4.6 Environmental Health Risks—Vessel Transport

This section addresses the potential environmental health risks associated with offsite vessel transport in Grays Harbor. 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, or explosions associated with vessel transport under the proposed action. This section then describes the existing planning, preparedness, and response framework in place that is intended to address risks related to vessel transport and identifies additional applicant mitigation measures. The section concludes with a discussion of 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 during vessel transport.

4.6.1 What are the existing risks?

Under the no-action alternative, the environmental health and safety risks during vessel transport would include the potential for vessel incidents that could harm people or the natural environment, particularly if the incidents resulted in spills of hazardous materials. These risks would be similar to existing conditions at least initially but could increase over time because of projected increases in vessel traffic over the 20-year analysis period (2017 to 2037) unrelated to the proposed action (Chapter 3, Section 3.17, *Vessel Traffic*).

Under existing conditions, large commercial vessel traffic in Grays Harbor consists primarily of dry-cargo vessels that carry grain and wood products and vessels carrying cars, referred to collectively in this document as *cargo vessels*. In addition, there are tank vessels[1] carrying bulk liquids, including methanol related to existing operations.

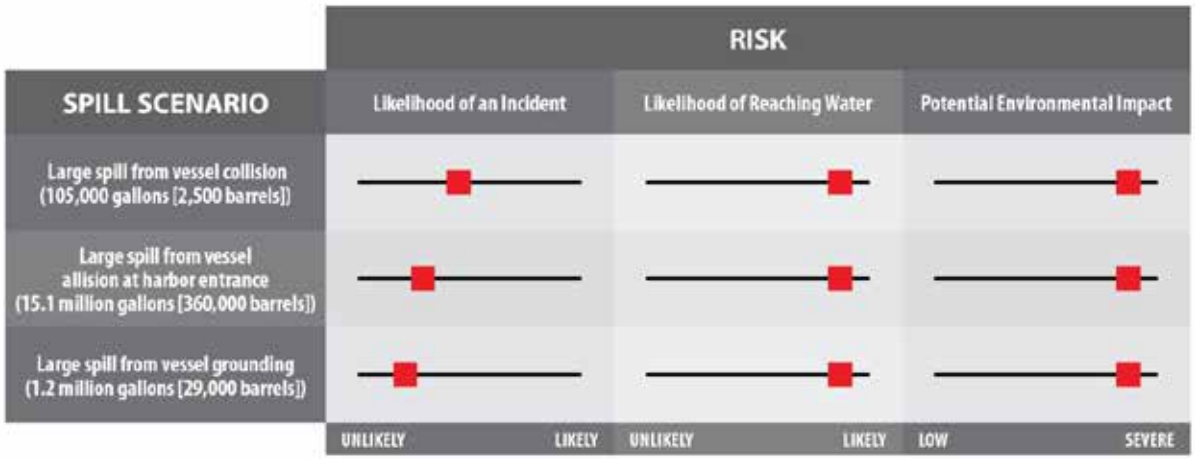
As it is not possible to predict the timing or magnitude of an incident, the following large spill scenarios were considered to provide an understanding of risks under the no-action alternative.

- **Vessel collision spill scenario:** vessel collision with another vessel resulting in a spill of up to 105,000 gallons (2,500 barrels).
- **Vessel grounding spill scenario:** vessel grounding resulting in a spill of up to one compartment of 1.2 million gallons (29,000 barrels).
- **Vessel allision spill scenario:** vessel allision with a fixed structure (e.g., jetty or pier) at the harbor entrance resulting in a spill of up to 15.1 million gallons (360,000 barrels).

The relative risks of these scenarios are shown graphically in Figure 4.6-1 and the likelihoods are summarized below. Spills related to vessel operations while at Terminal 1 are discussed in Section 4.4, *Environmental Health Risks—Terminal (Onsite).*

[1] *Tank vessels* include *tankers* (self-propelled ships) and *tank barges* (barges propelled by tugs). While these are cargo vessels as well, they are referred to separately for the purposes of this document. Tank vessels and cargo vessels are referred to collectively in this document as *large commercial vessels*.

Figure 4.6-1. Environmental Health Risks from Potential Spills during Vessel Transport—No-Action Alternative



The scenarios have the following likelihood of occurring under the no-action alternative.

- The **vessel collision spill scenario** could occur once in 920 years.
- The **vessel grounding spill scenario** could occur once in 3,500 years.
- The **vessel allision spill scenario** could occur once in 2,600 years.

The impacts of chemical releases into the environment are addressed in Chapter 3, Section 3.14, *Hazardous Materials*. For additional details about the analysis of risks under the no-action alternative, see Appendix M, *Risk Assessment Technical Report*.

4.6.2 What are the potential risks?

Under the proposed action, the environmental health and safety risks in the harbor would include the possibility of vessel incidents that could harm people or the natural environment, particularly if larger spills of oil occurred. These risks would be greater with implementation of the proposed action compared to the no-action alternative. The risks would be greater because there would be more vessels operating in the harbor, which would generally increase the potential for an incident. There would also be new environmental health risks related to the potential exposure of people and the natural environment to crude oil.

This section describes factors influencing the potential increase in risks in the harbor. It identifies the change in the likelihood of a spill occurring under the proposed action, identifies mitigating factors currently in place to reduce the impacts of a spill, 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 during vessel transport.

As noted in Chapter 3, Section 3.17, *Vessel Traffic*, operation of the proposed action would result in increased vessel traffic in the study area. The vessels would consist primarily of tug barges but could include the use of tankers. The actual mix of vessel type and size would be determined by the owner of the oil who contracts for ships to provide transport to or from the terminal. The decision is based on the distance of transport, fuel needs of the vessel, and the constraints of the receiving harbors and ports where the oil would be delivered. Under the proposed action, up to an additional 238 vessels trips[2] would operate annually in Grays Harbor. These are assumed to be tank barges, although tankers could be used, which, because they can carry more product, would reduce the number of vessel trips.

4.6.2.1 Oil Spills

Oil Spill Risk

Typically, spills from vessels occur from operations (transferring fuel internally or transferring fuel to or from the vessel) or because of an incident such as a collision, grounding, or allision. Incidents can result from situations such as a loss or reduction of propulsion, loss of steering, or other equipment failure, as well as human errors.

Grays Harbor has navigational challenges, including a bar at the entrance to the harbor, a constrained navigation channel for deep-draft vessels, and sharp turns in the channel. The substrate of the channel is generally sand and mud, which, in addition to the requirement for vessels to be double-hulled, reduces the potential of spill due to groundings.

From 2008 to 2014, several vessel incidents occurred in Grays Harbor, including one methanol spill from a vessel. Five incidents were caused by loss or reduction in propulsion. One of these resulted in a vessel grounding with no damage or spill and one resulted in an allision with a buoy with no damage or spill. In 2011, a ship spilled 200 gallons of methanol to water because of human error in connecting a hose to a flange for a transfer.

In 1988, the barge *Nestucca* spilled 231,000 gallons (5,500 barrels) of heavy fuel oil along Washington State's outer coast, offshore of the entrance to Grays Harbor. The barge was being towed and the line broke after crossing the Grays Harbor bar. The tug collided with the barge and ripped a gash in the hull, causing a spill. The oil spill affected beaches as far south as Oregon and north to Vancouver, British Columbia. Because of the spill, the Washington State Department of Ecology (Ecology) Spills Program and the Pacific State – British Columbia Oil Spill Task Force were established. Since that incident, Washington State laws and federal laws for oil spill prevention, preparedness, and response were implemented, including requirements for double-hulled vessels and natural resource damages.

The report, *Oil Spill Risk in Industry Sectors Regulated by Washington State Department of Ecology Spills Program for Oil Spill Prevention and Preparedness* (Washington State Department of Ecology 2009) noted 14 oil spills from tankers from 1995 to 2008, with a total of 13,709 gallons (326 barrels) of oil spilled. The report also found 14 oils spills from tank barges for a total of 7,002 gallons (167 barrels). Both of these data points indicate that most spills are far less than a full

[2] A vessel trip represents a one-way trip; in other words, an inbound trip and an outbound trip count as two trips.

discharge of contents. Another recent study (Glosten 2014) developed release probabilities that indicated 13 to 22% of incidents actually resulted in a spill. In the remaining 78 to 87% of the cases, there was no loss of cargo resulting from the incident.

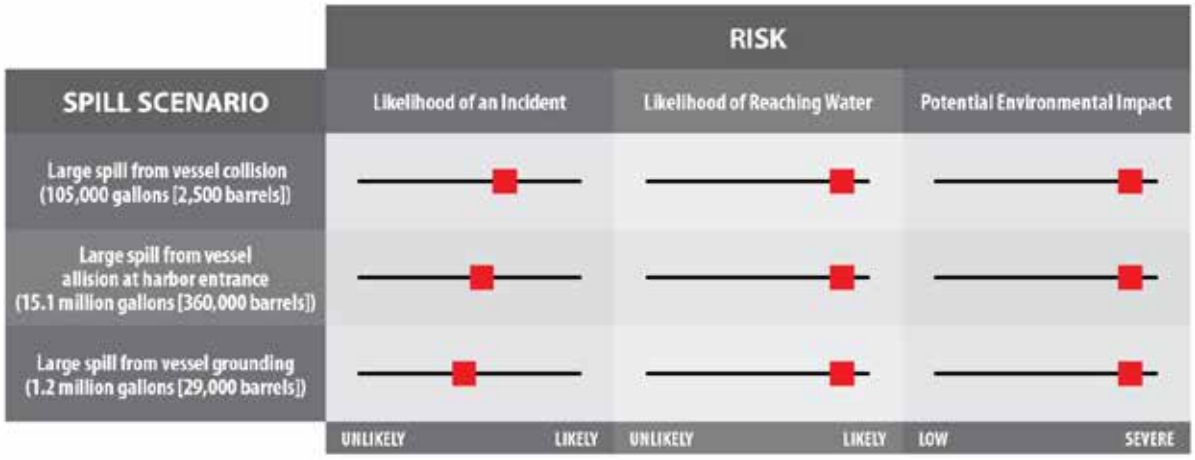
A risk assessment was completed (Appendix M, *Risk Assessment Technical Report*) to determine the potential frequency of spills of different sizes based on planning requirements applicable to vessel transport. A tank vessel can suffer structural damage and a resulting spill of cargo as the result of a collision with another vessel, an allision with a fixed structure such as a jetty or pier, or a grounding. The evaluation of vessel transport risks considers all three events. The risk assessment applied incident rates for each of these types of events combined with the rate of release to the number of vessels anticipated for the proposed action for each scenario below. Appendix M provides a discussion of the risk scenarios and the methods used to determine spill frequencies.

Because of the increased number of vessel trips to and from the project site, 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 are very similar. The likelihood of very large releases would remain low. As noted previously, it is not possible to predict the timing or magnitude of an incident; therefore, to provide an understanding of risks under the proposed action, the following large spill scenarios were considered.

- **Vessel collision spill scenario:** vessel collision with another vessel resulting in a spill of up to 105,000 gallons (2,500 barrels).
- **Vessel grounding spill scenario:** vessel grounding resulting in a spill of up to one compartment of 1.2 million gallons (29,000 barrels).
- **Vessel allision spill scenario:** vessel allision with a fixed structure (e.g., jetty or pier) at the harbor entrance resulting in a spill of up to 15.1 million gallons (360,000 barrels).

The relative risks of the scenarios are shown graphically in Figure 4.6-2 and are summarized below. The potential impacts of exposure to spills are addressed in Section 4.7, *Impacts on Resources.*

Figure 4.6-2. Environmental Health Risks from Potential Spills during Vessel Transport—Proposed Action



The scenarios have the following likelihood of occurring under the proposed action.

- The **vessel collision spill scenario** could occur once in 120 years.
- The **vessel grounding spill scenario** could occur once in 470 years.
- The **vessel allision spill scenario** could occur once in 360 years.

Additional analysis illustrates the potential spread and movement of spills from a vessel. Appendix N, *Oil Spill Modeling,* demonstrates that the movement of spilled oil in the harbor can vary dramatically, depending on the amount spilled, the location of the spill, material spilled, weather conditions, and flow conditions. Depending on the specific conditions, it is possible for spilled oil to reach the far shores of the estuary and even the Pacific Ocean from a vessel at the facility within 24 hours, or it may remain near the spill. The model does not include any response actions, which would be expected to occur for any spill. In general, the modeling shows that under summer conditions, most of the oil is pushed into the South Bay of the harbor and that under winter conditions, oil is more likely to move more quickly outside of the harbor into the ocean, depositing oil along beaches near the mouth. Oiling along the outer coast occurred during the *Nestucca* spill in 1988. Models and historical data indicate an oil spill originating from a vessel just outside of Grays Harbor could oil shorelines within Grays Harbor and along the outer coast. The oil, if uncontained, could travel as far north as Canada and south to Oregon depending on spill quantity and weather conditions at the time of the spill.

Oil Spill Prevention

As discussed in Section 4.2, *Applicable Regulations*, vessels transporting oil as cargo have construction design features (protective double bottoms and sides) and mechanical measures (oil discharge monitoring systems and emergency shutdown devices for the oil transfer system) to prevent spills. Vessel operators are required to develop and implement safety and contingency plans to ensure that appropriate protocols, equipment, and training are in place to reduce the chances and extent of damage related to spills. Additionally, vessels use navigational equipment (depth sounders and electronic position fixing devices) to verify position and prevent collisions or groundings that all contribute to the prevention of oil discharges into the marine environment.

Containment Standards

Containment is required around each loading manifold, overfill pipe, and oil transfer connection point on the vessel. The containment is designed according to the size of the transfer hose to capture small spills and prevent the spill from reaching the water.

Double-Hull Construction Standards

Double hulls provide a measure of protection by creating a space between the outside of the vessel and oil tank areas. Both the tug barges and the crude oil tankers that would transport liquids for the proposed action would have double hulls. Yip et al. (2011) concluded that a double-hull design reduces the size of oil spills in incidents by 62% for tankers and 20% for tank barges.

Pollution Prevention Equipment and Requirements

Oil tankers and barges with an overall length of 400 feet or more are required to carry equipment for the containment and removal of on-deck oil spills of at least 12 barrels (33 CFR 155.205). The following materials must be carried.

- Sorbents
- Nonsparking hand scoops, shovels, and buckets
- Containers suitable for holding recovered waste
- Emulsifiers for deck cleaning
- Protective clothing
- A minimum of one nonsparking portable pump with hoses
- Scupper plugs

Oil Transfer Procedure Requirements

Formalized oil transfer procedures describe the roles and responsibilities of any personnel involved in oil transfers and the actions that should occur in the case of a spill. The transfer procedures required by 33 CFR 155.720 are as follows.

- Designate the person-in-charge who has the appropriate license, training, and familiarity with vessel equipment for the transfer operations.
- Have oil discharge removal equipment and supplies available.
- Describe the transfer procedures using the specific equipment on the ship.

Oil Spill Response

Vessel Contingency Planning

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

- Notify companies and agencies that are responsible for the cleanup effort.
- Stop the flow of oil, if possible, and prevent ignition.
- Ensure the safety of all response personnel and the public.
- Get trained personnel and equipment to the site quickly.
- Define the size, position, and content of the spill; its direction and speed of movement; and its likelihood of affecting sensitive habitats. Contain the spill to a limited area.
- Remove and dispose of the oil properly.

The owner or operator of the vessel must notify the National Response Center as required by federal law. The center will notify federal agencies, including the U.S. Coast Guard. State laws and regulations RCW 90.56 and WAC 173-182-262, Oil Spill Contingency Plan also requires the owner or operator to notify the Washington Emergency Management Division of a discharge or substantial threat of a discharge. The division will notify other state and local agencies, including Ecology. Notification must be made immediately upon the discharge or substantial threat of a discharge, or as soon as is feasible without further endangering the vessel or personnel.

The owner or operator activates the vessel contingency plan by making notifications and coordinates with Ecology and the U.S. Coast Guard to take any necessary actions to protect the public health, welfare, and natural resources of the state.

Geographic Response

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 in the study area. For example, the Grays Harbor GRP contains response strategies relevant to an oil spill that could 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). 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.

The GRPs describe response strategies such as placing boom to close off access of spilled oil into environmentally sensitive sites (such as Grass Creek in North Bay or Newskah Creek just to the south of Rennie Island). The boom also would deflect oil moving on the river or in the harbor into a containment area for collection (with vacuum trucks and sorbent materials), or divert oil away from areas that are sensitive or hard to clean. The GRPs also proposed culvert blocks or underflow dams 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 discussed prior to a spill and reflected accordingly in the GRPs to prevent a delay in the allocation of potentially scarce response assets during an active spill response.

Each GRP identifies potential spill origin points. 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 inevitable 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 24 strategies to combat the spread of spilled oil from spill origin point designation GH-B, located near the mouth of the Chehalis River, in the lower southeast quadrant of Grays Harbor.

In addition to the site-specific information contained in the GRPs, there is relevant information in other sections of the larger Northwest Area Contingency Plan that supplement the site-specific strategies that would also address potential risks related to the proposed action. For example, Chapter 3000 – Operations, contains a section titled *Operational Safety Issues Associated with Bakken Crude Oil*. Section 9420 of the Northwest Area Contingency Plan, titled *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 fresh water marshes) and appropriate cleanup considerations for each type.

4.6.2.2 Fires or Explosions

Fire or Explosion Risk

Crude oil and refined oils are carried in bulk by oil tankers and oil barges. A spill could cause fire or explosion if there is an ignition source and combustible gases are present in a quantity that could ignite.[3]

There is a Washington State record of an explosion on a tank vessel in November 1993. The tanker *Sea River Philadelphia* suffered an explosion in an inert gas compartment while moored in Anacortes. No one was injured and no oil was spilled. The cause of the explosion was inadequate maintenance procedures (Washington State Department of Ecology 2015: 44). Other tank vessel explosions in the United States between 1993 and 2013 were caused by human error and improper procedures or a combination of both (Table 4.6-1).

Table 4.6-1. Tank Vessel Explosions in the United States, 1993 to 2013[a]

Date	Name of vessel	Location	Cause
April 24, 2013	Kirby barges 28182 and 28194 and Towing Vessel *Safety Runner*	Mobile, Alabama	High concentration of tank vapors from tank cleaning operations resulting in explosions on towing vessel and barges.
January 19, 2005	Tank Barge EMC 423	Chicago Sanitary and Ship Canal	Heating of a cargo pump with a propane torch accidently ignited vapors escaping through the standpipe.
October 9, 1993	OMI Charger	Galveston, Texas	Ignition of an explosive atmosphere with a welder's arc.

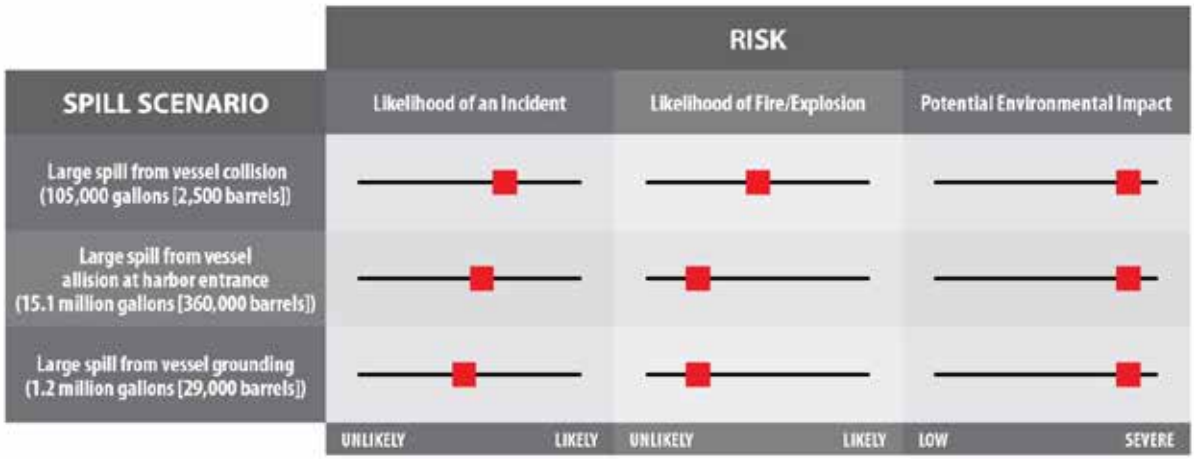
Sources: National Transportation Safety Board 2014 ; U.S. Coast Guard 1997, 2010

[a] The tank vessels in this table were not carrying crude oil. The OMI Charger was a single-skin tank ship that carried gasoline; the EMC 423 was a single- skin tank barge that was carrying clarified slurry oil; the Kirby barges (28182 and 28194) were being cleaned and had a total of about 11 barrels of residual natural gasoline (a liquid, flammable, first distillation of crude oil).

[3] The term *flammable liquid* means any liquid that gives off flammable vapors at or below 80°F. In general, crude oil is considered to be highly flammable. The term combustible liquid means any liquid having a flashpoint above 80°F. The regulations discussed in this section are applicable to either hazard.

The risks of fires or explosions during vessel transport related to the proposed action are presented graphically in Figure 4.6-3. Additional information regarding the risks of fire and explosions during rail transport is provided in Appendix M, *Risk Assessment Technical Report*.

Figure 4.6-3. Environmental Health Risks from Potential Fires or Explosions during Vessel Transport—Proposed Action



Explosion Prevention

Regulating agencies have developed structural, mechanical, and procedural requirements to reduce the threat of a fire or explosion on tank vessels and barges. USCG vessel inspectors have the authority to inspect any tank vessel in U.S. waters for compliance with U.S. laws and international treaties and issue the certificates that represent this compliance for U.S. tank vessels. Ecology also conducts vessel inspections. Vessel classification societies also regularly survey vessels to ensure compliance. The following types of features prevent fires and explosions on tank vessels.

- Structural
  - Cargo piping must not pass through machinery spaces (a source of ignition).
  - Cargo pumps must be isolated and away from machinery spaces.
  - A venting system that prevents tanks from being over-pressurized while they are being loaded or if the product expands while being transported. Vapors are released high above the deck at the end of vent risers, away from potential ignition sources.
- Mechanical and electrical
  - Tankers use an inert gas system, which replaces air with an inert (nonflammable) gas in oil tanks. This system is used when offloading oil to remove potentially flammable gases and to

provide an atmosphere that is not explosive.[4] Loading usually requires no additional inert gas if the tank is already inert: the incoming cargo will displace the inert gas in the tank, which is then vented. Monitoring equipment is required to verify the status of tank atmospheres during loading, unloading and transit.

- ¡ Emergency steering system.
- ¡ Remote manual shutdowns for cargo pump systems to shut down transfers quickly from multiple locations.

- Procedural
  - ¡ Crew training on proper oil transfer procedures and firefighting.
  - ¡ Prohibits any work that could provide an ignition source (e.g., welding).
  - ¡ Smoking prohibitions.

Explosion Response

Should a spill occur, the emergency response plan would address the roles, responsibilities, and actions to take, depending on how much was spilled, and where and whether ignition has already occurred. Typical responses to an explosion are as follows.

- Activate the marine firefighting and oil spill contingency plan.
- Make notifications.
- Account for all personnel and initiate search and rescue operations if necessary.
- Ensure the safety of all response personnel and the public.
- Conduct hazard assessment and risk evaluation and institute measures to protect the public if necessary (from airborne hazards caused by fire or additional, potential, explosion hazards).
- Conduct continuous air monitoring, as appropriate.
- Conduct fire suppression operations, if appropriate.
- Initiate oil spill response activities, as appropriate.

4.6.3 What mitigation measures would reduce impacts related to vessel transport?

This section describes the applicant mitigation and other measures that would reduce onsite impacts on environmental health and safety from rail transportation related to the proposed action.

[4] This requirement is based on the fact that when oxygen levels are under 8%, there is not sufficient oxygen to support combustion.

These mitigation measures are in addition to regulatory compliance and best practices discussed above.

4.6.3.1 Applicant Mitigation

The applicant will implement the following mitigation.

- Due to sensitivity of the local environment, tribal resource concerns, and the potential presence of sensitive species, to reduce potential risk of incident due to loss of propulsion, loss of steering, grounding, or severe weather, the applicant will not receive or load crude oil to tankers or tank barges, unless the vessels have tug escorts through Grays Harbor as described below. This requirement will remain in place until rules are implemented pursuant to ESHB 1449, Section 12, at which time the rules will apply to the project.
  - At least one escort tug must accompany a laden tanker or tank barge carrying oil between the Hoquiam River and Grays Harbor entrance, and two tugs (one escort tug and one assist tug) must assist the vessel during mooring procedures.
  - For laden tankers, the escort tug must be appropriately tethered while transiting Grays Harbor.
  - Escort tugs must have an aggregate shaft horsepower equivalent to at least 5% of the deadweight tons of the escorted oil tanker or tank barge.
  - Escort tugs will have sufficient mechanical capabilities to provide for safe escort.
- To ensure adequate safety for tug operations and thereby reduce the risk of an incident, the applicant will not receive or load crude oil to tankers or tank barges unless the vessels supply Grays Harbor Pilots and tug companies with bollard pull capacities of the vessels prior to entering Grays Harbor.
- To reduce potential risk of incident of vessel collision or allision in Grays Harbor, the applicant will work with the U.S. Coast Guard, Ecology, Port of Grays Harbor, and Grays Harbor Safety Committee to propose, develop, and implement a formal vessel management system. The vessel management system will include the ability to schedule, track, and monitor vessel movements in the harbor and off the entrance to the harbor. The vessel management system will be active prior to the applicant beginning the proposed operations.
- To reduce potential risk of incident of vessel collision while in Grays Harbor, the vessel management system should act as follows.
  - Ensure vessel traffic is limited while a laden tank vessel is in the navigation channel.
  - Prohibit the transit of any other deep-draft vessels within the South Reach of the navigation channel (just off Westport) to Terminal 1 in both directions whenever a laden tank vessel is transiting within the same channel.
  - Include real-time Automatic Identification System tracking and monitoring.

- To reduce the risk of a fire or explosion from tank barges, the applicant will not receive or supply Bakken crude oil to tank barges unless the tank barges are able to inert their tanks when carrying Bakken crude oil.
- To reduce the risk of an incident, the applicant will coordinate with the Port of Grays Harbor and as a member of the Grays Harbor Safety Committee, work to develop and implement specific procedures for escorting, tethering, and emergency maneuvering to control laden tank vessels. The procedures must be drafted prior to the proposed operations beginning. These procedures should be included in the Grays Harbor Safety Plan. At a minimum, these must include the following elements.
  - Escort configurations and maneuvering characteristics of escorted tankers and tank barges.
  - Specific emergency connection and tethering procedures for connection of tugs to tankers and tank barges.
  - Specific maneuvers necessary for the tug to maintain control of the tanker while transiting Grays Harbor waters specifically during incidents of loss of propulsion or steering.
  - Appropriate safe speed of transit in Grays Harbor when tugs are tethered.
  - Guidelines for tanker or tank barge bridge team to rapidly recognize and respond to a loss of power or steering. By improving recognition and reaction time, the tug can more effectively steer the vessel through the navigation channel upon incident.
  - Requirement for a pretransit conference.
  - Refueling operations.
- To reduce the risk of an incident during vessel refueling, the applicant will ensure that any tank barges loaded with fuel for purposes of refueling vessels at the project site follow the navigation and safety mitigation measures for crude oil tank barges described in this section.
- To improve response times and increase coordination of responses, the applicant will develop and implement a program approved by Ecology to educate its tankers and tank barge customers on the reporting requirements for vessel incidents resulting in a threat of a spill under Revised Code of Washington 88.46.100, Notification of Vessel Emergencies Resulting in Discharge of Oil, prior to beginning the proposed operations.
- To improve response times and communication in the event of an incident that could affect commercial or recreational fishing, the applicant will develop a method for provide information on potential incidents to commercial and recreational fishing boats and will describe this measure in the oil spill contingency plan prior to beginning operations.

4.6.3.2 Other Measures to Be Considered

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

- To reduce the risk of an incident, the Grays Harbor pilots, Port of Grays Harbor, and tug company operating under contract with the Port of Grays Harbor should conduct the following training.
  - Regular training between the pilots and tug crews to ensure that the tugs will be able to meet the pilot's expectations during an emergency.
  - Exercises or drills to demonstrate appropriate emergency connection and tethering.
- To reduce potential risk of incident or vessel collision or allision in Grays Harbor, the Port of Grays Harbor, Grays Harbor Safety Committee, and the U.S Coast Guard should research the need for vessel traffic service for Grays Harbor and, if needed, implement a vessel traffic service.
- To reduce potential risk of incident of vessel collision while in Grays Harbor, the Port of Grays Harbor and USCG should research the need for a one-way channel transit along the inner harbor for laden tank vessels and, if needed, revise regulations.
- To improve safety during high traffic or bad weather conditions or in the case of an incident, the Grays Harbor Safety Committee should work with USCG to designate an anchorage in Grays Harbor with specific requirements for tank vessels as described in 33 CFR 109.07.
- To reduce the potential risk of vessel incidents due to lack of knowledge of local conditions, the Port of Grays Harbor should require all tanks vessels and barges to take a Grays Harbor pilot while transiting Grays Harbor waters.
- To improve safety in Grays Harbor, the Port of Grays Harbor should conduct annual assessments on pilot availability and capacity to meet projected increases in vessel traffic.

4.6.4 Would the proposed action result in unavoidable and significant adverse environmental impacts related to vessel transport?

A large oil spill or explosion would likely cause unavoidable and significant adverse environmental impacts. As described above, the likelihood of a large spill or related explosion is low; however, the potential for significant consequences to the environment and human health in the case of a large spill or explosion is high. The specific impacts would vary based on the location, amount spilled, type of liquid, and weather conditions. Examples of these impacts are described in Section 4.7, *Impacts on Resources*. Regulatory requirements for the prevention of, preparedness for, and response to a large spill or explosion and mitigation measures to reduce impacts are detailed above. However, no mitigation measures would completely eliminate the possibility of a large spill or explosion, nor would they completely eliminate the adverse consequences of a large spill or explosion.

4.6.5 Who would pay for the response and cleanup of a vessel transport spill?

Washington State law requires the operators of tankers and tank barges transporting hazardous substances to provide evidence of financial responsibility. Under RCW 88.40.020, Evidence of Financial Responsibility, tank vessels that transport oil in bulk as cargo must demonstrate financial

responsibility to pay at least 1 billion dollars. With a few limited exceptions, federal law requires vessel operators (all types of vessels) to have a Certificate of Financial Responsibility for vessels over 300 gross tons using the navigable waters of the United States (33 CFR 138.15). The certificate is evidence to the U.S. Coast Guard that the vessel owner or operator can meet their oil spill removal obligations under the Oil Pollution Act should they spill oil into the navigable waters of the United States.

Washington State places no limits on liability of third parties, allowing the state to recover cleanup costs and natural resource damages beyond the federal limit. The federal limits of liability for oil spill removal costs related to tank vessels are summarized in Table 4.6-2.

Table 4.6-2. Limits of Liability for Tank Vessels

Reference	Applicability	Limits of Liability
33 CFR 138.230(a)(2)	Tank vessels greater than 3,000 gross tons	The greater of $2,000 per gross ton or $17,088,000
33 CFR 138.230(a)(4)	Tank vessels equal to or less than 3,000 gross tons	The greater of $2,000 per gross ton or $4,272,000

CFR = Code of Federal Regulations; RCW = Revised Code of Washington