6.6 Air Quality

Air quality is essential to human and environmental health, and is protected by federal, state, and local regulations. Air pollution can harm humans, plants, animals, and structures. Ambient air quality can be affected by climate, topography, meteorological conditions, and pollutants emitted from natural or human sources.

This section describes air quality in the study area and the potential impacts on air quality from construction and operation of the proposed export terminal. Coal dust, which can also affect air quality, is addressed separately in Section 6.7, *Coal Dust*.

6.6.1 Regulatory Setting

Laws and regulations related to air quality are summarized in Table 6.6-1.

Table 6.6-1. Regulations, Statutes, and Guidelines for Air Quality

Regulation, Statute, Guideline	Description
Federal	
Clean Air Act and Amendments	Enacted in 1970, as amended in 1977 and 1990, requires EPA to develop and enforce regulations to protect the public from air pollutants and their health impacts.
National Ambient Air Quality Standards (U.S. Environmental Protection Agency)	Specifies the maximum acceptable ambient concentrations for seven criteria air pollutants: CO, O_3, NO_2, SO_2, lead, PM2.5, and PM10. Primary NAAQS set limits to protect public health, and secondary NAAQS set limits to protect public welfare. Geographic areas where concentrations of a given criteria pollutant exceed a NAAQS are classified as nonattainment areas for that pollutant.
State	
Washington State General Regulations For Air Pollution Sources (WAC 173-400) and Washington State Clean Air Act (RCW 70.94)	Establish the rules and procedures to control or prevent the emissions of air pollutants. Provides the regulatory authority to control emissions from stationary sources, reporting requirements, emissions standards, permitting programs, and the control of air toxic emissions.
Washington State Operating Permit Regulation (WAC 173-401)	Establishes the elements for the state air operating permit program.
Washington State Controls for New Sources of Toxic Air Pollutants (WAC 173-460)	Establishes the systematic control of new or modified sources emitting toxic air pollution to prevent air pollution, reduce emissions, and maintain air quality that will protect human health and safety.
Washington State Ambient Air Quality Standards (WAC 173-476)	Establishes maximum acceptable levels in the ambient air for particulate matter, lead, SO_2, NO_2, O_3, and CO.

Regulation, Statute, Guideline	Description
Local	
Southwest Clean Air Agency (SWCAA 400)	Regulates stationary sources of air pollution in Clark, Cowlitz, Lewis, Skamania, and Wahkiakum Counties.

Notes:
EPA = U.S. Environmental Protection Agency; CO = carbon monoxide; O_3 = ozone; NO_2 = nitrogen oxides; SO_2 = sulfur dioxide; PM2.5 = particulate matter less than or equal to 2.5 micrometers in size; PM10 = particulate matter less than or equal to 10 micrometers in size; NAAQS = National Ambient Air Quality Standards; WAC = Washington Administrative Code; RCW = Revised Code of Washington; SWCAA = Southwest Clean Air Agency

6.6.1.1 Federal and State Ambient Air Quality Standards

Federal and state regulations govern maximum concentrations for criteria air pollutants, which are key indicators of air quality. Table 6.6-2 lists the federal ambient air quality standards for five criteria air pollutants plus total suspended particulates. Annual standards are never to be exceeded, while short-term standards are not to be exceeded more than once per year, except as noted in Table 6.6-2.

The National Ambient Air Quality Standards (NAAQS) consist of primary standards and secondary standards. Primary standards are designed to protect public health, including sensitive populations such as asthmatics, children, and the elderly. Secondary standards are designed to protect public welfare from effects such as visibility reduction, soiling, and nuisance (e.g., preventing air pollution damage to vegetation).

The NAAQS were established by the U.S. Environmental Protection Agency (EPA) under authority of the Clean Air Act to protect the public from air pollution. Air pollutants for which there are NAAQS are called *criteria pollutants*. Under the federal Clean Air Act, states are authorized to administer monitoring programs in different areas to determine if those areas are meeting the NAAQS.

EPA regulates nonroad mobile sources under the Clean Air Act to control emissions from nonroad engines (such as construction equipment, locomotives, and vessels). Regulations relevant to the proposed export terminal include locomotive emissions standards and limiting the sulfur content in fuel oil for marine vessels.

6.6.1.2 Federal and State Air Toxics

Under the federal Clean Air Act, EPA controls air toxics, which are pollutants known or suspected to cause cancer or other serious health effects, such as birth defects or reproductive effects. Examples of air toxics include benzene, formaldehyde, and toluene. EPA has identified 188 air toxics, which it refers to as hazardous air pollutants (HAPS). No ambient air quality standards have been established for HAPS, and, instead, EPA has identified all major industrial stationary sources that emit these pollutants and developed national technology-based performance standards to reduce their emissions. The performance standards are designed to ensure that major sources of HAPS are controlled, regardless of geographic location.

Table 6.6-2. Federal Ambient Air Quality Standards

	Primary	Secondary
Carbon monoxide		
8-hour average[a]	9 ppm	No standard
1-hour average[a]	35 ppm	No standard
Ozone		
8-hour average[b,c]	0.070 ppm	0.070 ppm
Nitrogen dioxide		
1-hour average[d]	100 ppb	No standard
Annual average	53 ppb	53 ppb
Sulfur dioxide		
Annual average	No standard	No standard
24-hour average[e]	No standard	No standard
3-hour average[e]	No standard	0.50 ppm
1-hour average[f]	75 ppb	No standard
Lead		
Rolling 3-month average	0.15 μg/m^3	0.15 μg/m^3
PM10		
24-hour average[g]	150 μg/m^3	150 μg/m^3
PM2.5		
Annual average[h]	12 μg/m^3	15 μg/m^3
24-hour average[i]	35 μg/m^3	35 μg/m^3

Notes:

[a] Not to be exceeded on more than 1 day per calendar year.

[b] In December 2015, EPA lowered the federal standard for 8-hour ozone from 0.075 ppm to 0.070 ppm.

[c] 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 0.070 ppm.

[d] 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

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

[f] 99th percentile of 1-hour daily maximum concentrations averaged over 3 years.

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

[h] Annual mean averaged over 3 years.

[i] 98th percentile averaged over 3 years.

Source: U.S. Environmental Protection Agency 2012.

ppm = parts per million; ppb= parts per billion; PM10 = particulate matter with a diameter less than or equal to 10 micrometers; PM2.5 = particulate matter with a diameter less than or equal to 2.5 micrometers ; μg/m^3 = micrograms per cubic meter

An action that requires a Notice of Construction application under WAC 173-400-110 is subject to the review requirements of controls for new source of toxic air pollutants, unless the emissions before control equipment of each toxic air pollutant from a new source or the increase in emissions from each modification is less than the applicable *de minimis* emissions threshold for the toxic air pollutant listed in WAC 173-460-150. Southwest Clean Air Agency has a separate list of pollutants that may apply to emissions from this stationary source. The purpose is to establish the systematic control of new or modified sources emitting toxic air pollutants to prevent air pollution to the extent reasonably possible and maintain levels of air quality to protect human health.

6.6.2 Study Area

The study areas are the same for both the On-Site Alternative and Off-Site Alternative. Direct impacts were analyzed within an approximate 5-mile radius around the project areas. Indirect impacts were analyzed up to approximately 20-mile radius from the project areas. These study areas are based on the Corps' NEPA scope of analysis Memorandum for Record (February 14, 2014), adjusted to reflect the sources of emissions in and near the project areas.

6.6.3 Methods

The following sources of information were used to identify the potential impacts of the proposed export terminal on air quality in the study areas.

- Data and information on terminal construction and operation (URS Corporation 2015)
- Northwest International Air Quality Environmental Science and Technology Consortium for existing conditions data (2015)
- *California Air Resources Board Vessel Transit Emissions Study* (California Air Resources Board 2011)
- National Climatic Data Center Longview, Washington climate data (National Climatic Data Center 2011)
- U.S. Environmental Protection Agency air pollutant emissions factors (U.S. Environmental Protection Agency 1995a, 1995b, 1995c, 1996)
- U.S. Environmental Protection Agency's air modeling guidance (U.S. Environmental Protection Agency 2004, 2014)
- U.S. Environmental Protection Agency's vessel fuel consumption data (U.S. Environmental Protection Agency 2000)
- U.S. Environmental Protection Agency's NONROAD Model (U.S. Environmental Protection Agency 2009)
- U.S. Environmental Protection Agency's vessel exhaust emissions standards (U.S. Environmental Protection Agency 2012)

6.6.3.1 Impact Analysis

The analysis evaluated emissions from construction and operations of the proposed export terminal. Air emissions were estimated for the criteria air pollutants carbon monoxide, nitrogen oxides, sulfur dioxide, particulate matter less than or equal to 2.5 micrometers in diameter (PM2.5), and particulate matter less than or equal to 10 micrometers in diameter (PM10). Total suspended particles and diesel particulate matter were also estimated. Because construction emissions are temporary and have a short period of activity, these emissions were only evaluated in comparison with emissions thresholds. Operations emissions, however, were evaluated with respect to their impacts on air quality.

Construction

The Applicant has identified three construction-material-delivery scenarios: delivery by truck, rail, or barge.

- **Truck.** If material is delivered by truck, it is assumed approximately 88,000 truck trips would be required over the construction period. Approximately 56,000 loaded trucks would be needed during the peak construction year.
- **Rail.** If material is delivered by rail, it is assumed approximately 35,000 loaded rail cars would be required over the construction period. Approximately two-thirds of the rail trips would occur during the peak construction year.
- **Barge.** If material is delivered by barge, it is assumed approximately 1,130 barge trips would be required over the construction period. Approximately two-thirds of the barge trips would occur during the peak construction year. Because the project area does not have an existing barge dock, the material would be off-loaded at an existing dock elsewhere on the Columbia River and transported to the project area by truck.

The emissions for all three scenarios were analyzed to determine the scenario with the highest emissions. Emissions were estimated for the peak construction year in each scenario.

The following sources of emissions were evaluated.

- Construction equipment operations
- Fugitive dust from earthwork activity
- Vehicle delays at at-grade rail crossings
- Construction worker vehicles commuting to the project area
- Truck emissions associated with delivery of construction supplies and materials
- Locomotive emissions associated with delivery of construction supplies and materials (rail delivery scenario only)
- River barges

Emissions were estimated based on frequency and duration of use and fuel types using EPA emissions data or the EPA NONROAD2008a model for nonroad construction equipment activity. The *NEPA Air Quality Technical Report* provides detailed information on the methods used to calculate emissions for the peak year of construction.

Operations

The air quality model assessed emissions from operation of the proposed export terminal and its impact on local air quality. The air quality modeling method followed general EPA protocols used in air quality permitting. Representative background concentrations for the study area (Northwest International Air Quality Environmental Science and Technology Consortium 2015)[1] were used to

[1] The Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) developed background design value estimates for 2009 through 2011 based on model-monitor interpolated products. These provide realistic background design value estimates where nearby ambient monitoring data are unavailable. The work is sponsored by EPA Regional 10, Ecology, and others.

determine background concentrations in air quality analyses since no representative monitoring data are available.

Emissions were estimated for operations that would emit particulate matter from the handling and transfer of coal, including unloading from rail cars, transferring coal on conveyors, piling coal onto storage piles, storing coal in storage piles, and loading coal onto ships. The on-site transfer and storage of coal would create fugitive emissions of coal dust due to product movement and wind erosion. In addition, the assessment considered locomotive exhaust emissions during the unloading and movement of project-related trains, emissions emitted from docked vessels during loading, emissions from tugs used to maneuver vessels into the terminal, emissions from operations and maintenance equipment, and vehicle delay at grade crossings along the Reynolds Lead and BNSF Spur. Emissions were evaluated using EPA's standard regulatory air dispersion model, AERMOD (Version 14134). AERMOD output results were compared to the federal and state ambient air quality standards presented in Table 6.6-2. To assess impacts associated with the proposed export terminal, the model was used to predict the increase in criteria air pollutant concentrations. The model's maximum incremental increases for each pollutant and averaging time were added to applicable background concentrations. The resulting total pollutant concentrations were then compared with the appropriate NAAQS.

Annual locomotive and vessel emissions for project-related trains and vessels were estimated and compared to existing annual emissions to provide context of potential air quality impacts beyond the project area. The *NEPA Air Quality Technical Report* provides detailed information on the methods used to calculate and model emissions during operations.

Coal Storage and Handling

Most on-site coal movement would occur in enclosed areas, including the rotary coal car dump and conveyors. Some transfer activities at the coal storage piles would not be enclosed; however, the conveyors, transfer towers, and the coal storage piles themselves would have systems in place for dust control (watering or dry fogging). Watering of the coal storage piles would help to reduce wind erosion. In general, the combination of these control systems would be expected to provide a high level of dust control (up to 99%). However, because these control systems would not operate with negative pressure,[2] a more conservative effectiveness assumption of 95% was used in this analysis.

Locomotives

The impact analysis approach for rail operations used EPA-projected emissions factors for line-haul locomotives, which are based on projected changes in locomotive fleet over the next 30 years (U.S. Environmental Protection Agency 2009). These emissions were based on locomotive engine load and associated fuel consumption during transport to and from the terminal, the unloading of coal from train cars, as well as the total annual coal throughput. It was assumed all locomotives would use ultra-low-sulfur diesel (15 parts per million [ppm] sulfur).

Vessels

The impact analysis approach for vessel operations assumed each marine vessel would need three tugs to maneuver the ship, and would require 3 hours total time to assist with docking and

[2] Negative pressure is a ventilation system that allows air to flow within an enclosed space, with more air pressure outside than inside.

departing operations. Further, it was estimated an average of 13 hours would be needed to load each vessel, and during this period of time, the vessel would be using auxiliary engines. To comply with International Maritime Organization 2016 Emission Control Areas for North America, all vessels were assumed to use the maximum allowed sulfur content marine distillate fuel of 0.1% (1,000 ppm). It was also assumed all tugboats would use ultra-low-sulfur diesel (15 ppm sulfur).

6.6.4 Affected Environment

This section describes the environment in the study areas related to air quality potentially affected by construction and operation of the proposed export terminal.

6.6.4.1 Attainment Status

EPA and Ecology designate regions as being attainment or nonattainment areas for regulated air pollutants. Attainment status indicates air quality in an area meets the federal, health-based ambient air quality standards. Nonattainment status indicates air quality in an area does not meet those standards. Cowlitz County is currently in attainment for all NAAQS. This designation means EPA and Ecology expect the area to meet air quality standards.

6.6.4.2 Air Quality Conditions

Climate and Meteorological Conditions

The project areas are located along the Columbia River in southwestern Washington, approximately 50 miles east of the Pacific Ocean. The region is characterized as a mid-latitude, west coast marine-type climate. The Cascade Range to the east has a large influence on the climate in Cowlitz County. The Cascade Range forms a barrier from continental air masses originating over the Columbia River Basin. The Cascades also induce heavy amounts of rainfall; as moist air from the west rises, it is forced to rise up the mountain slopes, which produces heavier rainfall on the western slopes of the Cascades and moderate rainfall in the low-lying areas, such as Longview.

Summers in the region are mild and dry. Winters are cool, but typically wet and cloudy with a small range in daily temperature. The average annual precipitation in Longview is approximately 48 inches, with most precipitation falling from November through March (National Climate Data Center 2011). Average annual rain events, taken as days with more than 0.01 inch of rainfall, occur approximately 175 days per year, based on National Climatic Data Center summaries.

Temperatures are usually mild in the lower Columbia River basin. Days with maximum temperatures above 90 degrees Fahrenheit (°F) occur about seven times per year on average. Days with a minimum temperature below 32°F occur about 57 times per year on average, and temperatures below 0°F occur only very rarely (none recorded between 1931 and 2006). Mean high temperatures range from the high 70s in the summer to mid-40s (°F) in winter, while average lows are generally in the low 50s in summer and mid-30s in winter.

Meteorological data collected by the Weyerhaeuser meteorological tower at the nearby Mint Farm Industrial Park between 2001 and 2003 (URS Corporation 2015) indicates the prevailing winds near the project areas are from the west-northwest and southeast, following along the alignment of the Columbia River. In the fall and winter (October through March), the winds are primarily from the southeast and east; the winds are typically from the west-northwest in the spring and summer (April through September).

Cowlitz County

Cowlitz County is in attainment or unclassified for all criteria air pollutants, indicating air quality near the project areas meet federal and state ambient air quality standards.

The only available local air pollutant monitoring is for PM2.5, at a station approximately 1.5 miles east of the project areas. The monitoring data show PM2.5 levels are well within the PM2.5 air quality standards. Although no other monitoring data are available, concentrations of other criteria air pollutants in the study area also are expected to be well within air quality standards.

The Longview air toxics study showed measured levels of toxic air pollutants were below levels of concern for short-term and long-term exposures (Southwest Clean Air Agency 2007). The study found, of the air toxics directly monitored, the air toxics of most concern for potential health risk in Longview are acetaldehyde, arsenic, benzene, manganese, and formaldehyde, while diesel particulate matter was identified as the most likely contributor to cancer risk in Washington State. No further studies on air toxic monitoring in the Longview-Kelso area have been conducted. The most recent national air toxic assessment showed Cowlitz County had an overall inhalation cancer risk of 30 cancers per million, which is lower than the state average of 40 cancers per million, as well as below the national average of 40 cancers per million (U.S. Environmental Protection Agency 2011).

6.6.5 Impacts

Potential direct and indirect impacts on air quality from construction and operation of the proposed export terminal are presented below.

6.6.5.1 On-Site Alternative

This section describes the potential impacts from construction and operation of the proposed export terminal at the On-Site Alternative location. The analysis and discussion of direct and indirect analyses are combined.

Construction

The construction material delivery scenario with the highest emissions would be the barge scenario, which would deliver construction materials via barge and truck. Haul truck emissions are included for the truck trips needed to make deliveries of construction material to the project area. Maximum annual construction emissions estimates for the peak construction year are shown in Table 6.6-3. Table 6.6-4 illustrates the maximum daily construction emissions estimates.[3]

[3] The estimated emissions shown assume that best management practices would be followed, including measures to reduce idling and dust generated by soil disturbance, and the application of water along access roads to minimize track-out of soil. Maximum daily emissions are relevant to short-term air quality standards that may be of concern for a long-term construction project. Construction emissions were based on a 5 days-per-week construction schedule with maximum activity levels for construction and earth movement equipment.

Table 6.6-3. Estimated Maximum Annual Construction Emissions

Source	Construction Emissions (tons per year) [maximum per year]								
	CO	NO_X	SO_2	PM2.5	PM10	VOCs	TSP	HAPS	DPM
Combustion Sources									
Equipment (in project area)	9.04	24.60	0.95	1.93	1.93	2.23	2.34	0.05	2.34
Haul trucks (in project area)	0.88	4.06	0.01	0.13	0.19	0.18	0.23	0.004	0.23
Haul trucks (in study area)[a]	2.04	9.37	0.03	0.31	0.44	0.41	0.54	0.010	0.54
Barges (not in study area)[b]	15.68	59.0	0.028	1.06	1.06	1.51	1.29	0.03	1.29
Passenger commute vehicles/crossing-delay (in study area)[a]	7.5	0.05	0.010	0.04	0.22	0.13	0.22	0.001	<0.001
Total Combustion Sources (in project area)	**9.92**	**28.66**	**0.96**	**2.06**	**2.12**	**2.41**	**2.57**	**0.05**	**2.57**
Total Combustion Sources (all study area)[c]	**19.5**	**38.1**	**1.0**	**2.4**	**2.8**	**2.95**	**3.3**	**0.07**	**3.1**
Fugitive Sources									
Fugitive earthwork (project area)	—	—	—	1.22	5.87	—	12.00	—	—
Total Fugitive Sources	—	—	—	**1.22**	**5.87**	—	**12.00**	—	—
Total									
Construction emissions sources (project area)	**9.9**	**28.7**	**0.96**	**3.28**	**7.99**	**2.41**	**14.6**	**0.05**	**2.6**
All construction emissions sources[c]	**19.5**	**38.1**	**1.0**	**3.6**	**8.7**	**2.95**	**15.3**	**0.07**	**3.1**
General Conformity *de minimis* levels for ozone maintenance areas (CFR 93.153)	100	100	100	100	100	100	—	—	—

Notes:

[a] Not in the project area but in study area.

[b] Not in the study area as defined Section 6.6.2, *Study Area,* provided for reference. Based on barge maneuvering time for docking of 0.5 hour in and 0.5 hour out; does not include transit on the Columbia River.

[c] Rounded. Does not include barge emissions (outside the study area).

CO = carbon monoxide; NO_X = nitrogen oxide; SO_2 = sulfur dioxide; PM2.5 = particulate matter less than or equal to 2.5 micrometers in diameter; PM10 = particulate matter less than or equal to 10 micrometers in diameter; VOCs = volatile organic compounds; TSP = total suspended particles; HAPS = hazardous air pollutants; DPM = diesel particulate matter; Fugitive Sources = emissions that are not directly vented through a stack, chimney, vent, or other functionally equivalent opening.

Table 6.6-4. Estimated Maximum Daily Construction Emissions

	Construction Emissions (pounds per day) [maximum daily]								
Source	**CO**	**NO_x**	**SO_2**	**PM2.5**	**PM10**	**VOCs**	**TSP**	**HAPS**	**DPM**
Combustion Sources									
Equipment (in project area)	82.89	229.60	8.67	17.66	17.66	20.40	21.49	0.42	21.50
Haul trucks (in project area)	14.40	54.70	0.20	2.60	5.00	3.10	6.10	0.10	6.12
Haul trucks (in study area)[a]	24.00	110.48	0.33	3.66	5.21	4.81	6.34	0.12	6.34
Barges (not in study area)[b]	120.80	454.70	0.21	8.14	8.14	11.6	9.90	0.61	9.90
Passenger commute and crossing delay (in study area)[a]	20.00	1.43	0.03	0.11	0.58	0.35	0.58	0.01	<0.001
Total Combustion Sources (in project area)	**97.29**	**284.3**	**8.87**	**20.26**	**22.66**	**23.50**	**27.59**	**0.52**	**27.62**
Total Combustion Sources (all study area)[c]	**141.29**	**396.2**	**9.23**	**24.0**	**28.5**	**28.7**	**34.5**	**0.65**	**34.0**
Fugitive Sources									
Fugitive earthwork (in project area)	—	—	—	6.80	32.6	—	66.7	—	—
Total Fugitive Sources	—	—	—	**6.80**	**32.6**	—	**66.7**	—	—
Total									
Construction emissions sources (project area)	**97.29**	**284.3**	**8.87**	**27.1**	**55.3**	**23.5**	**94.3**	**0.52**	**27.6**
All construction emissions sources[c]	**141.29**	**396.2**	**9.23**	**30.8**	**61.1**	**28.7**	**101.21**	**0.65**	**34.0**

Notes:

[a] Not in the project area but in study area.

[b] Not in the study area as defined Section 6.6.2, *Study Area*; provided for reference. Based on barge maneuvering time for docking of 0.5 hour in and 0.5 hour out; does not include transit on the Columbia River.

[c] Rounded. Does not include barge emissions (outside the study area).

CO = carbon monoxide; NO_X= nitrogen oxide; SO_2 = sulfur dioxide; PM2.5 = particulate matter less than or equal to 2.5 micrometers in diameter; PM10 = particulate matter less than or equal to 10 micrometers in diameter; VOCs = volatile organic compounds; TSP = total suspended particles; HAPS = hazardous air pollutants; DPM = diesel particulate matter; Fugitive Sources = emissions that are not directly vented through a stack, chimney, vent, or other functionally equivalent opening.

The maximum annual construction-related emissions would be well below the *de minimis* levels[4] established by EPA, as shown in Table 6.6-3. This means although emissions of criteria air pollutants would occur during construction, emissions would not be expected to cause a substantial change in air quality or adversely affect sensitive receptors[5] near the project area.[6]

Operations

Sources of emissions during operations would include coal handling equipment, coal storage piles, maintenance and operation vehicles, employee commute vehicles, and project-related trains and vessels.[7]

Emissions

As shown in Table 6.6-5, rail and vessel transport would be the largest sources of emissions during operations. The terminal would produce small quantities of air pollutants from maintenance and operational activities.

Impact Assessment

An analysis was performed with the AERMOD dispersion model and the results from the modeling compared with the NAAQS. Two sets of emissions were developed for use in the impact assessment. The first set was used to model annual average concentrations, reflecting emissions over an entire year with train and vessel arrivals spread across the year to simulate the average anticipated activity at the terminal. The second set of emissions was used to determine concentrations for the applicable short-term averaging period (1-hour, 3-hour, 8-hour, or 24-hour). Peak activity included a coal train unloading at the terminal, a vessel loading with coal, and a second vessel docking at the terminal.

Estimated emissions for the proposed export terminal, in combination with the background concentrations, are not anticipated to violate any NAAQS. Table 6.6-6 summarizes the maximum predicted criteria air pollutant concentrations due to maintenance and operation of the terminal, coal handling, and exhaust emissions from motor vehicles. The highest increase in concentration due to operation of the terminal is the 24-hour PM10 impact, which would increase 57 $\mu g/m^3$, or about 38% of the PM10 NAAQS. The next highest increase in concentration due to operation of the terminal is the 24-hour PM2.5 impact, which would increase 4.8 $\mu g/m^3$, or about 14% of the PM2.5 NAAQS. Similarly, the 1-hour NO_2 impact would increase 15 $\mu g/m^3$, or about 8% of the NO_2 NAAQS. All other pollutants would increase less than 2% of the relevant NAAQS.

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[4] The *de minimis* levels are the lowest thresholds that meet the General Conformity Rule for a federal action. This rule ensures that the action will conform to air quality standards.

[5] Sensitive air quality receptors were defined as a facility or land use that houses or attracts members of a population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of sensitive receptors include schools, hospitals, day care centers, convalescent facilities, senior centers, and parks or recreational facilities.

[6] While the study area is in attainment for all criteria air pollutants and therefore not subject to federal General Conformity rules (40 CFR 93, subpart B), the emission *de minimis* levels were used to provide a threshold against which to evaluate potential impact from construction.

[7] This analysis was updated after publication of the SEPA Draft EIS based on a review of the analysis. This subsection reflects the revised results.

Table 6.6-5. Maximum Annual Average Emissions from Operations

	Maximum Annual Average Emissions (tons per year)								
Source	**CO**	**NO_x**	**SO_2**	**PM2.5**	**PM10**	**TSP**	**VOCs**	**HAPS**	**DPM**
Fugitive Sources									
Coal transfer (except coal storage piles)									
Material handling	—	—	—	0.28	1.84	5.25	—	—	—
Coal storage piles									
Wind erosion	—	—	—	0.14	0.92	1.08	—	—	—
Material handling	—	—	—	0.14	0.92	2.62	—	—	—
Mobile Sources									
Maintenance/operations equipment									
Combustion	1.42	4.36	0.19	0.31	0.31	0.38	0.36	0.01	0.38
Employee commute and crossing delay	2.05	0.13	0.003	0.02	0.08	0.008	0.04	0.01	<0.01
Locomotive									
Combustion (study area)[a]	7.63	17.5	0.027	0.36	0.37	0.45	0.60	0.08	0.45
Fugitive dust (study area)[a]	—	—	—	0.12	0.80	0.94	—	—	—
Combustion (project area)	4.00	11.6	0.01	0.24	0.25	0.30	0.48	0.04	0.21
Fugitive dust (project area)	—	—	—	0.27	1.79	2.10	—	—	—
Vessels									
Combustion (study area)[a]	37.9	24.8	3.04	1.64	1.78	2.17	14.1	0.03	0.00
Combustion (project area)	65.9	23.3	4.52	1.02	1.05	1.27	15.3	0.08	0.56
Total: All Mobile Sources, Project Area, Study Area	118.9	81.7	7.8	4.0	6.4	7.6	30.9	0.3	1.6
Total Project Area Sources	71.3	39.3	4.72	2.40	7.08	13.00	16.14	0.13	1.15
Fugitive Dust Only, Project Area	—	—	—	0.83	5.47	11.05	—	—	—
Mobile Combustion Sources, Project Area	71.32	39.26	4.72	1.57	1.61	1.95	16.4	0.13	1.15

Notes:

[a] Study area does not include the project area.

CO = carbon monoxide; NO_X = nitrogen oxide; SO_2 = sulfur dioxide; PM2.5 = particulate matter less than 2.5 micrometers in diameter; PM10 = particulate matter less than or equal to 10 micrometers in diameter; TSP = total suspended particles; VOCs = volatile organic compounds; HAPS = hazardous air pollutants; DPM = diesel particulate matter

Table 6.6-6. Maximum Modeled Concentrations from the Operation of the Proposed Export Terminal[a]

Pollutant	Averaging Period	Modeled Impact (µg/m³)	Background[b,c] (µg/m³)	Total Predicted Concentration (µg/m³)	NAAQS (µg/m³)
CO	1 hour[d]	10.7	827	838	40,000
	8 hour[d]	4	600	604	10,000
NO_2	1 hour[e,f]	15	56.6	72	188
	Annual[f,g]	0.4	5.3	6	100
SO_2	1 hour[h]	0.9	14.7	15.6	196
	3 hour[i]	0.6	11.5	12.1	1,300
PM2.5	24 hour[j]	4.8	17.8	22.6	35
	Annual[k]	0.2	6.1	6.3	12
PM10	24 hour[l]	57	23	80	150

Notes:

[a] Sources include emissions from handling coal, the coal storage piles, and mobile source exhaust emissions from operation and maintenance of the terminal.

[b] Background design value estimates for 2009 through 2011, based on model-monitor interpolated products (except PM2.5) sponsored by EPA Regional 10, Ecology, and others. From NW AIRQUEST tool Washington State University (http://www.lar.wsu.edu/nw-airquest/lookup.html.)

[c] PM2.5 background based on Ecology's Kelso Monitor (2012 through 2014).

[d] Modeled impact is the highest second high for each calendar year over the 3 modeled years.

[e] The NO_2 1-hour modeled impact is the 3-year average of the 98th percentile of 1-hour daily maximum concentrations.

[f] Modeled NO_2 impacts applied the Tier III Ozone Limiting Method (OLM), using an ozone background of 42ppb, as per the NW-AIRQUEST tool. For additional information regarding the modeling methodology, see the *NEPA Air Quality Technical Report*.

[g] The NO_2 annual modeled impact is the maximum annual mean over the 3 modeled years.

[h] The SO_2 1-hour modeled impact is the 3-year average of the 99th percentile of the 1-hour daily maximum concentrations.

[i] The SO_2 3-hour modeled impact is not to be exceeded more than once per year.

[j] The PM2.5 24-hour modeled impact is the 3-year average of the 98th percentile of 1-hour daily maximum concentrations.

[k] The PM2.5 annual modeled impact is the 3-year average of the annual mean.

[l] The PM10 24-hour modeled impact is 3-year average of the highest 2nd high concentration.

µg/m³ = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standards; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM2.5 **=** particulate matter less than or equal to 2.5 micrometers in diameter**;** PM10 = particulate matter less than or equal to 10 micrometers in diameter

Table 6.6-7 shows the modeling results for sources in the project area plus cargo vessel and train operations while in the project area.

The highest increase in emissions from operation of the terminal plus cargo vessel and train operations is the 1-hour NO_2 impact, which would increase 93 µg/m³, or about 50% of the NO_2 NAAQS. The next highest increase concentration increase is the 24-hour PM10 impact, which would increase 66 µg/m³, or about 44% of the PM10 NAAQS. Similarly, the 24-hour PM2.5 impact would increase 7 µg/m³, or about 20% of the PM2.5 NAAQS. All other pollutants would increase less than 10% of the relevant NAAQS.

Table 6.6-7. Project Area Concentration from Operations (All Sources)[a]

Pollutant	Averaging Period	Modeled Impact (μg/m^3)	Background[b,c] (μg/m^3)	Total Predicted Concentration (μg/m^3)	NAAQS (μg/m^3)
CO	1 hour[d]	220	827	1,047	40,000
	8 hour[d]	43	600	643	10,000
NO_2	1 hour[d,e]	93	56.6	149.6	188
	Annual[f,g]	9.0	5.3	14.3	100
SO_2	1 hour[h]	3	14.7	17.7	196
	3 hour[i]	2	11.5	13.5	1,300
PM2.5	24 hour[j]	7	17.8	24.8	35
	Annual[k]	0.6	6.1	6.7	12
PM10	24 hour[l]	66	23	89	150

Notes:

[a] Sources include emissions from handling coal, the coal storage piles, and mobile source exhaust emissions from the operation and maintenance of the facility.

[b] Background design value estimates for 2009 through 2011, based on model-monitor interpolated products (except PM2.5) sponsored by EPA Regional 10, Ecology, and others. From NW AIRQUEST tool Washington State University (http://www.lar.wsu.edu/nw-airquest/lookup.html.)

[c] PM2.5 background based on Ecology's Kelso Monitor (2012 through 2014).

[d] Modeled impact is the highest second high for each calendar year over the 3 modeled years.

[e] The NO_2 1-hour modeled impact is the 3-year average of the 98th percentile of 1-hour daily maximum concentrations.

[f] Modeled NO_2 impacts applied the Tier III Ozone Limiting Method (OLM), using an ozone background of 42ppb, as per the NW-AIRQUEST tool. For additional information regarding the modeling methodology, see the *NEPA Air Quality Technical Report*.

[g] The NO_2 annual modeled impact is the maximum annual mean over the 3 modeled years.

[h] The SO_2 1-hour modeled impact is the 3-year average of the 99th percentile of the 1-hour daily maximum concentrations.

[i] The SO_2 3-hour modeled impact is not to be exceeded more than once per year.

[j] The PM2.5 24-hour modeled impact is the 3-year average of the 98th percentile of 1-hour daily maximum concentrations.

[k] The PM2.5 annual modeled impact is the 3-year average of the annual mean.

[l] The PM10 24-hour modeled impact is 3-year average of the highest 2nd high concentration.

μg/m^3 = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standards; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM2.5 = particulate matter less than or equal to 2.5 micrometers in diameter; PM10 = particulate matter less than or equal to 10 micrometers in diameter

Table 6.6-8 shows the modeling results for all project area sources and study area sources (vessels arriving and departing from the terminal, assist tugs, plus trains arriving and departing from the terminal, to approximately 5 miles out). These results are similar to the project area sources. The highest increase in emissions is the 1-hour NO_2 impact, which would increase 93 μg/m^3, or about 50% of the NO_2 NAAQS. The next highest increase concentration increase is the 24-hour PM10 impact, which would increase 66 μg/m^3, or about 44% of the PM10 NAAQS. Similarly, the 24-hour PM2.5 impact would increase 7 μg/m^3, or about 20% of the PM2.5 NAAQS. All other pollutants would increase no more than 10% of the relevant NAAQS.

Table 6.6-8. Study Area Concentrations from Operations (All Sources)

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Background[a,b] ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
CO	1 hour[c]	346	827	1,173	40,000
	8 hour[c]	97	600	697	10,000
NO_2	1 hour[c,d]	93	56.6	149.6	188
	Annual[e, f]	10	5.3	15.3	100
SO_2	1 hour[g]	10	14.7	24.7	196
	3 hour[h]	10	11.5	21.5	1,300
PM2.5	24 hour[i]	7	17.8	24.8	35
	Annual[j]	0.7	6.1	6.8	12
PM10	24 hour[k]	66	23	89	150

Notes:

[a] Background design value estimates for 2009 through 2011, based on model-monitor interpolated products (except PM2.5) sponsored by EPA Regional 10, Ecology, and others. Source: NW AIRQUEST tool Washington State University (http://www.lar.wsu.edu/nw-airquest/lookup.html.)

[b] PM2.5 background based on Ecology's Kelso Monitor (2012 through 2014).

[c] Modeled impact is the highest 2nd high for each calendar year over the 3 modeled years.

[d] The NO_2 1-hour modeled impact is the 3-year average of the 98th percentile of 1-hour daily maximum concentrations.

[e] Modeled NO_2 impacts applied the Tier III Ozone Limiting Method, using an ozone background of 42ppb, as per the NW-AIRQUEST tool.

[f] The NO_2 annual modeled impact is the maximum annual mean over the 3 modeled years.

[g] The SO_2 1-hour modeled impact is the 3-year average of the 99th percentile of the 1-hour daily maximum concentrations.

[h] The SO_2 3-hour modeled impact is not to be exceeded more than once per year.

[i] The PM2.5 24-hour modeled impact is the 3-year average of the 98th percentile of 1-hour daily maximum concentrations.

[j] The PM2.5 annual modeled impact is the 3-year average of the annual mean.

[k] The PM10 24-hour modeled impact is 3-year average of the highest second high concentration.

$\mu g/m^3$ = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standards; CO = carbon monoxide; SO_2 = sulfur dioxide; NO_2 = nitrogen dioxide; PM2.5 **=** particulate matter less than or equal to 2.5 micrometers in diameter**;** PM10 = particulate matter less than or equal to 10 micrometers in diameter**;**

6.6.5.2 Off-Site Alternative

This section describes the potential impacts of construction and operation of the proposed export terminal at the Off-Site Alternative location. As noted in Section 6.6.2, *Study Area*, air emissions are aggregated and regulated at a larger scale than a localized study area. Therefore, the direct and indirect impacts of the On-Site Alternative are combined.

Construction

Construction of the terminal at the Off-Site Alternative location would have the same construction activity levels and emissions sources as the On-Site Alternative. Therefore, estimated maximum daily and annual construction emissions would be very similar to the On-Site Alternative, which were estimated to be well below the *de minimis* levels established by EPA. This means that although emissions of criteria pollutants would occur, they would not be expected to cause a substantial change in air quality and are unlikely to adversely affect sensitive receptors near the project area.

Operations

Operation of the terminal at the Off-Site Alternative location would have similar direct and indirect impacts on air quality as the On-Site Alternative. Operation activity levels and emissions sources in the project area would be the same as the On-Site Alternative. Emissions from project-related trains outside the project area but within the study area would increase approximately 7% because project-related trains would travel approximately 0.5 mile further on the Reynolds Lead to the Off-Site Alternative project area than project-related trains under the On-Site Alternative. Vessel transport was estimated to be the largest source of emissions during operations for the On-Site Alternative (Table 6.6-5). Vessel transport in the study area would be approximately 13% lower than vessel emissions for the On-Site Alternative because vessels would not need to travel as far upriver as the On-Site Alternative location. Using the findings from the On-Site Alternative analysis and this subsection, the maximum impacts for each pollutant plus maximum background concentrations under the Off-Site Alternative are anticipated to be below the NAQQS for all criteria pollutants.

6.6.5.3 No-Action Alternative

Under the No-Action Alternative, the Corps would not issue a Department of the Army permit authorizing construction and operation of the proposed export terminal. As a result, impacts resulting from constructing and operating the terminal would not occur. In addition, not constructing the terminal would likely lead to expansion of the adjacent bulk product business onto the On-Site Alternative project area.

A limited-scale future expansion scenario proposed by the Applicant was evaluated, as described in Chapter 3, *Alternatives*. Emissions were estimated for rail and vessel operations and emissions associated with truck transport to the nearby Weyerhaeuser facility under this scenario (Table 6.6-9). The largest emissions for any single air pollutant would be nitrogen oxides at 4.4 tons per year. These emissions would be substantially lower than the proposed export terminal, which were shown not to cause a substantial change in air quality or adversely affect nearby population areas.

Table 6.6-9. Estimated No-Action Alternative Annual Average Emissions from Rail, Vessel, and Haul Trucks

	Maximum Annual Average Emissions (tons per year)								
Source	**CO**	**NO_X**	**SO_2**	**PM2.5**	**PM10**	**VOCs**	**TSP**	**HAPS**	**DPM**
Locomotive combustion	1.4	3.1	0.01	0.06	0.07	0.11	0.08	0.01	0.06
Vessel combustion	2.6	1.1	0.19	0.06	0.06	0.63	0.08	0.003	0.02
Haul trucks	0.1	0.2	0.002	0.01	0.04	0.02	0.04	0.001	0.04
Total	**4.1**	**4.4**	**0.20**	**0.13**	**0.17**	**0.76**	**0.20**	**0.014**	**0.12**

Notes:
CO = carbon monoxide; NO_X= nitrogen oxide; SO_2 = sulfur dioxide; PM2.5 = particulate matter less than or equal to 2.5 micrometers in diameter; PM10 = particulate matter less than or equal to 10 micrometers in diameter; VOCs = volatile organic compounds; TSP = total suspended particles; HAPS = hazardous air pollutants; DPM = diesel particulate matter

6.6.6 Required Permits

The following permit would be required for the proposed export terminal.

- **Notice of Construction—Southwest Clean Air Agency.** Businesses and industries causing, or have the potential to cause, air pollution are required to receive approval from the local air agency prior to beginning construction. These are requirements of Washington's Clean Air Act and apply statewide (Chapter 70.94 Revised Code of Washington [RCW]). Businesses located in Cowlitz County are regulated by the Southwest Clean Air Agency. The agency rules generally require an air permit for stationary sources emitting more than 0.75 ton per year of PM10 or 0.5 ton per year for PM2.5.[8] It is anticipated these levels would be exceeded and the Applicant would need to file a permit application and receive an approved Notice of Construction air permit prior to constructing, installing, establishing, or modifying any equipment or operations that may emit air pollution.

[8] Other criteria air pollutants have higher emission thresholds.