4.4 Environmental Health Risks—Terminal (Onsite)

This section addresses the potential environmental health risks (specifically the likelihood of spills, fires, or explosions of various sizes) associated with operations at the terminal (onsite). This section first describes the environmental health risks that would exist under the no-action alternative to provide context for how risks would change with the addition of the proposed action. It then describes the potential risks related to oil spills, fires, and explosions associated with terminal operations under the proposed action. This section describes the existing planning, preparedness, and response framework intended to address risks at the terminal and identifies additional applicant mitigation measures to further address risks. The section concludes with a discussion of the unavoidable and significant adverse impacts of the proposed action and an explanation of financial responsibility for emergency response and cleanup activities if an incident occurred at the terminal.

4.4.1 What are the existing risks?

This section describes the existing risks and potential environmental health risks (frequencies and consequences of different scenarios) that could occur under the no-action alternative, which would represent a continuation of the existing risks. The environmental health risks at the existing facility include the potential for exposure of people and the environment to the liquids and chemicals that are currently stored, handled, and transported on site. Exposure to these materials could occur due to incidents caused by human error, equipment failure, or in extreme cases, natural disasters, such as earthquakes or other seismic-related events. Depending on the circumstances of an incident and the properties of the chemicals, the people, plants, and animals in the environment could suffer direct toxic impacts or secondary impacts from exposure to vapors. In some cases, incidents could result in the potential for fires or explosions.

4.4.1.1 Oil Spills

Under the no-action alternative, the methanol distribution facility would continue similar to existing conditions. As described in Chapter 3, Section 3.14, *Hazardous Materials*, the environmental health risks would be related primarily to exposure to hazardous materials such as fuels used in facility vehicles, solvents, cleaning agents, paints, oil filters, used oil, batteries, aerosol cans, and fire-fighting foam. Spills of these chemicals and those stored in bulk, including methanol, could occur as the result of human error (e.g., improper use, not following required handling and storage protocols) or equipment failure (e.g., leaking vehicles or minor hose leaks). As noted in Section 3.14, *Hazardous Materials*, most spills that occurred under these circumstances would be expected to be relatively small and easily contained.

The greatest potential for larger-scale spills would be related to incidents involving materials that are handled, stored, or transported in bulk. Under the no-action alternative, these would continue to include methanol. During existing operations, the greatest potential for impact from larger-scale spills would be associated with vessel transfers. This is because vessels carry the greatest volumes at one time and they travel and transfer oil exclusively over water where spills are not as easily contained.

Because it is not possible to predict the timing or exact magnitude of an incident, the following spill scenarios were considered to provide an understanding of the range of risks under the no-action alternative. For additional details about the analysis of risks under the no-action alternative, see Appendix M, *Risk Assessment Technical Report*.

Because the potential impacts of exposure to spills would vary depending on the specific circumstances at the time of the incident, the potential environmental impacts are addressed in general terms in Chapter 3, Section 3.14, *Hazardous Materials*.

- The **small rail-unloading spill scenario** (up to 2,100 gallons [50 barrels]) could occur once in 25 years. Reported data have shown that most of these spills would be fewer than 200 gallons. Because the spill amount is less than the unloading area containment, the spill is expected to be contained.
- The **small vessel-loading spill scenario** (up to 2,100 gallons [50 barrels]) could occur once in 37 years. Reported data have shown that most of these spills would be fewer than 200 gallons. Some methanol is likely to be contained on the facility, on the deck of the vessel, or on the dock but could spill to surface waters or to the ground.
- The **medium vessel-loading spill scenario** (represented by 10,000 gallons [238 barrels]) could occur once in 588 years. A small amount of the methanol would be contained on the facility or vessel but the remainder could spill to water.
- The **medium pipeline or storage tank spill scenario** (represented by 50,400 gallons [1,200 barrels]) could occur once in 2,500 years. This volume of spill could occur in the event of a pipeline rupture or a smaller storage tank failure. Depending on circumstances of the event, it is possible that the existing containment areas would contain the majority of a spill of this size; however, if extensive infrastructure damage were to occur, as might be the case in the event of an earthquake, widespread environmental damage could occur.
- The **large storage tank spill scenario** (up to 3.4 million gallons [80,000 barrels]) could occur once in 50,000 years. This release of the entire contents of a storage tank resulting from storage tank or containment failure could occur as a result of a material failure, containment failure, or a seismic or tsunami event. Some of the methanol would be caught in the containment area but the remaining oil could spill to land or water. If extensive infrastructure damage were to occur, widespread environmental damage would be likely.

4.4.1.2 Fires or Explosions

Under the no-action alternative, there would be the possibility of fires or explosions related to the ongoing methanol operations. Although no incidents have occurred at the existing facility, one explosion at the adjacent Imperium Terminal Services site was reported on December 2, 2009, when a 10,000-gallon tank containing heated glycerin exploded because of over-pressurization. The explosion damaged a 5,000-gallon tank of sulfuric acid (U.S. Environmental Protection Agency 2009 and Butorac pers. comm.). No one was injured and no sulfuric acid or glycerin reached the water because of the incident.

While the materials released would not be crude oil, the existing operations still handle and store flammable materials, such as methanol, which might ignite if spilled and exposed to an ignition source. The chance of an explosion is dependent on the material involved and the configuration of the release, including the amount of combustible gases present. Explosions would be less likely to

occur than a fire, as not all flammable materials are explosive and not all releases would have the necessary amount of confinement to support an explosion.

4.4.1.3 Response

The existing methanol facility, other Port facilities, commercial uses, and the City of Hoquiam and Aberdeen residents rely on the Hoquiam Fire Department and the Aberdeen Fire Department for initial incident response. As noted in Section 4.2, *Applicable Regulations,* and described below, local emergency services has limited equipment for hazardous materials responses.

Hoquiam Fire Department

The Hoquiam Fire Department provides 24-hour fire protection and emergency medical services (EMS) to the city of Hoquiam. The department's headquarters station is located at 625 8th Street and a second station, closer to the project site, is located at 517 Ontario Street. The headquarters station is approximately 2 miles from the project site; the second station on Ontario Street is approximately 1 mile from the project site. In the event of a spill or fire at the project site, personnel from one or both stations may be dispatched, depending on other obligations. The fire department consists of seven personnel that rotate through three shifts to have three full-time personnel on call at one time. Currently, the station responds to approximately 3,000 calls per year. A majority of these are related to emergency medical services with a small percentage being fire-related. One fire truck/engine and one ambulance are stationed at the Ontario Street station; both are in need of replacement to be able to adequately respond to a fire or emergency call at the project site (Dean pers. comm.).

In addition to fire trucks, a foam trailer, stored at the Ontario Street station, carries four 265-gallon alcohol-resistant aqueous film-forming foam (AR-AFFF) totes and a 300-gallon Purple K dry extinguisher. The totes do not have pumping capabilities and must be paired with a fire engine to pump and apply the foam. The Hoquiam Fire Department works with the Aberdeen Fire Department through a mutual aid agreement that dictates that both departments respond to calls together.

Aberdeen Fire Department

The Aberdeen Fire Department provides fire protection and EMS to the city of Aberdeen and EMS coverage outside of the city. Specifically, the Aberdeen Fire Department is responsible for providing initial fire response for railway incidents on the east side of the Port of Grays Harbor, Poynor Yard, and the rail line through East Aberdeen.

The department includes two stations, the north-side headquarters station at 700 West Market Street and a substation in south Aberdeen at 700 West Curtis Street. Staffing at both stations includes approximately 33 uniformed personnel, one EMS account specialist, and one department chaplain. Eight to 10 personnel staff both stations daily and firefighters are trained in paramedic and emergency medical technician-level services. In 2013, the fire department responded to 4,696 service calls (453 fire-related and 4,243 emergency medical response-related) (City of Aberdeen Fire Department 2014). Per comments submitted on the public Draft EIS, Aberdeen currently has one fire truck, one ladder, and one ambulance.

The response to a fire or hazardous material incident would include one command unit with one battalion chief, one ladder truck with two personnel, one fire engine with three personnel, and one ambulance with two personnel. On escalating incidents, the fire chief and assistant chief respond

and off-duty personnel are called back to service using predetermined alarm escalations (Hubbard pers. comm.).

Hazardous Materials Response

A hazardous materials response at the project site would involve personnel and equipment from The Aberdeen and City of Hoquiam Fire Departments under the mutual aid agreement. The State of Washington requires that fire fighters receive training in hazardous materials response and fire fighters from the City of Aberdeen and City of Hoquiam have been trained to the Hazardous Materials Operations level. This 32-hour course at the Washington Fire Training Academy provides first responders with the understanding and skills necessary to detect the presence of hazardous materials, identify the hazards associated with the materials, and take defensive action against the materials.

Other Local Response Assets

The Cosmopolis Fire Department is a volunteer fire department located approximately 4.5 miles southeast of the project site (City of Cosmopolis Fire Department undated). Additional municipal fire departments that could support an emergency at the project site are the City of Westport and the City of Ocean Shores Fire Departments. Both are located along the perimeter of the harbor, to the southwest or northwest of Hoquiam, respectively. Response time to an emergency at the project site is dependent on vehicle travel times over surface roads, which could take from 30 to 60 minutes for either department depending upon traffic. The Westport Fire Department is called upon occasionally (approximately four times a year) to the Westport Boat Basin to investigate sheens on the water (Benn pers. comm.).

In addition to the above-listed municipal fire departments, Grays Harbor Fire Protection Districts are available to provide personnel and fire apparatus in the event of an emergency within their respective areas of operation. Refer to Table 4.5-1 in Section 4.5, *Environmental Health Risks—Rail Transport*, for additional information.

Emergency Response Plans

The applicant has an Occupational Safety and Health Administration-mandated Emergency Action Plan for the existing facility. The Emergency Action Plan details actions to be taken by employees on site in the event of an emergency and stipulates notifications to the National Response Center, the U.S. Coast Guard, and the U.S. Environmental Protection Agency in the case of a spill, fire, or explosion.

The Grays Harbor County Local Emergency Planning Committee represents local government, emergency response officials, environmental and citizen groups, industry and other interested parties for the purpose of local emergency awareness and planning for a hazardous material incident within the county. The committee is not a response organization but its membership consists of local, state, and federal first responders.[1] The committee supports community preparedness by encouraging open communication, training, and periodic drills and exercises. The

[1] The Local Emergency Planning Committees meet and plan under the auspices of the State Emergency Response Commission established for the purposes of implementing Title III of the Superfund Amendments and Reauthorization Act passed in 1986 by the federal government and adopted by Washington State in 1987.

Grays Harbor County committee manages the development, maintenance, and promulgation of the County Comprehensive Emergency Management Plan, which is the guidance for local fire departments and other agencies responding to an oil spill or hazardous material incident that takes place at the project site.

4.4.2 What are the potential risks?

Under the proposed action, additional risks would include the possibility of spills of oil that could adversely affect people and the natural environment. The greatest potential for larger-scale spills would occur during the proposed rail unloading, storage, and vessel-loading activities. Under the proposed action, the likelihood of a spill occurring would be greater compared with the no-action alternative, primarily because of the increased number of storage tanks and corresponding increased total volume of crude oil stored on site and increased rail and vessel-unloading and loading activities. Additionally, there would be new environmental health risks related to the potential exposure of people and the natural environment to crude oil.

This section describes the proposed facility and activities that could result in increased risks of a spill, determines the change in the likelihood of a spill occurring under the proposed action, identifies mitigating factors currently in place to minimize the impacts of an incident, and describes the potential extent of a spill and the response actions that would occur. This section also describes the risks of fires or explosions related to the proposed action and the response actions that would occur in the event of a fire or explosion at the project site.

Westway currently has four storage tanks on the northern portion of the site. Each tank has the capacity to hold approximately 80,000 barrels. Under the proposed action, up to five 200,000-barrel floating-roof tanks would be added to store crude oil. The tanks are required to have containment areas able to collect the capacity of the largest tank plus precipitation. However, containment could fail in a catastrophic event. Leaks from the tank or piping within the containment would be expected to remain in the containment and be collected for proper disposal. Tanks are typically isolated using valves unless in use, so a leak or rupture from piping outside of the containment would likely be limited to the quantity of the substance in the piping.

Rail car and vessel unloading and loading would also occur under the proposed action. The rail unloading area would also include a containment area with a capacity to hold the contents of one rail car (typically 30,000 gallons) plus precipitation. Rail-unloading activities (up to approximately 27,594 times annually) would comprise the greatest number of active transfers because of the number of rail cars that must be unloaded on a daily basis. Spills could also occur during the vessel-loading activities (up to 119 additional loadings[2] annually) with releases directly to the water or to containment. Small-quantity containment areas are required at valve connections for transfer operations. Rail activities are more common than vessel activities and this higher frequency poses a greater potential for releases from unloading hoses or connection failures.

[2] As noted in Section 3.17, *Vessel Traffic*, any combination of tank barges and tankers, including those listed in Table 3.17-9, could be used to transport bulk liquids from Terminal 1. For the purposes of this analysis, the maximum number anticipated would be associated with the use of all tank barges. As discussed in Section 4.6, *Environmental Health Risks—Vessel Transport*, reducing the number of vessel trips by using larger vessels would lower the likelihood of a spill; however, in the event that a spill occurred, the spill could be larger.

4.4.2.1 Oil Spills

Oil Spill Risk

Historically, no oil or hazardous materials spills to the water have occurred from the project site since the applicant began activities in Grays Harbor. In 2009, one biodiesel spill of 5,000 gallons occurred at Imperium Terminal Services, and the oil was confined to the containment area with no impact on water. The cause for the spill was mechanical failure.

A summary of West Coast oil spill data for 2014 reported 1,193 spills, of which 15 spills were over 10,000 gallons. More than 79% of the spills were to land. Over the past 13 years, the major spill causes were identified as equipment failure (55%) and human error (30%) (Pacific States/British Columbia Oil Spill Task Force 2015).

Although no major spills have been reported at the project site, the proposed action would increase daily operations, particularly the frequency of loading vessels and unloading rail cars with crude oil. As such, the proposed action would result in the potential for more frequent spills of bulk liquids relative to the no-action alternative, although the orders of magnitude for large spills are very similar. Additionally, the proposed action would introduce bulk handling and storage of crude oil, which is not currently present in the study area. The likelihood of very large releases from storage tank failures would remain low.

A risk assessment (Appendix M, *Risk Assessment Technical Report*) determined the potential frequency of spills of different sizes based on planning requirements applicable to the terminal operations. Incidents with the potential to result in oil spills could occur as the result of various factors, such as human error, equipment failure, and natural events like earthquakes. Activities at the project site most likely to result in oil spills include rail unloading, onsite pipeline transport, tank storage, and vessel loading. The risk assessment applied failure rates for each of these types of events combined with the number of tanks or loadings and unloadings anticipated for the proposed action to derive the likelihood of each scenario. Appendix M provides a discussion of the risk scenarios and the methods used to determine spill frequencies.

As noted previously, it is not possible to predict the timing or magnitude of an incident involving the release of crude oil; therefore, the following spill scenarios were considered to provide an understanding of the types of risks under the proposed action. The likelihood of each spill scenario occurring under the proposed action and related risks are summarized below. For more information about the assumptions, methods, and sources of data used to determine the likelihood of these spills occurring, see Appendix M, *Risk Assessment Technical Report*.

- The **small rail-unloading spill scenario** (up to 2,100 gallons [50 barrels]) could occur once in 9 years. The spill amount is less than the unloading area containment so the spill is expected to be contained.
- The **small vessel-loading spill scenario** (up to 2,100 gallons [50 barrels]) could occur once in 8 years. Some oil is likely to be contained on the facility, on the deck of the vessel, or on the dock but could spill to surface waters or to ground.
- The **medium vessel-loading spill scenario** (represented by 10,000 gallons [238 barrels]) could occur once in 136 years. A small amount of the oil would be contained on the facility or vessel but the remaining oil could spill to water.

- The **medium pipeline or storage tank spill scenario** (represented by 10,000 gallons [238 barrels]) could occur once in 2,000 years. Depending on the circumstances of the event, it is possible that the existing containment areas would contain the majority of a spill of this size; however, if extensive infrastructure damage were to occur, as might be the cause if the cause was an earthquake widespread environmental damage could occur.
- The **large storage tank failure spill scenario** (up to 8.4 million gallons [200,000 barrels]) could occur once in 40,000 years. This release of the entire contents of a storage tank resulting from storage tank or containment failure could occur as a result of a material failure, containment failure, or seismic or tsunami event. Some of the oil would be caught in the containment area but the remaining oil could spill to land or water.

To provide additional information about the risks of a spill and to inform prevention, preparedness, and response planning, oil spill modeling was completed for a subset of the spill scenarios. The purpose of this modeling was to demonstrate the potential extent of spilled oil within the available parameters of the models used and to illustrate the relative influence of various factors, including the location of the spill, material spilled, weather conditions, and hydrologic flow conditions, on the movement of spilled oil. As presented in Appendix N, *Oil Spill Modeling,* the modeling demonstrates that the movement of spilled oil in the harbor can vary dramatically depending on these factors. For more information about the assumptions, methods, and limitations of the modeling, refer to Appendix N.

Depending on these conditions and assuming no efforts were taken to contain the spill, modeling showed that oil could move from the project site to the far shores of the estuary within 24 hours or could remain near the spill site. Spilled oil could also move out of Grays Harbor and up or down the coast, depending on the specific conditions at the time of the incident. Because the potential impacts of exposure to spills on human health and the environment would vary depending on the specific size and circumstances of the spill, impacts affecting the following resources are addressed in general terms in Section 4.7, *Impacts on Resources*.

- Water
- Plants
- Animals
- Aesthetics
- Recreation
- Commercial fishing
- Cultural resources
- Tribal resources
- Air
- Human health
- Public services

Oil Spill Prevention

As discussed in Section 4.2, *Applicable Regulations*, facilities that store and handle oil and hazardous substances must meet federal and state design standards, equipment, training, and operation requirements to prevent spilled oil or hazardous materials from reaching the environment. Washington State has specific regulatory spill prevention, training, and pollution containment equipment standards for Class 1 facilities such as large, fixed, shoreside facilities that transfer materials to or from tank vessels. The facility would be designated a Class 1 facility under the proposed action and subject to Class 1 spill prevention, training and operational standards.

Storage Tank Containment

The proposed facility would be designed and constructed in accordance with 40 CFR 112, 33 CFR 154, and WAC 173–180. The applicant would be required to install appropriate containment and diversionary structures or equipment such as dikes, berms, and retaining walls to prevent discharged oil from reaching navigable waters. The containment must be capable of containing the contents of the largest tank plus precipitation.

Design Standards

State construction and design standards for facilities (WAC 173–180) include oil transfer requirements, containment boom, fixed lighting, effective voice communication requirements, emergency shutdown equipment and procedures, storage tank and pipeline construction and inspection standards, and hose and loading arm specifications. Oil and hazardous material pollution containment equipment, such as sorbent materials and boom, would be positioned in the facility and accessible to employees (33 CFR 154.545).

All hazardous substances must be accounted for in the facility design standards in accordance with state and federal laws and regulations to prevent incidents and to minimize the environmental impact of incidents. For example, all storage tanks and rail car unloading areas would be protected with fire-fighting foam capabilities (foam blanketing fire protection). Tanks would be equipped with high-level alarms, over-pressure protection, floating roofs, and emergency overflows into containment (Imperium Terminal Services 2013:25). Floating roofs could provide vapor containment to reduce air toxics by sitting on the surface of the tank contents, reducing the potential for vapor generation.

Training and Certification Program for Oil-Handling Personnel

Washington State requires that a specific training and certification program be in place for certain employees at Class 1 facilities. The purpose of the training is to reduce the risk of oil spills due to human error (WAC 173–180–510). Personnel involved in oil transfers must be trained in emergency response and oil transfer procedures (WAC 173–180 Part E, Training and Certification and 33 CFR 154). Personnel are stationed near shutoff equipment to quickly stop the flow of oil in the case of a spill and begin notifications and initial responses. The program must be reviewed and approved by the State of Washington.

Advance Notice of Crude Oil Deliveries

WAC 173-185-070 requires owners and operators of a facility that will receive crude oil from a railroad car to provide Washington State Department of Ecology (Ecology) with advance notice of deliveries. The information must be provided weekly. The information must include contact

information, region of origin of crude oil, rail route in Washington, gravity of crude oil and scheduled delivery date and volume. Ecology will share the advance notice information with the state emergency management division and any county, city, tribal, port, or local government emergency response agency upon request. Information will be published quarterly on Ecology's website including the mode of transport, origin of oil, number of volume of reported spills during transport and delivery, and number of railroad cars delivering crude oil. Information on the route, week, and type of crude oil will be aggregated.

Oil Spill Response

Spill response actions would follow the protocols and procedures set forth in Section 4.2.3, *What framework provides responses to an incident?* As noted, in Section 4.2.3, the local emergency service providers described under Section 4.4.1, *What are the existing risks?* would likely be the first responders to an oil spill at the project site. As noted previously, crude-by-rail transport would be a new activity in the study area and therefore could present challenges to local responders not addressed in existing basic training. Moreover, the foam trailer stored at the Ontario Street station requires pumping capability to be effective. Adequate staffing and equipment to deploy and apply the foam is not currently addressed in local protocols (Hubbard pers. comm.). The potential impact of the proposed action on local emergency service providers are addressed in Section 4.7, *Impacts on Resources*.

Depending on the severity of the incident, when considering impacts on public health and the environment, the U.S. Environmental Protection Agency, U.S. Coast Guard, and Washington State Department of Ecology (Ecology) may take a more aggressive role in the initial response operations to ensure that the responsible party is taking appropriate and timely action to mitigate damages to the environment.

Applicant Contingency Planning

The site contingency plan required for the proposed action required of the applicant will provide specific oil spill response actions and will include information on the specific equipment, valves, pipelines, and loading arms. Typical actions for responding to a spill are as follows.

- Notify companies and agencies that are responsible for the cleanup effort.
- Get trained personnel and equipment to the site quickly.
- Ensure the safety of responders and the public.
- Define the size, position, and content of the spill; its direction and speed of movement; and its likelihood of affecting sensitive habitats.
- Stop the flow of oil, if possible, and preventing ignition.
- Contain the spill to a limited area.
- Remove the oil.
- Dispose of the oil once it has been removed from the water or land.
- Investigate immediate and contributing causes for the spill.
- Apply lessons learned to prevent future spills.

Facility Response Plan

The existing facility response plan would be updated as required by U.S. Coast Guard regulations (33 CFR 154 Subpart F) and state regulations (WAC 173–182) to include contingencies for situations that could create a risk of spill of oil, fire or explosion.

Geographic Response Plans

As mentioned in Section 4.2, *Applicable Regulations*, the Grays Harbor and the Chehalis River Geographic Response Plans (GRPs) contain specific response strategies in the event of an oil spill (from any source) into or threatening waters and related environmental resources within the study area. For example, the Grays Harbor GRP contains response strategies relevant to an oil spill that would affect the lower Chehalis River (including response strategies related to tributaries or wetlands that connect to the river), the North and South Bays, and Bowerman Basin (near Grays Harbor airport). GRP strategies are designed for use with persistent heavy oils that float on water and may not be suitable for other petroleum products or hazardous substances. Response strategies for coastal shorelines along the Pacific Ocean west of Grays Harbor are also included (Ocean City, Ocean Shores, Westport, Cohasset Beach, and Grayland) in case of an oil spill that drifts outside of the harbor entrance or that leaks from a vessel located near the harbor entrance. The Chehalis River GRP geographically covers the river from Cosmopolis, picking up where the Grays Harbor GRP ends, and follows the river southeast to Centralia, concluding at Pe Ell.

GRPs do not describe all actions comprehensively. For example spill containment and on-water recovery are the first priorities. Neither are not described in GRPs. Response strategies described in GRPs encompass the placement of a boom to achieve any of the following results.

- To close off access of spilled oil into environmentally sensitive sites (such as the Oyhut Wildlife Recreation Area near the harbor entrance).
- To deflect oil moving on the river or within the harbor into a containment area for collection (with vacuum trucks and sorbent materials).
- To divert oil away from areas that are sensitive and/or hard to clean.

Culvert blocks or underflow dams are also response strategies presented in the GRPs to aid in shoreline protection and oil collection. The GRPs contain supplemental information related to the response strategies that support their implementation. For example, the Grays Harbor GRP includes a table with recommended boom lengths, appropriate boom deflection angles, and the number of required anchors to support boom placement for a range of different current speeds. Predesignated staging area locations (for equipment and personnel) and relevant logistics for their use are clearly described.

The response strategies are prioritized in the GRPs to reflect the sensitivity of threatened environmental resources or potential public health concerns (as in the case of spill proximity to populated areas or water intakes). In some cases economic considerations may dictate response priorities (for example preventing oil from affecting shellfish harvest areas or a marina). These priorities are considered prior to a spill and reflected accordingly in the GRPs to prevent a delay in the allocation of response assets during a spill response.

Each GRP identifies potential spill origin points in order to plan for a variety of potential spill sources. There is no attribution in the GRPs for the cause of the spill at the spill origin points. Each spill origin point has a multitude of associated response strategies within the GRPs due to the

likelihood that spilled oil will spread on and flow with water until it is contained and removed. For example, the Grays Harbor GRP contains over 40 site-specific strategies to combat the spread of spilled oil from spill origin point designations GH-C, located near Grays Harbor entrance, and GH-B, located near the mouth of the Chehalis River, and in the lower southeast quadrant of Grays Harbor. These site-specific strategies are designed for individual areas, not for the entire Grays Harbor area.

In addition to the site-specific information contained in the GRPs, relevant information in other sections of the larger Northwest Area Contingency Plan (Section 4.2.2.2, *Northwest Area Contingency Plan*) supplements the site-specific strategies (Region 10 Regional Response Team 2016). For example, *Chapter 3000 – Operations* contains a section titled *Operational Safety Issues Associated with Bakken Crude Oil*. Another section, *Northwest Area Shoreline Countermeasures Manual and Matrices*, contains an in-depth description of 10 shoreline types (ranging from fine- to medium-grained sand beaches to salt and freshwater marshes) and appropriate cleanup considerations for each type.

4.4.2.2 Fires or Explosions

Fire or Explosion Risk

As noted in Section 3.14, *Hazardous Materials*, crude oil is flammable but would generally be in a liquid and not gaseous form. Typically, terminal activities resulting in a spill would have limited potential to result in ignition because terminals are designed to reduce ignition potential as noted in Section 4.2, *Applicable Regulations.*

An incident involving a spill could result in a fire or explosion if there is an ignition source and combustible gases are present in a quantity that could ignite. The incident could cause sparking, which could ignite the spill. The extent of the damage would depend on numerous factors, including the cause of the incident, any fire suppression capabilities, and the timing and nature of response actions. It would also depend on the material: Bakken crude oil is more flammable than other heavier crude oils. The flammability of diluted bitumen varies based on the diluent (diluting agent) used.

Although fires or explosions can result spills caused by collisions and derailments, long-term historical data show that most spills do not result in fires or explosions. A fire or explosion would be less likely to occur than a spill. However, a spill of any size poses the risk of a fire or explosion, depending on the conditions.

Additional information regarding the risks of fire and explosions from onsite operations is provided in Appendix M, *Risk Assessment Technical Report*.

Because the potential impacts of exposure to fires or explosions on human health and the environment would vary depending on the specific size and circumstances of the spill, impacts affecting the following resources are addressed in general terms in Section 4.7, *Impacts on Resources*.

- Air
- Human health
- Plants
- Animals

- Aesthetics
- Recreation
- Commercial fishing
- Cultural resources
- Tribal resources
- Public services

Fire or Explosion Prevention

The proposed facility would meet national and state design codes for fire protection. These include tank separation distances, containment requirements, pressure relief valves, and fire suppression or protection systems. Numerous containment areas on the project site would control or limit where a release could spread; these also would reduce the chance of an ignited release effecting other equipment or traveling off site via land or water. Shutoff valves would limit the quantity of material released. In addition, ignition and possible explosions would be limited through a range of physical and procedural precautions and facility personnel would be appropriately trained as required by existing regulations. Fire suppression and firefighting equipment would be located on site.

Measures that reduce the chance of ignition include but are not limited to the following:

- Install floating roofs to limit vapor generation in confined areas.
- Eliminate ignition sources.
- Use nonsparking tools and explosion-proof equipment.
- Separate tanks by appropriate distance.
- Ground all equipment.

Fire or Explosion Response

Should a release occur, the emergency response plans listed above address the roles, responsibilities, and actions to take, depending on how much was spilled, and where and whether ignition has already occurred. The National Fire Protection Agency has issued codes and standards for all types of facilities and storage, including oil-handling facilities. The agency also regularly analyzes historic events to improve codes and standards (National Fire Protection Agency 2014, 2015). Typical responses to an explosion are as follows.

- Implement emergency response plan.
- Protect public health and safety.
- Make notifications.
- Conduct hazard assessment and risk evaluation.
- Conduct continuous air monitoring, as appropriate.
- Confine the spill.

- For fire suppression, isolate or evacuate based on the product (e.g., the Emergency Response Guide No. 128 for petroleum crude oil recommends isolation and initial evacuation for 0.5 mile in all directions).
- Begin fire suppression operations.
- Clean up spill.
- Investigate immediate and contributing causes for the incident.
- Apply lessons learned to prevent future incidents.

Emergency response actions would follow the protocols and procedures set forth in Section 4.2.3, *What framework provides responses to an incident?* As noted, in Section 4.2.3, the local emergency service providers described in Section 4.4.1, *What are the existing risks?* would likely be first responders to a fire or explosion at the project site. The potential impact of the proposed action on human health, resources and local emergency service providers are addressed in Section 4.7, *Impacts on Resources*.

4.4.3 What mitigation measures would reduce impacts related to terminal operations at the project site?

This section describes the applicant mitigation and other measures that would reduce environmental health and safety impacts at the terminal from the proposed action. These mitigation measures are in addition to regulatory compliance and best practices discussed above.

4.4.3.1 Voluntary Measures and Design Features

The applicant has committed to the following voluntary measure to address risks related to crude oil operations at the project site.

- Supply three totes of AR-AFFF at the project site for use by local fire departments.

4.4.3.2 Applicant Mitigation

The applicant will implement the following mitigation.

- To improve response effectiveness in the case of a spill, provide information to support oil spill modeling, identify specialized spill response or prevention equipment for the facility prevention plan and contingency plan, and assist with determinations of safe and effective conditions for prebooming, the applicant will purchase an equipment and software package to supplement information on environmental conditions. Information will include tides, currents, wave heights, wind (speed and direction), air temperature, water temperature, and barometric pressure. This information should be provided for the following locations: at the facility, at the entrance to Grays Harbor, at Oakville on the Chehalis River. In addition, the applicant will purchase and stage a current measuring device that includes direction and velocity at the facility dock. The system will be in place before construction begins. Data will be provided to Ecology at 6, 12, and 18 months after the system is in place. At least 12 months of data will be provided before operations begin.
- To improve contingency planning and response actions and to minimize potential impacts, the applicant will gather and provide data to improve the GNOME Location File for Grays Harbor.

The data will assist in developing trajectories for the GNOME and TAP oil spill models. To support model development and use, the applicant will collect remote sensing data at the facility location, at the entrance to Grays Harbor, at Oakville on the Chehalis River. The data provided will be sufficient so that the models can complete the following actions:

- Predict how wind, currents, and other processes might move and spread oil spilled on the water.
- Depict a relative distribution of spilled oil movement in Grays Harbor from the entrance to the Pacific Ocean to a point upstream in the Chehalis River near Oakville, Washington.
- Predict a spills trajectory based on a worst-case spill scenario from spills at the terminal, from vessels transiting to and from the terminal, and from derailments along the PS&P rail line.

The applicant will coordinate with Ecology to ensure the data meets the identified criteria. A peer review of the model will be funded by the applicant using a third-party reviewer as approved by Ecology. Data will be gathered and the peer review conducted before operations for the proposed facility begin.

- To improve oil recovery in the case of a spill during vessel loading at the dock, the applicant will retain a licensed engineer to perform an independent engineering analysis and feasibility study. The engineer will determine the number of days per year it is safe and effective to preboom oil transfers and will identify site-specific improvements. The applicant will submit the study to Ecology for review and approval before operations begin. If approved, the applicant will implement improvements from the study.

  If the study identifies no feasible alternative or until the changes are in place, and if prebooming is not feasible, the applicant will implement the following alternative measures during oil transfers in addition to those measures already required by regulation:

  - One oil spill response vessel with crew, skimmer, and at least 1,000 feet of boom at the dock.
  - On-water tank barge storage devices (not including bladders) prestaged at the dock with the skimmer to ensure a minimum of 450 barrels of recovery ready to be deployed.

- To reduce the risks and impacts from an oil spill, prior to beginning the proposed operations the applicant will conduct a study to identify an appropriate level of financial responsibility for the potential costs for response and cleanup of oil spills, natural resource damages, and costs to state and affected counties and cities for their response actions. The study should address the factors in RCW 88.40.025, Evidence of Financial Responsibility for Onshore or Offshore Facilities, including a reasonable worst-case spill volume; the cost of cleaning up the spilled oil; the frequency of operations at the facility; prevention measures employed by the facility that could reduce impacts through spill containment, immediate discovery, and shutoff times; and the damages that could result from the spill (including restoration). The study should identify any constraints related to the commercial availability and affordability of financial responsibility. Based on the study, Ecology will determine the appropriate level of financial responsibility and require the applicant to demonstrate their financial responsibility to the satisfaction of Ecology. Proof of financial responsibility will be included as documentation in the applicant's contingency plan.

- To improve oil recovery in the case of a spill, equipment required at hour 6 under WAC 173–182–355 must be resident in Grays Harbor. Additionally, the applicant must purchase and stage the following equipment in Grays Harbor:
  - An additional 200 feet of boom and temporary storage of at least 196 barrels with the ability to collect, contain, and separate collected oil from water. The additional boom should be capable of encountering oil at advancing speeds of at least 2 knots in waves. This boom will be of a type appropriate for the operating environment.
  - An additional 1,000 feet of shore seal boom.
- To improve oil recovery in the case of a spill of crude oil that weathers, sinks or submerges, the applicant will ensure access through agreements or contracts to have the following equipment available. The equipment will be capable of being on scene within 12 hours of spill notification and the means of access will be documented in the applicant's contingency plan and available prior to beginning operations.
  - Sonar, sampling equipment or other methods to locate the oil on the bottom or suspended in the water column.
  - Containment boom, sorbent boom, silt curtains, or other methods to contain the oil that may remain floating on the surface or to reduce spreading on the bottom.
  - Dredges, pumps, or other equipment necessary to recover oil from the bottom and shoreline.
  - Equipment necessary to assess the impact of such discharges.
  - Other appropriate equipment necessary to respond to a discharge involving the type of oil handled, stored, or transported.
- To reduce the impacts from an oil spill, the applicant will establish and implement a procedure for blocking all drains on the dock prior to oil transfers and observing the area for discharges before removal. This best practice will be documented in the facility operations manual for approval by Ecology.
- To improve preparedness for incidents, including oils spills, explosions, and fires, the applicant will ensure an emergency preparedness workshop is conducted prior to beginning project operations. The applicant will coordinate the workshop with Ecology. The workshop will be no more than 1 day in length. It will be held prior to beginning operations and thereafter will become part of the facility drill program. The initial workshop will focus on familiarizing local emergency responders, tribes, and communities with the contents of the Northwest Area Contingency Plan, the Grays Harbor and Chehalis GRPs, other local response plans, the facility response plan, and the measures that are in place for a rapid and effective spill response
- To improve the capability of local emergency responders to respond to spills, fires, or explosions at or near the project site, the applicant will contribute a fair share of the total cost to replace the City Hoquiam Fire Department's fire apparatus to ensure it is able to handle crude oil fires. Equipment must be available and operational prior to beginning operations. The applicant will consult with the local fire departments to determine specifications for the equipment. The total applicant contribution will be determined by the City and applicant through negotiation at the time of the equipment purchase.

- To improve response times and communication in the event of an incident that could affect tribal resources, the applicant will include tribal contacts (names and/or phone numbers) in notification protocols in the oil spill contingency plan.
- To reduce risks related to an explosion or fire onsite, the applicant will meet with local emergency management officials including representatives from the City of Hoquiam and City of Aberdeen Fire Departments to identify training needs for local responders who will respond to an emergency on the project site. This effort will include development and execution of a training program for those responders to increase level of awareness and understanding of the hazards associated with a rail tank car incident or a storage tank incident onsite. The training will include identification of notification protocols, use of personal protective equipment, and equipment deployment procedures. This training will be completed before the applicant begins receiving oil trains and will be offered at least annually.

4.4.3.3 Other Measures to Be Considered

Potential impacts associated with the proposed action could be further reduced by implementing the following measures.

- To improve communications to the public in the case of an incident, the Port of Grays Harbor should develop a formal system for notifying potentially affected residents and businesses. The notification process should also address Spanish speakers and accommodate low-literacy readers.[3]
- To improve response times and communication if an incident could affect tribal resources, the following measures should be considered.
    - The Confederated Tribes of the Chehalis Reservation and the Quinault Indian Nation should identify members or staff to be contacted in the case of an incident with potential impacts on tribal resources.
    - PS&P and the Port of Grays Harbor should include notification of tribal contacts in internal procedure and planning documents.

4.4.4 Would the proposed action result in unavoidable and significant adverse environmental impacts related to terminal operations at the project site?

Regulatory requirements for prevention of, preparedness for, and response to incidents involving the release of crude oil, and mitigation measures to reduce impacts are detailed above. However, no mitigation measures would completely eliminate the possibility of a spill, fire, or explosion, nor would they completely eliminate the adverse consequences of a spill, fire, or explosion. Depending on the location of the incident, amount spilled, type of crude oil, and environmental conditions, such as the time of year, water flows, and weather conditions, the potential adverse environmental impacts could be significant.

[3] Chapter 7, *Economics, Social Policy and Cost-Benefit Analysis*, provides information on common languages in the study area.

The following resources could experience significant impacts as described in Section 4.7, *Impacts on Resources*.

- Water
- Plants
- Animals
- Aesthetics
- Recreation
- Commercial fishing
- Cultural resources
- Tribal resources
- Public services
- Air
- Human health

4.4.5 Who would pay for the response and cleanup of an onsite spill?

Generally, the polluter pays for costs and damages associated with oil spills. For incidents at the project site, the applicant would be the responsible party. The federal government has established high limits on that liability. Washington State places no limits on liability of polluters to third parties, allowing recovery of cleanup costs and natural resource damages beyond the federal limit (Table 4.4-1). To cover removal costs above the federal limits of liability, the U.S. Congress established a one billion dollar Oil Spill Liability Trust Fund to pay for expeditious oil removal and uncompensated damages.

Washington State law requires owners or operators of facilities to provide evidence of their financial ability to pay for damages that might occur during a reasonable worst-case spill of oil from the facility into the navigable waters of the state. The method to determine this is described in Section 4.4.3.2, *Applicant Mitigation.*

Washington State law requires the party responsible for a spill of oil or hazardous substances to state waters to pay for the following costs.

- Their own costs to cleanup and remove oil spills.
- Damages to persons or property, including natural resources.
- Reimbursement to the state for necessary expenses for investigating, containing, removing, or treating oil related to an incident.

The responsible party may also be required to pay a penalty for violation of state law or rule.

Table 4.4-1. Limits of Liability for Spill Removal Costs

Reference	Applicability	Limits of Liability
33 U.S.C. 2704(a)(4)	Oil handling facilities	$350 million or less taking into account size, storage capacity, oil throughput, proximity to sensitive areas, type of oil handled, history of discharges, and other factors relevant to risks posed by the class or category of facility this limit may be reduced to less than $350 million but not less than $8 million.
RCW 88.40	Oil handling facilities	Washington State places no limits on liability.

U.S.C. = United States Code; RCW = Revised Code of Washington