5.2 Rail Safety

Railroads provide transportation for passengers and a wide range of commercial goods, and support regional economic activity. Similar to other forms of transportation, rail traffic is subject to various regulatory requirements to protect public safety.

This section assesses impacts on rail safety that could result from construction and operation of the Proposed Action and No-Action Alternative. This section describes the regulatory setting, presents historical and current rail safety conditions in the study area, and assesses potential rail safety impacts for the Proposed Action and No-Action Alternative. Section 5.3, *Vehicle Transportation*, addresses grade crossing safety related to vehicle transportation. This section also presents measures to mitigate impacts resulting from the Proposed Action and any remaining unavoidable and significant adverse impacts.

5.2.1 Regulatory Setting

Laws and regulations relevant to rail safety are summarized in Table 5.2-1. Regulations pertaining to at-grade rail crossings are presented in Section 5.3*, Vehicle Transportation.*

Table 5.2-1. Regulations, Statutes, and Guidelines for Rail Safety

Regulation, Statute, Guideline	Description
Federal	
Federal Railroad Safety Act of 1970	Gives FRA rulemaking authority over all areas of rail line safety. FRA has designated that state and local law enforcement agencies have jurisdiction over most aspects of highway/rail at-grade crossings, including warning devices and traffic law enforcement.
Highway Safety Act and the Federal Railroad Safety Act	Gives FHWA and FRA regulatory jurisdiction over safety at federal highway/rail at-grade crossings.
Federal Railroad Administration General Regulations (49 CFR 200–299)	Establishes railroad regulations, including safety requirements related to track, operations, and cars.
State	
Title 81, Transportation—Railroads, Employee Requirements and Regulations (RCW 81.40)	Establishes general requirements for railroad employee environment and working conditions, the minimum crew size for passenger trains, and requirements for flaggers.
Rail Companies—Clearances (WAC 480-60)	Establishes operating procedures for railroad companies in Washington State. Includes rules of practice and procedure, walkway clearances, side clearances, track clearances, side clearances, track clearances, and rules for operation of excess dimension loads.
Rail Companies—Operation (WAC 480-62)	Establishes railroad operating procedures in Washington State.

Regulation, Statute, Guideline	Description
Local	
No local regulation, statutes, or guidelines apply to rail safety.	

Notes:
FRA = Federal Railroad Administration; FHWA = Federal Highway Administration; CFR = Code of Federal Regulations; USC = United States Code; RCW = Revised Code of Washington; WAC = Washington Administrative Code

5.2.2 Study Area

The study area for direct impacts on rail safety is the project area. The study area for indirect impacts on rail safety is the expected rail routes of Proposed Action-related trains within Washington State, as illustrated in Figure 5.1-1 in Section 5.1, *Rail Transportation*.

5.2.3 Methods

This section describes the sources of information and methods used to evaluate the potential impacts on rail safety associated with the construction and operation of the Proposed Action and No-Action Alternative.

The analysis used the definition of a rail accident from the Federal Railroad Administration (FRA):[1]

> Collisions, derailments, fires, explosions, acts of God, or other events involving the operation of railroad on-track equipment (standing or moving) and causing reportable damages greater than the reporting threshold for the year in which the accident/incident occurred.

The FRA reporting threshold was $10,500 in 2016. Therefore, accidents include a wide variety of incidents and are not limited to collisions or derailments.

5.2.3.1 Information Sources

The following sources of information were used to identify the potential impacts of the Proposed Action and No-Action Alternative on rail safety in the study area.

Existing and Projected Rail Traffic

- **Reynolds Lead and BNSF Spur.** Existing (2015) and projected (2028) rail traffic on the Reynolds Lead and BNSF Spur was based on estimates from the Longview Switching Company (LVSW) and field observations.
- **BNSF main line routes**. Existing (2015) and projected (2028) rail traffic for BNSF Railway Company (BNSF) main line routes within Washington State were based on estimates from the *Washington State Rail Plan* (Washington State Department of Transportation 2014a).

[1] The Federal Railroad Administration (FRA) was created by the U.S. Department of Transportation Act of 1966. It is one of ten agencies within the U.S. Department of Transportation concerned with intermodal transportation. FRA's mission is to enable the safe, reliable, and efficient movement of people and goods. FRA has established federal regulations pertaining to the safety of interstate commerce. These regulations set standards for all railroads dealing with the interchange of railroad cars and equipment.

Proposed Action-Related Train Operations

- **Volumes.** Proposed Action-related rail traffic to the project area was provided by the Applicant, notably 8 loaded and 8 empty trains per day if the coal export terminal is constructed and operated at full terminal throughput in 2028.
- **Routes.** Routes to and from the project area within Washington State were based on existing BNSF operations and Washington State Department of Transportation (WSDOT) documents including the *Washington State Rail Plan* and *Washington State Freight Mobility Plan* (Washington State Department of Transportation 2014b).[2] Figure 5.1-1 in Section 5.1*, Rail Transportation*, illustrates the expected routes for Proposed Action-related trains in Washington State.
- **Train parameters.** Train parameters including the number of rail cars were based on information provided by the Applicant and existing BNSF train operations.

Accident Rates

Rail accident data from FRA were used as the basis for the analysis. While the Washington Utilities and Transportation Commission gathers information on accidents that occur in Washington State, it does not have the corresponding data on train miles within the state for determining accidents per million train miles traveled.

Accident rates were compiled from FRA data for year 2012 through 2014.[3] Published literature was also used to identify derailment rates by track class.[4]

5.2.3.2 Impact Analysis

The following methods were used to evaluate the potential rail safety impacts of the Proposed Action and No-Action Alternative.

Accident Frequency

Accident rates for BNSF freight trains, Union Pacific Railroad (UP) freight trains, and all railroads (freight and passenger trains combined) were calculated using FRA data for the 3 most recent years of available data (Table 5.2-2). Specific train accident rates for BNSF in Washington State were not available in FRA data. LVSW did not have any reported train accidents in the FRA database because no train accidents occurred on the Reynolds Lead or BNSF Spur 2012 through 2014.

[2] In 2012, BNSF introduced a directional routing strategy to enhance existing capacity, which routes all westbound-loaded unit trains (including coal trains) from Pasco to Vancouver via the Columbia River Gorge. Empty unit bulk trains (including coal trains) generated north of Vancouver, including Cowlitz County, travel to Pasco and to points east via Stampede Pass.

[3] 2014 data were the most recent available data when the analysis was completed.

[4] As part of its jurisdiction, FRA categorizes all tracks into track classes, segregated by maximum speed limits for freight and passenger trains. FRA maintenance and inspection requirements vary by track class.

Table 5.2-2. Nationwide Train Accident Rates

Year	Accident Rate per Million Train Miles		
	All Railroads (Passenger and Freight Trains)	BNSF (Freight Trains)	UP (Freight Trains)
2012	2.41	2.20	3.04
2013	2.43	2.11	3.02
2014	2.27	1.89	2.82

Notes:
Source: Federal Railroad Administration (2015).
BNSF = BNSF Railway Company; UP = Union Pacific Railroad

Historically, accident rates (accidents per million train miles) do not change dramatically from year to year, but generally trend downward over time because of improved control systems, communications, and inspection practices. Because Proposed Action-related rail traffic in Washington State would be on BNSF routes, a rate of two accidents per million train miles, based on the data in Table 5.2-2, was used for the analysis.

FRA track safety standards establish nine specific classes of track (Class 1 to Class 9). Class of track is based on standards for track structure, geometry, and inspection frequency. Each class of track has a maximum allowable operating speed for both freight and passenger trains. The higher the class of track, the greater the allowable track speed and the more stringent the applicable track safety standards. Accident rates have been shown to vary considerably by track class, with higher accident rates occurring on lower track classes. However, lower track classes have lower maximum operating speeds, which can reduce the consequences of more frequent accidents.

Data on accident rates by track class were used to generate a baseline accident rate in the study area. The Reynolds Lead and BNSF Spur are currently maintained in accordance with the Track Class 1 standard. LVSW plans to upgrade the Reynolds Lead and BNSF Spur to a Track Class 2 designation for the Proposed Action or other future action, as described in Section 5.1, *Rail Transportation*. The Reynolds Lead and BNSF Spur would be maintained as Track Class 1 if planned improvements are not made. This analysis conservatively assumed Track Class 3 for all BNSF main line routes in Washington State.

Train accident rates are generally distinguished only by freight versus passenger service, not by specific cargoes. The predicted number of accidents per year was calculated by multiplying segment length by the number of trains per year and applicable accident rate; the number was then adjusted for track classification based on published accident data research by track class.

The predicted accident per year for a segment can be summarized as follows.

(Segment length) x (Number of trains) x (Accident rate for segment x) = Predicted accidents per year for segment x

More information on these methods is provided in the *SEPA Rail Safety Technical Report* (ICF 2017).

5.2.4 Existing Conditions

Section 5.1*, Rail Transportation*, describes existing conditions for Proposed Action-related train routes in more detail.

Based on FRA data, there were two accidents in Cowlitz County in 2014, and neither accident involved an injury or fatality. One incident was in a rail yard with no derailment and the other involved a derailment of 11 cars on main line track. In Washington State, there were 36 accidents in 2014, two of which involved an injury. Thirteen accidents were on main line track, and the others were in rail yards or on industry track. Derailments (main line and industry track) involved between 0 and 11 rail cars.

5.2.5 Impacts

This section describes the potential direct and indirect impacts related to rail safety (train accidents) that would result from construction and operation of the Proposed Action and the No-Action Alternative.

5.2.5.1 Proposed Action

This section describes the potential impacts on rail safety that could occur in the study area as a result of construction and operation of the Proposed Action. Chapter 2, *Project Objectives, Proposed Action, and Alternatives*, describes construction-related activities and scenarios for transporting materials to the project area. Under the rail scenario, an average of 1.3 construction trains would travel to and from the project area per day. Construction impacts are based on the peak construction period, assumed to be in 2018. Operations impacts are based on the maximum coal export terminal throughput capacity (up to 44 million metric tons of coal per year), which would result in 8 loaded and 8 empty trains per day in 2028.

Construction—Direct Impacts

Any accidents in the project area would be related to construction in the project area and would not affect rail safety on the Reynolds Lead.

Construction—Indirect Impacts

Construction-related activities associated with the Proposed Action could result in indirect impacts on rail safety as described below. As explained in Chapter 2, *Project Objectives, Proposed Action*, *and Alternatives,* construction-related activities include demolishing existing structures and preparing the site, constructing the rail loop and dock, and constructing supporting infrastructure (i.e., conveyors and transfer towers).

Increase the Potential for Train Accidents

According to the Applicant, construction materials could be delivered by rail. This would require an estimated 350 loaded trains of 100 cars each and 350 empty trains of 100 cars each. It is anticipated two-thirds of the construction material would be transported during the first year of construction in 2018 (approximately 467 trains, an average of 1.3 trains per day). Construction trains would use the Reynolds Lead and BNSF Spur. Because the specific main line routes for Proposed Action-related construction trains are not known, the expected routes for Proposed Action-related trains in Washington State during operations was used to illustrate the possible range of accident frequencies.

The predicted accident frequencies during the peak year of construction are shown in Table 5.2-3. Proposed Action-related construction rail traffic would have a relatively small increase on predicted train accidents.

Table 5.2-3. 2018 Predicted Train Accidents during Peak Year of Construction

Route Segment	Length (miles)	Predicted Proposed Action-Related Construction Train Accidents[a]
Loaded Trains		
Idaho/Washington State Line–Spokane	18.6	0.03
Spokane–Pasco	145.5	0.27
Pasco–Vancouver	221.4	0.41
Vancouver–Longview Junction	34.8	0.07
Longview Junction–LVSW Yard (BNSF Spur)	2.1	0.01
LVSW Yard–Project Area (Reynolds Lead)	5.0	0.03
Empty Trains		
Project Area–LVSW Yard (Reynolds Lead)	5.0	0.03
LVSW Yard–Longview Junction (BNSF Spur)	2.1	0.01
Longview Junction–Auburn	118.6	0.22
Auburn–Yakima	139.6	0.26
Yakima–Pasco	89.4	0.17
Pasco–Spokane	145.5	0.27
Spokane–Idaho/Washington State Line	18.6	0.03

Notes:
[a] Accidents related to Proposed Action-related trains; these would be additive to baseline conditions.

Operations—Direct Impacts

At full terminal operations, 8 loaded trains would travel to the project area, and 8 empty trains would travel from the project area daily. These trains would maneuver along the rail loop in the project area. The accident rates described previously are not applicable to the project area. Any accidents in the project area would be related to operations in the project area and would not affect rail safety on the Reynolds Lead.

Operations—Indirect Impacts

Based on current operations, BNSF loaded and empty Proposed Action-related trains would be expected to travel via the same route between the coal mines in the Powder River Basin in Montana and Wyoming, and Pasco, Washington.

- West of Pasco, loaded BNSF trains would be expected travel to the project area via the Columbia Gorge through Vancouver to Longview Junction, and travel along the BNSF Spur and Reynolds Lead to the project area.

- Empty BNSF trains would be expected to travel from the project area along the Reynolds Lead and BNSF Spur and return from Longview Junction via Stampede Pass route through Auburn and Yakima to Pasco.

Loaded and empty Proposed Action-related UP trains would be expected to move between Vancouver and Longview Junction in Washington State. Because UP operates over the same track that carries BNSF trains, no additional analysis was required for Proposed Action-related rail traffic in Washington State for UP trains.

Operation of the Proposed Action would result in the following indirect impacts. Operations-related activities are described in Chapter 2, *Project Objectives, Proposed Action*, *and Alternatives*.

Increase the Potential for Train Accidents

The Proposed Action would increase the potential for train accidents by adding loaded and empty rail traffic on rail routes in Washington State. The predicted accident frequencies in 2028 are shown in Table 5.2-4.

Table 5.2-4. 2028 Predicted Train Accidents per Year[a]

Route Segment	Length (miles)	2028 Proposed Action-Related Trains	2028 Baseline Conditions
Loaded Trains			
Idaho/Washington State Line–Spokane	18.6	0.22	2.88
Spokane–Pasco	145.5	1.70	11.90
Pasco–Vancouver	221.4	2.59	15.52
Vancouver–Longview Junction	34.8	0.41	3.71
Longview Junction–LVSW Yard (BNSF Spur)	2.1	0.07	0.06
LVSW Yard–Project Area (Reynolds Lead)	5.0	0.18	0.04
Empty Trains			
Project Area–LVSW Yard (Reynolds Lead)	5.0	0.18	0.04
LVSW Yard–Longview Junction (BNSF Spur)	2.1	0.07	0.06
Longview Junction–Auburn	118.6	1.39	12.64
Auburn–Yakima	139.6	1.63	2.24
Yakima–Pasco	89.4	1.04	1.44
Pasco–Spokane	145.5	1.70	11.90
Spokane–Idaho/Washington State Line	18.6	0.22	2.88

Notes:

[a] Assumes the Reynolds Lead and BNSF Spur would be improved to Class 2 standards by LVSW. If the Reynolds Lead and BNSF Spur are not improved to Class 2 standards, the predicted train accidents per year would increase approximately 1.5 to 3 times higher than the Class 2 accident rate.

The following summarizes the predicted accident frequencies.

- **With track improvements to the Reynolds Lead and BNSF Spur (Track Class 2).** The predicted number of accidents is 0.25 per year for loaded Proposed Action-related trains, and 0.25 accident per year for empty Proposed Action-related trains. Therefore, 1.0 accident for each type of train (loaded and empty) every 4 years is predicted. Proposed Action–

related traffic would increase the predicted accident frequency on the Reynolds Lead and BNSF Spur from 0.11 accident per year to 0.61 accident per year for all rail traffic.

- **Without track improvements to the Reynolds Lead and BNSF Spur (Track Class 1).** Accident rates for Track Class 1 are more uncertain given the small percentage of train miles that occur on Track Class 1. Therefore, it is difficult to predict accident rates for Track Class 1, but data indicate the 2028 Proposed Action-related predicted train accidents per year in Table 5.2-4 would be approximately 1.5 to 3 times higher without planned improvements to the Reynolds Lead and BNSF Spur.

- **BNSF Main Line Routes in Washington State (Track Class 3).** The predicted number of accidents for loaded Proposed Action-related trains on BNSF main line varies between 0.22 accident per year to 2.59 accidents per year.

Not every accident of a loaded Proposed Action-related train would result in a coal spill and spills that would occur would vary in size. Coal spills on the Reynolds Lead or BNSF Spur would be expected to be less frequent and smaller than on main line routes due to lower train speeds. Impacts from coal spills on the natural environment are addressed in Chapter 4, Sections 4.5, *Water Quality,* 4.6, *Vegetation*, 4.7, *Fish,* and 4.8, *Wildlife*.

Cowlitz County Impacts

The predicted number of loaded Proposed Action-related train accidents in Cowlitz County (BNSF main line, BNSF Spur, and Reynolds Lead) is 0.46 per year, or approximately 1.0 accident every 2 years. The predicted number of empty Proposed Action-related train accidents is slightly higher (0.50 per year), due to the greater number of miles within Cowlitz County on the empty train route.

The baseline predicted number of accidents is approximately 4.30 per year. The number of predicted accidents per year would be 5.25 with Proposed Action-related trains (an increase of approximately 22%), which illustrates the relative contribution of Proposed Action-related trains to overall rail safety within Cowlitz County. Additional information is provided in the *SEPA Rail Safety Technical Report.*

Statewide Impacts

The predicted number of loaded train accidents related to the Proposed Action in Washington State (including Cowlitz County) is 5.16 per year. The predicted number of Proposed Action-related empty train accidents is 6.23 per year, due to the greater length of the empty train rail route.

Adding the train accidents from the inbound and outbound trains related to the Proposed Action to the total accident baseline would increase accidents from 50.43 accidents per year to 61.81 accidents per year. This means that within Washington State, the predicted increase in rail traffic accidents related to the Proposed Action is approximately 11.38 accidents per year (an increase of approximately 22% over the baseline).

5.2.5.2 No-Action Alternative

Under the No-Action Alternative, the Applicant would not construct the proposed coal export terminal. The Applicant would continue with current and proposed future increased operations in the project area. The project area could be developed for other industrial uses including an expanded bulk product terminal. The Applicant has indicated that, over the long term, it would expand the existing bulk product terminal and develop new facilities to handle more products such as calcine petroleum coke, coal tar pitch, and cement.

The Applicant anticipates planned growth under the No-Action Alternative would require approximately 2 trains per day; therefore, the predicted number of accidents would be lower than the Proposed Action and higher than the baseline conditions (Table 5.2-4). Various types of rail cars would be needed for the range of expected cargoes. No-Action Alternative-related rail traffic would have various cargoes (mixed-load train). The potential for a mixed-load train derailment or accident on the Reynolds Lead and BNSF Spur would presumably be lower than for a unit train because mixed-load trains tend to have fewer rail cars than a unit train.

5.2.6 Required Permits

No permits related to rail safety would be required for the Proposed Action.

5.2.7 Proposed Mitigation Measures

This section describes the proposed mitigation measures that would reduce impacts related to rail safety from construction and operation of the Proposed Action. These mitigation measures would be implemented in addition to project design measures, best management practices, and compliance with environmental permits, plans, and authorizations that are assumed as part of the Proposed Action.

5.2.7.1 Applicant Mitigation

The proposed mitigation measure identified in Section 5.1, *Rail Transportation*, to mitigate impacts on rail transportation would also mitigate impacts on rail safety.

MM RT-1. Notify BNSF and UP about Operations on Main Line Routes.

To allow for adequate planning to address Proposed Action-related trains contributing to segments exceeding rail capacity on main line routes in Washington State, the Applicant will notify BNSF and UP before each identified operational stage (Stage 1a, Stage 1b, and Stage 2) begins that will change average daily rail traffic on main line routes in Washington State. The Applicant will prepare a report to document the notification of BNSF and UP and changes to average daily rail traffic. The report will be submitted to BNSF, UP, WSDOT, Utilities and Transportation Commission, and Cowlitz County at least 6 months before the change in average daily rail traffic.

Impacts on vehicle safety at grade crossings and measures by the Applicant to mitigate such impacts are discussed later in Section 5.3, *Vehicle Transportation*.

5.2.7.2 Other Measures to Be Considered

The following measure is provided for consideration by agencies, organizations, and others for permitting or planning.

- LVSW should consider improvements to track infrastructure on the Reynolds Lead and BNSF Spur. This could include installing traffic control systems, installing a new switch from the BNSF Spur to Reynolds Lead, upgrading rail, adding new main track, or adding siding. The improvements would benefit rail safety by upgrading the Reynolds Lead and BNSF Spur per Track Class 2 requirements, which would lower the expected accident rate.

5.2.8 Unavoidable and Significant Adverse Environmental Impacts

Proposed Action-related trains would add rail traffic along rail routes in Cowlitz County and Washington State, which would increase the potential for train accidents. LVSW, BNSF, and UP could improve rail safety through investments or operational changes, but it is unknown when those actions would be taken or permitted. Therefore, Proposed Action-related trains could result in an unavoidable and significant adverse impact on rail safety.