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Chapter 10

Comments and Responses on the Draft EIS

10.1 INTRODUCTION

The Energy Facility Site Evaluation Council (EFSEC) sought comments on the Draft Environmental Impact Statement (EIS) from members of the public, regulatory agencies, tribes, and other stakeholders. The Draft EIS was made available for review and comment to all interested parties and was posted to the publicly accessible EFSEC website: http://www.efsec.wa.gov/Tesoro%20Savage/SEPA%20-%20DEIS/DEIS_PAGE.shtml. The official comment period for the Draft EIS was 60 days: from November 24, 2015, through January 22, 2016. The public was invited to review and comment on the Draft EIS through a dedicated comment website, by email or mail, or at a public meeting in which comments could be provided in either written or oral format. All comments received on the Draft EIS, whether in written or verbal form, were considered by EFSEC in preparing this Final EIS.

This chapter of the Final EIS describes the process by which comments were reviewed, categorized, and evaluated. The Draft EIS was revised in response to the comments received to create this Final EIS. This chapter includes a set of consolidated responses that address key issues raised during the comment period.

10.2 PUBLIC PARTICIPATION

Three public meetings were held in January in Vancouver and Spokane, Washington.

The events were attended by members of the public, representatives of governmental agencies and tribes, nongovernmental organizations, private individuals, and Tesoro Savage Petroleum Terminal LLC (the Applicant). All attendees were given the opportunity to comment throughout the events by speaking in front of EFSEC, providing verbal comments to a designated court reporter at the meeting (two were at each meeting in a separate room from the main event), or by writing comments on comment cards. In total, approximately 655 people provided verbal comments at the public meetings. All verbal comments were transcribed by a court reporter and can be found in the meeting transcripts, along with copies of all individual website comments, comment emails, letters, and cards (referred to as ‘comment submittals’).

10.3 COMMENTS RECEIVED

EFSEC accepted comments on the Draft EIS in the following ways:

- Through a dedicated comment website
- Orally and in writing at the public meetings
- By email to EFSEC staff
- By mail or direct delivery to EFSEC staff

Over 250,000 comment submittals were received from individuals, agencies, tribes, and organizations. Each comment submittal was logged upon receipt and placed in the administrative record for the Project with a unique identification number.

Among the comment submittals, 38 form letters were received that contain the same text within a template. The 38 separate form letters were given the identification codes of FL1, FL2, FL3, FL4, and so on. In some cases, individuals added unique comments to these form letters, which were considered.

10.4 THE COMMENT-RESPONSE PROCESS

Individual substantive comments within each submittal were identified within the overall text. Substantive comments were characterized by one or more of the following:

- Questioned the accuracy of information in the Draft EIS
- Questioned the adequacy of, methodology for, or assumptions used for the environmental analysis
- Questioned about Project details and about the regulatory process
- Suggested new information relevant to the analysis
- Offered reasonable alternatives other than those analyzed in the Draft EIS
- Recommended changes or revisions in one or more of the alternatives
- Suggested use of alternative documents, studies, and methods of analyses
- Suggested additional analyses of topics/issues not covered in the Draft EIS
- Requested EFSEC or the Applicant to undertake something (e.g., collect additional information)

Comments that did not fall into the categories above were not considered relevant for the environmental analysis. These non-substantive comments were characterized by one or more of the following:

- General comments in favor of or against the Project
- Comments that didn't pertain to the Project or the areas that could be affected by the Project (such as "the government must end dependence on fossil fuels")
- Comments that took the form of vague, open-ended or irrelevant questions or opinions

Each unique substantive comment within a submittal was assigned a sequential identification number as a sub-index to the comment submittal number. For example, Comment 025-003 indicates the third substantive comment within comment submittal number 025. This process resulted in the identification of approximately 4,700 individual substantive comments. All substantive comments were assigned to a resource category or issue category so like comments could be grouped together and addressed by the appropriate resource specialists and agency staff. A comment-response table (Appendix R) was developed to include each substantive comment, its assigned category or resource topic, and a response. The Draft EIS was revised as necessary in response to comments, as indicated in the individual responses to comments within Appendix R.

10.5 SUMMARY RESPONSES TO COMMENTS RECEIVED ON THE DRAFT EIS

After identifying and sorting all substantive comments, common issues were identified for summary responses. Summary responses are provided in the following subsections to address multiple related issues and provide context to the discussion on the broader issue. Where individual comments pertain to these issues, the relevant issue and associated summary response are referenced in Table R-1 of Appendix R.

10.5.1 Summary Response 1: Purpose and Need of the Proposed Facility

10.5.1.1 Comments

Comments related to the purpose and need for the proposed Facility covered the following topics:

- Whether the proposed Facility was needed in light of alternative methods of transporting oil to market (including pipeline, rail directly to refineries, or existing distribution terminals), the increased use of renewable energy, and the long-term viability of production from sources in the Bakken region.
- The possibility that the maximum throughput volume of crude oil could exceed 360,000 barrels per day (bpd) or the possibility of more than 4 trains per day. These comments referred to terms of the original Port of Vancouver (Port) lease (dated July 23, 2013) that grants the Applicant "right of first opportunity" to develop a second crude oil terminal if the proposed Facility achieved an average throughput of 400,000 bpd, based upon a rolling 12-month period.
- Potential crude oil destinations (e.g., refineries) other than those on the West Coast, particularly since the US ban on export of crude oil has been rescinded and crude oil could be exported overseas.
- The economic viability of the proposed Project given current and future demand for crude oil and the fluctuating price of crude oil.

10.5.1.2 Responses

Need for the Proposed Facility

As discussed in Section 1.6 of the Final EIS, the purpose and need for the proposed Facility is to Construct and operate a facility that would provide the service of transloading mid-continent North American crude oil to the West Coast to allow shipment of crude oil to refineries located primarily on the West Coast of North America.

See Summary Response 2: Alternatives and Section 2.9 of the Final EIS for a discussion on alternative methods of transporting crude oil to market. An alternative using renewable energy sources would not meet the purpose and need for the proposed Facility.

Chapter 1 of the Final EIS has been revised to include additional information that has become relevant since publication of the Draft EIS. A new section (Section 1.7, Oil Markets Conditions) has been added to the Final EIS to provide greater understanding of the US and global oil markets and provides context for the purpose and need for the proposed Facility. In relation to the long-term viability of the Bakken region, projections in the US Energy Information Administration's *Annual Energy Outlook 2016* indicate that US tight[1] oil production is expected to reach 7.08 million bpd by 2040 (EIA 2016a). For context, US tight oil production averaged 3.22 million bpd in the fourth quarter of 2013 (EIA 2014).

1 "Tight" oil refers to oil found within reservoirs with very low permeability, including but not limited to, shale.

Potential for Exceeding the Proposed Throughput Volume and the Potential for an Expanded Facility based on Lease Conditions

The proposed Facility is designed to transship an annual average of 360,000 bpd of crude oil. This indicates that on any given day the actual transshipment volume could be higher or lower than 360,000 barrels (bbl) depending on rail delivery and vessel shipping logistics (e.g., on-time shipments versus delayed shipments), but would not exceed an annual throughput of 131,400,000 bbl. The analyses included in the development of the Draft and Final EISs use this capacity.

As described in Section 2.3.1 of the Final EIS, the proposed Facility would be constructed in 2 phases over an 18-month construction period, with most facilities constructed during the first 12 months and the remaining elements completed during the last 6 months to achieve full buildout. Full buildout refers to the completion of all facilities identified in the EIS, and the environmental impacts of full buildout are addressed in this Final EIS. It does not refer to any future expansion of the proposed Project or to any second facility at the site.

The 2013 lease agreement between the Port and the Applicant (effective August 1, 2013[2]) originally included terms that would have granted the Applicant "right of first opportunity" to develop a second crude oil terminal if the proposed Facility achieved an average throughput of 400,000 bpd of crude oil based upon a rolling 12-month period. However, this language was later removed in the 2016 lease agreement[3] (effective April 26, 2016). The Port of Vancouver has information about its key projects at https://portvanusa.com/.

EFSEC has not been presented with an amended application for an increased capacity, expanded, or new facility and, therefore, is not considering a larger facility, beyond that described in the Application for Site Certification (ASC). Thus, EFSEC could not make a recommendation to approve a larger facility based on the environmental review of a smaller one. In the event that the Applicant amended their ASC (including a proposal to increase the throughput volume), EFSEC would carry out additional siting review.

Crude Oil Destinations

On December 18, 2015, a spending and tax relief bill was signed into law by the US government that included the repeal of the crude oil export ban. Therefore, no federal constraint would apply to the export of crude oil to foreign destinations from the proposed Facility. The purpose and need of the Project has not changed in response to the repeal of the export ban; the purpose and need statement describes shipment of crude oil to refineries located primarily on the West Coast of North America. Nevertheless, EFSEC recognizes that some crude oil export could occur from the proposed Facility, and the Final EIS has been revised to recognize potential exporting of crude oil overseas (see Section 1.7.1 and Section 5.19.1 of the Final EIS). See also Summary Response 15: Crude Oil Export.

Relative to transshipment of crude oil from the proposed Facility to refineries in the Midwest and eastern United States, infrastructure (e.g., pipelines, railroads) specifically constructed to meet demand in these

2 The original lease agreement can be found at: http://www.portvanusa.com/assets/Tesoro-Savage-Lease-10232013-redacted.pdf.

3 The second paragraph in Section 8E was deleted in the amended lease agreement. The 2016 lease agreement can be found at http://www.portvanusa.com/assets/042616-VE-LeaseAmendment-Final.pdf.

areas is the likely means by which Bakken crude oil and/or Western Canadian crude oil would be transported to these refineries.

Economic Viability

A State Environmental Policy Act (SEPA) EIS analyzes environmental impacts and is used by agency decision makers, along with other relevant considerations or documents, in making final decisions on a proposal. Information that is not required to be discussed in an EIS includes methods of financing proposals, economic competition, profits and personal income and wages, and social policy analysis (Washington Administration Code [WAC] 197-11-448). Nevertheless, Section 1.7 of the Final EIS has been added to include information on current national and global oil markets to assist the reader in understanding the circumstances that affect crude oil demand and export.

See also Summary Response 24: Socioeconomics.

10.5.2 Summary Response 2: Alternatives

10.5.2.1 Comments

Multiple commenters requested that the EIS include consideration and evaluation of the following additional alternatives to the proposed Facility:

- An alternative that would include direct rail shipments of crude oil to West Coast refineries.
- An alternative with a terminal location farther upriver that would avoid the need to transport crude oil through certain populated areas.
- An alternative that would require the removal of additional volatile components from Bakken crude oil prior to rail shipment from North Dakota.
- A "delay alternative" that would postpone construction and operation of the Project long enough to allow full evaluation of environmental risks and provide time to implement additional safety enhancements, such as safer crude oil tank cars.
- A "Reduced Capacity Alternative" that would have a lower average daily throughput capacity compared to the proposed Facility.
- A "Reduced Impact Alternative" that would reduce the risk of oil spills to water resources, eliminate higher risk and consequence crude oil types (e.g., diluted bitumen [dilbit]), reduce storage tank size, use smaller vessels, reduce the number of transfer points on the route from oil production facilities to refineries, supply Alaska refineries with more proximate Alaska oil production, reduce the carbon footprint of transporting each barrel of oil from its point of production to a refinery, place the terminal in a lower seismic risk location, and place the terminal in a location where vessel prebooming would be effective during most of the year.
- Renewable energy alternatives including energy conservation, energy efficiency, solar, and wind energy generation.

10.5.2.2 Response

The discussion of alternatives has been expanded in the Final EIS to include additional alternatives to the Proposed Action. See Section 2.9 of the Final EIS.

A Direct Rail Alternative

Alternatives to the proposed Facility that are considered in Section 2.9.2 of this Final EIS include the following:

- Direct rail shipments of crude oil to West Coast refineries
- Delivery of crude oil to the proposed Facility by tanker trucks
- Delivery of crude oil to the proposed Facility by barge from upriver locations
- Delivery of crude oil to the proposed Facility by pipeline

Each considered alternative is described in terms of feasibility and the extent to which the alternative would meet the stated purpose and need of the proposed Facility (see also Summary Response 1 – Purpose and Need). As discussed in Section 2.9.2.4, the direct rail alternative could deliver crude oil to 17 of the 25 West Coast refineries that are accessible by rail. However, this alternative would not feasibly attain or approximate the stated purpose and need to provide a transfer facility (rail to vessel), because no transfer facility would be constructed or operated. The other West Coast refineries included in the analysis either cannot or do not currently intend to pursue a rail connection, or information on their plans is not known.

An Upriver Terminal Alternative

An upriver terminal location alternative that would avoid crude oil transport through certain populated areas was considered in the Draft EIS (see Section 2.8.2.2 of the Draft EIS). This alternative would not eliminate unit trains traveling through many populated areas such as the cities of Spokane and Spokane Valley, but would eliminate unit trains traveling through the city of Vancouver. Alternative site locations are also considered in Section 2.9.2.5 of the Final EIS.

A Reduced Volatility Alternative

Before transport by rail, Bakken crude oil originating from North Dakota is preconditioned to have a vapor pressure no greater than 13.7 pounds per square inch (psi) and is not blended with liquids recovered from gas pipelines or with natural gas liquids (North Dakota Industrial Commission Order No 25417). This preconditioning lowers the in-situ volatility (explosiveness) of Bakken crude oil. An alternative exploring further removal of volatile components was not included in the Final EIS.

A Delay Alternative

Delay of the Project was discussed in Section 2.9 of the Draft EIS, and the discussion has been updated in Section 2.10 the Final EIS to describe benefits or disadvantages of reserving Project approval for a later date, which includes the following that specifically address the summary comment:

- Consideration of the results of the *Washington State Legislature's Joint Transportation Committee study investigating road-rail conflicts in Washington cities* (published in January 2017).
- Additional time for the Washington Utilities and Transportation Commission (UTC) to develop rules establishing minimum standards for signs at all private crossings on the proposed rail routes and a process for ordering additional signage or other safety measures at private crossings with restricted sight distances or other safety deficiencies, as authorized under House Bill 1449 (signed by the governor on July 1, 2015).

- Additional time for recommendations in Washington State Department of Ecology's (Ecology's) 2014 Marine and Rail Oil Transportation Study (Ecology 2015) to be implemented prior to operations.
- Implementation of the Pipeline and Hazardous Materials Safety Administration's (PHMSA's) final rule on crude oil unit train standards.
- Time for emergency responders to undergo training and update spill response plans.
- Additional time for railroads to more fully implement positive train control (PTC) per the Surface Transportation Extension Act of 2015, which provides a 3-year extension of the deadline for railroads to implement PTC (to December 31, 2018).

A Reduced Capacity Alternative

The discussion of a Reduced Capacity Alternative, including reasons this alternative is eliminated from detailed analysis, is included in Section 2.9.2.6 of the Final EIS. See also Section 2.9.1 of the Final EIS for a discussion of the evaluation of alternatives to the Proposed Action.

A Reduced Impact Alternative

Onsite alternatives, such as storage tank location, railcar unloading facility options, and marine terminal considerations are discussed, along with their potential environmental impacts, in Section 2.9.2.6 of the Final EIS. As noted above, alternative site locations for the marine terminal are considered in Section 2.9.2.5 of the Final EIS. Some of the measures suggested as part of a "Reduced Impact Alternative" were considered as part of the analysis of environmental impacts and mitigation for the proposed Facility, and are discussed in the Final EIS.

Renewable Energy Alternative

An alternative using renewable energy sources would not meet the purpose and need for the proposed Facility, which is the transshipment of crude oil primarily to West Coast refinery destinations.

10.5.3 Summary Response 3: No Action Alternative

10.5.3.1 Comments

Comments regarding the No Action Alternative included the following requested revisions:

- Analysis of the impacts from rail and vessel transportation to and from the proposed Facility site that would otherwise occur unrelated to the Proposed Action
- Assessment of the significance of the four unit trains and one vessel that would serve the proposed Facility per day as a part of the overall variation in rail and vessel traffic over time (using historical and projected traffic volumes)
- Consideration of the continued transport of mid-continent North American crude oil to West Coast refineries via existing alternative transportation modes in the absence of the proposed Project
- Consideration of alternative uses for the site beyond handling high-risk commodities

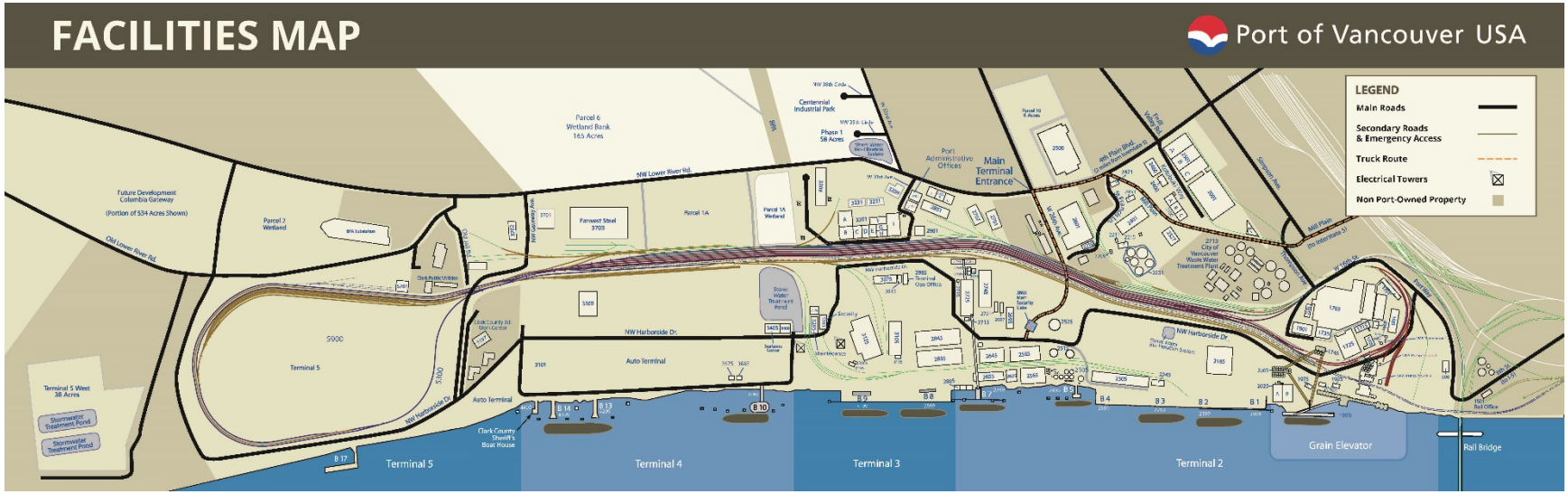
10.5.3.2 Response

Under the No Action Alternative, the governor would deny the Applicant's request to construct and operate the proposed Project at the Port, and, as described in Section 2.9.2.7, it is possible that no facility

would be constructed during the 20-year timeframe, or that an alternate facility would be designed and operated to handle dry and/or liquid bulk commodities to use the existing unit train rail infrastructure and vessel berthing facilities at the marine terminal. As described in Section 2.9.2.7, the No Action Alternative assumes a "No Development" scenario with no change in the current use of Port property used by the proposed Project. Under the No Action Alternative, the current demand by West Coast refineries for mid-continent North American crude oil would continue. The following subsections address the Draft EIS comments in the context of this scenario.

Rail and Vessel Operations at the Proposed Facility Site under the No Action Alternative

If no development occurred at the proposed Facility site over the 20-year timeframe of the Proposed Action, there would be no change in the number of rail or vessel trips at the proposed Facility site. Existing Port facilities are shown on Figure 10-3 and described in Section 3.0.5 of the Final EIS; Section 3.0.5 also describes existing rail and vessel traffic when discussing the study areas for the proposed Facility. Resource discussions within Chapter 3 also discuss existing rail and vessel traffic where necessary for understanding impacts from the proposal as it relates to that particular resource (e.g., transportation). Chapter 5 of the Final EIS considers cumulative impacts from the proposed Facility combined with past, ongoing, or future projected rail and vessel traffic over a 20-year timeframe.



Source: Port 2016

Figure 10-1 Port of Vancouver Facilities

Significance of Project Unit Trains and Vessels within the Overall Traffic System

Impacts from existing rail traffic may include air emissions from trains and idling vehicles at at-grade crossings; wildlife collisions; contaminant impacts to terrestrial vegetation and wildlife from small oil spills/leaks; temporary noise, vibration, and visual impacts to receptors located near rail lines; and vehicular delays at at-grade crossings. Impacts from existing vessel operations include air emissions; wake-induced shoreline erosion and spread of invasive plants; entrainment of fish and wake stranding of small or juvenile fish; increased turbidity; contaminant impacts to aquatic species from small oil spills/leaks; collisions or interference with other vessels (such as recreational and tribal fishing boats); and noise impacts to receptors within and along the Columbia River. A large earthquake or massive volcanic eruption would also impact existing rail and vessel traffic.

In the event that the proposed Facility were not constructed, these impacts would continue to occur to a greater or lesser degree that would partially depend on the volumes of rail and vessel traffic that operate in these areas now or in the future. The number of trains that operate along rail lines in Washington and beyond and the number of vessels that travel through the Columbia River system fluctuate over time. However, it is important to recognize that impacts from the four unit trains and one vessel that would serve the proposed Facility each day represent a new activity, which includes an increase in average rail and vessel traffic and composition.

While transportation of crude oil by rail and vessel currently occurs in Washington, this proposed Facility would increase the volume shipped along rail lines and along the Columbia River. The risk of accidents associated with transporting crude oil would be increased over existing conditions with operation of the proposed Facility. See Chapter 4 for analyses and discussion of risks associated with the transportation of crude oil by rail and vessel. Chapter 5 contains a discussion of the potential impacts of future rail and vessel operations as part of the cumulative impacts analysis.

Continued Transport of Mid-Continent North American Crude Oil to West Coast Refineries

If the proposed Facility is not constructed and operated, crude oil would continue to be transported from sources in the Bakken region and Western Canada to refineries along the West Coast of North America by existing transportation modes. Currently, crude oil is transported to these refineries by pipeline, tanker truck, vessel, and rail. Each method of transportation has its own set of risks and potential impacts, as described in Section 2.9.2. Generally, pipeline transport can have impacts that include noise from pumping stations and pinhole leaks and pipeline ruptures. Truck transport impacts include increased roadway maintenance requirements; increased air emissions (including greenhouse gases [GHGs]) and noise; and increased likelihood of accidents and oil spills on public roads. Although the size of the largest spill would be limited to the tank volumes carried by the one truck, the spill would most likely occur on a roadway shared with smaller automobiles. In the absence of the proposed Facility, the volume of crude oil and the associated impacts that currently occur from the transportation of crude oil by similar and alternative methods would continue.

Alternative Low-Risk Uses for the Site

With the completion of the West Vancouver Freight Access project, an industrial facility could be constructed that would use the existing unit train rail infrastructure and vessel berthing facilities at the marine terminal. Such a facility would likely be designed and operated to handle dry and/or liquid bulk commodities. Low-risk commodities could include grain, sand and gravel, lumber, or metal. This scenario is not analyzed in the Final EIS because (1) currently the proposed Facility site has no proposed alternative use; (2) information is insufficient to define an alternative facility that might be developed at the proposed Facility site; and (3) such a facility, if defined, would be an action alternative that would

likely be eliminated from detailed analysis in the Final EIS because it would not meet the purpose and need of the proposed Facility.

EFSEC acknowledges that some future project could be constructed and operated at the proposed Facility site; however, it is not possible at this time to define such a project. In the event that an alternate type of facility not handling crude oil were constructed, the risks associated with transportation of crude oil (such as oil spills and resulting environmental impacts) would not occur and, instead, could be replaced by other types of impacts.

10.5.4 Summary Response 4: Study Area and Scope of Analysis

10.5.4.1 Comments

Several commenters requested revisions to the EIS study area and analyses for the rail and vessel corridors by including the following:

- Vessel transportation routes along the Washington coastline, the Strait of Juan de Fuca, the Salish Sea northward, and California coastlines
- Several different rail lines that could service the proposed Facility
- A more detailed analysis of economic and environmental impacts (including derailments) in communities along rail lines in states other than Washington and Oregon

Conversely, some commenters requested reduction in the study area to limit the analysis of impacts to those that would occur only at the proposed Facility site because impacts associated with the transportation of crude oil already exist and will continue to occur. Some commenters noted that the proposed Project is not modifying existing rail lines or adding a new rail corridor. These commenters stated that train traffic is dynamic in nature and that it is speculative and not reasonably foreseeable to assume that the proposed Project would cause increased traffic on any particular route. They further stated that train traffic is projected to grow over the next 20 to 25 years and the four additional trains per day added by the proposed Project are small in comparison to that projected growth. These commenters have, therefore, requested limiting the study area to the area within and adjacent to the proposed Facility.

10.5.4.2 Response

An average of four trains with approximately 100 to 120 rail cars each containing approximately 650 to 750 bbl of crude oil would unload at the proposed Facility daily, and an average of one vessel per day would be loaded with approximately 360,000 bbl of crude oil. The Final EIS focuses on impacts associated with the primary source locations of the crude oil and the representative rail route to the proposed Facility, the location of the proposed Facility, and the vessel corridor in the Lower Columbia River.

Coastline Routes

The actual destination of the crude oil beyond the Columbia River would be determined by the shippers, not the Applicant. Section 3.0.7 of the Final EIS has been revised to clarify that the scope of analysis for the vessel transportation corridor does not include routes to specific destinations. The study area does not include specific routes of vessels to refinery destinations because the frequency of trips to any one of these refineries is not known, and the degree to which these trips would represent incremental impacts of either a greater or lesser nature than existing conditions is not quantifiable.

Rail Routes

The Applicant has reported that the primary sources of crude oil destined for the proposed Facility would likely be the Bakken formation in North Dakota, Montana, and Saskatchewan, and the oil sands of Alberta (see Section 2.1.1 of the Final EIS).

The EIS analysis used the most likely rail route from these source areas. This route was chosen to attempt to appropriately assess indirect impacts from the majority of unit trains that would serve the proposed Facility. The route was also chosen to address specific, relevant concerns raised by members of the public, government agencies, tribal representatives, and other interested stakeholders during the SEPA scoping process (see Section 3.0.2 of the Final EIS).

The analyzed route is the Burlington Northern Santa Fe (BNSF) rail line extending approximately 1,187 miles from Williston, North Dakota, to the Port. This route is referred to as the Columbia River Alignment (see Figure 3.0-1 in Section 3.0.6 of the Final EIS). It was chosen because it is the most direct route between likely crude oil loading facilities in North Dakota, is accessible to loaded unit trains originating in Alberta, and is the most likely to be used because alternative westbound rail routes in Washington pass over the Cascade Mountains, where the steep inclines are prohibitive to heavily loaded trains.

The actual crude oil rail loading locations would be determined by the shippers who contract with the Applicant for transshipment, and the actual rail routes for delivery of the crude oil to the proposed Facility would be determined by the railroad companies contracted by the shipper (e.g., the Union Pacific corridor along the Oregon side of the Columbia River).[4]

Impacts Outside Washington and Oregon

Actions related to the Proposed Action that would be carried out nearest the proposed Facility, such as onsite construction, would be the most certain to occur. Therefore, these actions were analyzed in detail, and impacts were quantified where possible. For example, noise resulting from construction at the site was quantified and assessed with respect to sensitive receptors at or near the site. Other actions associated with the proposed Facility that could occur in various locations, such as the transportation of crude oil by rail using different routes within the state or routes beyond the Washington state border, were analyzed in less detail. This approach is due to less certainty that impacts would occur in these areas as many routes could be taken in these areas and impacts could therefore be dispersed. The potential impacts of these unit trains along the representative rail route in Washington are discussed in Chapter 3 of the Final EIS under each environmental resource section. It is assumed that similar impacts could occur in other areas that facility-bound trains could pass through that are not otherwise analyzed in detail.

Limiting the Impact Study Area

EFSEC acknowledges that existing train traffic, including crude oil unit train traffic, occurs along rail routes throughout the United States, and impacts associated with rail traffic are already occurring. Limiting the analysis of impacts to only the proposed Facility site would not address the impacts along the rail and vessel corridors that could result from construction and operation of the proposed Facility. The study area chosen for analysis in the EIS is consistent with the requirements of SEPA to analyze the direct and indirect impacts of a proposal and is consistent with the Project description as included within the revised ASC (see Chapter 2 of this Final EIS).

4 Figure 2-23 shows a map of the North American rail system (see Section 2.6.2 of the EIS).

10.5.5 Summary Response 5: Impact Assessment under SEPA

10.5.5.1 Comments

Several comments were received regarding the methods and criteria used to assess potential impacts and the significance of identified impacts. For example, commenters suggested that analyses of oil spills are not required because these spills would be extremely unlikely to occur and are speculative. Other commenters recommended that the impact rating scheme (particularly the risk assessment discussions) be revised to incorporate the *likelihood* or *frequency* of any particular risk when considering whether the risk constitutes a "significant" impact. Commenters contend that impacts identified in Chapter 4 do not consider the WAC 197-11-794(1) direction that "the severity of an impact should be weighed along with the likelihood of its occurrence" and that this omission results in overstatement of the significance of many of the impacts described in Chapter 4. Some commenters also pointed out that "moderate" impacts are not "significant unavoidable adverse impacts" under SEPA and that impacts had to have a reasonable likelihood to qualify as significant.

10.5.5.2 Response

Although SEPA WAC 197-11-794 (1) cited by the commenters defines a significant impact as one with a "reasonable likelihood of more than a moderate adverse impact on environmental quality,", WAC 197-11-794 (2) provides guidance on how to assess the impacts of low likelihood events, stating "an impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred." Therefore, the analysis of impacts resulting from unlikely events, such as crude oil spills, fires, and/or explosions, has been appropriately included in the Final EIS.

The four-tier ranking scheme for impacts in the Draft EIS has been revised in the Final EIS to consider several factors, including likelihood of occurrence and severity of impacts, when determining the significance of identified potential impacts (see Section 3.0.3 and 4.6.1 of the Final EIS, and WAC 197-11-330 and WAC 197-11-794). The analysis of impacts within each resource area has been updated in the Final EIS in light of the revised impact assessment. *Significant impacts* are those impacts:

- Which have a reasonable likelihood of more than a moderate adverse impact on environmental quality (likely, more than moderate); or
- Where the chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred (unlikely but severe).

The text in Section 3.0.3 has been revised to also state that significant unavoidable impacts are those impacts that remain significant, even after all mitigation measures committed to by the Applicant or recommended by EFSEC have been applied.

10.5.6 Summary Response 6: Mitigation Measures

10.5.6.1 Comments

Comments were received that questioned EFSEC's jurisdiction with regard to the mitigation measures proposed in the Draft EIS. Commenters noted that many mitigation measures address impacts that are not specifically attributable to the Proposed Action, exceed what is required to mitigate the portion of more general impacts that are attributable to the Proposed Action, or are vague and unlikely to be successful. Commenters stated that not all of the Best Management Practices (BMPs) and mitigation measures identified by the Applicant have been included in the Final EIS. Other commenters requested an assessment of the feasibility of potential mitigation measures, their ability to be accomplished, their

enforceability, and an explanation of how such mitigation measures would effectively avoid, reduce, or compensate for specific environmental impacts.

Some commenters stated that the mitigation measures identified in the Draft EIS lacked specificity and/or requested strengthening the language of the proposed mitigation measures to hold a particular agency, company, or organization accountable for implementing them. Others requested additional information on how companies and agencies would coordinate or fund some of the measures identified in the EIS, including providing cost estimates of implementing mitigation strategies.

10.5.6.2 Response

The term "mitigation" in a SEPA context means (WAC 197-11-768):

1. **Avoiding** the impact altogether by not taking a certain action or parts of an action;
2. **Minimizing** impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
3. **Rectifying** the impact by repairing, rehabilitating, or restoring the affected environment;
4. **Reducing** or eliminating the impact over time by preservation and maintenance operations during the life of the action;
5. **Compensating** for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
6. **Monitoring** the impact and taking appropriate corrective measures.

The mitigation measures included in this Final EIS are proposed to address specific impacts as discussed within each resource section in Chapters 3 and 4. Measures proposed by the Applicant are considered to be part of the Proposed Action and are not considered "mitigation" in response to identified impacts in this FEIS. The mitigation discussed includes two categories:

- Mitigation for the Applicant, which could be imposed by EFSEC as part of a site certification agreement (SCA) and is implementable and enforceable. These measures are considered effective towards mitigating the identified impacts.
- Mitigation that could be implemented or required by other parties, and would not be implementable or enforceable by EFSEC. Because these measures cannot be required by EFSEC, they are not considered effective mitigation for the purposes of this EIS; and for the purpose of this environmental analysis, cannot be credited towards mitigating the impact.

Table 2-13 of the Final EIS includes a comprehensive list of the BMPs and other measures committed to by the Applicant. Chapters 3, 4, and 5 also include discussion of actions that are already committed to by others, such as track improvement commitments made by BNSF or ongoing actions to address at-grade crossings made by the UTC. The potential impacts to resources from the proposed Facility and associated train and vessel traffic consider these mitigation measures and actions in the discussions presented in Chapters 3, 4, and 5.

The scope and objectives of the suggested mitigation measures presented in the Final EIS are described with sufficient detail to aid decision makers in determining their appropriateness and adequacy. EFSEC has the authority to impose mitigation for identified impacts that goes above the standards required under existing state statute because EFSEC's governing statutes and rules preempt other state and local

regulatory permits, requirements, and standards per Revised Code of Washington (RCW) 80.50 (see Section 1.12.1 for more information and WAC 197-11-660). Mitigation measures identified in the Final EIS are for consideration by EFSEC, other jurisdictional agencies, the state legislature, and stakeholders with the ability to implement or enforce measures to mitigate impacts.

The EFSEC statute directs the Council to regulate the construction and operation of the facility. The Council has the regulatory authority to enforce compliance with state laws and the conditions in a Site Certification Agreement through fines or by ceasing construction or operation of the project. Mitigation measures outside the authority of EFSEC to impose as a condition of site certification are presented to aid other agencies and organizations in their decision making for resources under their purview. The Final EIS has been updated to include discussion of funding mechanisms for mitigation measures where this information is available.

Consistent with WAC 197-11-660, the responsibility for implementing mitigation measures would be imposed upon the Applicant only to the extent attributable to the identified adverse impacts of the Proposed Action. The Final EIS has been revised to further clarify those mitigation measures for the Applicant that are specifically attributable to the Proposed Action and could be required of the Applicant in the SCA or any other local/state approval that would apply.

In the event that an SCA is granted, terms of the agreement would include a full list of required conditions, including mitigation measures, and responsibilities of the Applicant. Responses to comments regarding specific mitigation measures have been included in Table R-1 in Appendix R.

10.5.7 Summary Response 7: Rail Spill Risk Analysis

10.5.7.1 Comments

Comments were received on the rail risk analysis performed for the Draft EIS. These comments requested that EFSEC perform the following in the Final EIS:

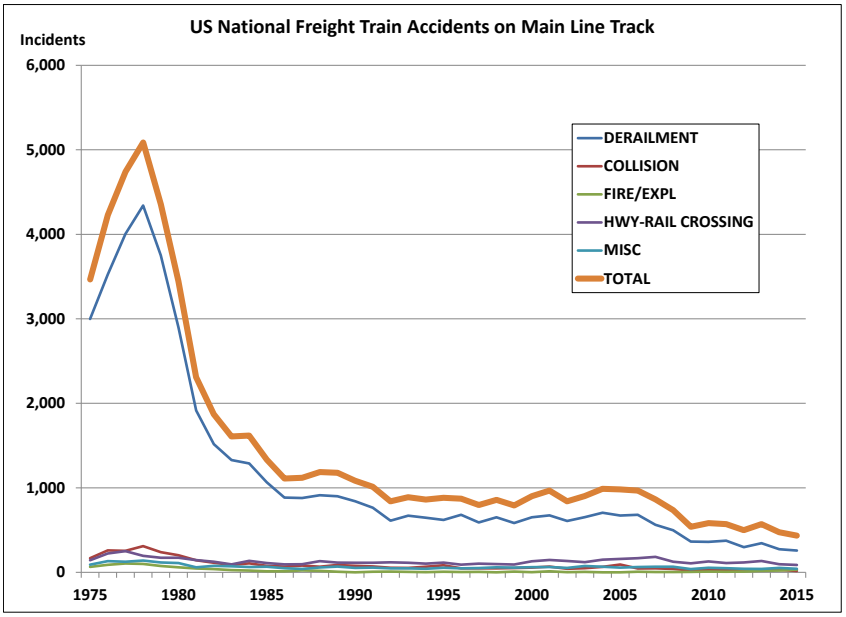
- Reassess the probability of derailments considering accident data specific to crude oil unit trains rather than historical accident data for all types of freight cars. Alternatively, reassess the probability of derailments and oil spills for train traffic using various data sources including BNSF non-yard derailment rates; FRA or NTSB data on the total number of tank car punctures or ruptures since 2012; the number of tank car derailment spills in North America since the beginning of 2013; the number of tank cars carrying alcohol, propane, LPG, diluted bitumen, and other crude; the number of loaded tank cars that have ruptured or caught fire in an accident since 2012; and Canadian rail incidents.
- Calculate the likelihood of incidents considering specific crude oil railcar types (e.g., US Department of Transportation [DOT]-117 vs DOT-111 railcars).
- Review the risk of derailments in light of understating the Lac-Mégantic derailment spill volume in the risk analysis, leading to underestimates for the worst-case scenarios for oil train accidents.
- Disregard or replace the rail spill risk analysis because of alleged conflict of interest for one of the contractors participating in the risk analysis.

10.5.7.2 Response

Probability of Derailment

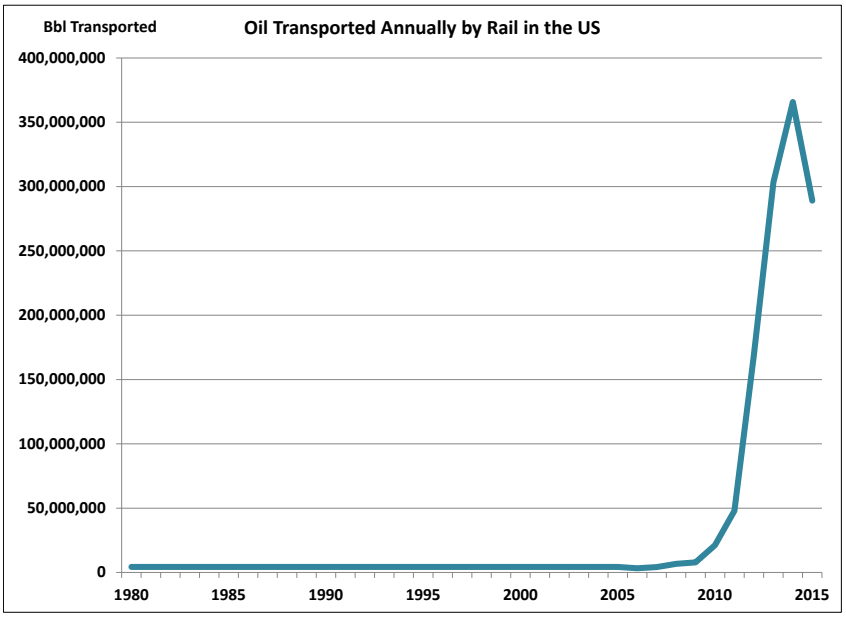
Accidents, including derailments, generally occur independent of the cargo content of the freight cars. Track conditions, rail operating procedures, and other factors unrelated to cargo content are the factors

that most strongly influence accident frequencies and locations (Appendix E). Some commenters expressed concern that using data for all freight rail would downplay the risk of a derailment from the Proposed Action; however, using historical data for all freight rail dating back to 1975 actually incorporates higher accident frequencies. As shown on Figures 10-2 and 10-3, the frequency of freight train accidents decreased dramatically in the late 1970s and early 1980s as several important rail operations and equipment safety regulations were enacted, and crude oil transport by rail has only significantly increased within the last 5 years (Appendix E).



Source: Appendix E

Figure 10-2 US National Mainline Freight Accidents, 1975–2015



Source: Appendix E

Figure 10-3 US Oil Transport by Rail, 1980–2015

In addition, accurate data on accidents specifically involving crude oil unit trains or "key trains"[5] are not readily available from the Federal Railroad Administration (FRA) or other sources. FRA records do not categorize trains as unit trains or identify trains with respect to their cargo, including crude oil. The FRA data do, however, include information about the numbers of "hazmat" cars (i.e., cars carrying hazardous materials as cargo) on board each train involved in an accident, as well as the total number of freight cars involved. Based on this information, a selection of accident data was reviewed to provide the best possible representation of a dataset for crude oil unit trains. These results are presented in Appendix E for informational purposes and to demonstrate the need to rely on other types of data. These results were not employed in the spill probability analyses because the dataset is very small and based on assumptions regarding whether the trains are truly crude oil unit trains, and because there are no reliable nationwide data on mileage for crude oil unit trains (which is necessary to determine accident rates per train-mile to apply to projections of train traffic associated with operation of the proposed Facility). The rail spill risk analysis in the Final EIS uses a large dataset of historical incidents (54,480 freight rail accidents[6] on US mainline tracks from 1975 to 2015) to calculate the likelihood that an accident resulting in a spill will occur.

Several commenters were concerned that crude oil unit trains are heavier than other freight trains, leading to a greater risk of derailment; however, the weight of crude oil unit trains falls within the range of other freight trains and is, therefore, accounted for in the historical dataset used in the Final EIS rail spill risk analysis in Appendix E. For comparison purposes, examples of loaded railcar weights for commodities known to be transported by unit train (including crude oil) are provided below.

- Auto car carrier (tri-level): 179,000 pounds (lbs) (BNSF 2016a)
- Coal car: 286,000 lbs (BNSF 2016b)
- Covered hopper car (used for grain, flour, fertilizer etc.): 263,000 to 286,000 lbs (BNSF 2016c)
- Crude oil car (DOT-117): 286,000 lbs (see Figure 4.8-1, Diagram of DOT 117 Tank Car and DOT 120 Tank Car)

Spill Likelihood Based on Railcar Type

The range of spill volumes that could result from an accident is specific to the railcar type. The statistical modeling used in the Rail Spill Risk Analysis (Appendix E) has been refined to calculate the likelihood of a range of spill volumes specific to unit trains comprising different tank car types. As discussed in Section 4.8.3 of the Final EIS, the analysis uses historical accident data for older tank cars adjusted using PHMSA's analysis on the newer models of tank cars found to be more effective at minimizing spills.[7] (See Section 4.8.3 for further information.)

The new standards for the design and construction of (DOT Specification 117) railcars include requirements for increased thickness of the tank shell, the addition of full height protection (head shields) at each end, improved protection for the top fittings and discharge valves, and reconfigured tank vents for automatic reclosing (see Section 4.8.1.3 for further information). These new designs and retrofits will

5 Trains with blocks of at least 20 hazmat tank cars.

6 This number is based on FRA accident data on freight trains of at least 20 freight cars on mainline track; it includes derailments (80 percent of accidents), collisions, highway-rail accidents, fire-explosion incidents (primary cause, not aftermath of accident), and miscellaneous accidents (e.g., foreign object on tracks).

7 Federal Register Vol. 79, No. 108 (Page 45053, Table 17).

increase the weight of rail tank cars, which could lead to more track wear and subsequent maintenance (PHMSA 2015). This issue is addressed in Section 3.14 and Chapter 4 of the Final EIS.

Consideration of the Lac-Mégantic Incident

The Rail Spill Risk Analysis has been updated to include the volume of crude oil spilled in the Lac-Mégantic incident as reported by the Transportation Safety Board of Canada (Appendix E). The initial derailment caused a spill of 26,303 bbl, and an additional 11,436 bbl were spilled due to thermal damage from the fire. Using this information and additional information from other recent rail incidents, the effective worst-case discharge (WCD) analysis has been refined (see Appendix E). The effective WCD for crude oil unit trains consisting of DOT-111 type railcars is 35,363 bbl. This volume is very similar to the amount of crude oil released in the Lac-Mégantic incident.

With regard to concerns about the analysis including an incident similar to the Lac-Mégantic incident, it would be unlikely to re-occur due to enhanced regulations and railroad operating practices in place:

- Under current regulations and protocols, a crude oil unit train cannot be left unattended as was the case with the unit train involved in the Lac-Mégantic incident.
- The locomotive involved in that incident would not meet revised safety standards in place today and, therefore, would not be in operation.
- A freight train with hazardous cargo can no longer be operated by a single person.
- The use of safer tank cars (meeting DOT-117 specifications or greater) and the lower volatility of preconditioned Bakken crude would reduce the likelihood of an incident similar in scale to the Lac-Mégantic event (Appendix E).

Given the enhanced design of the DOT-117 railcars, the effective WCD for a crude oil unit train comprising these cars is 22,830 bbl (see Section 4.8.3.1 of the Final EIS and Appendix E). The Applicant has committed to only accepting crude oil delivery at the proposed Facility from unit trains consisting of DOT-117 railcars or more advanced cars such as the DOT-120 model.

Alleged Conflict of Interest of the Rail Spill Risk Analysis Preparer

To ensure no real or perceived conflict of interest exists for the contractors preparing the Rail Spill Risk Analysis, EFSEC's contractors have all maintained a strict protocol that restricts any contributors to the EIS from contracting with the following entities for the duration of the Project (from August 2013 through publication and end of contract terms): Tesoro Savage Petroleum Terminal LLC or Vancouver Energy, Tesoro (and all its affiliates/subsidiaries), Savage Industries, BNSF, and the Port of Vancouver (USA).

10.5.8 Summary Response 8: Vessel Spill Risk Analysis

10.5.8.1 Comments

Comments received on the Vessel Spill Risk Analysis performed for the Draft EIS included the following:

- Criticisms of the analytical methods and data set used to determine the vessel worst-case discharge (WCD) volume.

- Requests for accurate forecasts of future vessel traffic levels and fluctuating vessel traffic volumes on the Columbia River, including the use of two vessel traffic studies prepared by Det Norske Veritas (DNV GL 2016a, b) to update the analysis in the Final EIS.
- Requests for a new and comprehensive Vessel Traffic Risk Assessment that covers the full extent of the Columbia River from its mouth to the proposed Facility, including the risk of a large spill occurring during the crossing of the Columbia River bar.

10.5.8.2 Response

Worst-Case Discharge Volume Analysis

A Vessel Spill Risk Analysis (Appendix J) was performed to determine the risk of oil spills from vessels that would transport crude oil from the proposed Facility, including calculating the likelihood of an accident, the likelihood that an accident would result in a spill, and the likelihood that the incident would result in a spill volume less than or equal to the WCD. The risk assessment used historical accident rates of vessels with drafts of greater than 15 feet along the Lower Columbia River from 1990 to 2011. That analysis has been updated for use in the Final EIS by supplementing the data on vessel accidents in the Columbia River with additional historical accident statistics from 2012 through 2015. The analysis was also updated to include Columbia River baseline traffic data from 2013 to 2015 (the most recently available public dataset) and more recent publicly available information on other proposed projects that could influence current and future cumulative Columbia River vessel traffic.

In addition to calculating the likelihood of Project-related vessel accidents, the Vessel Spill Risk Assessment calculated WCD volumes for all vessel types expected at the proposed Facility including the "regulatory worst-case discharge" (i.e., the volume used for spill response planning required by federal or state regulations) and "effective worst-case discharges" (i.e., the most credible or realistic WCD volumes). These effective WCD volumes are based on maximum possible outflow as determined through modeling using the proprietary software program HECSALV. HECSALV is used for oil outflow assessments by the American Bureau of Shipping, the US Coast Guard (USCG), and the US Navy, among others. This model uses International Maritime Organization's distributions for side and bottom damage for tankers as input parameters and estimates crude oil releases after side and bottom damage occurs, based on actual hull geometries. Using this model approach, the report provides the effective WCD volumes for the types of tank vessels that would call at the proposed Facility (see Appendix J).

Vessel Traffic Analysis

A Quantitative Vessel Traffic Risk Assessment prepared by DNV GL (2016a) for the Applicant and submitted as part of a revised ASC (Vancouver Energy 2016) was reviewed and incorporated into Chapter 4 of the Final EIS as appropriate. The report is included as Appendix T to the Final EIS. The DNV GL study used different data and methods to calculate the probability of Project-related vessel accidents and resulting oil outflow volumes from the Vessel Spill Risk Analysis prepared for the EIS and, therefore, contains slightly different results. The data collected were for the period July 1, 2013, to June 30, 2014, and the likelihood of navigation incidents was estimated using a DNV GL proprietary model, Marine Accident Risk Calculation System (MARCS) (See Section 4.9.3.1 for more detail).

The Quantitative Vessel Traffic Risk Assessment prepared for the Applicant focuses on estimating the likelihood of accidents occurring (not necessarily resulting in a spill), and the Vessel Spill Risk Analysis prepared for EFSEC focuses on estimating the likelihood of an accident resulting in a spill and estimating the likelihood of a range of spill sizes. The results of both studies are summarized in Section 4.9.3 and provide a range of calculated accident frequencies and potential spill volumes.

Fluctuating volumes of vessel traffic are also addressed in Summary Response 3. Past trends on vessel calls in the Lower Columbia River, as well as predictions of future changes in vessel traffic, are described in detail in Section 5.1.3.3. The number of vessels that travel through the Columbia River system do fluctuate over time; however, it is important to recognize that the one vessel that would serve the proposed Facility each day represents a new activity, which includes an increase in average vessel traffic and composition.

Locations for the Vessel Traffic Risk Assessment

Location-specific modeling of oil spill trajectories was undertaken to address concerns regarding the fate of a large oil spill from a vessel in the Columbia River. The study assessed the trajectory of two oil types (Bakken crude and Canadian dilbit) and potential mixing with sediment within the water column (i.e., sinking) of a hypothetical oil spill near Cathlamet, Washington, in the Lower Columbia River.

While commenters requested analysis of the risk of a large spill occurring during the crossing of the Columbia River bar, the location near Cathlamet was chosen for the spill trajectory analysis because it is the site of a recent grounding accident on the river. In March 2016, a 623-foot bulk grain carrier went out of the shipping channel and hit a boulder in the river (Ecology 2016). The oil spill model results from the vessel grounding scenario at this location show that 48 hours after a release of both Bakken crude oil and dilbit, a black oil and large dark brown sheen would have traveled away from the source location to cover a large portion of the river channel to the river mouth, including the Columbia River bar (see Section 4.9.4.1 for more detail).

The results of the Vessel Spill Risk Analysis (Appendix J) and vessel grounding oil spill trajectory analysis (Appendix F) have been incorporated into the Final EIS and are considered in the assessment of impacts to resources (see Section 4.9).

10.5.9 Summary Response 9: Proposed Facility Spill Risk/Impact Analysis

10.5.9.1 Comments

Several comments included the following requests:

- An analysis of spill risks for various elements of the proposed Facility in addition to the transfer (or vessel loading) spill risk analysis presented in the Draft EIS. These Facility elements include the rail unloading facility, transfer pipelines, and storage tanks.
- An assessment of the proposed volumes and number of secondary containment berms for the storage tank area and the rail unloading facility. Commenters also requested an assessment of the impacts to resources if the storage tank area berm were breached or overwhelmed and the contents of one or more storage tanks were released, and requested that spill containment, spill response plans and resources be factored into the assessment of likelihood and magnitude of impacts.
- The addition of complete emergency response plans, including a Facility Response Plan, in the Final EIS.

10.5.9.2 Response

Analysis of Spill Risks at the Proposed Facility Site

The Draft EIS included discussions of potential spill volumes from various proposed Facility elements. Since publication, a Facility Siting Study and Quantitative Risk Analysis were prepared for the Applicant

and submitted to EFSEC as part of the updated ASC in May 2016 (see Appendix T). The analysis includes an assessment of the failure rates for onsite storage tanks and associated pumps. Analysis of potential spills from crude oil unit trains while operating within the boundaries of the proposed Facility was carried out as part of the Rail Spill Risk Analysis (included as Appendix E to this Final EIS) and analysis of spill likelihood at the marine terminal during vessel loading was carried out as part of the Vessel Spill Risk Analysis (included as Appendix J to the Final EIS). Please refer to Section 4.7 in Chapter 4 for further information on these analyses and results.

Section 4.7 of the Final EIS also includes discussion of emergency shutoff systems and secondary containment systems for elements of the proposed Facility, and regulatory requirements for the rail loops and unloading facility, transfer pipelines, storage tanks, and the marine terminal (see Table 4.7-2). To assess potential impacts from a spill at the proposed Facility, a spill trajectory model was conducted that modelled a crude oil spill from a transfer pipeline, assuming the release of the entire capacity of one pipeline (5,505 bbl). This facility oil spill trajectory analysis is included as Appendix F.

Spill Containment at the Proposed Facility Site

Relative to the size of the proposed containment area for the storage tank area, the proposed secondary containment berm is sized to capture 110 percent of the volume of one storage tank plus the volume of precipitation from a 24-hour, 100-year storm event (see Section 2.2.2.4). According to the Applicant, this capacity reflects the most stringent requirements of Washington state spill prevention and control and the National Fire Protection Association, and exceeds the requirements for secondary containment under 40 Code of Federal Regulations (CFR) 112.7, General Requirements for Spill Prevention, Control, and Countermeasure Plans. EFSEC conducted a review of secondary containment sizing requirements in other states with crude oil storage tank farms near waterways (California, Texas, and Louisiana). The review confirmed that the measures required for the proposed Facility by Washington state and federal regulations are stricter than the standards in these other states (California Health and Safety Code Section 25270.4.5(b)3; Texas Administrative Code 30.1.334(F); Business and Legal Resources 2016). An Ecology facility engineer, in coordination with EFSEC, has also reviewed the proposed secondary containment berm sizing for the storage tank area. However, the Final EIS has been revised to discuss a scenario involving release of oil from one or more crude oil storage tanks and failure of the secondary containment berm (see Section 4.11).

Emergency Response Plans

Appendix D to the Draft EIS contained many oil spill prevention and response plans. The Operations Facility Oil Spill Contingency Plan (OSCP; discussed in Section 4.7.2.2) addresses state and federal oil spill contingency planning requirements, including 40 CFR 112.20. The Applicant submitted a draft OSCP to EFSEC in 2015, and the revised plan based on EFSEC's review is attached as Appendix D to the Final EIS. The Applicant also submitted a Fire Protection Plan, prepared by a licensed fire protection engineer, to EFSEC as Section 16 of the Vancouver Energy Operations Facility Safety Program (Appendix D.12). The Applicant would update the plan based on EFSEC's review and in compliance with WAC 296-24-567.

With regard to a Facility Response Plan, as discussed in Section 4.7 of the Final EIS, the Applicant would develop contingency response plans for potential spill scenarios at the proposed Facility (including the development of a Facility Response Plan) and implement associated training and drills per the requirements of 40 CFR 112 Subpart D, which is administered by the US Environmental Protection Agency (EPA).

10.5.10 Summary Response 10: Fire and Explosion Risk Analyses

10.5.10.1 Comments

Many commenters expressed concern regarding the safety of crude-by-rail traffic, and some requested analyses of worst-case scenarios (fire and/or explosion) for the proposed Facility as follows:

- Analysis of a derailment within communities along the rail delivery route. Some commenters referenced the Lac-Mégantic incident and suggested including an overlay of the Lac-Mégantic blast zone area on an aerial photograph of the city of Vancouver to provide a graphical representation of the potential impact of such an incident. Additionally, commenters requested the incorporation of the Petroleum Crude Oil Unit Train Transportation Risk Analysis by Barkan et al. (2016) into the discussions of fire and explosion in the Final EIS.
- Consideration of fires and explosions of storage tanks at the proposed Facility, including accidents caused by lightning, and the circumstances around a storage tank explosion in Buncefield, Hertfordshire, England.
- Consideration of fires and explosions for trains along the route and for vessels on the Columbia River in the Final EIS associated with terrorist acts or hunting accidents. Commenters also requested the incorporation of a Quantitative Vessel Traffic Risk Assessment by DNV GL (2016a) into the discussions of fire and explosion in the Final EIS.

10.5.10.2 Response

Fire and/or Explosion Risk along the Rail Corridor

The transportation of crude oil by rail has become an important topic in many communities in Washington and Oregon, particularly since the derailment in Mosier, Oregon, on June 3, 2016, where four railcars were involved in a fire that burned for approximately 14 hours, according to a report by the FRA (2016). Officials estimated that 1,000 bbl of crude oil were released from the 4 railcars (Ecology 2016), and elected officials in Oregon and Washington have called for tighter rail safety measures in response to the incident. The Mosier incident has been used as an example case with which to assess impacts to communities along the rail route in this Final EIS (see Section 4.8) because it occurred on rail lines directly across the Columbia River from the BNSF rail lines included in the environmental assessment for the proposed Project. The ecological conditions (e.g., topography, habitats) and response efforts that would occur for trains transporting crude oil to the proposed Facility would be similar.

The Lac-Mégantic incident occurred in Quebec, Canada, in 2013, when a 73-car freight train carrying crude oil derailed near the downtown area of Lac-Mégantic, causing multiple cars to explode. The incident caused fatalities and substantial damage to the downtown area. Many aspects of this incident are not applicable to the proposed Project. Modeling the affected area of a similar incident at or near the proposed Facility would not be appropriate, because the factors contributing to the Lac-Mégantic incident are specific to that site. The geography and topography of the area within which the events leading to the Lac Mégantic incident occurred are not coincident with the geography and topography of the inbound rail corridor near the city of Vancouver. It would, therefore, be inappropriate and misleading to overlay the Lac-Mégantic blast zone area on an aerial photograph of Vancouver. Moreover, regulations and operating procedures in place in that location at that time and implemented prior to and during that event were very different from what is now required within the United States and specifically within Washington and neighboring states along the inbound rail corridor for the proposed Project.

Storage Tank Fire and/or Explosion Risk at the Proposed Facility Site

The failure of bulk storage tanks can be attributed to a number of causes as described in Section 4.3. One well documented storage tank explosion event occurred on December 11, 2005 at the Buncefield fuel depot in Hemel Hempstead, Hertfordshire, England. The Hertfordshire Terminal handled more than two million metric tons of gasoline, diesel, and aviation fuel each year and was the fifth largest oil products storage depot in the UK (Lewis 2015). The explosion was related to the overfilling of a gasoline tank leading to overflow into the secondary containment area. Crude oil is less volatile than gasoline. The volatility of crude oils is described in Section 4.2.

After publication of the Draft EIS, the Applicant provided a Facility Siting Study and Quantitative Risk Assessment (BakerRisk 2016 [Appendix S]) that provides a quantitative assessment of risks from proposed Facility operations, including the rail unloading facility, the marine loading facility, and the crude oil storage tanks. The purpose of the Applicant's study was to identify and evaluate the consequences and associated risks of fire, toxic, and explosion hazards to onsite personnel and offsite populations. The analysis considered both the consequences of events and the likelihood of the occurrence of events. Accident frequencies were determined using equipment counts, typical industry failure rates, ignition probabilities and timing, and regional meteorological statistics.

The BakerRisk (2016) report also included a detailed analysis of an internal explosion within the storage tanks. The explosion analysis conservatively assumes the entire volume of one tank was free to fill with flammable vapors and ignite, which would cause an internal tank explosion, resulting in blast waves propagating from the tank and the tank roof being detached and thrown. Based on the analysis, the roof debris is predicted to be thrown at a maximum distance of 230 feet from the tank, which is still within the terminal boundary. The results of the BakerRisk (2016) analysis are included in Section 4.7.3 and the report is included as Appendix S to the Final EIS.

Risk of Fire and/or Explosion from Hunting or Terrorism Activities

Most types of ammunition used in hunting are not likely to cause a fire or explosion when hitting an oil tank car. Most ammunition used for hunting is soft-tipped and designed to transfer as much kinetic energy as possible to the target, expanding to increase stopping power. Expanding bullets are less likely to penetrate a double-hulled tanker.

The analysis of terror threats in the United States is outside of the scope of this Final EIS. As discussed in Section 3.15.2.1 of the Draft EIS, the Port provides security services at the proposed Facility site, and all Port operations are conducted in accordance with the Port's security program. Access to the Port's marine terminals is gated, and all entrants must show photo identification and have a valid business purpose to access existing operations. Additional information on site security has been added to Section 3.8 of the Final EIS.

DOT and the Department of Homeland Security (DHS) recognize that crude oil trains can be considered targets for terrorist attacks and have taken actions to enhance the security of the transportation of hazardous materials (hazmat), including enhanced security measures to reduce the threat of such an attack. For example, DOT requires shippers and carriers to implement security plans regarding specified hazmat transportation and DOT has contacted thousands of companies seeking to improve their security programs and has established communication links with industry. DHS conveys threat information to law enforcement and industry, and conducts vulnerability assessments. DHS administers a grant that provides training and the communications infrastructure that facilitates the reporting of safety and potential security concerns, and DHS seeks to determine whether commercial hazmat transporters pose a security threat necessitating denial of their hazmat endorsement. (Congressional Research Service 2005).

The safety of vessel traffic in the Columbia River is under USCG's jurisdiction. The Homeland Security Act of 2002 divided the USCG's statutory missions between homeland security and non-homeland security. Reflecting the USCG's role in defending the nation, the act delineated "Ports, Waterways, and Coastal Security" (PWCS) as the first homeland security mission. The PWCS mission "entails protection of the US Maritime Domain and the US Maritime Transportation System (MTS) and those who live, work, or recreate near them; the prevention or disruption of terrorist attacks, sabotage, espionage, or subversive acts; and response to and recovery from those that do occur. Conducting PWCS deters terrorists from using or exploiting MTS as a means for attacks on US territory, population centers, vessels, critical infrastructure, and key resources" (USCG 2016).

The USCG Portland Station is responsible for the Columbia River from Puget Island to Bonneville Dam. USCG Station Cape Disappointment is responsible for the Columbia River west of Puget Island and the Pacific coastline from Long Beach Peninsula on the Washington coast south to Tillamook Head on the Oregon coast.

Fires and explosions are possible for any number of reasons. Chapter 4 (Sections 4.4.2, 4.8 and 4.9) provides extensive discussion of the risk and potential impacts from fires or explosions related to rail and vessel traffic.

10.5.11 Summary Response 11: Emergency Response Capabilities and Gaps in Service

10.5.11.1 Comments

Commenters requested adding the following actions to existing planning for emergency response:

- Describe the resources necessary to prevent a release.
- Carry out a full gap analysis of emergency responders' capabilities to respond to a major event, including analysis of the specific training, staffing, or equipment needed to respond to spills and fires at the proposed Facility or along the rail and vessel routes. Examine disaster plans for communities along the route of the crude oil, and disclose response times of the Vancouver Fire Department (VFD) and mutual aid fire departments. Assess impacts to regional emergency response systems and describe evacuation procedures, capabilities, shelter capacity, medical resources, and routes to be used in an emergency.
- Discuss the effectiveness of response actions in previous oil train incidents that have happened across the country the past couple of years;
- Identify gaps in Geographic Response Plans (GRPs) for inland regions and marine areas along rail and vessel transportation routes and gaps in response strategies for dealing with submerged or sinking oils.

10.5.11.2 Response

Resources for Preventing Oil Release

Spill prevention measures are addressed throughout Chapter 4 of the Final EIS, because spill prevention is the most critical component to avoid environmental impacts from a crude oil release. Spill measures are also discussed in detail because minimizing the size and spread of a release, and being prepared for a rapid, coordinated, and effective response, are also vital to reducing impacts from a release. Section 4.3.2 has more detailed discussion on practices and resources for spill prevention.

Emergency Responders' Capabilities

Section 4.5.3 of the Final EIS includes a general discussion of equipment and strategies to respond to a crude oil release on land or in water. The behavior of crude oil, including the potential for crude oil to sink under certain environmental conditions, is discussed in Section 4.4 of the Final EIS. Approaches to cleanup of submerged crude oil are discussed in Section 4.5.3 of the Final EIS. Effectiveness of response actions to previous oil spills are discussed in Section 4.5.4 of the Final EIS and above in Summary Response 10 (Fire and Explosion Risk Analyses), above.

Section 4.5 of the Final EIS discusses the general response capabilities that would be available in the event of a crude oil release along the inbound rail delivery route, along the outbound vessel corridor, and in the vicinity of the proposed Facility. A full-scale gap analysis of each response organization or team that could be activated in the event of a crude oil release is not necessary because sufficient information has already been collected to identify that most fire districts along the rail and vessel routes lack staff, training, and equipment to respond effectively to an oil spill. At the facility, on-site staff would play a role in first response and would have access to trained staff and equipment for smaller spills.

The Final EIS recognizes the importance of assessing and rectifying any critical gaps in response capabilities along the transportation corridors and at the proposed Facility. The recently enacted Oil Transportation Safety Act (Engrossed Substitute House Bill [ESHB] 1449) updated several state laws, programs, and initiatives designed to prepare and respond to crude oil spills and related fires and/or explosions. As a result of ESHB 1449, Ecology's Spills Program is undertaking multiple policy initiatives to help address the risks brought on by transporting oil in Washington, including the following:

- Requiring railroads transporting crude oil to develop spill contingency plans
- Requiring facilities to provide advanced notice of crude oil movement by rail
- Performing a Vessel Traffic Safety and Evaluation Assessment for the Columbia River
- Updating GRPs (see more below)
- Providing Equipment Cache Grants

More information on these initiatives and the ramifications of enacting ESHB 1449 are discussed in Section 4.5 of the Final EIS.

Oil trains are currently passing through 31 communities along the Columbia River from Vancouver to the Washington border daily. Some of these communities (e.g., Spokane County) have developed plans that encompass both natural and manmade disaster preparedness, while others have focused on natural disasters such as earthquakes and wildfires. For example, Skamania County (Washington) and Hood River County (Oregon) have both prepared Natural Hazards Mitigation plans (Skamania County 2010, Hood River County 2012) containing information such as where at-risk populations of people live, areas at greater risk for particular types of events (e.g., landslides), and measures to mitigate and prepare for natural disasters. Spokane County developed the Greater Spokane Comprehensive Emergency Management Plan (Spokane County 2014); this plan lists the groups responsible for tasks such as setting up shelters, coordinating food for emergency responders, caring for affected animals, coordinating fire suppression efforts, and conducting evacuations. The potential hazards discussed within the plan include natural disasters as well as hazardous materials accidents, train derailments, power/utility outages, terrorism, and other technological and human hazards. The plan provides guidelines for how members of the public should prepare for and react to an industrial/transportation or chemical accident.

One indirect method of estimating a community's fire response capabilities is by reviewing its Washington Survey and Rating Bureau (WSRB) rating number. The WSRB inspects and evaluates the fire defenses and building code enforcement of cities, counties, and municipal fire districts to develop and publish comparative classifications for the purposes of determining levels of insurance coverage. Communities are assigned a class between 1 and 10, with 10 indicating no creditable fire protection (WSRB 2016). The Clark County Fire District 6 has been rated as Class 4 (Clark County Fire District 6 2015). Portland does not have a WSRB rating because it is in Oregon, but the city holds a Class 2 rating by the Insurance Service Office (ISO) (Portland Fire & Rescue 2015). ISO ratings occur on a scale of 1 to 10, with 10 being poor.

To ensure trainings stay current, mitigation is recommended in Chapter 4 for the Applicant to sponsor training exercises for initial and regular emergency response in Vancouver, Spokane, and the Columbia River Gorge. EFSEC has also identified annual training needs for the VFD, including training in crude oil transshipment response at a marine terminal, industrial rescue, water response, industrial fire suppression, flammable liquids handling and fire suppression, and foam application in a live fire event (FEIS Section 4.7.7.2). Other mitigation measures that could be imposed on the Applicant by EFSEC addressing response preparedness at the proposed Facility, and along the rail and vessel corridors are identified in 4.7.7, 4.8.7, and 4.9.7 of the Final EIS, respectively.

Effectiveness of Previous Response Measures to Crude Oil Releases

Any time a crude oil release occurs, it is a unique event of a specific magnitude in a specific location. The extent of the spill and possible response capabilities at that specific location could be highly variable. For this reason, it is not possible to provide a meaningful discussion of the impacts to every regional emergency response system, precise evacuation procedures, response times (e.g., of VFD and mutual aid fire departments), shelter capacities, number of hospital beds, and evacuation routes that would be used in the event of an actual crude oil release. Spill response methods and recovery rates are discussed in Section 4.5.3 of this Final EIS.

Geographic Response Plans

GRPs have two main objectives:

1. To pre-identify sensitive resources at risk, and
2. To help direct response actions for sensitive resource protection during the initial hours of a response.

As directed by the state legislature in ESHB 1449, Ecology prepared a Gap Analysis Report (December 2015) evaluating the status of GRPs in Washington. As part of the gap analysis, Ecology identified Water Resource Inventory Areas (WRIAs) that are not covered by existing GRPs; certain WRIAs along the rail corridor that would be used to transport crude oil to the proposed Facility are not currently covered by GRPs. Based on Ecology's Gap Analysis and input from Northwest Area Committee (NWAC) members, Ecology has selected nine GRPs for development in 2015 and 2016. The status of the GRPs at the time of the FEIS is discussed in Section 4.5.5.2. EFSEC has imposed as a mitigation measure that the Applicant contribute to all updates of the Lower Columbia River GRP and other applicable Northwest GRPs for the lifetime of the proposed Facility; this would ensure that the plans address the types and volumes of crude oil stored or transferred at the proposed Facility (see Section 4.7.7.2 of the Final EIS).

An interval spill modeling analysis has been conducted for the entire inbound rail corridor, as described in Section 4.8 of the Final EIS. This analysis provided information on potential spill trajectories for a series of modeled releases, and these results have been compared to areas within WRIAs that could be impacted

by spills along the corridor that are not covered by existing GRPs. This information has been summarized in Section 4.5.5 in the Final EIS.

In addition, spill trajectory modeling was performed to replace the dispersion modeling results used in the Draft EIS spill impact assessment. The modeling was done for three site-specific locations: one along the inbound rail corridor, one at the proposed Facility, and one along the outbound vessel corridor. The results of these analyses include spill trajectory maps at time intervals including 6 hours (the maximum response time that must be demonstrated for response contractors to be certified by the USCG), 12 hours, 24 hours, and the furthest extent of the model runs (~7 days).

10.5.12 Summary Response 12: Seismic Risk Analysis and Design

10.5.12.1 Comments

Comments were received from members of the public and from the Applicant regarding the Draft EIS's assessment of ground improvement elements of the proposed seismic risk mitigation. The comments cover the following topics:

- Applicable seismic design standards for proposed Facility elements
- A recommendation to require the Applicant to conduct additional modeling of the performance of the proposed ground improvements during ground shaking
- Mitigation measures proposed by EFSEC to reduce the potential for damage to structures from a seismic event

10.5.12.2 Response

Seismic Design Standards

The proposed Facility must be designed consistent with federal and industry design standards to adequately withstand a major[8] seismic event. Given the importance of seismic design to the safety of the proposed Facility and the environment, EFSEC included peer review of seismic design in its development of the Draft EIS. Section 3.1.3 of the Final EIS has been updated to include the most recent information on seismic design.

Analysis Related to Ground Shaking Events and Mitigation Measures

During preparation of the Final EIS, EFSEC commissioned an independent peer review of potential seismic hazards that could affect the proposed Facility and an assessment of the design of the proposed Facility, including ground improvements committed to by the Applicant to address seismically induced soil liquefaction (Appendix C). As described in Section 3.1.3.5 of the FEIS, the analysis determined the following:

- Within the storage tank area (Area 300), the ground improvement procedures proposed by the Applicant, primarily installation of vibroreplacement stone columns extending to the underlying dense gravel layer, would prevent damage to tank foundations resulting from ground shaking associated with the maximum considered earthquake (MCE). (See Appendix C.2, Section 5.2.1.)

8 Earthquakes of magnitude 7 or above on the Richter scale are considered to be major.

- Within the storage tank area (Area 300), no ground improvement is proposed for soils underlying the secondary containment berm. EFSEC's independent peer review of the estimated settlements and magnitude of deformations in this area has confirmed that the proposed design is appropriate (see Appendix C.2, Section 5.2.1).
- At the dock and adjacent transfer pipeline within the marine terminal (Area 400), the MCE could result in 7 to 14 feet of lateral spreading at the dock and at the proposed transfer pipeline near the shoreline. EFSEC's independent peer review indicates that the revised ground improvement concept appears to be appropriate, with recommended further analysis conducted by the Applicant.
- The Applicant's proposed strengthening schemes for piles in the dock area (Area 400) are described in Section 2.3.3.5 (Dock Modifications) and are intended to increase resistance to the simultaneous effects of earthquake ground shaking and slope failure (lateral spreading) of the riverbank soils. Additional analysis by the Applicant is required to verify or modify the load combination percentages. Revisions may lead to modifications of proposed strengthening schemes and/or strengthening of piles for the final design (e.g., increasing the outside diameter of additional piles, or upgrades to more existing piles). See Appendix C.2 for details on additional analyses and current strengthening schemes for piles in the dock area.
- In the transfer pipelines area (Area 500), existing data indicate that the depth to very dense non-liquefiable soils ranges from about 55 to 85 feet below ground surface (bgs). The current design for pipeline foundations includes footings between 5 and 16 feet bgs, which would not reach these underlying stable soils. EFSEC's independent peer review agrees that, given the Applicant's proposed design of the pipeline support system, additional ground improvements in Area 500 would not be necessary.

The mitigation measures presented in 3.1.4 have been updated in the Final EIS to reflect the new analysis and conclusions.

10.5.13 Summary Response 13: Cumulative Impacts Analysis

10.5.13.1 Comments

Comments related to the cumulative impacts analysis included the following:

- Questions on the projects that were included in the cumulative impacts analysis, and requests to update information on these projects in light of developments that have occurred since publication of the Draft EIS.
- Requests for detailed analysis of impacts from all proposed future actions including risks of oil spills from all trains/vessels operating in the Project area from other projects, and cumulative statewide impacts to natural and human environments if all the coal and oil terminals are approved.
- Requests to include a discussion of cumulative impacts under the No Action Alternative.

10.5.13.2 Response

Projects Included in the Cumulative Impacts Analysis

Cumulative impacts are those that occur to environmental resources from a proposed action when considered in combination with impacts from other past, present, and/or reasonably foreseeable future

actions on the same environmental resources and over the same time period as the effects of the Proposed Action (in this case, 20 years).

Reasonably foreseeable future actions are defined in the EIS as "projects that have been announced, are in permitting, or have been permitted" (see Section 5.1.3 of the Final EIS). It is not possible to know which of the proposed or planned projects will actually be built. It is therefore appropriate to consider all of these projects in the discussion of cumulative impacts. The identification of future projects, actions, and trends involves some uncertainty, as does the assessment of the intensity, magnitude, and duration of impacts now and in the future. The cumulative impacts analysis is designed to explore the range of potential cumulative impacts while recognizing that uncertainty.

The list of projects and actions considered in the analysis of cumulative impacts has been updated in this Final EIS to reflect current information, including denial of permits (e.g., Gateway Pacific Terminal) and updated proposals.

Analysis of Cumulative Impacts from Spills

It is not appropriate to carry out a detailed cumulative analysis of oil spill risks and impacts from all past, present, and reasonably foreseeable future actions in combination with the risks identified for the Proposed Action; this is because the scope of a cumulative effects analysis is tied to the direct and indirect impacts of the Proposed Action—those with a reasonable likelihood of occurring. An oil spill is far from certain to occur and as such is not considered a probable direct or indirect impact from the Proposed Action. The analyses of rail and vessel oil spill risk performed for this Project include consideration of other trains and vessels, and the results are included in Chapter 4 and Section 5.19.

The cumulative impact analysis presented in the Final EIS includes potential impacts from continued rail and vessel operations combined with construction and operation of the proposed Facility (see Chapter 5 of the Final EIS).

Cumulative Impacts under the No Action Alternative

As noted above, cumulative impacts are tied to the direct and indirect impacts of the Proposed Action when considered in combination with impacts from other past, present, and/or reasonably foreseeable future actions. As described in Section 2.9.2.7, the No Action Alternative assumes a "No Development" scenario, with no change in the current use of Port property included in the proposed Project, and no change in the number of rail or vessel trips at the proposed Facility site. The No Action Alternative therefore would have no direct or indirect impacts. If no direct or indirect impacts to any environmental resources are identified for the No Action Alternative, then there would be no cumulative effects analysis of this alternative.

10.5.14 Summary Response 14: Tribal Consultation and Treaty Rights

10.5.14.1 Comments

Nine tribes provided comments on the Draft EIS. Comments included requests to expand the analysis of potential impacts to tribal treaty resources, Usual and Accustomed (U&A) areas, and cultural and historical resources from normal operations, and requests for government-to-government consultation. Tribes also requested additional analyses of oil spill impacts to tribal resources including cultural resources and fisheries.

10.5.14.2 Response

Potential impacts to tribal treaty resources were broadly discussed in the Draft EIS for U&A fishing and hunting areas. To assess potential impacts to specific resources in specific locations, information was required from the tribes because this information is not publicly or readily available. In response to tribal comments received on the Draft EIS, EFSEC sent follow-up letters to 10 tribes requesting additional information on tribal resources, including the identification of properties of religious and cultural significance (including Traditional Cultural Properties) and historical tribal use areas for hunting, fishing, and gathering. As part of the tribal outreach effort, EFSEC also invited tribal members to attend a phone call or in-person meeting to discuss the proposed Project. Archival research was carried out at the National Archives repository (Seattle), the State Library (Salem), and the historical society in Longview. Oral interviews with tribal members were also carried out to obtain additional information. Section 3.17 of the Final EIS provides a summary of tribal coordination. Sensitive information obtained from tribes is included in a confidential technical report that has been used to inform the impact discussions in the Final EIS.

For the Draft EIS, the Washington State Department of Archaeology and Historic Preservation and the Oregon State Historic Preservation Office archives were reviewed for available relevant information concerning the majority of extant cultural resources within the proposed Facility study area and rail and vessel study areas. In response to comments received from tribes on the Draft EIS, additional research was carried out at repositories that were not previously visited, including the Bureau of Indian Affairs Northwest Regional Office (Portland, OR), Washington Governor's Office of Indian Affairs (Olympia, WA), Washington State Department of Natural Resources (Olympia, WA), Washington Department of Fish and Wildlife (Olympia, WA), and local libraries, historical societies, and newspapers. The Columbia River Intertribal Fish Commission[9] member tribes were also contacted for additional information on tribal resources on the Columbia River. The Final EIS has been revised to include additional information gathered on tribal treaty resources, U&A lands, cultural resources, and historical resources.

The Final EIS includes a new section in Chapter 3 on treaty rights, with a focus on U&A lands. The treaty and U&A information included in Section 3.13 – Cultural Resources of the Draft EIS has been expanded and moved into new sections to address concerns about the relation of treaty rights and cultural resources and to provide more information about treaty rights and U&A lands (see Sections 3.17, 4.7.4, 4.8.4, 4.9.4, and 5.20 of the Final EIS).

10.5.15 Summary Response 15: Crude Oil Export

10.5.15.1 Comments

Many commenters expressed concern that since publication of the Draft EIS in November 2015, the 40-year ban on exporting domestically produced US oil has been repealed, and that this change could have implications for the analysis in the EIS. Commenters requested revisions, including assessing impacts related to the following:

- The use of a different mix of vessels than stated in the Draft EIS, including implication of using larger foreign vessels bound for overseas markets (e.g., Asia), which may be subject to different safety standards than US vessels

9 Members of the Columbia River Intertribal Fish Commission include the Yakama Nation, Confederated Tribes of the Umatilla Indian Reservation, Warm Springs, and Nez Perce tribes.

- Potential increases in the volume of crude oil that would be transshipped through the proposed Facility to accommodate foreign exports
- Potential for the proposed Facility to increase US oil production leading to greater worldwide GHG emissions
- Varieties of crude oil other than Bakken or dilbit being shipped through the proposed Facility
- Regional rail and vessel traffic from overseas exports
- Overseas refining of US crude oil (i.e., GHG emissions, air quality, water quality, and worker safety)

Additionally, a commenter requested a condition in the SCA stipulating that shipping US domestically produced crude oil would only be allowed to domestic locations in California, Washington, Oregon, Alaska, and Hawaii.

10.5.15.2 Response

Potential Export of Crude Oil

Prior to the lifting of the crude oil export ban in December 2015, the United States sold up to 500,000 bpd to overseas nations since the ban allowed the export of certain crude oils (see Section 1.7.1 of the Final EIS for further information regarding crude oil exports). When the export ban was lifted, the United States began exporting crude oil from ports in the Gulf of Mexico (Petroleum Administration for Defense Districts [PADD] 3) to Europe and elsewhere, including Israel, China, and Panama (Blas and Hurst 2016; see Section 5.18.2 for further discussion on PADDs). Since the export ban was lifted, through July 2016 no apparent upward trend in crude oil exports from PADD 5 (i.e., US West Coast) ports has occurred (EIA 2016b).

EFSEC acknowledges that the Applicant does not determine the ultimate destination of crude oil that would be shipped through the proposed Facility (which is instead controlled by the shippers themselves). EFSEC recognizes that some crude oil export could occur from the proposed Facility, and the Final EIS has been revised to 1) discuss any recent changes to volumes of crude oil exports by the some of the US PADD ports including PADD 5 (e.g., US West Coast) ports; 2) discuss the economic circumstances that could affect crude oil export volumes (see Section 1.7.1 of the Final EIS); and 3) include impact information for certain resources for vessel operations beyond 3 nautical miles (nmi) from the mouth of the Columbia River. However, the study areas for these resources do not include specific vessel routes between the 3 nmi limit and refinery destinations because the probable destinations and frequency of these trips is not known (see Section 3.0.7 of the Final EIS).

Vessel Types and Origins

The maximum size of ships that could call at the proposed Facility is determined by the depth of the river along the vessel corridor (maintained at a depth of 43 feet), which limits vessel drafts allowed, and the availability of each vessel type in the commercial fleet. Unlike marine terminals in British Columbia, marine terminals and ports in the US Pacific Northwest (including the Port of Vancouver) are not deep enough to accommodate the largest tanker ships, such as very large crude carriers (VLCCs) or ultralarge crude carriers (ULCCs). Currently, no proposals exist to further deepen the Columbia River navigation channel to accommodate larger vessels.

The largest vessel types that could call at the proposed Facility would be Suezmax vessels, which are included as part of the mix of three vessel sizes that would call at the Proposed Facility. The Applicant anticipates that the majority of vessels calling at the proposed Facility would be medium-sized tankers

with cargo capacities similar to the storage capacity of individual storage tanks at the terminal. These vessels are approximately 600 feet long and 105 feet wide (Handymax) with an operating draft of 41 feet and a crude oil cargo capacity of 319,925 bbl. See Section 2.7 of the Final EIS for a complete discussion of Columbia River navigation and the anticipated vessel fleet traveling to the proposed Facility. Section 2.7.6 of the Final EIS includes a new discussion of vessel safety requirements that would pertain to domestic and foreign vessels.

Potential Increase in Crude Oil Throughput Volume for Export

Vessels that would be used to transport crude oil to refineries on the West Coast of North America through the proposed Facility are the same or of similar size to vessels currently used to export crude oil to foreign markets. The proposed Facility has been designed for a throughput of an average of 360,000 bbl of crude oil each day, with the maximum throughput of 131,400,000 bbl per year transported on four unit trains and one oceangoing vessel per day. This amount of crude oil is the maximum volume that would be allowed to be transported under the Proposed Action (see also Summary Response 1: Purpose and Need) regardless of the ultimate destination of the crude oil.

Potential Increases in US Oil Production and Resulting Greenhouse Gas Emissions

The crude oil that would be transported through the proposed Facility is anticipated to replace existing supplies and, as such, not induce increased oil production in the US or constitute an increase in global GHG emissions even with repeal of the crude oil export ban. As discussed in Section 1.7.1, current market conditions make US West Coast terminals an unlikely launching point for major overseas shipments because the low price for a barrel of oil on the global market makes shipments economically unattractive (Bernton 2015). In the coming years, if the price of a barrel of oil increases sufficiently, incentive to ship Bakken crude oil overseas may occur, and if that happens, crude oil could be transshipped through the proposed Facility and exported to markets overseas.

To address GHG emissions, Section 5.19 of the Final EIS includes an analysis of the amount of GHGs that would be emitted from the full life-cycle of crude oil use (from extraction to end use) for the 360,000 bpd of crude oil that would be transported through the proposed Facility. As noted in that section, the crude oil that would be transported through the proposed Facility would likely replace existing sources of crude oil received at refineries on the West Coast, primarily in PADD 5 (see Sections 10.5.15.2 and 5.19.2 of this Final FEIS for further discussion on PADDs). In this case, the GHG emissions from refineries that receive crude oil transported through the proposed Facility would not contribute to an incremental increase in global GHG emissions and would already be accounted for in existing GHG emissions. However, in the event that export of US domestic or Canadian crude oil transshipped through the proposed Facility induced new refinery construction or expansion/modification of an existing refinery in the destination country to process more crude oil than currently exists, the amount of GHGs emitted during the refining process and during product combustion could be incremental to existing levels. See Section 5.19 for additional information.

Crude Oil Types

The intent of the proposed Facility is to move light, sweet crude oil from the Bakken region and heavier dilbit crude oil from western Canada to US West Coast markets. These two oil types exemplify the range of crude oil types that could be transshipped through the proposed Facility. While it is possible that other types of crude oil could be transported through the Facility, such as from the Niobrara formation in Wyoming and Colorado and the Uinta formation in northeast Utah, all crude oil that is produced in the United States would be within this range of crude oil types (with regard to viscosity and volatility) and is, therefore, accounted for in the discussions of potential impacts to resources. Enhanced discussions of the

properties of Bakken crude and dilbit and their general behavior and potential effects when released into the environment are presented in revised Chapter 4 in this Final EIS.

Regional Rail and Vessel Traffic from Overseas Exports

The proposed Facility has been designed for a throughput of an average of 360,000 bbl of crude oil each day, with the maximum throughput of 131,400,000 bbl per year, transported on four unit trains and one oceangoing vessel per day. This amount of crude oil is the maximum volume that would be allowed to be transported under the Proposed Action (see also Summary Response 1: Purpose and Need) regardless of the ultimate destination of the crude oil. The number of unit trains or vessels serving the proposed Facility would not change; therefore, the impacts to regional traffic would be the same as presented in this Final EIS.

Overseas Refining of US Crude Oil

In the event that crude oil transshipped through the proposed Facility were exported overseas, it would be refined there. Section 5.19 of the Final EIS includes estimates of GHG emissions from all life-cycle stages of crude oil: extraction, transport, refining, and end use. These estimates are applicable no matter where the ultimate refining of the crude oil occurs. Specific localized impacts to natural resources (i.e., air quality, water resources, and worker safety) resulting from the refining process would occur in the area in which the refining occurs. Since crude oil could be exported to countries in Europe, Asia, or elsewhere, attempting to accurately portray such impacts is beyond the scope of this Final EIS.

10.5.16 Summary Response 16: Earth Resources

10.5.16.1 Comments

Comments received on earth resources issues included requests to address the following:

- Impacts to the rail corridor in the event of a significant earthquake, including how a seismic event could delay rail traffic, engineering options to stabilize railway tracks against the potential for liquefaction and lateral spreading, and how soil types/fill used for rail bed construction may be impacted during a seismic event.
- Potential impacts of landslides along the rail corridor, both in general, and at specific locations.
- An incorrect use/oversimplification of references (Pearson et al. 2006; Pearson and Skalski 2011) cited in Sections 3.1 and 3.6 of the Draft EIS regarding vessel wake impacts and shoreline erosion. Comments point out that the reference to this study were oversimplified and incorrectly applied to the Lower Columbia River, rather than to certain segments of the river as defined by the study.

10.5.16.2 Response

Seismic Impacts on Rail Corridor

Section 3.1.3.3 of the Final EIS addresses potential impacts of seismic activity on the rail corridor. BNSF policy requires that rail operations halt all traffic following a seismic event of magnitude 5.5 or higher in those areas where impacts could occur. Railroad track beds consist of ballast, a manufactured rock material typically produced from granite, quartzite, dolomite, or limestone. It is not a liquefiable material. A detailed description of earthquake hazards along the rail corridor in Washington is provided in Appendix C of the Final EIS. Rail bed susceptibility to earthquakes outside of Washington is not analyzed in detail in the Final EIS, but is expected to be similar to conditions within Washington.

Landslide Impacts along Rail Corridor

Section 3.1.3.34 of the Final EIS addresses the potential impact of landslides on rail transportation. BNSF monitors locations where landslide susceptibility is high. Slope stabilization and landslide debris containment techniques are in place to minimize potential impacts to the rail corridor, and monitoring and inspections are heightened during the rainy season. Areas along the rail corridor that are at an elevated risk for landslides are identified in Appendix P of the Final EIS.

Vessel Wake Impact on Shoreline Erosion in Lower Columbia River

Section 3.1.3.4 of the Final EIS addresses potential soil erosion due to vessel wake along the vessel corridor. The references to data from Pearson et al. (2006) and Pearson and Skalski (2011) have been revised in the Final EIS in Sections 3.1.3.4 and 3.6.3.4 as they do not pertain to the impact of vessel wakes on potential erosion in the Lower Columbia River.

10.5.17 Summary Response 17: Air Quality

10.5.17.1 Comments

Comments received on air quality included questions pertaining to the following:

- Compliance with National Ambient Air Quality Standards (NAAQS)
- Offsite emissions due to rail transport
- Offsite emissions due to vessel transport
- Dispersion modeling and risk
- Ambient air monitoring
- Health impact assessments

10.5.17.2 Response

Compliance with National Ambient Air Quality Standards

Commenters requested more information on whether air emissions associated with the operation of the proposed Project would be in compliance with NAAQS. Of particular concern were potential ozone emissions within the Portland-Vancouver Air Quality Maintenance Area and the potential atmospheric formation of secondary pollutants from any released crude oil vapors.

According to the EPA, Region 10, "The Portland/Vancouver air quality maintenance area (AQMA) was designated an interstate ozone nonattainment area and was further classified as marginal upon enactment of the Clean Air Act Amendments in 1990. Washington State submitted an ozone maintenance plan for the Vancouver portion of the AQMA on June 13, 1996 and Oregon submitted an ozone maintenance plan for the Portland portion of the AQMA on August 30, 1996. The EPA approved the plans on May 19, 1997 (62 FR 27204).

On April 30, 2004 (69 FR 23858), the EPA designated areas for the 1997 8-hour ozone standard and the Vancouver portion of the AQMA was designated attainment/unclassifiable. Subsequently, on June 15, 2005, the EPA revoked the 1-hour ozone standard. The EPA had set forth requirements for antibacksliding purposes for areas that were designated attainment/unclassifiable for the 1997 8-hour ozone standard if the area had also been previously designated nonattainment for the 1-hour ozone standard. Areas like the Vancouver Portion of the AQMA were required to submit a maintenance plan,

under section 110(a)(1) of the Clean Air Act, to demonstrate that the area would continue to attain the 1997 8-hour ozone standard for at least 10 years. The 110(a)(1) maintenance plan requirement did not include conformity obligations (unlike maintenance plans required under section 175A of the CAA). On January 8, 2007, Washington State submitted to the EPA a section 110(a)(1) maintenance plan to maintain the 1997 8-hour." (EPA Region 10 2017)

Emissions from sources associated with the proposed Project include both mobile and stationary sources. These sources were included in the analysis. Emissions of the criteria pollutants, for which ambient air quality standards exist, would be considered significant if they would cause exceedances of the ozone 8-hour standard. The analysis did not indicate significant impacts would result from these emissions, and the proposed Facility is anticipated to receive an air quality permit as a minor stationary source.

Additionally, the Vancouver area was designated a non-attainment area for CO on November 15, 1990. It was redesignated as an attainment area on October 21, 1996 and has attained the NAAQS since. While the Vancouver area is technically still designated a maintenance area and has a maintenance plan, compliance with the CO NAAQS continues to be achieved.

The atmospheric formation of secondary pollutants, including formaldehyde, occurs through chemical reactions with released crude oil vapors that are slow and occur both over time and over distance. The result is that any secondary pollutant formed by the atmospheric reactions with crude oil vapors will be dispersed over a large geographic area. Note that direct emissions of formaldehyde were incorrectly reported in the initial dispersion modeling report, and the error has since been corrected and updated model results have been provided (see Appendix G of the Final EIS). The results from the analysis using the correct emission factor show that the predicted annual average formaldehyde concentration was approximately 93% of the applicable acceptable source impact level (ASIL[10]).

Offsite Emissions due to Rail Transport

Commenters requested additional information on the impacts of offsite emissions associated with rail transport, primarily focused on two issues: increased emissions from rail transport (including locomotive emissions and loss of crude oil from evaporation, and emissions from empty railcars) and increased vehicle emissions from idling at rail crossings.

With regard to increased emissions from rail transport, the Final EIS analyzed the impact of rail activities at locations in the vicinity of the proposed Facility where the most intensive and continuous Project-related train activities would be expected to occur. The results of the analysis indicated that in the most likely area of intense train activity, no significant air quality impacts would likely occur.

With regard to increased emissions from motor vehicles idling at rail crossings, the average vehicle delay will be approximately 2.5 minutes. The shortest duration NAAQS/WAAQS, which are designed to be protective of human health and the environment, is 1 hour. It is highly unlikely that 2.5 minutes of motor vehicle emissions would result in an exceedance of a NAAQS/WAAQS whose averaging periods are 1 hour or more. Additionally, many manufacturers of newer vehicles are introducing start-stop battery technology so that cars shut off during idling. Over time the implementation of this technology, as a way to conserve fuel, will reduce emissions from idling vehicles, further reducing the impact at rail crossing delays.

[10] Acceptable source impact levels (ASILs) are concentrations of toxic air pollutants (TAPs) in the ambient air.

Some commenters requested information regarding possible release of volatile emissions from railcars during transport. The emissions for the proposed Project are documented in Section 3.2.4 and do not include fugitive emissions from the tank cars while in transit. Tank cars have emergency vents, which are designed to open and close at a specific pressure to prohibit pressure or vacuum building up in the tank beyond what it is designed to hold. Under normal operating conditions, these emergency vents are closed to the atmosphere and are not an emissions source. These vents are set at 75 psi by regulation (DOT-111) and would open only in an upset condition. For comparison, Bakken crude has an average vapor pressure of 8 to 15 psi at 100 degrees F.

Offsite Emissions due to Vessel Transport

Comments were provided requesting analysis of the impacts of the number of vessel trips that could occur if all reasonably foreseeable future actions were to be implemented. A description of these actions can be found in the cumulative section of the Final EIS in Tables 5-1 and 5-2. Quantifying emissions from these potential future projects is not possible because it is unknown which of them will be implemented and, if so, whether they will be developed as currently described and what mitigation measures would be implemented as part of their proposal. Quantification with any degree of accuracy is not feasible and not necessary to understand the proposed Facility's (cumulative) impact when considered in combination with other reasonably foreseeable future proposals. Emissions from vessels traveling the Columbia River and out to 3 nmi from the mouth of the river have been calculated and can be found in Appendix G. These are discussed in the Final EIS.

Dispersion Modeling and Risk

Numerous comments were submitted regarding dispersion modeling and possible cancer/other health risks associated with emissions from the proposed Facility, including requests for additional analysis of the areas around the site. The air dispersion modeling that was performed assessed a 10-square kilometer (3.86-square mile) area centered on the proposed Facility site. The model (AERMOD), approved by the EPA for evaluating on and offsite stationary source emission impacts, evaluated pollutant concentrations throughout this area, with 8,000 individual receptor points. The results were compared to the NAAQS, which are intended to protect human health and welfare with a margin of safety regardless of land use, including residential areas. The Fruit Valley neighborhood, which is nearly a mile away, was included in the analysis. The results indicated that the ambient concentration of pollutants attributable to the proposed Facility, including mobile sources operating within the Facility, and including existing measured concentrations of the pollutants, would be below the ambient air quality standards and, therefore, not injurious to public health or welfare. No modeling was done for ozone because the proposed Facility would be permitted as a minor source.

It was determined that 13 TAPs, not counting those that are modeled as criteria pollutants, will potentially exceed the Small Quantity Emission Rates (SQERs) at the full operation of the proposed Facility. With the exception of diesel particulate matter (DPM), the maximum predicted ambient concentrations of all TAPs were determined to be below the applicable ASILs. A Tier II risk assessment was conducted for DPM emissions and it was determined that DPM emissions would not result in a significance impact. More on this topic can be found in Section 3.2 of the Final EIS.

Ambient Air Monitoring

Comments were received recommending that ambient air monitoring be performed to evaluate criteria pollutant and hazardous air pollutant (HAP) emissions, which would include relevant TAPs, beyond the fenceline. Evaluation of criteria pollutants and HAPs/TAPs was conducted and is described in Section 3.2 of the Final EIS. It was determined that the facility would not cause or contribute to an exceedance of an

applicable air quality standard and no TAPs will result in impacts in excess of state thresholds. As a result, ambient air quality monitoring is not recommended as a mitigation measure in the Final EIS.

Health Impact Assessments

Multiple commenters desired information on health risk and impacts associated with train and vessel traffic, vehicular delays, pollution effects on sensitive receptors (children, the elderly, and the ill) as well as acute vs chronic effects of the air emissions. An assessment of DPM at the proposed Facility site and lifetime excess cancer risk at nearby properties is included in Section 3.2 of the Final EIS. Impacts to human health are also discussed in Section 3.8 of the Final EIS (see also Summary Response 22: Human Health Impacts).

10.5.18 Summary Response 18: Greenhouse Gases and Climate Change

10.5.18.1 Comments

Comments received on GHGs and climate change included the following requests:

- Expand the Proposed Action's impacts analysis to access GHG emissions from out-of-state activities, tank cars while in transit, and other life-cycle stages of crude oil (including emissions of various gases at the Bakken oil fields, and emissions from flaring).
- Reassess the GHG life-cycle analysis to account for oil from the Bakken formation, which is less carbon-intensive than other oils but requires more flaring or venting of gas.
- Edit text and reassess GHG life-cycle emissions assuming that the crude oil is not replacing existing supplies.
- Provide climate change impacts on a global scale and describe the proposed Project's contribution to global warming.
- Describe how the Project would meet the President's Climate Action Plan.
- Justify the global warming potential used in GHG emission estimates.
- Evaluate GHG impacts using the social cost of carbon method.
- Assess mitigation for GHG impacts from the proposed Facility.

10.5.18.2 Response

Proposed Action GHG Emissions

The estimated GHG emissions associated with implementation of the Proposed Action are documented in Section 3.2.4.5. These estimates do not include emissions for activities outside of Washington (see Summary Response 4: Study Area and Scope of Analysis). Additionally, as addressed in Summary Response 15: Air Quality, emissions from crude oil rail tank cars are not included because these tank cars have emergency vents under the domes that are designed to open and close at a specific pressure to prohibit pressure or vacuum building up in the tank beyond what it is designed to hold. Under normal operating conditions, these emergency vents are closed to the atmosphere and are not an emissions source. These vents are set at 75 psi by regulation (DOT-111) and would open only in an upset condition. For comparison, Bakken crude has an average vapor pressure of 8 to 15 psi at 100 degrees F. New crude oil tank cars built after October 1, 2015 must meet DOT-117 design or performance criteria, which includes enhanced pressure relief valves and bottom outlet valves. As of January 1, 2018, all DOT-111 tank cars in crude oil service must be retrofitted to meet DOT-117 standards.

A discussion in 5.19.1 covers GHG emissions associated with the crude oil life cycle, which includes transport and other life-cycle states of crude oil. See the response below for Life-Cycle GHG Analysis.

Life-Cycle GHG Analysis

The life-cycle GHG analysis of crude oil is documented in Section 5.18 (for US average crude and Canadian tar sands) and was conducted in accordance with guidelines from the US Department of Energy's National Energy Technology Laboratory (2008, 2009). It includes GHG emissions from raw material acquisition, raw material transport, liquid fuels production/refining, product transportation and refueling, and vehicle/aircraft operation. The physical boundaries of the life cycle include operations that have a significant contribution to the total life-cycle GHG emissions and include emissions from foreign transport as well as flaring and venting.

The US Department of Energy's Argonne National Laboratory released two studies in September 2015 that concluded that shale/tight oil production generates GHG emissions at levels similar to traditional crude oil production. Both studies took into consideration flaring and venting of natural gas and noted that drilling and fracturing wells for shale oil is more energy intensive than conventional drilling, but the wells have higher productivity and require less energy to produce and process the crude. Additionally, total energy consumption in the Bakken, including energy consumed for nonproductive purposes, is dominated by flaring; therefore, GHG emissions could be reduced and lower than for traditional crude oil production if flaring is controlled. The GHG emissions for the life-cycle analysis are as presented in Section 5.18 of the Final EIS are, therefore, appropriate and consistent with SEPA's requirements.

Replace Existing Supplies

It is likely that the crude oil that would be transported through the proposed Facility would replace decreasing existing supplies (e.g., Alaska North Slope supplies) because the crude oil is expected to be shipped to existing North American refineries. The Applicant has no plans to export crude oil to foreign markets (see also Summary Response 15: Crude Oil Export). In any case, the estimated life-cycle GHG emissions use has been quantified for the 360,000 bpd of crude oil (131,400,000 bbl annually) that would be transported through the proposed Facility (see Section 5.19).

Climate Change Impacts

As indicated by the Council on Environmental Quality (2016), GHG emissions serve as a proxy for assessing climate change impacts. It is not possible for the EIS to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand. However, a discussion of potential global and local consequences of climate change has been added to Section 5.19 of the Final EIS. Mitigation measures that the Council could impose are described in Section 3.2 of the Final EIS.

Climate Action Plan

The US has committed to reducing its annual GHG emissions to 26 to 28 percent below the 2005 level, with a goal of doing so by 2025; and to make best efforts to reach 28 percent below the 2005 level. A combination of new laws, regulations, and incentives may be enacted at the federal level to help achieve these goals under the Climate Action Plan. Information on President Obama's climate action plan has been included in Section 5.18 of the Final EIS. However, future actions to address climate change are uncertain with the recent (2017) change in presidential administration.

Global Warming Potential

The Global Warming Potential (GWP) is a relative measure of how much heat a GHG or mixture of GHGs traps in the atmosphere. It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide. The GWP represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in absorbing outgoing thermal infrared radiation. The Kyoto Protocol is based on GWPs from pulse emissions over a 100-year time frame. To estimate GWP, the United States quantifies GWP emissions using the same 100-year timeframe values as established in the Intergovernmental Panel on Climate Change's Fifth Assessment Report (2014) and in accordance with the United Nations Framework Convention on Climate Change (2014) reporting procedures. Although the Final EIS used the GWP from the Fifth Assessment Report, some references may have used the Fourth Assessment Report (2007). The 100-year timeframe is not arbitrary, but is both a national and international standard. GWP is discussed in 5.19.1.1

Social Cost of Carbon

Under Executive Order 12866, federal agencies are required, to the extent permitted by law, "to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs." The social cost of carbon (SCC) is meant to be a comprehensive estimate of climate change damages and includes changes in net agricultural productivity, human health, property damages from increased flood risk, and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. The purpose of the SCC estimates is to allow federal agencies to incorporate the social benefits of reducing carbon dioxide emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions. An estimate of the SCC is not required under SEPA, and the proposed Project is not being initiated by a federal agency or involved in a federal rule making.

Mitigation for GHG Emissions

Mitigation that could be imposed on the Applicant by EFSEC for project-related GHG emissions is described in Section 3.2 of the Final EIS.

10.5.19 Summary Response 19: Water Resources

10.5.19.1 Comments

Comments received on water resources issues presented the following concerns:

- Possible impacts to groundwater resources near the proposed Facility resulting from proposed ground improvements, such as possible remobilization of contaminants remaining at the site from prior industrial activities.
- Potential impacts to water quality and local water supplies from the Troutdale Aquifer System (TAS), identified as a sole-source aquifer for the City of Vancouver. Commenters included requests to visually identify additional groundwater wells such as individual wells and small community water system wells.
- Baseline groundwater quality and monitoring data; commenters requested that a presentation on these items be included in the EIS. Others requested additional monitoring and studies to be conducted for groundwater and surface water including creation of a database for information gathered at well sites in the proposed Facility area.

- Specific aspects of Facility surface water and stormwater management during construction and operation. Some commenters requested changes to the impact assessments based on additional information provided.
- Spill impacts to water resources such as rivers and aquifers along the transportation corridor, including the Clark Fork River, the Spokane River and regional aquifer, and the Washougal aquifer.

10.5.19.2 Response

Impacts to Groundwater from Ground Improvement Activities

Section 3.3 of the Final EIS has been revised to include additional information regarding groundwater and surface water resources and water quality protection activities. Section 3.3.3.2 describes potential construction impacts from dewatering, construction, and ground improvement activities as well as monitoring and discharge procedures for extracted groundwater.

Impacts to Troutdale Aquifer Water Quality and Local Water Supplies

As described in Section 3.3, permanent changes to the shallow aquifer from ground improvements are expected but would represent a very small area of the total Troutdale Aquifer System. As illustrated on Figure 3.3-8, the proposed Facility is located generally downgradient from public and private wells and outside of wellhead protection zones.

Request for Baseline Water Quality Data and Additional Monitoring

Extensive ground and surface water sampling has been conducted onsite for the cleanup associated with the Alcoa/Evergreen property as described in Section 3.3.2.1 of the Final EIS. The state maintains a database of groundwater quality measurements (http://www.ecy.wa.gov/eim/groundwater.htm) and the EPA manages the STORET water quality database (https://ofmpub.epa.gov/storpubl/dw_pages.querycriteria).

The Applicant has provided additional information on water quality monitoring that would be used during construction of ground improvements, and this information has been incorporated into the Final EIS.

Stormwater Management

Section 3.3 of the Final EIS has been revised to include additional information provided by the Applicant regarding surface water, stormwater, and groundwater management activities and mitigations. Where appropriate, impact assessments and proposed mitigation have been updated based on additional information.

Spill Impacts to Aquifer Systems along the Rail Corridor

Chapter 4 has been revised to include an updated analysis of potential impacts from oil spills, including the results of spill modeling along the rail corridor. An interval spill model has been conducted along the entire rail corridor, and site-specific spill modeling has been conducted for the following:

- A potential spill at a location along the rail corridor near the Columbia River
- A spill during vessel loading at the proposed Facility dock
- A vessel grounding spill from a loaded vessel downstream of the proposed Facility

An assessment of potential impacts from spills informed by these spill modeling results is presented in Chapter 4, and potential impacts to surface water, groundwater, water supplies, and wetlands that could be associated with similar spills are described in Sections 4.7.4, 4.8.4 and 4.9.4.

10.5.20 Summary Response 20: Lower Columbia River Water Quality Impacts

10.5.20.1 Comments

Comments were received regarding impacts to the Lower Columbia River associated with vessel transportation, particularly in relation to the following topics:

- Potential water quality impacts due to release of ballast water, bilge, and/or vessel fuel or lubricant leaks
- Potential impacts from vessel wakes to water quality due to the mobilization of bed sediments (including possible resuspension of contaminated materials), and other wake-induced erosion impacts to shorelines and/or wetlands

10.5.20.2 Response

Ballast, Bilge, or Other Leaks

The potential for water quality impacts due to the release of operational discharges from vessels, during routine operation and/or emergency actions required for safe navigation, are discussed in Section 3.3. These discharges include ballast water and bilge fluids. Bilge water may include leaking cooling water and fuel or lubricant oils, but oil tankers and other large vessels must be fitted with equipment for bilge water cleaning and the discharge or release of such water is controlled. Such activities are highly regulated by international, federal, and state laws regarding tanker vessel construction, discharge control equipment, and operation.

The USCG bilge water regulations include the Vessel General Permit requirements and incorporate by reference several other related laws (40 CFR Part 110, 50CFR Part 116, 50 CFR Part 117, and 33 CFR 151.10). These regulations prohibit any discharge of oil or oily mixtures except under very restricted conditions, and require retaining any bilge water that cannot meet these requirements onboard or discharging to a designated receiving facility, except under emergencies to save the ship or human life at sea. The Applicant has stated the proposed Facility would not be a designated receiving facility of bilge water.

Wake-Induced Mobilization of Bed Sediments and Erosion

As discussed in Section 3.3, the operation of deep-draft vessels could generate waves that break at the shoreline, causing localized erosion, and could modify currents that could churn and locally mobilize bed sediment of the Columbia River, potentially remobilizing existing legacy contaminants. However, such temporary increases in turbidity and local redistribution of sediment on the channel bed, active channel bars, and floodplain surfaces from vessel transits would not be considerably different from natural geomorphic processes or dredging within the Lower Columbia River. Nor would these temporary increases be expected to alter the river channel, its hydrology, or water quality relative to baseline conditions. See Sections 3.3 and 3.6 for further detail.

10.5.21 Summary Response 21: Aquatic Species and Habitat Effects

10.5.21.1 Comments

Many commenters on the Draft EIS raised issues surrounding potential effects to aquatic species and the environment. Most of these comments can be grouped into four areas of concern:

- Potential impacts associated with vessel wake (e.g., wake stranding)
- Potential noise impacts to aquatic species (including impacts to passive aquatic species life stages) associated with pile driving
- Potential impacts to water quality from propeller wash/scour and ballast water release
- A recommended revision to a proposed mitigation measure identified in the Draft EIS

10.5.21.2 Response

Vessel Wakes

Vessel wakes can cause soil erosion along the banks of the Columbia River, increase turbidity and decrease localized water quality from eroded materials entering the waterbody, impact riparian vegetation directly through breakage, spread aquatic invasive plants through altered patterns of erosion and deposition, alter shoreline habitats, and cause wake stranding[11] of aquatic species. All of these potential impacts occur within portions of Essential Fish Habitat for Pacific salmon, groundfish, and pelagic species and are discussed in more detail in Chapter 3 with regard to vessels associated with the proposed Facility and in Chapter 5 for a potential increase in vessels in the future.

The discussion on wake stranding impacts to aquatic species has been updated in Section 3.6.3 of the Final EIS to clarify that physically-based susceptibility (i.e. wave characteristics, river geomorphology) to fish stranding from vessel wakes along the vessel transportation corridor is limited to 33 miles of noncontiguous shoreline in the Lower Columbia River as determined using spatial analysis. Although stranding has been observed along different reaches of the Lower Columbia River, one study targeting three areas (total shoreline distance sampled was approximately 800 meters) along the vessel corridor with a high probability of stranding determined that impacts from deep-draft vessel wakes were greatest to subyearling Chinook salmon. To better understand the temporal and spatial extent of fish stranding along the entire vessel corridor, further study and the collection of detailed biological information (e.g., fish abundance and distribution by season) would be required and is included in Section 3.6.4 as mitigation.

Noise from Pile Driving

Impacts to marine life from pile driving are described in Section 3.6.3 of the Final EIS. The discussion on underwater noise has been updated to clarify that hearing in certain aquatic species is dependent on a combination of sound pressure and water particle motion. However, due to the limited availability of particle motion data and a general lack of standards for analyzing that data, the impact analysis in the Final EIS is still based on sound pressure. The discussion was revised to address potential noise impacts to larval fish associated with transiting vessels and cites the findings of Jørgensen et al. (2005) that auditory and nonauditory larval fish behaviors (including behaviors of salmonids and minnows) were not significantly affected by varying levels of sound.

11 Wake stranding happens when aquatic species are lifted by a vessel's wave onto a shoreline and are stranded.

Water Quality

Section 3.6.3 of the Final EIS has been updated to better characterize the potential impacts of ballast release and propeller scour to aquatic species and habitats in the study areas. The potential for introduction of invasive species through ballast water exchange is minimal and such species are not likely to jeopardize the existence of listed species or, by extension, other aquatic species present in the vessel corridor. Propeller scour, which is the movement of water from vessel propellers and resulting sediment movement, has the potential to impact benthic communities. The vessel corridor currently experiences propeller scour from existing vessel traffic and from maintenance dredging, resulting in a disturbed baseline condition. The marine terminal that will be used at the proposed Facility currently experiences minimal vessel traffic, so the potential exists for long-term impacts on the benthic community from an increase in propeller scour in this area. This increase in propeller scour could result in more mobile invertebrates moving out of the dock area and recolonization by organisms that are more suited to such disturbed conditions.

Mitigation

The Draft EIS contained a potential mitigation measure that would require a lower vessel speed to reduce potential wake- and scour-related impacts. Commenters suggested removing this potential mitigation since pilots operating vessels on the Columbia River must be consistent with USCG regulations and safety protocols (USCG 2014). The mitigation measures identified in Section 3.6.5 of the Final EIS have been modified accordingly.

10.5.22 Summary Response 22: Human Health Impacts

10.5.22.1 Comments

Multiple commenters requested that the EIS include an expanded discussion of potential impacts to human health from proposed Facility construction and operations, associated train and vessel traffic, and an accidental release of crude oil. Comments pertaining to public health focused on the following:

- Potential impacts of air emissions from train and vessel traffic and vehicular delays related to crude oil unit train operations, particularly with regard to vulnerable populations (i.e., children, the elderly, immune-compromised) and communities in Montana.
- Acute and chronic effects of contamination from crude oil spills, including toxicity and carcinogenicity of crude oil constituents and risk following a crude oil spill.
- Mental/psychological impacts of noise related to construction and operation of the proposed Project.
- A Health Impact Assessment (HIA), which several commenters requested be performed, and the results included in the EIS.

10.5.22.2 Response

Impacts from Air Emissions

Air emissions related to construction and operation of the proposed Project as estimated by dispersion modeling are discussed in Section 3.2.3. This section also includes an assessment of DPM at the proposed Facility site and lifetime excess cancer risk at nearby properties. Potential impacts to human health (including vulnerable populations) related to proposed Facility and associated train and vessel operations are discussed in new subsections added to Section 3.8.

Impacts to the health of Montana residents near the rail transportation corridor are not discussed specifically. However, the analysis in Section 3.8.3.3 of the Final EIS assumes that health impacts to residents along the rail corridor outside Washington would be similar to those discussed for Washington residents.

Impacts from a Crude Oil Release

Toxicity and carcinogenicity of oil constituents and acute and chronic effects resulting from human exposure to crude oil releases are discussed in Section 4.4.2.1 of the Final EIS. Potential human health impacts from a crude oil spill and/or fires/explosions at the proposed Facility and along the rail and vessel transportation corridors are discussed in Sections 4.7, 4.8, and 4.9, respectively.

Impacts from Noise

Project-related noise impacts are discussed in Section 3.9.4. Existing ambient sound levels in the Port vicinity (see Table 3.9-4 and Figure 3.9-1 in Section 3.9) were obtained at three locations: (1) the Fruit Valley residential area, (2) the Clark County Jail Work Center (JWC), and (3) the Tidewater office building. Noise levels for construction and operation were estimated and applied to these areas to determine the increase in noise expected from proposed Facility construction and operation using thresholds for adverse community reaction. See Section 3.9 for further information and determination of noise effects to sensitive receptors.

Health Impact Assessment

An HIA was not completed for the proposed Project. EFSEC has coordinated with the Washington State Department of Health (WDOH) in its updated evaluation of potential human health impacts of the proposed Project and associated train and vessel traffic. To assist in the human health impact evaluation, WDOH provided EFSEC with demographic information regarding age groups and vulnerable populations along the rail transportation corridor, as well as guidance for human health impact evaluation presented in the new human health subsections of Section 3.8 of the Final EIS.

10.5.23 Summary Response 23: Noise Issues

10.5.23.1 Comments

Comments received on noise issues included requests to perform the following in the EIS:

- Clarify and correct the construction noise impacts assessment due to the non-applicability of the Washington State and City noise regulations during daytime hours.
- Reassess allowing noise impacts from construction activities to exceed regulatory levels due to impacts on the Clark County JWC and the Tidewater office building.
- Reassess noise impacts from train operations as a cumulative source, including activities such as braking and restarting during loading.
- Remove mitigation measures for all noise impacts that would be less than significant.

10.5.23.2 Response

Construction Noise Impact Assessment

Section 3.9 of the Final EIS has been updated to clarify that construction noise is exempt from Washington State and City noise limits during daylight hours (7 am to 8 pm). The analysis uses the Federal Transit Administration's general assessment guidance for construction noise and vibration

impacts. The guidance has the following noise levels as threshold criteria for adverse community reaction, based on a 1-hour equivalent sound level (Leq): (1) maximum of 90 A-weighted decibels (dBA) for residential and (2) 100 dBA for commercial and industrial land uses for acceptable daytime noise levels.

The Applicant has requested the option of conducting some nighttime construction. New analysis and mitigation has been added to noise (Section 3.9) regarding that issue. Because noise at night would also impact other resources, noise mitigation is also considered for the following resources: land use (Section 3.10), environmental justice (Section 3.16), aquatic species (Section 3.6), visual resources (Section 3.11) and terrestrial wildlife (Section 3.5).

Impacts at the Clark County Jail Work Center and Tidewater Office Building

American Correctional Association's (ACA's) Standards for Adult Correctional Institutions were considered for the noise impact analysis at the JWC dormitories located just over 400 feet from the transfer pipelines (Area 500). However, these standards apply to construction and operation of correctional facilities for accreditation purposes. Additionally, the ACA standards are based on noise measurements taken inside the inmate housing, unlike the state and city noise limits, which are based on noise measurements taken from outside of the building at the property line. Because the Project noise would occur outside the housing unit, the Project noise levels as measured externally would be more stringent and appropriate to use for impacts analysis. Therefore, the ACA standards would not apply.

The Applicant's noise mitigation measures include scheduling noisy construction activities between 7 am and 8 pm. However, if outdoor construction is required outside of these hours, the Applicant proposes to consult with the City, notify EFSEC in advance, and not conduct the work until EFSEC has reviewed and approved the planned activities. Based on its analysis of noise in Section 3.9 of the Final EIS, EFSEC identified mitigation to reduce nighttime noise impacts at nearby receptors (including the JWC and Tidewater building) during construction. Specifically, nighttime (between the hours of 8 p.m. and 7 a.m.) construction activities involving equipment powered by internal combustion engines (such as earth moving equipment), impact equipment (such as pile drivers), or other equipment or tools emitting noise levels in excess of 70 dBA at 50 feet was prohibited by EFSEC (see Section 3.9.5 of the Final EIS for more detail on noise mitigation).

Cumulative Rail Noise

Operational noise at the proposed Facility would be generated by crude oil railcar unloading, storage, vessel loading, and transport. Some of these sources are relatively quiet and would not be audible when louder equipment is operating. The noise impact analysis focused on the louder noise sources, including pumps, compressors, blowers, marine vapor combustion units (MVCUs), and train sources. Equipment that would be located inside buildings or concrete trenches (i.e., railcar unloading pumps). An Environmental Assessment was carried out for the West Vancouver Freight Access (WVFA) project, which accounted for noise associated with inbound and outbound trains, switching engines and railcars, and rail yard activity. The results of the noise studies conducted as part of the review found no long-term impacts to noise-sensitive receptors (Port 2011).

The analysis for noise impacts from trains along the rail corridor considered the cumulative effect of all noise sources to estimate the worst-case hourly sound level. To provide a basis for the noise impact assessment from increased rail volumes on statewide routes, rail volumes associated with the Proposed Action were compared to the estimated 2020 rail volumes assuming a high growth rate in rail traffic. The existing noise conditions of the affected area were taken into consideration in assessing the noise impacts attributable to the Proposed Action. Noise resulting from trains associated with the proposed Facility would be added to an area already exposed to train noise. Sound levels for operations were modeled for the proposed Facility and are not expected to result in significant noise impacts at any sensitive receivers

near the site when added to existing sound levels (see Section 5.10.1 of the Final EIS). State regulations exempt "sounds from surface carriers engaged in interstate commerce by railroad" from the noise limits.

Noise Mitigation

EFSEC has identified mitigation that could be imposed on the Applicant by EFSEC to address impacts from construction noise identified within this Final EIS. In particular, EFSEC identified that potentially significant noise impacts could be mitigated by prohibiting nighttime construction activities resulting in noise levels exceeding 70 dBA at 50 feet. EFSEC also identified mitigation that could be implemented by other parties to reduce impacts from rail noise during operation. See Section 3.9 and Summary Response 6: Mitigation Measures for additional information on mitigation measures.

10.5.24 Summary Response 24: Socioeconomics

10.5.24.1 Comments

Comments received on socioeconomic issues included requests for the following in the EIS:

- Provide a comprehensive accounting of all foreseeable impacts, costs, and damages that are likely to result from the current proposal. Consider the potential economic impacts to proposed developments including the Waterfront Development Project, the marine resources economy, small businesses, tourism, and property values. Evaluate the impact on insurance rates for properties near oil bearing rail lines. More thoroughly address the secondary, indirect economic impacts of the proposed Project, including an estimate of the number of businesses and residents lost from choosing to leave the City because of the proposed Facility.
- Reevaluate the economic benefits of the proposed Facility in light of estimates made from various sources.
- Include economic effects related to human health impacts from the proposed Facility, including air quality problems, increased collisions at at-grade crossings, and delayed emergency response time due to increased at-grade crossing closures.
- Study the economic impacts of oil spills on various forms of commerce including river and harbor traffic. Update the socioeconomic discussions in Chapter 4 of the EIS to include costs of community emergency preparation and response to a derailment incident and economic losses associated with environmental damage from an oil spill, including impacts to fisheries, tourism, and recreation.

10.5.24.2 Response

Socioeconomic Impacts

SEPA regulations state that while the general welfare, social, economic, and other requirements will be taken into account in weighing and balancing alternatives and in making final decisions, an EIS is not required to evaluate and document all of the possible effects and considerations of a decision or to contain the balancing judgments that must ultimately be made by the decision makers. Rather, an EIS analyzes environmental impacts and must be used by agency decision makers, along with other relevant considerations or documents, in making final decisions on a proposal (WAC 197-11-448). Thus, while a cost-benefit analysis is not required by SEPA (WAC 197-11-450), the Final EIS has been updated to include additional information on economic costs and benefits where possible and appropriate.

Additional information regarding secondary, indirect economic impacts of the proposed Project has been provided in Section 3.16 of the Final EIS. Quantitative estimates of economic impacts were developed

using the IMPLAN model, which is a widely used economic model grounded in data developed by the US Commerce Department's Bureau of Economic Analysis. It is recognized that these are estimates that are not necessarily the same as estimates from other models or sources. It would be speculative to attempt to estimate the number of businesses and residents that would choose to leave the City of Vancouver because of the proposed Facility. Since the Port is already an industrial area, increased industrial activity associated with the Project is not expected to have significant consequences to the businesses in the Waterfront Development Project, or the downtown Vancouver area. Analysis and discussion of potential socioeconomic impacts of the proposed Project and Waterfront Development Project are included in Appendix O. Impacts to employment and income are addressed in Section 3.16.

Socioeconomic Benefits

The socioeconomic analyses provided in the Final EIS disclose economic aspects of the proposed Project although they are not considered an environmental issue nor required by SEPA. These economic aspects include tax revenues from construction and operation of the Facility, as well as social aspects such as the number of jobs that would be created and potential housing impacts from workers. This information may be useful to decision makers and to the general public and was developed from issues raised during scoping.

Economic Impacts Related to Human Health Effects

Economic impacts related to human health effects including air emissions, collisions at at-grade crossings, and emergency response times are not provided in the EIS because it is the impacts themselves, rather than the financial cost of the impacts, that is the focus of this environmental review.

Economic Impacts of Spills

Chapter 4 of the Final EIS includes information on emergency preparation and response to crude oil spill incidents and on the Natural Resources Damage Assessment process to estimate damages after a spill event has occurred. Spill preparation and response costs would vary depending on numerous factors as discussed in Chapter 4. A new section has been added to the discussion of oil spill impacts in Chapter 4 of the Final EIS to address financial liability (see Section 4.10 of the Final EIS). See also Summary Response 25: Compensation and Liability for Accidental Crude Oil Releases.

10.5.25 Summary Response 25: Compensation and Liability for Accidental Crude Oil Releases

10.5.25.1 Comments

A number of commenters expressed concerns about liability in the event of a crude oil release at the proposed Facility and along the rail and vessel corridors. Key areas of concern include the following:

- Consideration of Potentially Responsible Parties (PRPs) liable for costs associated with loss of life, cleanup, and economic and environmental damages resulting from an oil spill or related accidents. Commenters requested discussion of the railroad company's liability in the event of a crude oil spill along a railroad.
- Potential costs borne by the federal government, the State of Washington, and local communities, including the sufficiency of existing funding (financial assurances, trust funds, and insurance policies) set aside to cover response, cleanup, and damages in the event of a crude oil spill.
- Sources of funding for training of first responders.

10.5.25.2 Response

Potentially Responsible Parties

A new section has been added to Chapter 4 of the Final EIS to include information on liability and compensation for crude oil spills and related damages (see Section 4.10). Such information includes determination of PRPs liable for the cost of an oil spill, covered damages and expenses, liability limits, types of insurance and liability coverages required, and documentation that must be provided according to law and regulation to demonstrate financial responsibility. Section 4.10 also describes regulations relevant to crude oil spill liability, including the federal and Washington State programs for oil spill prevention and response, the funding mechanisms for these programs, and processes implemented for recovery of the cost of damages and other expenses from the PRPs including damages to public and natural resources. In particular, the section summarizes recently implemented Washington State laws and regulations that strengthen oil spill response, planning, and capacity to ensure financial responsibility for both rail and onshore facilities.

Financial Assurance

Section 4.10 of the Final EIS provides information on financial assurances and insurance coverages required for crude oil releases and accidents involving vessels, rail, and facilities, and provides a summary of the specific insurance coverages and financial responsibilities proposed by the Applicant for the proposed Facility. The Applicant has stated that it will demonstrate financial responsibility in an amount determined by EFSEC as necessary to compensate state and affected local governments for damages that might occur during a reasonable worst-case spill of crude oil from the proposed Facility into the navigable waters of the state. Rail carriers and vessel operators are required to maintain financial responsibility in accordance with laws and regulations applicable to their operations. The status of relevant federal and state funds, including the federal Oil Spill Liability Trust Fund and the Washington State Oil Spill Prevention and Response accounts is also discussed.

It is important to note that EFSEC's governing statutes and rules preempt all aspects of certification and regulation of energy facilities reviewed under RCW 80.50 (RCW 80.50.110 and RCW 80.50.120). As a result, at EFSEC's discretion, otherwise applicable state and local regulatory permits, requirements, and standards may not be required of facilities issued SCAs, and EFSEC has the authority to require facility compliance with any state standard including those for facility operations and liability for spill costs and damages, for which other state agencies normally have enforcement and approval authority. EFSEC may also impose stricter standards than would otherwise be required under state and local regulations.

Funding Sources for Training of First Responders

Section 4.5 of the Final EIS and Summary Response 11: Emergency Response include discussion of response capabilities that would be available in the event of a crude oil release along the inbound rail delivery route, along the outbound vessel corridor, and in the vicinity of the proposed Facility. The Applicant has committed to sponsorship and funding for emergency response training exercises, backup staffing while employees attend emergency response training, and prioritizing the training of firefighters anticipated to be primary responders. To ensure trainings stay current, mitigation is recommended in Chapter 4 for the Applicant to extend its commitment to regular sponsorship of emergency response training exercises in Vancouver, Spokane, and the Columbia River Gorge.

10.6 UNIQUE RESPONSES TO COMMENTS RECEIVED ON THE DRAFT EIS

Individual responses to all substantive comments are included in Table R-1 in Appendix R. That table refers to these summary responses and revisions to sections in the Final EIS as appropriate.