous oxide. The Tailoring Rule further defines CO_2e as the sum of the mass emissions of the constituent GHG, each multiplied by the appropriate global warming potential factor provided in Table A-1 of the federal mandatory GHG reporting rule (MRR, codified in 40 CFR Part 98). Table 2.12-3 summarizes the calculations and shows that the project has the potential to generate a maximum of approximately 150,176 tons of CO_2e per year. An expanded review of these calculations is included in Section 5.1.

Table 2.12-3. GHG (Composite CO_2e) Emission Rates

Emission Unit	Activity	Emission rate (tpy)
~~Unloading~~ Area 600 boilers	2 units, 8,760 hours/year	63,284
~~Storage area~~ Area 300 boilers	1 unit, 8,760 hours/year	6,415
MVCU	360,000 bbl/day, 365 days/year	80,191
Components	Leaks: methane emissions	12
Tanks	Fugitive emissions of methane	261
Firewater pumps	3 engines, ½ hour per week plus 8 hours per month	14
Total:	--	150,176

[9] EPA GHG permitting guidance and tailoring rules available at: http://www.epa.gov/nsr/ghgpermitting.html