Kelso Martin's Bluff Improvement Projects – Tasks 5 and 6 Environmental Assessment

Prepared for:
U.S. Department of Transportation
Federal Railroad Administration

Prepared by:

Washington State Department of Transportation

Kelso Martin's Bluff Improvement Projects – Tasks 5 and 6

Environmental Assessment

Submitted pursuant to the National Environmental Policy Act

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Prepared for:
U.S. Department of Transportation
Federal Railroad Administration

Prepared by:
Washington State Department of Transportation

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Date of Approval

for Megan White
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EXECUTIVE SUMMARY

The Washington State Department of Transportation (WSDOT), through the State of Washington's (State's) Pacific Northwest Rail Corridor (PNWRC) Improvement Program, is implementing infrastructure improvement projects along the Washington section of the PNWRC. To fund these projects, WSDOT applied and was selected for grant funding through the Federal Railroad Administration's (FRA's) High Speed Intercity Passenger Rail (HSIPR) Program.

The State's PNWRC Improvement Program includes 17 individual tasks between Vancouver, Washington, and the Washington State–Canadian border. The tasks are defined in terms of improvements to passenger rail service along the PNWRC. Tasks were proposed for HSIPR funding based on analyses contained in the *Amtrak Cascades Mid-Range Plan* (WSDOT 2008). Although projects to improve service outcomes are distributed throughout the PNWRC, some projects are clustered in particular areas to address specific conditions that result in delays to passenger rail service. One such area included in the PNWRC Improvement Program is composed of three independent projects referred to as the Kelso Martin's Bluff Improvement Projects. The Kelso Martin's Bluff Improvement Projects are proposed to improve passenger rail operations around the Port of Kalama and the Port of Longview in Washington State. The Kelso Martin's Bluff Improvement Projects – Task 5: New Siding (Task 5) and Task 6: Kelso to Longview Junction (Task 6) are the subjects of this Environmental Assessment (EA).[1] As part of the PNWRC Improvement Program, Task 5 and Task 6 would help facilitate two additional Amtrak *Cascades* service round trips between Portland, Oregon, and Seattle, Washington, with improved reliability and reduced travel time. Although the PNWRC Improvement Program would not increase the number of Amtrak *Coast Starlight* trains (Amtrak's longer distance passenger rail service between Los Angeles, California, and Seattle), the program could improve the speed and reliability of those trains.

The purpose of the Task 5 and Task 6 projects is to improve reliability, enhance efficiency, and enhance frequency of HSIPR service along the PNWRC through the Kalama and Kelso, Washington, areas by relieving passenger rail congestion related to freight rail traffic entering and exiting the Ports of Kalama and Longview.

The Task 5 and Task 6 projects are needed to relieve passenger-freight rail congestion and interference in and around the Ports of Kalama and Longview, especially along the two existing main line tracks, which are used by both intercity passenger and freight rail operations. The current track configuration results in congestion and ultimately in service delays that adversely affect passenger train scheduling and reliability. Currently, freight rail traffic arriving and departing from the Ports of Kalama and Longview frequently blocks one main line track for extended periods of time. With one main line blocked, operations are limited to a single track. This inhibits the ability of passenger and other freight traffic to meet and pass efficiently on the main line and does not allow for the addition of new intercity passenger rail frequencies.

[1] Task 4 Toteff Siding Extension is the third project in the Kelso Martin's Bluff area and is being assessed under a separate environmental review as an independent project.

This EA evaluates a Build Alternative, consisting of implementing the elements of the Task 5 and Task 6 projects, and a No Build Alternative. The No Build Alternative includes only minor maintenance and repair activities necessary to keep the BNSF Railway line operational for existing service. Amtrak's *Cascades* and *Coast Starlight* passenger trains would continue to use the existing BNSF Railway rail line through Kelso near the Ports of Kalama and Longview. The No Build Alternative would not provide support for improved intercity passenger rail service as contemplated in Washington State's Service Development Plan – Pacific Northwest Rail Corridor, Cascades High-Speed Rail Program (WSDOT 2011a) because an increase in Amtrak service could not be accommodated without increased congestion and adverse effects on both passenger and freight rail operations. The No Build Alternative serves as a baseline and is useful when comparing the impacts of the Build Alternative.

The Task 5 and Task 6 projects include improvements to support better passenger service schedule reliability, improved travel times, and increased frequency in Amtrak *Cascades* service between Portland and Seattle from four daily round trips to six. The Build Alternative would improve the flow of passenger trains through Kalama and Kelso by establishing a new main line for passenger train use and new track switching to reduce delays caused to passenger train through-travel when freight trains transition to and from the Ports of Kalama and Longview and the main line tracks. The Build Alternative would allow Amtrak trains to operate at speeds up to 79 miles per hour (mph).

As part of the Built Alternative, the Task 5 project would include construction of approximately 4.1 miles of a third main line track to the east of the existing double-track main lines from approximately Toteff Road north toward the Kalama River. With the new main line, new turnouts would be installed at either end to facilitate train movements on and off the new track. New signals and signal control points would be installed to aid in dispatch, train control, and accommodation of passenger rail operations. The corridor would be brought up to safety standards with new crash walls under the Oak Street roadway overpass and an existing pedestrian overpass. In addition, three retaining walls would be constructed between the main line tracks and the adjacent Interstate 5 (I-5). Throughout the corridor, grading, excavation, and embankment construction would occur, along with extension of seven stormwater culverts beneath the track bed to accommodate the third main line track. The existing culvert at unnamed tributary 3 (MP 108.19) would be replaced through Louis Rasmussen Day Use Park with a fish passable culvert(s). In the City of Kalama, existing stormwater drainage culverts would be provided with additional protection so that culvert function is maintained and the new embankment is provided with scour protection. Utilities would be relocated as required.

The Task 6 project would include construction of approximately 3.7 miles of a third main line track; in addition, a section of siding would be upgraded to main line track. New turnouts would be installed at either end to facilitate train movements on and off the new track. New signals and signal control points would be installed to aid in dispatch, train control, and accommodation of passenger rail operations.

Under the Task 6 Project, two new bridges would be constructed, and one concrete box structure would be replaced and widened. One of the new bridges would be a single-track bridge over the Coweeman River. The other new bridge would be constructed adjacent to an existing bridge to accommodate the new third main line track over a private road. An existing concrete box structure over South Pacific Avenue would be replaced and widened to improve vehicle access under the rail line.

On the existing Coweeman River Bridge, a pedestrian walkway would be constructed for maintenance access. Scour protection would be provided along a short segment of the new third main line. Utilities would be relocated as required.

This EA describes the current environmental conditions relevant to the Task 5 and Task 6 projects of the PNWRC Improvement Program and discusses anticipated environmental effects. As discussed in Section 4.0, most effects from the Task 5 and Task 6 projects are short term and related to temporary construction activities. Clearing and grading activities would result in soil erosion, generation of dust, and increases in surface water runoff. Use of construction equipment could potentially result in spills of fuel and oil, increases in noise disturbances, and increases in construction vehicular traffic. Construction activities would also result in temporary, minor delays at the at-grade roadway crossings where construction is occurring. The mitigation, minimization measures, and best management practices (BMPs) described in Section 5.0 and Appendix M are integrated into the Task 5 and Task 6 projects. With these measures in place, anticipated environmental effects would be avoided or minimized.

Permanent, long-term effects of the Task 5 and Task 6 Projects would result in placement of fill in approximately 3.6 acres and 6.8 acres of wetlands, respectively. To offset these permanent, long-term effects, mitigation bank credits would be purchased, as described in Section 5.0.

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ABBREVIATIONS AND ACRONYMS

ACS	American Community Survey
APE	Area of Potential Effect
BMP	best management practice
CEQ	Council on Environmental Quality
CERC-NFRAP	Comprehensive Environmental Response, Compensation, and Liability Information System - No Further Remedial Action Planned
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Corps	U.S. Army Corps of Engineers
CORRACTS	Resource Conservation and Recovery Act (RCRA) Corrective Action
CP	control point
CSCSL	Confirmed and Suspected Contaminated Site List
CWA	Clean Water Act
DAHP	Department of Archaeology and Historic Preservation
dBA	A-weighted sound levels
DPS	Distinct Population Segment
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EDR	Environmental Data Resources, Inc.
EFH	essential fish habitat
EIS	Environmental Impact Statement
ERNS	Emergency Response Notification System
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
gpm	gallons per minute

HGM	hydrogeomorphic
HMIRS	Hazardous Materials Incident Report System
HSIPR	High Speed Intercity Passenger Rail
HSL	Hazardous Site Listing
Hz	hertz
I-5	Interstate 5
kg/gal	Kilograms per gallon
L_{dn}	day-night sound level
LEP	Limited English Proficiency
L_{eq}	equivalent sound level
LOS	level of service
LUST	leaking underground storage tank
Lv	root mean square (RMS) velocity in decibels (VdB), using a decibel reference of 1 micro-inch per second (μin/sec) and assuming a crest factor of 4
LWCF	Land and Water Conservation Fund
LWCFA	Land and Water Conservation Fund Act
MBTL	Millennium Bulk Terminals – Longview
MBtu	million British thermal units
μin/sec	micro-inch per second
MP	rail mile post
mpg	miles per gallon
mph	miles per hour
MSAT	mobile source air toxics
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFA	No Further Action
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_x	nitrogen oxides
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
Pb	lead
PM	particulate matter
PNWRC	Pacific Northwest Rail Corridor

PPV	peak particle velocity
RCRA	Resource Conservation and Recovery Act
RCO	Recreation and Conservation Office
RCW	Revised Code of Washington
RMS	root mean square
SEPA	Washington State Environmental Policy Act
SO_2	sulfur dioxide
SR	State Route
TCP	traditional cultural properties
USC	United States Code
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VCP	Voluntary Cleanup Program
VdB	vibration decibels
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WSNWCB	Washington State Noxious Weed Control Board

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1.0 INTRODUCTION

The Washington State Department of Transportation (WSDOT) is implementing infrastructure improvement projects along the Washington section of the Pacific Northwest Rail Corridor (PNWRC) through the State of Washington's (State) PNWRC Improvement Program. To fund these projects, WSDOT applied and was selected for grant funding through the Federal Railroad Administration's (FRA) High Speed Intercity Passenger Rail (HSIPR) Program. The Kelso Martin's Bluff Improvement Projects are key components of the PNWRC Improvement Program and, when completed, would help facilitate the addition of two additional Amtrak *Cascades* service round trips between Portland, Oregon, and Seattle, Washington, with improved reliability and reduced travel time. Although the PNWRC Improvement Program would not increase the number of Amtrak *Coast Starlight* trains (Amtrak's longer distance passenger rail service between Los Angeles, California, and Seattle), the program could improve the speed and reliability of those trains as well.

The State's PNWRC Improvement Program includes 17 individual tasks between Vancouver, Washington, and the Washington State–Canadian border. The tasks are defined in terms of improvements to passenger rail service along the PNWRC. Tasks were proposed for HSIPR funding based on analyses contained in the *Amtrak Cascades Mid-Range Plan* (WSDOT 2008). Although projects to improve service outcomes are distributed throughout the PNWRC, some projects are clustered in particular areas to address specific conditions that result in delays to passenger rail service. One such area included in the PNWRC Improvement Program is composed of three independent projects referred to as the Kelso Martin's Bluff Improvement Projects – Tasks 4, 5, and 6. The Kelso Martin's Bluff Improvement Projects are proposed to improve passenger rail operations around the Port of Kalama and the Port of Longview in Washington State. The Kelso Martin's Bluff Improvement Projects – Task 5: New Siding (Task 5) and Task 6: Kelso to Longview Junction (Task 6) are the subject of this Environmental Assessment (EA). Task 4: Toteff Siding Extension is an independent project that FRA and WSDOT are assessing under a separate environmental review.

To support the obligation of grant funds for the PNWRC Improvement Program, FRA and WSDOT issued a Tier 1 Programmatic EA analyzing the potential impacts of the projects comprising the PNWRC Improvement Program (WSDOT 2009a). Based on the identification of potential impacts and proposed measures to avoid, minimize, and mitigate potential impacts contained in the Programmatic EA, FRA issued a Finding of No Significant Impact (FONSI) in November 2010. Both the Programmatic EA and the FONSI anticipated a series of more detailed Tier 2, or project-level, environmental documents assessing the potential effects of component projects prior to the implementation of a specific component project. In conformity with the decisions made under the Tier 1 Programmatic EA and November 2010 FONSI, the PNWRC Improvement Program uses an existing transportation corridor, which reduces the overall environmental effects of providing improved passenger rail service compared to creating a new corridor (WSDOT 2009a).

Coordination with the public, agencies, community organizations, stakeholders, and other interested parties is critical to the successful adoption of this EA. FRA and WSDOT held a workshop to discuss alternatives for the Task 5 and Task 6 projects with the public and agency stakeholders in June 2013 to allow attendees the opportunity to review the conceptual design and draft purpose and need statements and to comment on the proposed the Task 5 and Task 6 projects. Additional coordination with federal, state, and tribal entities is ongoing throughout the National Environmental Policy Act (NEPA) process. Details regarding coordination and consultation for the Task 5 and Task 6 projects are provided in Section 6.0.

This project-level EA has been prepared in accordance with NEPA, the Council on Environmental Quality's (CEQ's) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and FRA's Procedures for Considering Environmental Impacts (64 Federal Register [FR] 28545, May 26, 1999) (FRA 1999). WSDOT would use this EA and other supporting documentation to satisfy the Washington State Environmental Policy Act (SEPA) (Washington Administrative Code [WAC] 197-11).

1.1 Project Area Description

The Task 5 and Task 6 projects are located in Cowlitz County, Washington, along an existing rail corridor between the Port of Kalama and the Port of Longview (referred to as the Kelso Martin's Bluff area). This area is surrounded by port facilities, roadways, and commercial and residential developments. Figure 1 shows the location of the Task 5 and Task 6 projects. The Task 5 project limits extend from approximately rail mile post (MP) 109.9 to MP 105.9. The Task 6 project limits extend from approximately MP 102.1 to MP 97.3. The existing BNSF right-of-way for the Task 5 project typically extends from 50 to 60 feet on either side of the centerline and from 50 to 100 feet on either side of the centerline for the Task 6 project.

The rail corridor through the Kelso Martin's Bluff area generally parallels and is west of the Interstate 5 (I-5) transportation corridor. The Task 5 and Task 6 projects are located within incorporated and unincorporated areas of Cowlitz County. The Task 5 project is located within the city of Kalama and unincorporated Cowlitz County. The Task 5 project area includes a variety of land uses, including residential homes and heavy port industrial development, recreation areas, and commercial businesses managed by the Port of Kalama. The Task 6 project is located within the city of Kelso and unincorporated Cowlitz County. Land use in the Task 6 project area includes single and multifamily dwellings, commercial and light industrial areas, a golf course, and an airport.

The railroad corridor and associated right-of-way where the Task 5 and Task 6 improvements would be made is owned by BNSF Railway. The railroad corridor has two main line rail tracks, industrial spurs, and sidings supported by ties and a gravel base. Managed (that is, sprayed and mowed) vegetation generally occurs at or near the edge of the railroad right-of-way. BNSF Railway-managed freight trains and Amtrak *Cascades* and *Coast Starlight* passenger train service operate along the route through the Kelso Martin's Bluff area. According to the Service Development Plan – Pacific Northwest Rail Corridor, Cascades High-Speed Rail Program (WSDOT 2011a), current service through the Kelso Martin's Bluff area is estimated at an average of 50 total freight and passenger trains per day. Amtrak service through the area includes eight *Cascades* trains and two *Coast Starlight* trains per day.

1.2 Organization of Environmental Assessment

This EA presents the purpose of and need for the project, compares the No Build and Build Alternatives that the agency could adopt, and discusses the projected environmental effects of the alternatives. Impacts are analyzed as the short-term and long-term effects of the alternatives on people and the environment. In addition, this EA presents mitigation, minimization measures, and best management practices (BMPs) that eliminate or reduce the effects of the alternatives. Finally, this EA discusses the coordination and consultation that has occurred with the public, agencies, community organizations, stakeholders, and other interested parties.

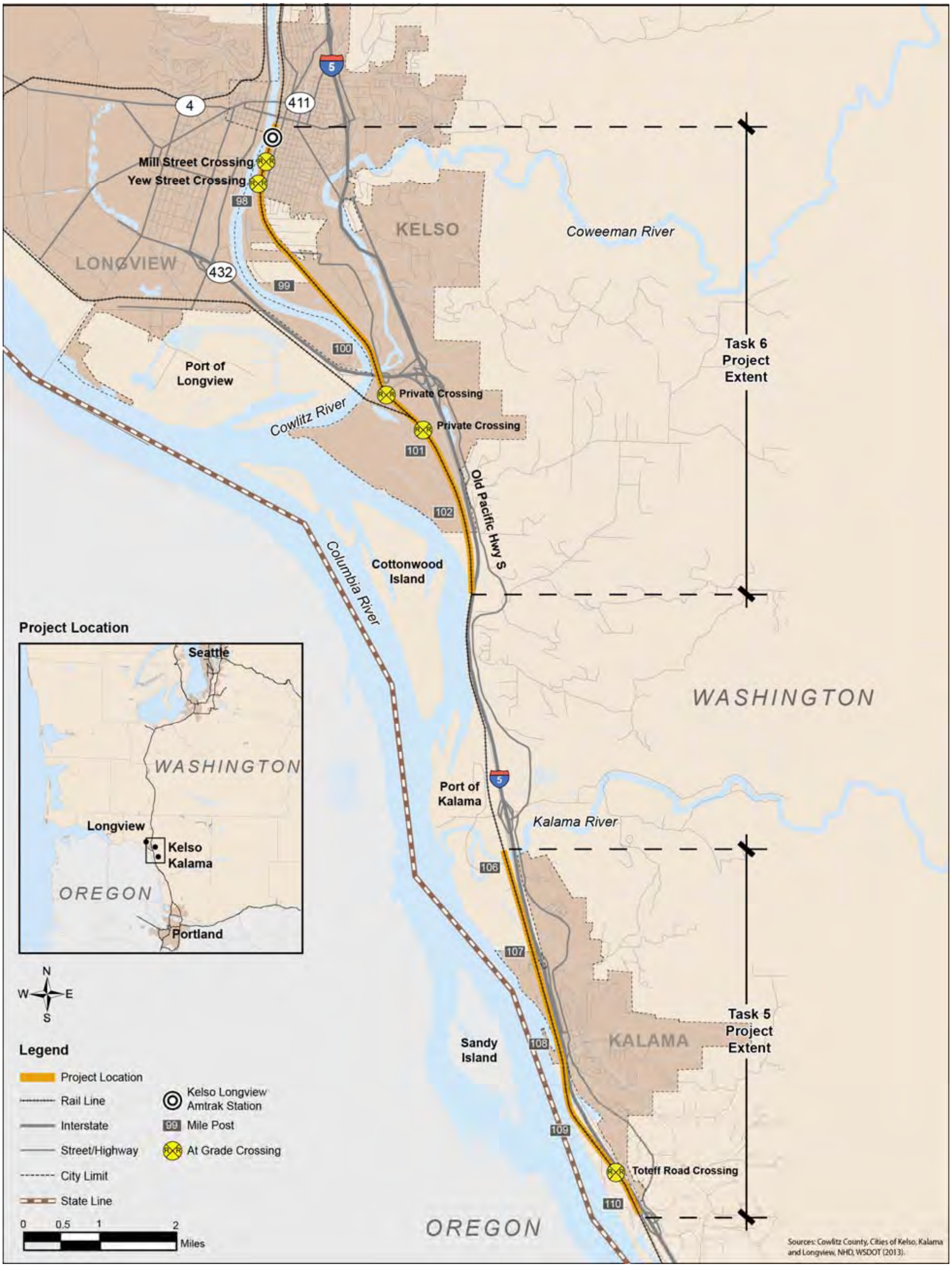

Figure 1. Project Location

2.0 PURPOSE AND NEED

2.1 Purpose of the Task 5 and Task 6 Projects

Washington State's vision for the PNWRC is to "…improve intercity passenger rail service by reducing travel times and achieving greater schedule reliability in order to accommodate growing intercity travel demand…" (WSDOT 2009a). As described in Section 1.0, the portion of the route through the Kelso Martin's Bluff area is part of the larger PNWRC. The purpose of the Task 5 and Task 6 projects is to improve the speed and reliability of HSIPR service along the PNWRC through the Kalama and Kelso areas by relieving passenger rail congestion related to freight rail traffic entering and exiting the Ports of Kalama and Longview. The Task 5 and Task 6 projects would improve intercity passenger rail service with:

- ***Improved Reliability:*** The projects would reduce scheduling conflicts with freight rail trains, thus minimizing and/or avoiding operational delays and improving on-time performance.
- ***Enhanced Efficiency:*** The projects would enhance the efficient movement of people by decreasing trip times and reducing the amount of time passenger trains spend yielding to freight rail movements in and around the Ports of Kalama and Longview.
- ***Enhanced Frequency:*** When completed, the projects would accommodate increasing Amtrak *Cascades* round trips, extending daily service schedules, and moving more people.

2.2 Need for the Task 5 and Task 6 Projects

The Task 5 and Task 6 projects are needed to relieve rail congestion in and around the Ports of Kalama and Longview, especially along the two existing main line tracks. While these tracks are used by both intercity passenger and freight rail operations the congestion caused by the current track configuration results in service delays that adversely affect passenger train scheduling and reliability. Specifically, freight rail traffic arriving and departing from the Ports of Kalama and Longview blocks one main line track for extended periods of time. Having one main line available for freight and passenger trains inhibits the ability of passenger and freight trains to meet and pass efficiently on the main line. In addition, the current inability of passenger trains to bypass freight rail traffic as freight traffic transitions from the main line to industrial spurs and port facilities, limits the number of passenger train trips that can be scheduled in a day. The Task 5 and Task 6 projects would facilitate passenger trains to bypass freight rail traffic and increase the number of passenger trains that could operate along the line.

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3.0 DESCRIPTION OF ALTERNATIVES

3.1 No Build Alternative

The No Build Alternative includes only minor maintenance and repair activities necessary to keep the existing BNSF Railway line operational for existing freight and intercity passenger rail service. Amtrak's *Cascades* and *Coast Starlight* passenger train service would continue to use the existing BNSF Railway rail line through Kelso and the Port of Kalama. However, the No Build Alternative would not include any other improvements to passenger rail, and delays due to congestion in the Task 5 and 6 project areas would continue. Further, there would be no opportunity for improved or additional intercity passenger train service because an increase in Amtrak service would further increase the existing congestion and result in adverse effects on both freight and passenger rail operations.

3.2 Build Alternative

The Build Alternative described in this EA includes both Task 5 and Task 6 (Figure 1). While both Task 5 and 6 each have independent utility and could be constructed separately, each project supports the overall goal of the PNWRC Program. While they are addressed here together the improvements called for are specific to each project's location and each addresses inefficiencies and delays related to rail congestion at two discrete locations (i.e. the Port of Kalama (Task 5) and the Port of Longview (Task 6)) without the construction of the other project. In addition, the implementation of the Build Alternative does not restrict the consideration of a reasonable range of alternatives in any other adjacent WSDOT projects.

The Task 5 and Task 6 projects include improvements to support improved passenger service schedule reliability, improved travel times, and increased frequency in Amtrak service between Portland and Seattle from four daily round trips to six. The Build Alternative would improve the flow of passenger trains through Kalama and Kelso by establishing a new main line for passenger train use and new track switching that would improve the transition of freight rail traffic off the main line tracks as those trains travel to and from the Ports of Kalama and Longview. The Build Alternative would allow Amtrak trains to operate at speeds up to 79 miles per hour (mph).

The subsections below provide additional detail about the specific improvements associated with the Task 5 and Task 6 projects. Unless otherwise noted, all improvements would be constructed within the existing BNSF Railway right-of-way. Figure 2 and Figure 3 show the locations of the improvements included in the Task 5 and Task 6 projects, respectively; each figure is located following the discussion of the respective project. Figure 4, located following the discussion of the Task 6 project, presents a schematic that explains how several of the key elements proposed in the Task 5 and Task 6 projects would be used during rail operations.

3.2.1 Task 5 Project – New Siding

The elements of the Build Alternative specific to the Task 5 project are described below and shown in Figure 2:

- Construction of approximately 4.1 miles of a third main line track to the east of the existing double-track main line from approximately Toteff Road (MP 109.90) north to just south of the Kalama River (MP 105.90). Track centers would be 20 feet in most areas; in some areas adjacent to I-5, where there is less space available in the BNSF Railway right-of-way, the spacing would be reduced to 15 feet.
- Installation of higher-speed turnouts on new embankment at both ends of the new track to facilitate train movements on and off the new third main line track, and modification of signal control points (CPs) and installation of intermediate signals to aid in dispatch, train control, and accommodation of all passenger rail operations.
- Construction of crash walls under a roadway overpass located at Oak Street (MP 106.81) and at an existing pedestrian overpass (MP 107.60). These crash walls are required by rail design safety standards to provide additional support and prevent damage to the overpasses in the event of a train impact.
- Grading, excavation, and embankment construction to support the new improvements.
- Construction of three retaining walls between the main line tracks and the adjacent I-5 from MP 107.94 to MP 108.27, MP 108.54 to MP 109.01, and MP 109.07 to MP 109.35.
- Armoring along approximately 200 feet of the new third main line grade limits to protect the new grade from scour from city of Kalama stormwater discharge culverts located adjacent to the railway near MP 107.50.
- Extension of seven stormwater culverts beneath the track bed to accommodate the third main line track.
- Replacement of the culvert at unnamed tributary 3 (MP 108.19) with a fish-passable culvert. The culvert would include up to two, 60-inch culverts that would pass beneath the track bed within the railroad right-of-way. West of the railroad right-of-way, a three-sided bottomless box culvert of approximately 5-foot-high by 15-foot-wide would be installed beneath Hendrickson Drive and the parking lot within Louis Rasmussen Day Use Park. There would be an outfall at the beach, where the box culvert would transition to a 70-foot long by 20-foot wide open, natural stream channel flowing across the beach use area of the Park. At the culvert outfall, a gate would be installed to prevent pedestrian access into the culvert.
- Relocation of utilities that are affected by the proposed improvements, as necessary.

Track center *refers to the distance between the center lines of the existing main line and the new parallel main line.*

Retaining walls *are structures that keep adjacent soils in place. They are generally placed in areas of steep slopes to prevent erosion and landslides. Retaining walls are typically constructed of either H-piles or soldier piles with concrete placed between the piles.*

A ***signal*** *is a mechanical or electrical device erected beside a rail line to pass information relating to the state of the line ahead to train engine drivers. Typically, a signal might inform the driver of the speed at which the train may safely proceed or it may instruct the driver to stop the train.*

Crash walls *are reinforced concrete walls, typically on bridge piers and abutments that are capable of withstanding a greater amount of force during an impact. They are intended to prevent damage and collapse of a bridge or structure from the impact of a train or other object crashing into the structure.*

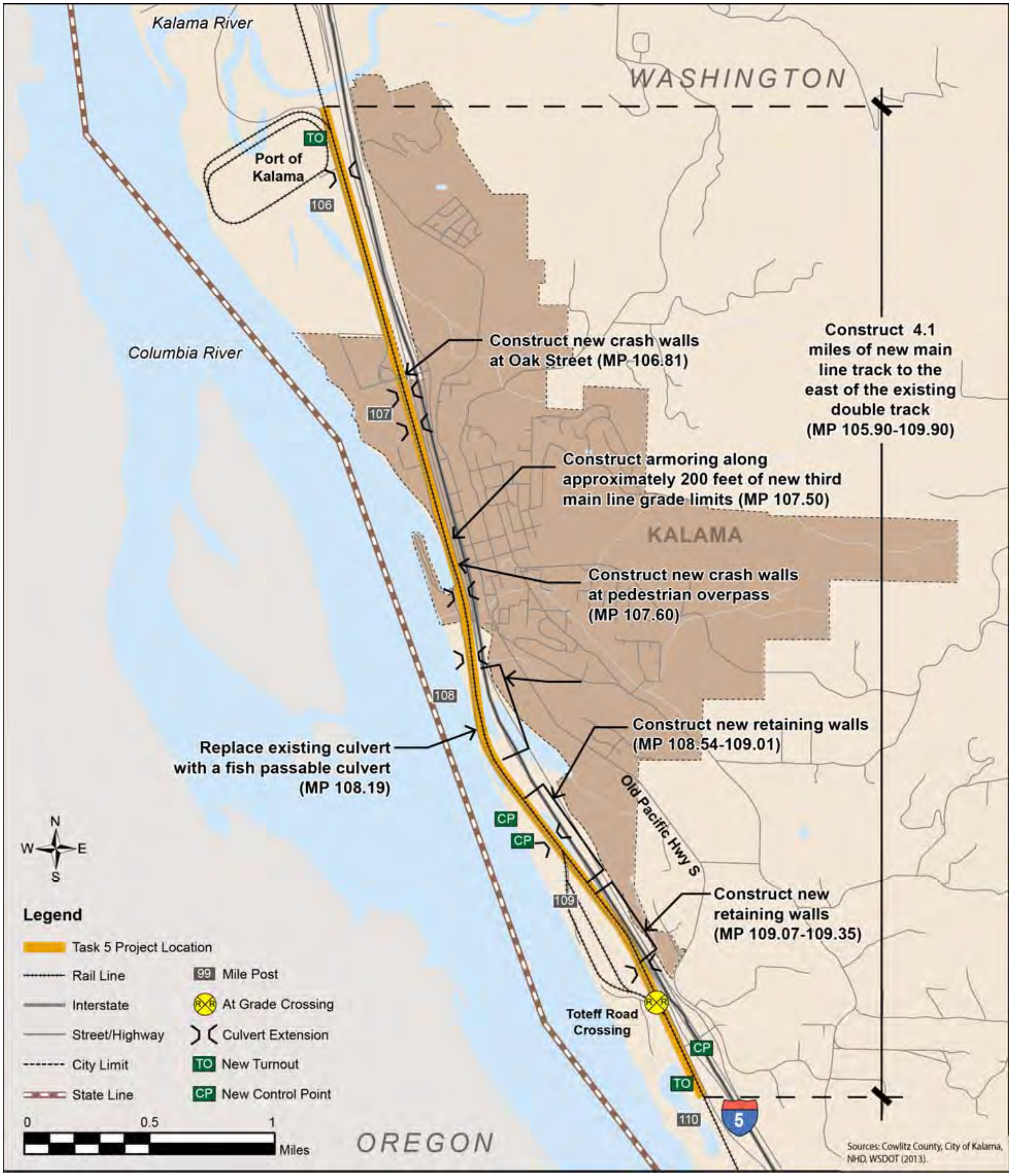

Figure 2. Task 5 Project – New Siding

3.2.2 Task 6 Project – Kelso to Longview Junction

The elements of the Build Alternative specific to the Task 6 project are described below and shown in Figure 3:

- Construction of approximately 3.7 miles of a third main line track from MP 98.43 to MP 102.11, including installation of four new turnouts (MP 99.15, MP 100.20, MP 100.22, and MP 100.32) and removal of one existing turnout (MP 100.27). Track centers would typically be 20 feet where the new third main line track is constructed on the east side of the BNSF Railway main line and reduced to 15 feet where the track is constructed on the west side.
- Upgrade of existing siding to main line track from MP 97.60 to MP 98.43, removal of 200 linear track feet and two existing turnouts near MP 97.40 and at MP 98.43, and installation of two new turnouts at (MP 97.40 and MP 98.63).
- Construction of a new single-track bridge, approximately 240 feet in length, over the Coweeman River (MP 100.15). The bridge would be a steel girder bridge supported by driven steel piles and offset from the existing Coweeman River rail bridge by 15 to 20 feet. The existing Coweeman River Bridge would be rehabilitated to include a walkway for maintenance purposes.

> ***Track feet*** *is a railroad term used to describe the removal of track components (for example, rail, ties, and ballast) along a lineal foot of the rail line. For example, removal of 10 track feet includes the removal of rails, ties, ballast, and other track components along 10 linear feet of the rail line.*

- Replacement of the existing concrete box structure with a widened rail bridge over South Pacific Avenue at MP 99.10 to provide better vehicular access under the rail line at this location, and construction of a new rail bridge to accommodate the new third main line track over a private road at MP 101.60. The widened rail bridge at MP 99.10 would be approximately 71 feet long and 22 feet wide. The additional width would provide the horizontal clearance necessary to allow emergency vehicles to pass beneath the bridge.
- Installation of 15 new turnouts, replacement of 2 existing crossovers with higher speed turnouts, and installation of 4 new crossovers, all of which would facilitate train movements among the three main line tracks.
- Modification of signal CPs (at MP 98.90 and MP 102.60) to aid in dispatch, train control, and accommodation of passenger rail operations.
- Grading, excavation, and embankment construction to support the new improvements.
- Relocation of utilities that are affected by the proposed improvements, as necessary.

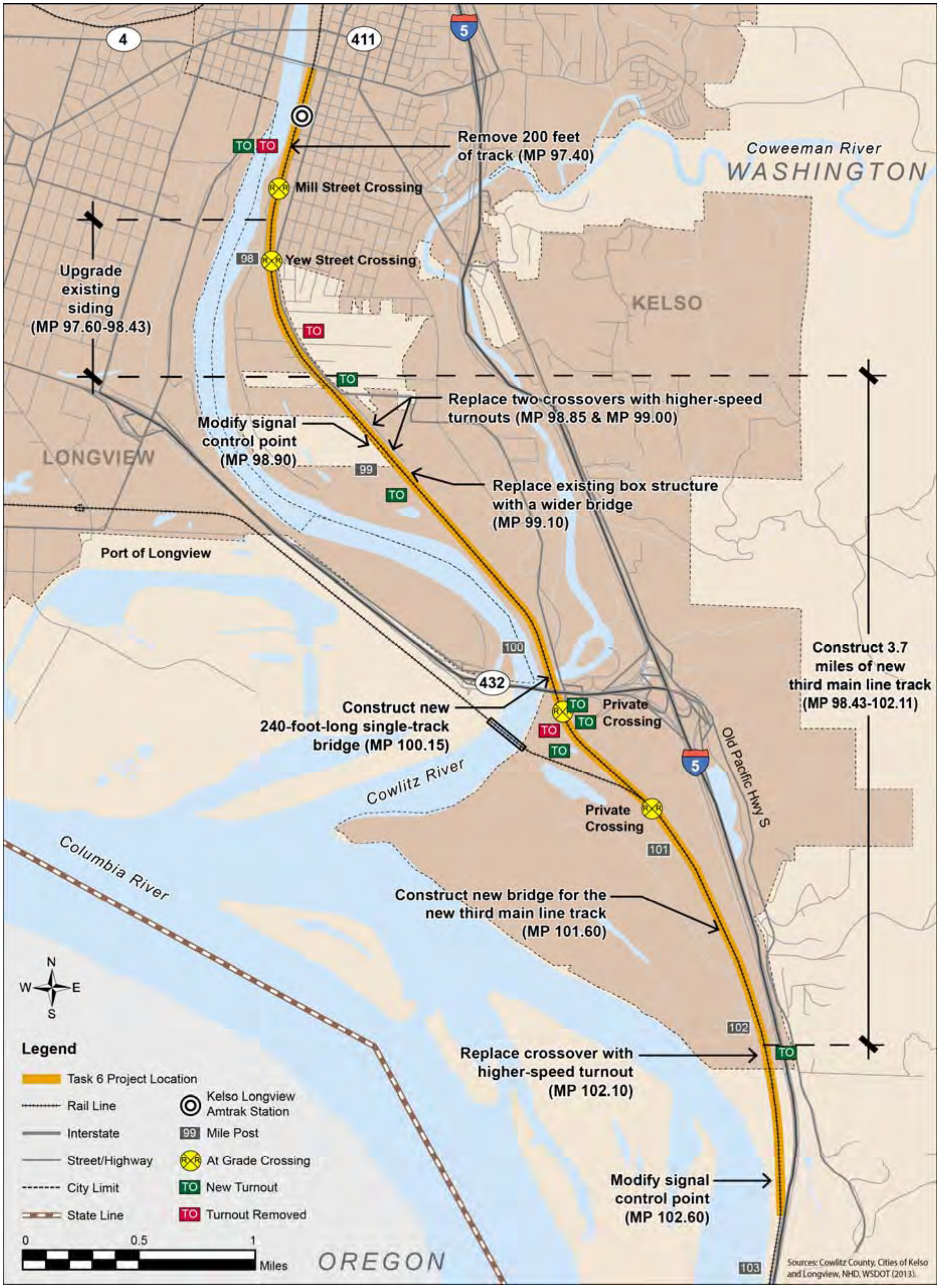

Figure 3. Task 6 Project – Kelso to Longview Junction

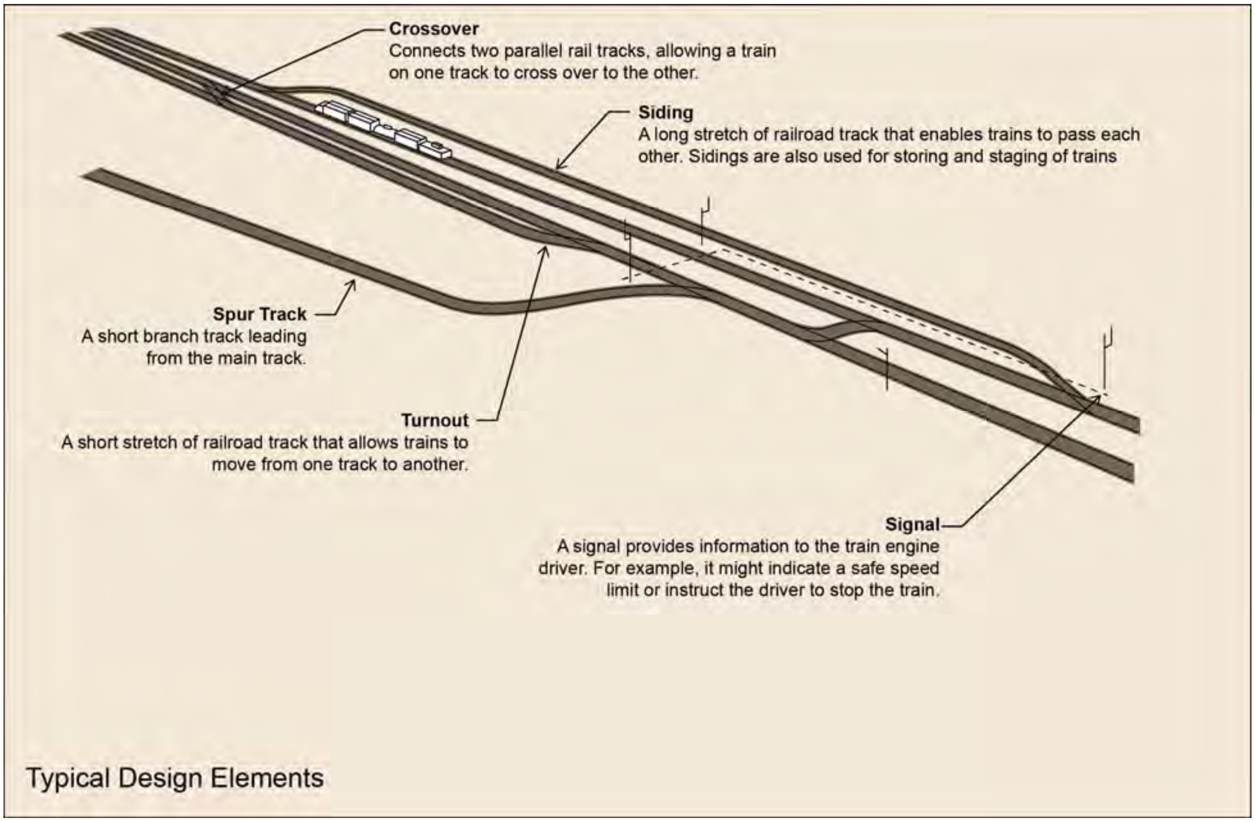

Figure 4. Key Design Elements of Task 5 and Task 6 Projects

3.3 Development of Alternatives

Planning to improve passenger rail service for the Portland–Seattle–Vancouver, British Columbia, segment of the PNWRC began in 1993 under an FRA high-speed rail initiative. In 1996, FRA, partnering with the Federal Highway Administration (FHWA), advised that the two agencies would prepare an Environmental Impact Statement (EIS) on this planning initiative. However, during development of the EIS, the agencies determined that additional planning in the form of a corridor service plan was needed. The goal of that corridor service plan was to increase passenger rail service to 13 daily round trips between Portland and Seattle.

The corridor service planning effort, which came to be known as the PNWRC Improvement Program, led to the identification of capital improvements needed to meet and expand passenger rail program service outcomes over a 20-year time frame. Because the PNWRC Improvement Program demonstrated that the capital projects had logical termini and utility independent of each other, the federal partners determined that the specific projects could be reviewed separately. As a result of this determination, WSDOT revised its approach to identifying and implementing capital investments along the corridor and determined that the original EIS was no longer needed. The PNWRC Improvement Program devised a sequential series of investments that would accomplish the desired goals of the program. Improvements in the Kelso Martin's Bluff area were identified in the planning for the PNWRC Improvement Program. The Kelso Martin's Bluff projects are included with other improvements intended to support the addition of a fifth and sixth daily round trip between Portland and Seattle, to reduce the travel time between these cities, and to improve reliability for existing train service.

In 2003, FRA, FHWA, and WSDOT began an EIS for rail improvements in the Kelso Martin's Bluff area. The EIS considered three alternative track alignments as build alternatives for the addition of approximately 19 miles of track and improvement of track transitions. The preliminarily preferred alternative was of much larger scope and was expected to result in significantly greater impacts (for example, blasting and real estate acquisition) than the Build Alternative analyzed in this EA. Ultimately, the 2003 EIS effort was deferred due to budget limitations and legislative direction.

In 2006, to consider means to achieve the corridor service objectives with fewer environmental impacts and more cost-effective improvements, WSDOT, in conjunction with BNSF Railway, Amtrak, and other providers, reexamined projects identified in the PNWRC Improvement Program. This effort resulted in the *Washington State Long-Range Plan for Amtrak Cascades* (WSDOT 2006). The long-range plan reconsidered the projects that would accomplish the desired increase in service between Portland, Seattle, and Vancouver, BC, from the PNWRC Improvement Program. The Kelso Martin's Bluff suite of improvements was retained as important components to meet the service outcomes. In 2008, WSDOT developed the *Amtrak Cascades Mid-Range Plan* (WSDOT 2008). The 2008 plan provided for the phased implementation of the PNWRC Improvement Program. In this plan, the Kelso Martin's Bluff Improvement Projects were separated into six phased projects that included the current Tasks 5 and 6.

In early 2009, the federal government introduced the HSIPR grant program, administered through FRA. As part of the required NEPA compliance for funding eligibility, WSDOT completed the *Pacific Northwest Rail Corridor, Washington State Segment – Columbia River to the Canadian Border, Program Environmental Assessment* in 2009 (WSDOT 2009a). In this 2009 Programmatic EA, the six phased projects noted in the 2008 *Amtrak Cascades Mid-Range Plan* were refined with additional planning and operational modeling to reduce both environmental impact and cost. This Programmatic EA developed the Corridor Service Expansion Alternative, which included Tasks 5 and 6 as part of the Kelso Martin's Bluff suite of projects, to increase passenger rail service. In 2010, FRA issued a FONSI, directing project-level environmental assessments where appropriate. As conceived and advanced through WSDOT's 2008 plan for the Amtrak *Cascades*, implementation of the Task 5 and Task 6 projects would support the overall goal of the PNWRC Improvement Program.

Based on the Programmatic EA and FONSI, in 2011 FRA and WSDOT executed a Cooperative Agreement to deliver the PNWRC Improvement Program. With part of the preliminary engineering funding through the Cooperative Agreement, several elements for Tasks 5 and 6 have been designed to a conceptual level to avoid environmental impact and reduce costs. Specifically, the tasks are now proposed to be fully within the BNSF Railway-owned corridor and do not require significant real estate acquisition. Other modifications to avoid effects include reducing track centers, changing fill slopes and retaining walls in places to minimize wetlands intrusions, locating rail support improvements away from sensitive wetland areas, and greatly reducing the extent of new main line. As detailed in this EA, WSDOT and FRA have identified and will implement additional minimization and mitigation measures.

3.4 Summary of Effects

FRA and WSDOT evaluated the anticipated short-term and long-term environmental effects of the No Build and Build Alternatives, which are summarized in Table 1. This EA considers short-term effects as those effects that are generally temporary in duration and typically occur during construction of the Task 5 and Task 6 projects. Long-term effects include those effects that are generally permanent and occur as a result of construction or operation of the Task 5 and Task 6 projects. A detailed discussion of the effects of the No Build and Build Alternatives is in Section 4.0. Mitigation, minimization measures, and BMPs are proposed and are described in detail in Section 5.0 and Appendix M. These measures would reduce or avoid the effects described in Section 4.0.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects		
		No Build Alternative	Build Alternative – Short-term Effects	Build Alternative – Long-term Effects
Geology and Soils	Task 5	No effects.	Temporary disturbance of soils and sediments due to grading and excavation would occur.	No effects.
	Task 6	No effects.	Temporary disturbance of soils and sediments due to grading and excavation would occur.	No effects.
Air Quality	Task 5	Negligible effects from increased emissions would occur from continued maintenance activities and increased congestion along the existing rail line.	No exceedance of the National Ambient Air Quality Standards (NAAQS) is anticipated from short-term construction activities.	No exceedance of the NAAQS or the *de minimis* threshold under the federal General Conformity requirement is anticipated from long-term operations or maintenance.
	Task 6	Negligible effects from increased emissions would occur from continued maintenance activities and increased congestion along the existing rail line.	No exceedance of the NAAQS is anticipated from short-term construction activities.	No exceedance of the NAAQS or the *de minimis* threshold under the federal General Conformity requirement is anticipated from long-term operations or maintenance.
Water Resources	Task 5	No effects.	Short-term increases in turbidity levels would result from grading, filling, and excavation for the new third main line. Potential release of pollutants into surface waters from construction equipment could occur. No short-term effects on floodplains are anticipated to result from construction activities.	No long-term effects on surface hydrology, floodplains, or water quality are anticipated from operations or maintenance.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects: No Build Alternative	Summary of Effects: Build Alternative – Short-term Effects	Summary of Effects: Build Alternative – Long-term Effects
	Task 6	No effects.	Short-term increases in turbidity levels would result from, grading, filling, and excavation for the new third main line. Potential release of pollutants into surface waters from construction equipment could occur. No short-term effects on floodplains are anticipated to result from construction activities.	No long-term effects on surface hydrology, floodplains, or water quality are anticipated from operations or maintenance.
Wetlands	Task 5	No effects.	Short-term decrease in water quality and reduced habitat availability would result from construction of staging areas and temporary access roads, and vegetation removal. Removal of vegetation would decrease the ability of the wetland to reduce water velocities during storm events.	Long-term placement of fill would result in the loss of 3.6 acres of wetlands and decrease functions related to flood water conveyance and habitat functions.
	Task 6	No effects.	Short-term decrease in water quality and reduced habitat availability would result from construction of staging areas and temporary access roads, vegetation removal, and dewatering activities. Removal of vegetation would decrease the ability of the wetland to reduce water velocities during storm events.	Long-term placement of fill would result in the loss of 6.8 acres of wetlands and decrease functions related to flood water conveyance and habitat functions.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects		
		No Build Alternative	Build Alternative – Short-term Effects	Build Alternative – Long-term Effects
Ecological Resources	Task 5	No effects.	Short-term decrease in water quality would result from increased turbidity from grading and clearing activities affecting non-listed and listed fish species. Removal of vegetation would introduce noxious weeds. Higher construction noise levels would affect non-listed and listed wildlife that would likely move to other habitat areas in the vicinity. Human disturbances during construction would be unlikely to affect non-listed and listed wildlife. Releases of pollutants from construction equipment into streams would decrease water quality affecting non-listed and listed aquatic species. In-water work would include dewatering and isolation of work areas that would require fish handling, and may result in direct mortality or elevated stress levels.	Disturbances from additional trains during operations may increase the likelihood of animal mortality due to train strikes.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects: No Build Alternative	Summary of Effects: Build Alternative – Short-term Effects	Summary of Effects: Build Alternative – Long-term Effects
	Task 6	No effects.	Short-term decrease in water quality would result from increased turbidity from grading and clearing activities affecting non-listed and listed fish species. Removal of vegetation would introduce noxious weeds. Higher construction noise levels would affect wildlife that would likely move to other habitat areas in the vicinity. Human disturbances during construction would be unlikely to affect non-listed and listed wildlife. Releases of pollutants from construction equipment into streams would decrease water quality affecting non-listed and listed aquatic species. In-water work would include dewatering and isolation of work areas that would require fish handling, and may result in direct mortality or elevated stress levels.	Disturbances from additional trains during operations may increase the likelihood of animal mortality due to train strikes.
Energy and Climate Change	Task 5	No effects.	No substantial short-term increase in fuel consumption, energy use, or greenhouse gas emission from construction activities would occur when compared to existing conditions.	No substantial long-term increase in fuel consumption, energy use, or greenhouse gas emissions would occur from Amtrak train operations when compared to existing conditions.
	Task 6	No effects.	No substantial short-term increase in fuel consumption, energy use, or greenhouse gas emission from construction activities would occur when compared to existing conditions.	No substantial long-term increase in fuel consumption, energy use, or greenhouse gas emissions would occur from Amtrak train operations when compared to existing conditions.
Noise	Task 5	No effects.	Short-term effects for residents near construction sites would result from temporary noise generated by construction equipment during construction activities.	A long-term marginal increase in noise would occur from the operation of additional *Cascades* passenger trains along the rail corridor.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects: No Build Alternative	Build Alternative – Short-term Effects	Build Alternative – Long-term Effects
	Task 6	No effects.	Short-term effects for residents near construction sites would result from temporary noise generated by construction equipment during construction activities.	A long-term marginal increase in noise would occur from the operation of additional *Cascades* passenger trains along the rail corridor.
Vibration	Task 5	No effects.	No effects.	No effects.
	Task 6	No effects.	No effects.	No effects.
Hazardous Materials	Task 5	No effects.	Contaminated soil, sediment, or groundwater could be encountered during construction; however, minimization measures would avoid, control, and manage any potential effects.	Long term operation would not result in increased exposure to hazardous materials from transport or operational spills.
	Task 6	No effects.	Contaminated soil, sediment, or groundwater could be encountered during construction; however, minimization measures would avoid, control, and manage any potential effects.	Long term operation would not result in increased exposure to hazardous materials from transport or operational spills.
Land Use, Recreation, and Section 6(f) Resources	Task 5	No effects.	No effects on land use. Short-term effects to Louis Rasmussen Day Use Park and park users during construction of the unnamed tributary 3 culvert, from noise and temporary access closures. No temporary physical changes would occur within Section 6(f) properties; therefore, no short-term effects on Section 6(f) resources would occur.	No effects on land use or recreation. No permanent physical changes to the recreational resource, displacement of existing land uses or acquisition of property, or conversion of the Section 6(f) resource would occur; therefore, no effects on Section 6(f) resources would occur.
	Task 6	No effects.	No effects.	No effects.
Cultural Resources	Task 5	No effects.	No effects to historic properties or Traditional Cultural Properties.	No effects.
	Task 6	No effects.	No effects	No effects.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects: No Build Alternative	Summary of Effects: Build Alternative – Short-term Effects	Summary of Effects: Build Alternative – Long-term Effects
Section 4(f) Resources	Task 5	No effects.	Construction activities would require temporary closure of the Louis Rasmussen Day beach, parking area, and Hendrickson Drive within the construction site of unnamed tributary 3 fish-passable culverts.	Replacement of the existing unnamed tributary 3 culvert would result in a *de minimis* impact to Louis Rasmussen Day Use Park as it would not adversely affect the activities, features, or attributes of the park.
	Task 6	No effects.	No effects.	No effects.
Socioeconomics and Environmental Justice	Task 5	No effects.	No short-term change in demographics, land use patterns, or other community characteristics would occur. Temporary benefits would result from construction expenditures. No disproportionate short-term adverse effects on environmental justice populations would occur.	No long-term change to economic conditions would occur. No disproportionate long-term adverse effects on environmental justice populations would occur.
	Task 6	No effects.	No short-term change in demographics, land use patterns, or other community characteristics would occur. Temporary benefits would result from construction expenditures. No disproportionate short-term adverse effects on environmental justice populations would occur.	No long-term change to economic conditions would occur. No disproportionate long-term adverse effects on environmental justice populations would occur.
Aesthetics	Task 5	No effects.	Minor temporary effects on the viewshed from the presence of construction equipment and materials would occur.	Minor long-term effects on the viewshed would occur from the introduction of the third main line track, retaining and crash walls, and signals.
	Task 6	No effects.	Minor temporary effects on the viewshed from the presence of construction equipment and materials would occur.	Minor long-term effects on the viewshed would occur from the introduction of the third main line track and siding track, bridges, and signals.

Table 1. Summary of Effects before Mitigation, Minimization, or Best Management Practices

Resource Area	Task	Summary of Effects: No Build Alternative	Summary of Effects: Build Alternative – Short-term Effects	Summary of Effects: Build Alternative – Long-term Effects
Transportation	Task 5	Traffic volumes would continue to increase, resulting in an increase in intersection delay.	Short-term minor effects on traffic (delays) may result from the delivery of construction materials to construction sites during construction. Short-term minor effects on traffic flow and delays as a result of the temporary closure of Hendrickson Drive during installation of the unnamed tributary 3 culvert.	Long-term beneficial effects would result from improved flow of passenger rail traffic through the project area. A non-significant increase in the frequency of traffic delays at at-grade crossings would occur due to the increase in the number of trains in the project area.
	Task 6	Traffic volumes would continue to increase, resulting in an increase in intersection delay.	Short-term minor effects on traffic (delays) may result from the delivery of construction materials to construction sites during construction.	Long-term beneficial effects would result from improved flow of passenger rail traffic through the project area. A non-significant increase in the frequency of traffic delays at at-grade crossings would occur due to the increase in the number of trains in the project area.
Public Services, Utilities, and Safety	Task 5	No effects on public services or utilities would occur. Annual accident rates at at-grade crossings would continue to increase due to increased freight and roadway traffic.	Short-term temporary disruptions of utility services would occur during construction. No effects on public services, or worker or public safety would occur.	No long-term effects on pedestrian or driver safety would occur from increases in passenger rail. No effects on public services or utilities would occur.
	Task 6	No effects on public services or utilities would occur. Annual accident rates at at-grade crossings would continue to increase due to increased freight and roadway traffic.	Short-term temporary disruptions of utility services would occur during construction. No effects on public services, or worker or public safety would occur.	No long-term effects on pedestrian or driver safety would occur from increases in passenger rail. No effects on public services or utilities would occur.
Indirect Effects	Task 5	No effects.	No effects.	
	Task 6	No effects.	No effects.	
Cumulative Effects	Task 5	No effects.	Long-term fill in wetlands would contribute to a cumulative effect.	
	Task 6	No effects.	Long-term fill in wetlands would contribute to a cumulative effect.	

4.0 Affected Environment and Environmental Consequences

This section identifies resources in the natural and human environments that may be affected by the No Build and Build Alternatives. This section also describes the areas potentially affected by the Task 5 and Task 6 projects. The discussion includes the methodology used to assess the potential construction and operational effects, and an analysis of the potential effects that the construction and operation of the Task 5 and Task 6 projects could have on people and the environment. Short-term effects include those effects that are generally temporary in duration and typically occur during construction of the Task 5 and Task 6 projects. Long-term effects include those effects that are generally permanent and occur as a result of construction of the facilities or operation of trains for the Task 5 and Task 6 projects. Laws, regulations, and permits required for the Task 5 and Task 6 projects are summarized in Appendix A. Additional information supplementing the effects analysis is provided in Appendix B through Appendix N.

CEQ regulations implementing NEPA require agencies to consider the direct and indirect effects and cumulative effects of major federal actions. The CEQ defines direct effects as those that "are caused by the action and occur at the same time and place," and indirect effects as those that "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8). The CEQ defines cumulative effects as those that result "from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). This section provides these analyses for the No Build and Build Alternatives for the Task 5 and Task 6 projects.

FRA's *Procedures for Considering Environmental Impacts* (64 FR 28545, May 26, 1999) (FRA 1999) outlines the resource areas that should be considered when evaluating the potential environmental impact of an action. This EA provides analysis for all of the resource areas identified in the FRA guidance except for Coastal Zone Management, Resource Lands, and Use of Natural Resources. These resource areas were either not present or no effects would occur; therefore, no additional analysis was required.

*The **project area** includes the area within BNSF Railway right-of-way for the extent of the project limits of Task 5 or Task 6 to the north and south, as defined in Section 3.0. This is the area where construction would occur and permanent facilities would be located.*

*The **study area**, which includes the project area, is the area where direct and indirect effects from the Task 5 or Task 6 project are anticipated. The size of the study area varies depending on the resource being analyzed and is defined for each resource at the beginning of each section.*

4.1 Geology and Soils

This section characterizes the geology and soils in the Task 5 and Task 6 study areas, presents an analysis of the potential effects of geologic hazards on the Task 5 and Task 6 projects, and describes the potential effects of the alternatives on geology and soils.

4.1.1 Study Area and Methodology

4.1.1.1 Study Area

The Task 5 and Task 6 study areas for the analysis of geology and soils include the area within 1,000 feet of the Task 5 and Task 6 project areas. Geologic and soil resources are described in a broad, regional context.

4.1.1.2 Methodology

Geologic information for the Task 5 and Task 6 study areas was obtained by collecting and reviewing existing data, including geologic maps, soils surveys, and critical area maps, from federal, state, and local sources. No field studies were conducted because existing data were adequate based on the anticipated ground disturbance associated with the Task 5 and Task 6 projects. Effects were determined based on the proximity of geologic critical areas to proposed project activities and the potential for geologic or soil conditions to affect or be affected by project construction or operations.

> *As defined by Washington State Growth Management Act (Chapter 36.70A.030(5) Revised Code of Washington [RCW]),* ***critical areas*** *are environmentally sensitive resources and include (a) wetlands, (b) areas with a critical recharging effect on aquifers used for potable water, (c) fish and wildlife habitat conservation areas, (d) frequently flooded areas, and (e) geologically hazardous areas.*

4.1.2 Affected Environment

4.1.2.1 Task 5 Project

The Task 5 study area lies in the Lower Columbia Basin physiographic area, which consists of relatively flat terrain formed on alluvial deposits with elevations ranging from 10 to 300 feet (Washington State Department of Ecology [Ecology] 2013a). Soils in this area are very deep, naturally or artificially well drained, on slopes of 0 to 3 percent. The soils were formed in mixed alluvium and are comprised of silty clay loam, silt loam, and fine to very fine sandy loam. Table 2 summarizes geologic critical areas within the Task 5 study area, which include seismic, volcanic, landslide, and erosion hazard areas, and aquifer recharge areas. There are no geologic or soil resources categorized as unique, protected, or of local interest within the Task 5 study area. Additionally, there are no areas categorized as having a risk of soil liquefaction potential and no topography that would indicate the presence of caverns or sinkholes.

4.1.2.2 Task 6 Project

The affected environment for the Task 6 project is similar to that described for the Task 5 project. However, the Task 6 study area also has moderate to high soil liquefaction potential in seismic hazard areas. All other geologic critical areas are the same.

Table 2. Geologic Critical Areas

Geologic Critical Area	Definition	Location within Study Area
Seismic Hazard Areas	Areas subject to severe risk of damage as a result of seismic-induced settlement, shaking, lateral spreading,[a] surface faulting, slope failure, or soil liquefaction.	There are no seismic hazard areas and no mapped faults within the Task 5 study area (Palmer et al. 2004).
Volcanic Hazard Areas	Areas subject to pyroclastic flows, lava flows, and inundation by lahars, debris flows, or related flooding resulting from geologic and volcanic events.	Accumulation of volcanic ash could occur within the Task 5 study area, but the study area is outside of the lahar and lava/pyroclastic flow hazard areas of Mount St. Helens (U.S. Geological Survey 2013).
Landslide Hazard Areas	Areas potentially subject to mass movement due to a combination of geologic, seismic, topographic, hydrologic, or human-made factors.	There are no landslide hazard areas in the Task 5 study area. Landslide hazard areas occur approximately 0.5 mile west of the existing rail corridor in the vicinity of MP 107 (Washington State Department of Natural Resources, Division of Geology and Earth Resources 2013).
Erosion Hazard Areas	Areas where the combination of slope and soil type makes the area susceptible to erosion by water flow, either by wave action, channel migration, or surface runoff.	Soil susceptible to erosion is present along the existing rail corridor when cleared of vegetation or exposed on cut or fill slopes.
Aquifer Recharge Areas	Areas that are a highly used source of groundwater and are tapped by public and private wells as a source of drinking water.	The alluvium deposits of the Task 5 study area are within a geologic unit that is a major aquifer; they provide aquifer recharge.

Note: In lateral spreading, soil behaves like a liquid, has an inability to support weight, and can flow down slopes.

4.1.3 Environmental Consequences

4.1.3.1 No Build Alternative

Minor maintenance and repair activities along the existing BNSF Railway rail line would continue to occur as part of the No Build Alternative. Additionally, there would be no increase in intercity passenger rail service. The geology and soils in the Task 5 and Task 6 study areas would remain undisturbed. Existing conditions and geologic hazards as summarized in Table 2 would persist under the No Build Alternative.

4.1.3.2 Build Alternative

4.1.3.2.1 Task 5 Project

Short-term Effects

Short-term effects on soils in the Task 5 study area would occur from the temporary disturbance of soils during construction activities. Land clearing and excavation into existing slopes and embankments would expose soil, making it susceptible to wind and water erosion. These effects would be limited to areas of active construction and would be temporary, occurring during construction activities only. Though the

Task 5 project is located within an aquifer recharge area, no short-term effects would be anticipated as there would not be an increase in impervious surfaces during construction. Conversely, no short-term effects on the Task 5 project would be expected from the soils and geologic critical areas in the Task 5 study area because the design of the project would take into consideration the existing soil conditions and geologic critical areas.

Long-term Effects

No long-term disturbance of soils would occur in the Task 5 study area; therefore, no long-term effects on soils would be anticipated. Areas in the Task 5 study area currently susceptible to geologic hazards (i.e. geologic critical areas) would continue to be susceptible; however, the Task 5 project would not increase the long-term susceptibility of the study area to these hazards. Though the Task 5 project is located within an aquifer recharge area, there would be only a negligible increase in impervious surfaces; therefore, no long-term effects on aquifer recharge would be expected.

Summary of Effects

Short-term effects from the temporary disturbance of soils would occur during construction activities; however, these effects would be minimized by adhering to the minimization measures and BMPs. For example, exposed soils would be stabilized to prevent erosion through use of hydroseeding, installing straw wattles, or installing a temporary erosion control blanket. The entire list of minimization measures and BMPs applicable to geology and soils are described in Appendix M. No short-term effects on geology and no long-term effects on geology and soils would result from the Task 5 project.

4.1.3.2.2 Task 6 Project

Short-term Effects

The short-term effects under the Task 6 project would be similar to those described for the Task 5 project. However, the Task 6 study area contains soils that have moderate to high liquefaction potential that are not present in the Task 5 study area. No short-term effects from these soils would occur because the design of the project would take their presence into consideration. The design would include methods to provide additional soil stabilization, which would minimize the potential effects of soil liquefaction should an earthquake occur.

Long-term Effects

The long-term effects under the Task 6 project would be similar to those described for the Task 5 project. However, the Task 6 study area contains soils that have moderate to high liquefaction potential that are not present in the Task 5 study area. Similarly, no long-term effects from these soils would occur because the design of the project would take their presence into consideration. The design would include methods to provide additional soil stabilization, which would minimize the potential effects of soil liquefaction should an earthquake occur.

Summary of Effects

Short-term effects from the temporary disturbance of soils would occur during construction activities; however, these effects would be minimized by adhering to the minimization measures and BMPs. For example, exposed soils would be stabilized to prevent erosion through use of hydroseeding, installing straw wattles, or installing a temporary erosion control blanket. The entire list of minimization measures and BMPs applicable to geology and soils are described in Appendix M. No short-term effects on geology and no long-term effects on geology and soils would result from the Task 6 project.

4.2 Air Quality

This section characterizes ambient air quality conditions in the Task 5 and Task 6 study areas and describes the potential effects on air quality that could result from the alternatives.

> *An **attainment area** is a geographic area that meets or exceeds the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants designated in the Clean Air Act.*
>
> *A **nonattainment area** is a geographic area that does not meet one or more of the NAAQS for the criteria pollutants designated in the Clean Air Act.*
>
> *A **maintenance area** is a geographic area that was formerly designated as a nonattainment area but that now meets or exceeds the NAAQS.*
>
> *The **General Conformity Rule** ensures that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with plans to meet NAAQS.*

4.2.1 Study Area and Methodology

4.2.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of air quality include the existing rail corridor in which the Task 5 and Task 6 projects, respectively, would be constructed, and the broader air quality attainment area, where dispersion of project-related emissions could reasonably be expected.

4.2.1.2 Methodology

The Task 5 and Task 6 project areas are located within the cities of Kalama and Kelso, respectively. According to the U.S. Environmental Protection Agency (USEPA) Region 10 attainment designations, neither project area is located within a designated nonattainment or maintenance area, so federal General Conformity requirements do not apply. Therefore, the air quality analysis is limited to a qualitative evaluation of the construction and operational characteristics of the Task 5 and Task 6 projects, and focuses on the Task 5 and Task 6 project elements and their potential to approach the General Conformity *de minimis* thresholds as specified in 40 CFR 93.153. The *de minimis* thresholds are used in the analysis as the metric for identifying adverse environmental impacts. In attainment and maintenance areas, *de minimis* thresholds for all pollutants except lead are 100 tons per year; the *de minimis* threshold for lead is 25 tons per year. Construction analysis considers emissions from construction equipment and dust generated during construction activities. The operations analysis considers emissions from the additional trains that would be operating in the rail corridor. There is also the potential for a change in emission levels from added periods of queuing of automobiles at at-grade crossings of the rail line during operations.

Pollutants of concern considered in this analysis, for which there are National Ambient Air Quality Standards (NAAQS), include the following:

- Carbon monoxide (CO) is a colorless, odorless gas resulting from the incomplete combustion of carbon-based fuels, including petroleum products. In most areas, vehicles are the primary source of CO emissions.
- Nitrogen dioxide (NO_2) is a yellowish-orange to reddish-brown gas resulting from high-temperature combustion. Nitrogen dioxide is important as it is a precursor to Ozone (O_3). Diesel vehicles and power plants are major sources of NO_2.
- Ozone is produced through a complex chemical reaction in which precursor compounds, such as hydrocarbons and nitrogen oxides, are transformed by sunlight into ozone molecules, which consist of three oxygen atoms. The primary emission sources for O_3 precursors are vehicular and industrial plants.
- Particulate matter (PM_{10} and $PM_{2.5}$) consists of suspended dust, fibers, combustion ash, liquid droplets and other fine particles. The major source is industrial emissions, but these pollutants also result from diesel vehicle emissions, unpaved roadways, agricultural activity, and dirt on paved roads kicked up by passing vehicles.
- Sulfur dioxide (SO_2) is a colorless gas with a rotten egg odor that results from the combustion of fuels containing sulfur. Primary sources are coal-fired power plants, industrial plants, and metal smelters, with some emissions from diesel vehicles burning low-grade fuels.
- Lead (Pb) in the atmosphere results primarily from the burning of leaded fuels. Lead pollution has been drastically reduced in the United States in recent years with the banning of leaded automobile fuels.

The air quality evaluation also includes a qualitative analysis of mobile source air toxics (MSATs) from highway vehicles and diesel locomotives. MSATs include benzene; naphthalene gas; 1,3 butadiene; formaldehyde; acrolein; diesel particulate matter and polyorganic cyclic organic matter. Greenhouse gases (GHGs), such as carbon dioxide (CO_2) and CO_2 equivalents (CO_2e are included in the analysis in Section 4.6.

4.2.2 Affected Environment

4.2.2.1 Task 5 Project

The Task 5 study area is located in an attainment area for all NAAQS criteria pollutants. The Task 5 study area consists predominantly of industrial and undeveloped land uses, with some low-density residential land uses near the city of Kalama. The nearest air quality monitoring site is the state maintained (Ecology) Longview-30th Avenue site, located approximately 2 miles west of the Task 5 study area. This site measures concentrations of $PM_{2.5}$. There have been no recent exceedances of the $PM_{2.5}$ NAAQS recorded at this monitoring site.

4.2.2.2 Task 6 Project

The Task 6 study area is located in an attainment area for all NAAQS criteria pollutants. The Task 6 study area consists predominantly of residential, commercial, and industrial areas in the city of Kelso. The nearest air quality monitoring site is the Longview-30th Avenue site, located approximately 10 miles northwest of the Task 6 study area. As described above, this site measures only concentrations of $PM_{2.5}$, and there have been no recent recordings of exceedances of the $PM_{2.5}$ NAAQS.

4.2.3 Environmental Consequences

4.2.3.1 No Build Alternative

Minor maintenance and repair activities along the existing rail line would occur as part of the No Build Alternative. Additionally, there would be no increase in intercity passenger rail service. The continuation of maintenance and repair activities would result in a negligible effect on air quality in the Task 5 and Task 6 study areas. No additional changes to air quality would be anticipated under the No Build Alternative.

4.2.3.2 Build Alternative

4.2.3.2.1 Task 5 Project

Short-term Effects

Minor, short-term effects on air quality would be expected from construction activities associated with the Task 5 project. Construction activities would temporarily generate PM_{10} and $PM_{2.5}$ (mostly dust) and small amounts of other pollutants associated with earthwork and demolition activities. PM from construction activities would be visible if uncontrolled. Mud and particulates from trucks may also be visible if construction trucks are routed through residential neighborhoods. According to the BNSF construction plan, fill material would be delivered to the project site by both rail cars and trucks (with side dump trailers), depending on site access. Ten to 45 trucks per day could be needed for delivering fill (depending on project and task needs) during the construction period [60 to 160 working days]) (HDR Engineering, Inc. [HDR] 2014). Trucks delivering fill material would generate exhaust emissions, but vehicle emissions readily disperse within a short distance from the vehicle. To exceed an NAAQS during construction, a very large number of vehicles would need to be operating at very low speeds (or idling) for long periods of times (on the order of months), which is not anticipated under the Task 5 project construction activities. Because the Task 5 project is in attainment for all priority pollutants and the construction periods are of relatively short duration, vehicle emissions from trucks are not expected to cause exceedances of the applicable NAAQS. Therefore, no exceedance of the NAAQS during construction would be anticipated.

Heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO and nitrogen oxides (NO_x) in exhaust emissions. These emissions would be temporary and limited to the immediate area surrounding the construction site. The temporary use of heavy trucks and construction equipment is not expected to cause exceedance of the applicable NAAQS because there would be only a relatively small number of heavy trucks and other types of construction equipment in operation at any one time. The use of diesel construction equipment would result in a temporary increase in MSAT emissions, especially diesel PM in the Task 5 study area. All emissions from construction activities, including vehicle emissions such as CO, NO_x, and MSATs, and all emissions from temporary facilities, such as asphalt batch plants, would cease at the conclusion of Task 5 project construction.

Long-term Effects

Negligible, long-term effects on air quality would be expected from the operation of trains and increased vehicle queue times at at-grade crossings associated with the Task 5 project. The Task 5 project would support an increase of two daily round trips of Amtrak passenger train service and would also support an increase in the operating speed of both passenger trains and freight trains through the Task 5 study area. The addition of two passenger rail trips represents a minimal increase in overall rail operations and, hence, a minimal increase in overall operational emissions. Therefore, it is not likely that the increase in passenger rail service supported by the Task 5 project would exceed the *de minimis* threshold under the federal General Conformity requirement.

The rail corridor through the Task 5 study area is primarily a freight corridor. The number of freight trains operating in the corridor is independent of the Task 5 project; however, the Task 5 project would support an increase in operating speed of all trains in the corridor (and potentially would reduce the number of idling locomotives, which would reduce the emissions from those sources). This change in operating speed is not anticipated to result in more than a negligible change in pollutant emissions from operating freight trains in the corridor.

A program-level evaluation of potential air quality effects was conducted in 2009 for the *Pacific Northwest Rail Corridor, Washington State Segment – Columbia River to the Canadian Border, Program Environmental Assessment* (WSDOT 2009a), which includes the Task 5 project. The program-level evaluation provides a useful substantiation of the results of this qualitative evaluation. According to that evaluation, "the de minimis air quality analysis that was performed for future rail operations indicated that the de minimis levels for each criteria pollutant was not exceeded. As such, this analysis confirms that the rail program's increased operations conform to the purpose and intent of the State Implementation Plans and Maintenance Plans for achieving the National Ambient Air Quality Standards" (WSDOT 2009a).

The addition of two round trip trains in the Task 5 study area would result in crossing gates being down four more times at each at-grade crossing. Crossing gates being down four more times over a 24-hour period would result in vehicle queues at additional time periods at the crossings. These additional vehicle queues would result in very minor emissions from idling vehicles; this addition would be negligible and would not significantly increase overall emission levels of any criteria pollutants. In addition, CO emissions due to the additional vehicle queues would not result in a level of service (LOS) degradation to LOS D (or worse), which is generally the congestion level at which increased CO emissions could potentially be an issue. LOS is discussed in further detail in Section 4.15.

Summary of Effects

The Task 5 project would have minor, short- and long-term effects on air quality. The Task 5 project would result in an increase in pollutant emissions during construction; however, these emissions would be temporary and would cease at the conclusion of construction. A negligible, long-term increase pollutant in emissions would result from the operation of trains and increased vehicle queue times at at-grade crossings. However, short- and long-term effects would be minimized by adhering to the minimization measures and BMPs. For example, haul roads would be sprayed with water to reduce dust and particulate matter emissions and construction equipment would be maintained with required pollution control devices. The entire list of minimization measures and BMPs applicable to air quality are described in Appendix M. No exceedance of the NAAQS or the *de minimis* threshold under the federal General Conformity requirement is anticipated from construction or operations under the Task 5 project.

4.2.3.2.2 Task 6 Project

Short-term Effects

The short-term effects of the Task 6 project on air quality would be the same as described for the Task 5 project.

Long-term Effects

The long-term effects of the Task 6 project on air quality would be the same as described for the Task 5 project.

Summary of Effects

The Task 6 project would have minor, short- and long-term effects on air quality. The Task 6 project would result in an increase in pollutant emissions during construction; however, these emissions would be temporary and would cease at the conclusion of construction. However, short-term effects would be minimized by adhering to the minimization measures and BMPs. For example, haul roads would be sprayed with water to reduce dust and particulate matter emissions and construction equipment would be maintained with required pollution control devices. The entire list of minimization measures and BMPs applicable to air quality are described in Appendix M. A negligible, long-term increase in pollutant emissions would result from the operation of trains and increased vehicle queue times at at-grade crossings. No exceedance of the NAAQS or the *de minimis* threshold under the federal General Conformity requirement is anticipated from construction or operations under the Task 6 project.

4.3 Water Resources

This section characterizes the water resources (that is, surface waters and floodplains) in the Task 5 and Task 6 study areas and describes the potential effects on water resources that could result from the alternatives.

4.3.1 Study Area and Methodology

4.3.1.1 Study Area

The Task 5 and Task 6 study areas include water resources within the footprint of the project areas of the proposed Task 5 and Task 6 to determine potential encroachments; their associated drainage basins; and downstream receiving waters within 500 feet of each project area. The Task 5 study area is located in Water Resource Inventory Area (WRIA) 27, Lewis Watershed, a 1,050-square-mile drainage basin adjacent to the Columbia River (Wade 2000a). The Task 6 study area is located in WRIA 26, Cowlitz Watershed, an approximately 2,480-square-mile drainage basin (Wade 2000b). Both watersheds are primarily forested and managed for commercial forest products; land uses in the immediate contributing basins of the Task 5 and Task 6 study areas include urban commercial, urban residential, agricultural, and mixed forest (Ecology 2002a, 2002b).

The Washington State Department of Ecology and other natural resources agencies have divided the state into 62 ***Water Resource Inventory Areas*** *as a means of delineating Washington State's major watersheds.*

4.3.1.2 Methodology

Water resources in the Task 5 and Task 6 study areas were identified and evaluated through review of state agency web pages related to watershed and water quality characteristics, geographic information system topographic and drainage basin maps and databases, aerial photographs, county and local jurisdiction drainage master plans, and groundwater protection zone information. Additionally, water resources in the Task 5 and Task 6 study areas that appear on Ecology's 303d list were identified. The 303d list is a list of impaired and threatened waters (that is, stream and river segments and lakes) that do not meet surface water quality standards and are not expected to improve within two years. This analysis considers whether or not the No Build Alternative and Build Alternative would contribute to the degradation of any water resources on the 303d list.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the study areas (FEMA 2001a, 2001b, 2001c, 2001d) were reviewed to identify the locations and extent of floodplains in the Task 5 and Task 6 study areas. In addition, site visits were conducted to supplement the literature review and verify existing conditions in the field.

Potential short-term and long-term effects were assessed by comparing water resources as identified above to Task 5 and Task 6 design information to determine potential encroachments in the study area and to determine if any project activities would degrade water quality. Potential impacts on floodplains (or flooding) were evaluated through review of the FEMA Flood Insurance Study maps, and hydraulic modeling to determine if a rise in surface water flood elevations would result from the No Build and Build Alternatives.

4.3.2 Affected Environment

4.3.2.1 Task 5 Project

4.3.2.1.1 Surface Water Resources – Task 5 Project

*The **303d list** is a list of impaired and threatened waters (that is, stream and river segments and lakes) where pollution controls are not sufficient to attain or maintain applicable water*

Three surface water resources are present in the Task 5 study area—unnamed tributaries 2 and 3 to the Columbia River, and Schoolhouse Creek—as shown in Figure 5. None of these surface waters are identified as impaired on Ecology's 303d list (Ecology 2013a). A brief description of each surface water resource follows:

- Unnamed tributary 2 flows west under the BNSF Railway rail line through a culvert at MP 107.10 and discharges to the Columbia River.
- Unnamed tributary 3 flows through Wetland EE and under the BNSF Railway rail line through a culvert at MP 108.19 before discharging to the Columbia River. As described in Section 3.2.1, under the Build Alternative the existing culvert would be replaced with a fish passable culvert and a natural stream channel at the confluence with the Columbia River.
- Schoolhouse Creek flows west through a culvert under I-5 and Dupont Road, daylights for approximately 20 feet at Wetland I, and then flows west through a culvert under the BNSF Railway rail line at MP 108.96. From this point, Schoolhouse Creek flows through Wetland K to a larger wetland complex west of the BNSF Railway right-of-way and then to the Columbia River.

Additional information related to surface water resources for the Task 5 project is provided in Appendix B.

Floodplains are designated by the Federal Emergency Management Agency (FEMA).

*A **floodplain** is the drainageway and adjoining land that is subject to inundation by flood. The floodplain consists of the following two parts: floodway and floodway fringe.*

*A **floodway** is the channel of a river or other watercourse and adjacent land areas that carry the bulk of floodwater downstream. The floodway must be kept open and free from development or other structures in order to discharge the base flood (that is, the 100-year flood) without cumulatively increasing the base floodwater surface elevation.*

*A **floodway fringe** is the portion of the floodplain landward of the floodway that does not receive the same depth or velocity of water as the floodway. Development, with restrictions, may be allowed in the floodway fringe.*

4.3.2.1.2 Floodplains – Task 5 Project

As illustrated in Figure 6 above, the FEMA Flood Insurance Rate Map for the city of Kalama includes the 100- and 500-year floodplains of the Columbia and Kalama rivers (FEMA 2001b, 2001c). The southern portion of the Task 5 study area, from Robb Road to the city of Kalama south, is within the 100-year floodplain of the Columbia River. The northern end of the Task 5 study area includes several areas where the 100- and 500-year floodplains of the Columbia River occur on the east side and the 100-year floodplain of the Kalama River occurs on the west side of the Task 5 study area. No federally designated levees are located within the Task 5 study area. Additional information related to floodplains for the Task 5 project is provided in Appendix C.

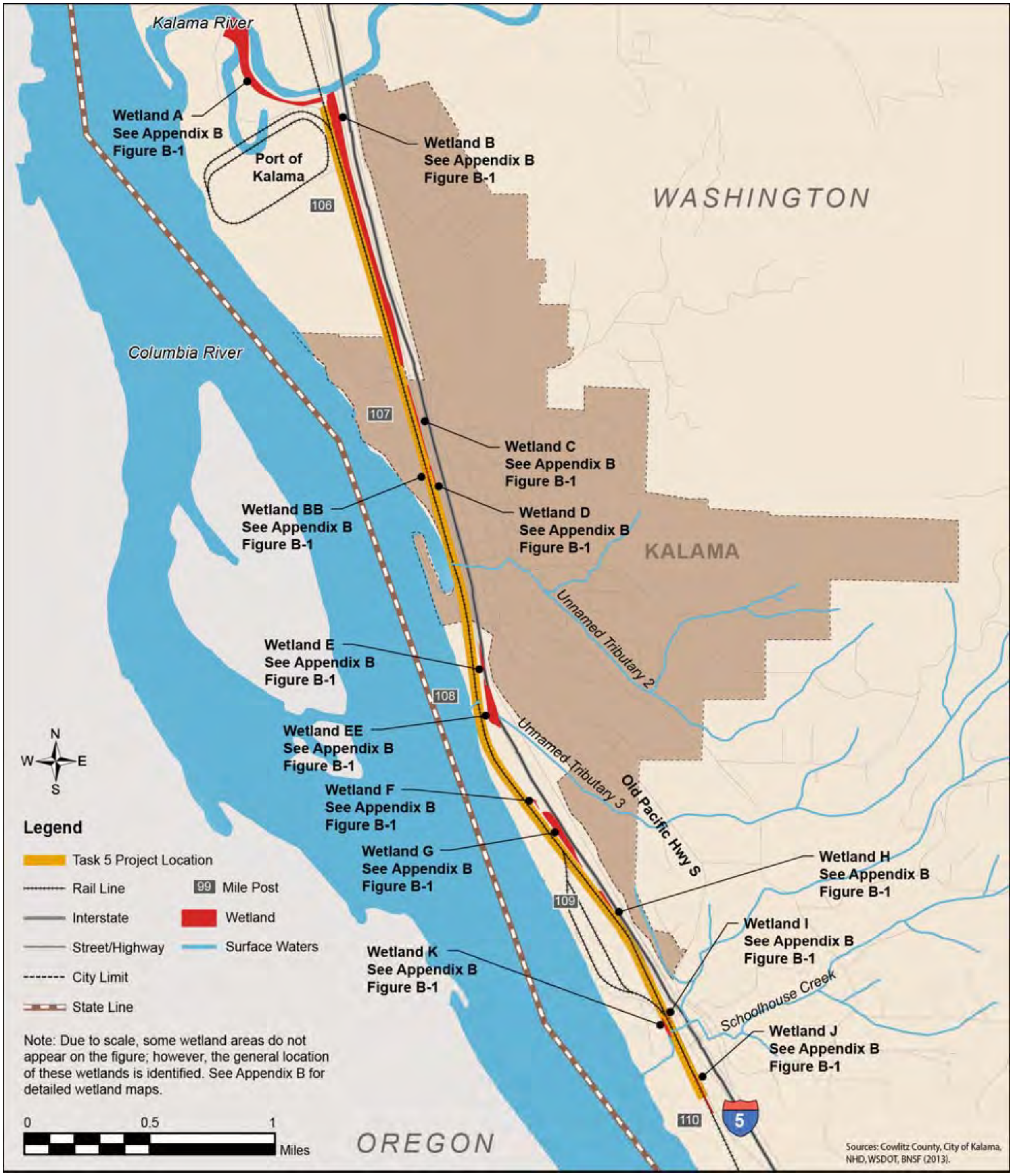

Figure 5. Task 5 Project Surface Waters and Wetlands

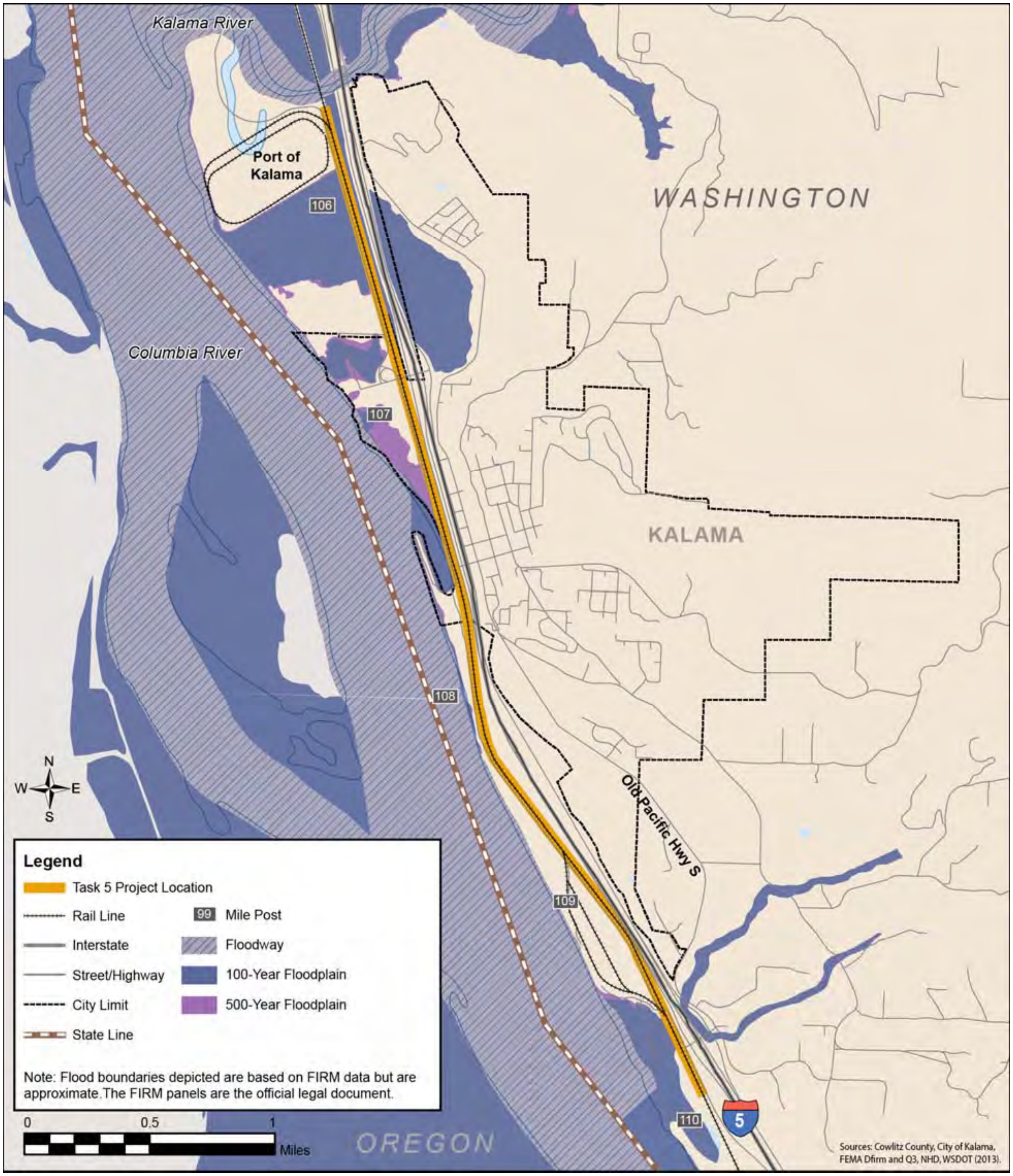

Figure 6. Task 5 Project Floodplains

4.3.2.2 Task 6

4.3.2.2.1 Surface Water Resources – Task 6 Project

Three surface water resources are present in the Task 6 study area—the Cowlitz River, Coweeman River, and Owl Creek—as shown in two figures, Figure 7 and Figure 8. A brief description of each surface water resource follows:

- The Cowlitz River originates on the south side of Mount Rainier and drains approximately 2,480 square miles at its confluence with the Columbia River (FEMA 2001a). The Cowlitz River is a navigable waterway in the Task 6 study area. The river flows from north to south before discharging to the Columbia River downstream of the Task 6 study area. According to Ecology's 303d list, the Cowlitz River is impaired due to elevated temperatures (Ecology 2013a).
- The Coweeman River is a tributary to the Cowlitz River and is also a navigable waterway. The confluence of the Coweeman River and the Cowlitz River is located in the Task 6 study area. An existing BNSF Railway bridge crosses the Coweeman River at MP 100.15. According to Ecology's 303d list, the Coweeman River is impaired due to elevated temperatures (Ecology 2013a).
- Owl Creek originates approximately 5 miles east of the Task 6 study area. Within the Task 6 study area, Owl Creek is a confined channel that flows west, under the BNSF Railway rail line through a culvert at MP 102.15, and continues south, paralleling the west side of the BNSF Railway rail line until discharging to the Columbia River approximately 0.5 mile south of the Task 6 study area. According to Ecology's 303d list, Owl Creek is not listed as impaired (Ecology 2013a).

> ***Navigable waters*** *are those waters that provide a channel for commerce and transportation of people and goods. These waters are regulated by the Rivers and Harbors Act and the Clean Water Act. Work within them can be subject to US Coast Guard permit and review.*

Additional information regarding the affected environment related to surface water resources for Task 6 is provided in Appendix D.

4.3.2.2.2 Floodplains – Task 6 Project

FEMA-designated 100- and 500-year floodplains for the Columbia, Cowlitz, and Coweeman rivers are located within the Task 6 study area (FEMA 2001a, 2001d) and are shown in two figures, Figure 9 and Figure 10. Flooding on the Columbia, Cowlitz, and Coweeman rivers predominantly occurs during the late fall and winter as a result of storms, snowmelt, and saturated soil conditions (FEMA 2001a). The Cowlitz County Consolidated Drainage Improvement District No. 3 operates and maintains two levee segments located within the Task 6 study area: one on the east bank of the Cowlitz River and the other on the north bank of the Coweeman River. The two levee segments tie into the existing BNSF Railway embankment. The levees and the BNSF Railway embankment provide flood protection to the city of Kelso from the high flows in the Cowlitz and Coweeman rivers (Cowlitz County 2013a). The existing BNSF Railway bridge crosses the Coweeman River 100-year floodplain, and portions of the bridge abutments are located within the Coweeman River floodway boundaries. Additional information related to floodplains for the Task 6 project is provided in Appendix E.

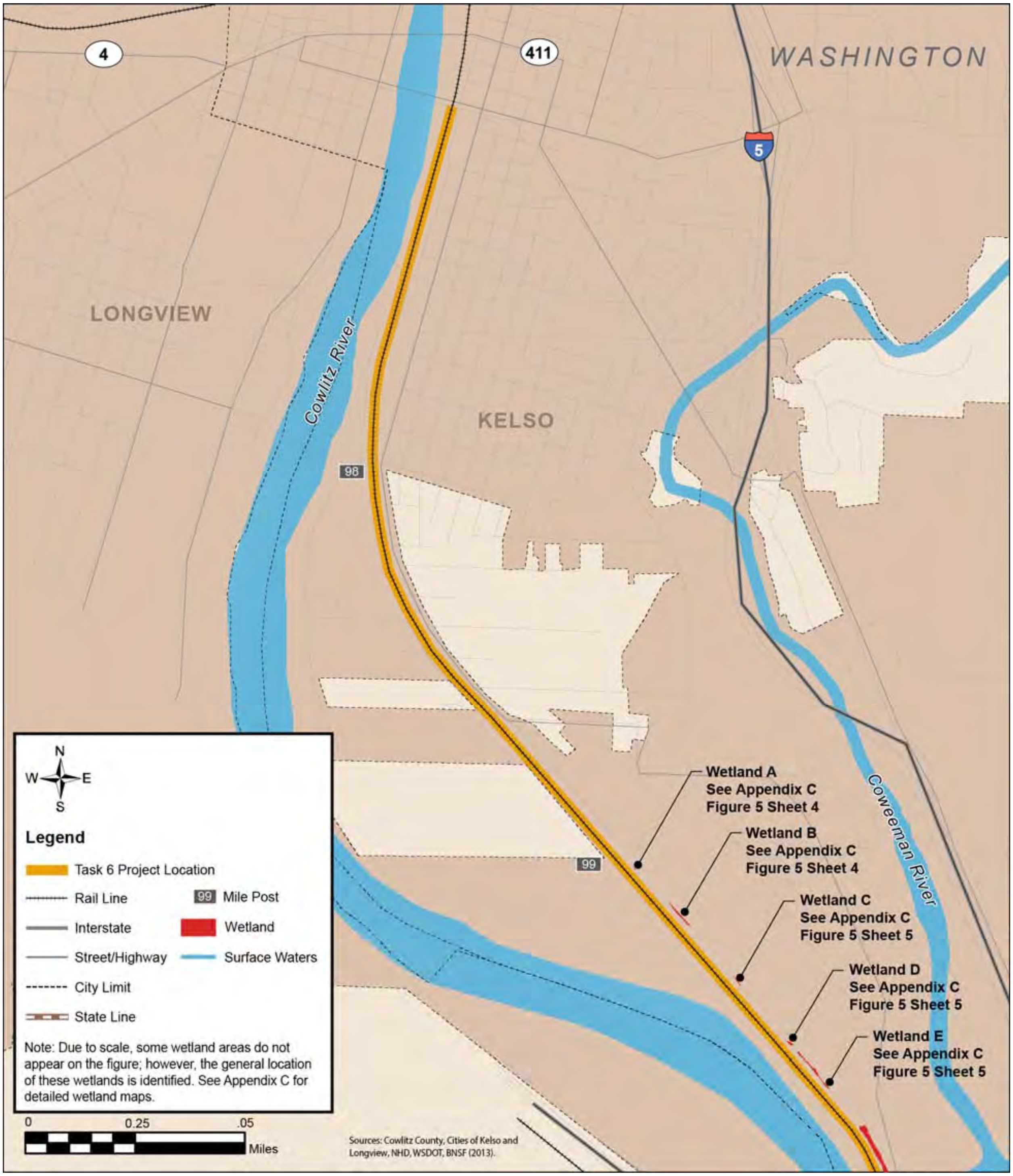

Figure 7. Task 6 Surface Waters and Wetlands – North End

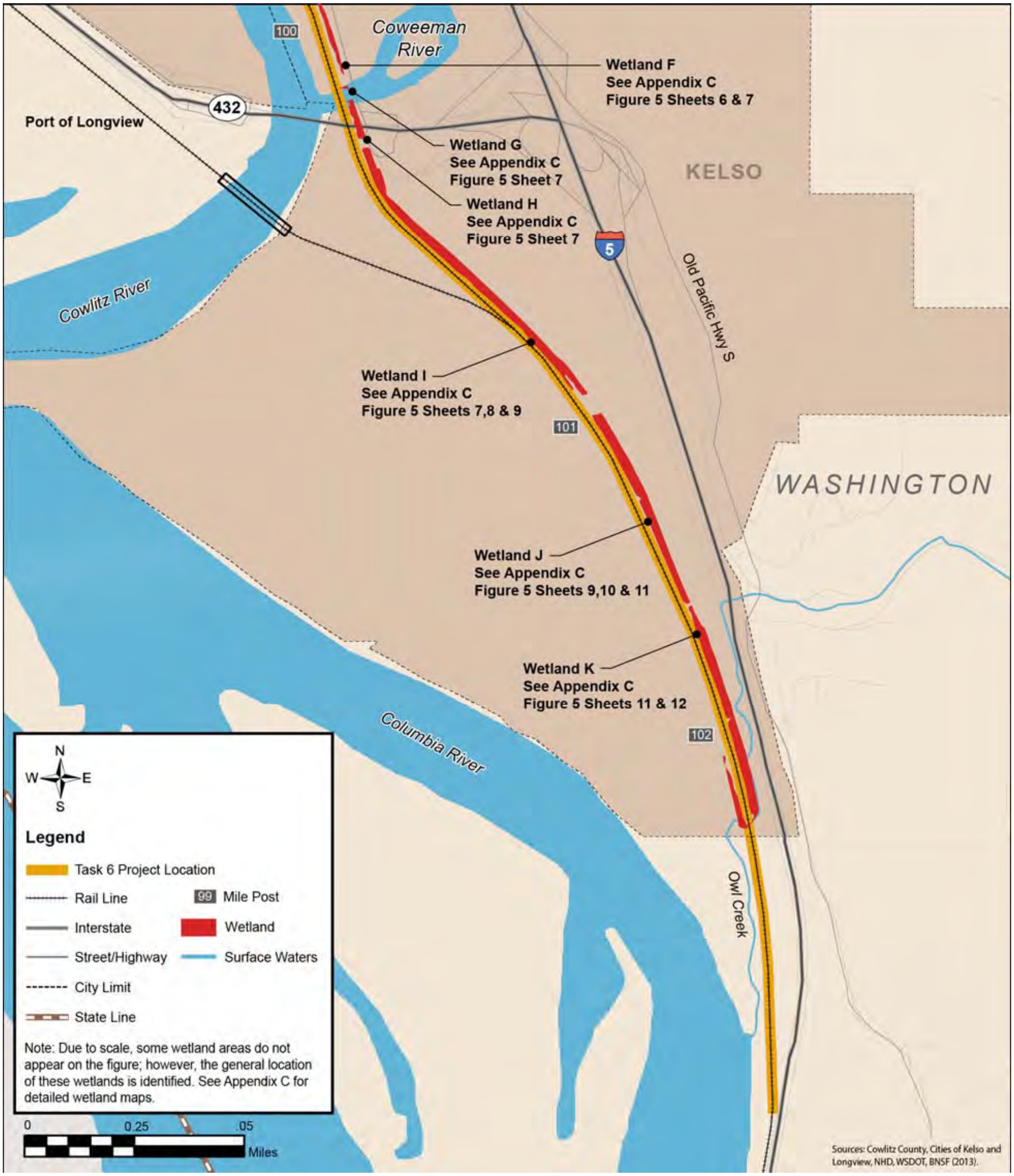

Figure 8. Task 6 Surface Waters and Wetlands – South End

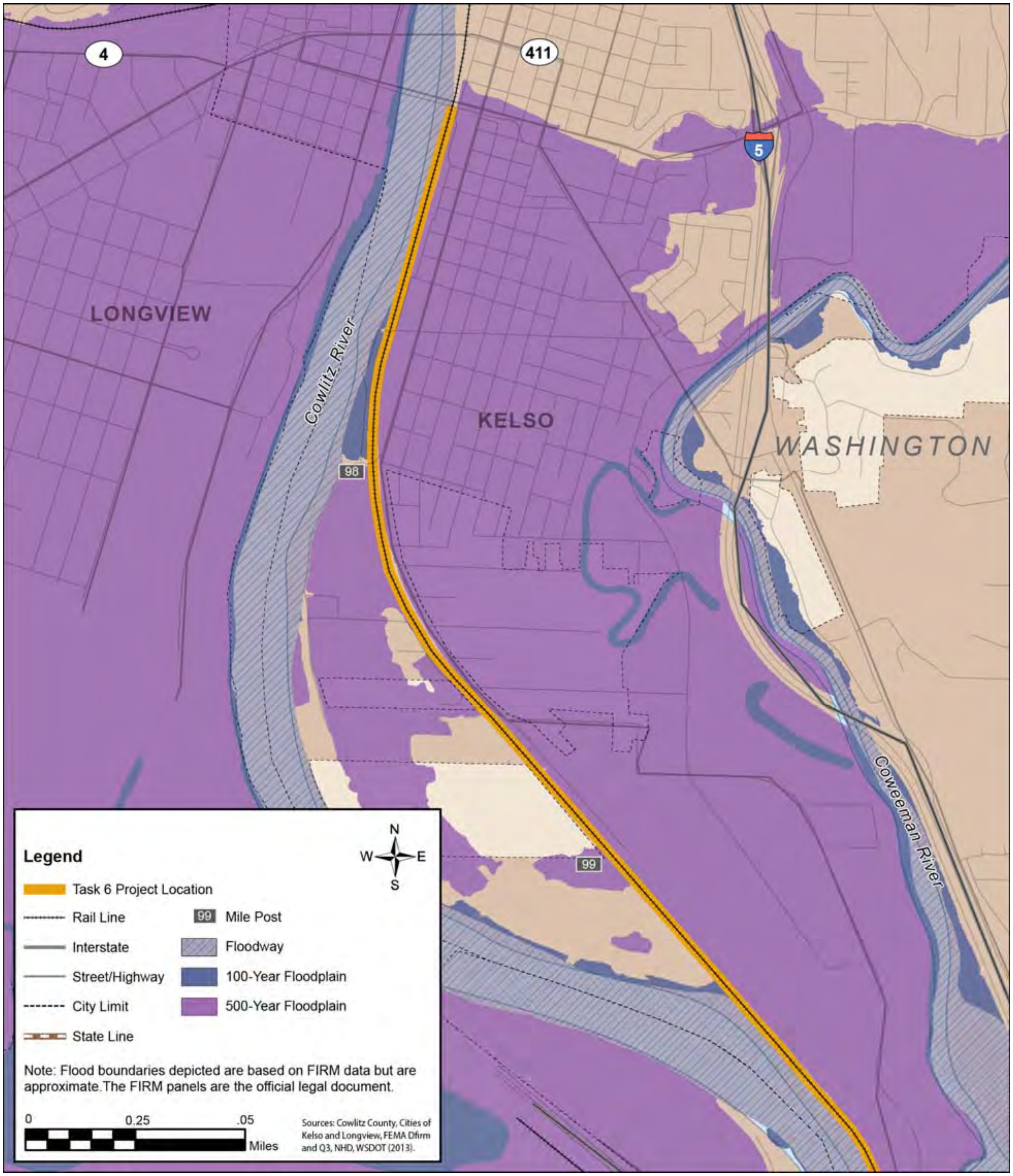

Figure 9. Task 6 Floodplains and Floodways – North End

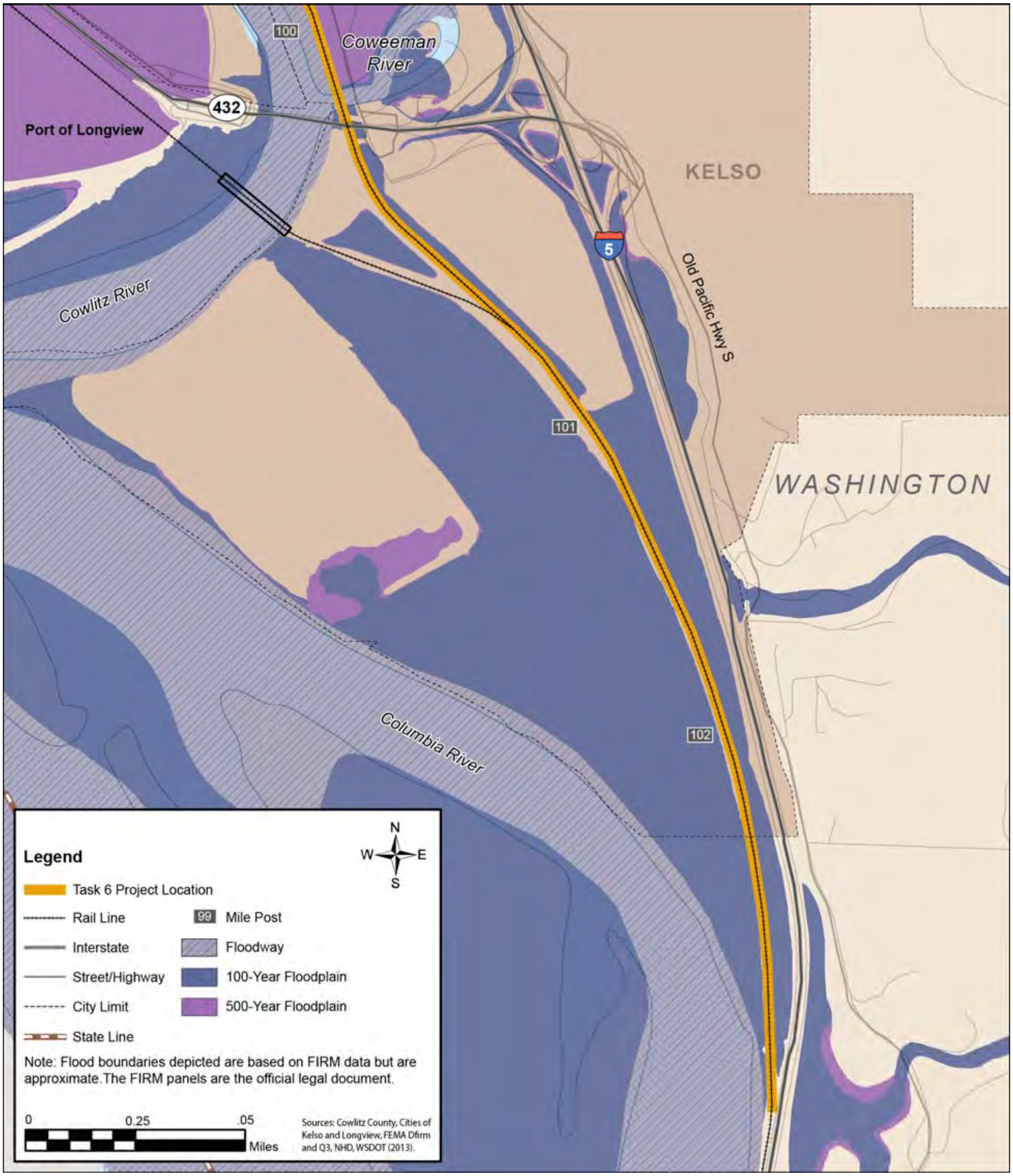

Figure 10. Task 6 Floodplains and Floodways – South End

4.3.3 Environmental Consequences

4.3.3.1 No Build Alternative

The No Build Alternative includes only minor routine maintenance and repair activities necessary to keep the existing BNSF Railway rail line operational. There would also be no increase in intercity passenger rail service. These activities could lead to a release of pollutants such as oil, fuel, or other petroleum products from equipment used into surface waters, floodplains, or other water resources. Releases of pollutants could be mobilized through water runoff into surface water resources, thereby diminishing water quality. Maintenance and repair activities would occur infrequently; therefore, the likelihood of a release of pollutants would be low.

4.3.3.2 Build Alternative

4.3.3.2.1 Task 5 Project

Short-term Effects

Surface Water Resources – Task 5 Project

Short-term effects on surface water resources would result from construction activities associated with the Task 5 project. These activities would include clearing, grading, filling, and excavation for the new third main line, which would result in loss of soil stability, and increased flow velocity and volumes of surface water runoff from the disturbed areas. Construction of staging areas and temporary access roads, and vegetation removal for construction access, could lead to minor erosion and temporarily increased sedimentation into surface waters, resulting in decreased water quality and reduced habitat availability. Effects from clearing activities on vegetation are further described in Section 4.5.3.2.1. Surface water runoff could mobilize sediments and reach surface water resources in the Task 5 study area, resulting in degraded water quality, primarily from increased turbidity. Construction activities occurring during the "wet" season (that is, winter) would have a greater potential effect on surface waters due to an increase in intensity, duration, and recurrence of storm events compared to other times of year to mobilize and carry sediment from the construction activities to surface waters in the Task 5 study area. Construction of the culvert replacement at unnamed tributary 3 (MP 108.19) would occur in the fall season during the later part of the in-water work window (July 15 through October 31) that was requested from the National Marine Fisheries Service (NMFS). A Biological Assessment was prepared and submitted to NMFS to evaluate potential effects to the Endangered Species Act (ESA)-listed Lower Columbia River coho and Lower Columbia steelhead. The proposed in-water work window limits potential effects to ESA-listed species and would be confirmed as part of the Biological Opinion issued by NMFS for the Task 5 project. Work within surface waters would disturb sediments in the stream and increase turbidity levels.

As there are no 303d listed water resources in the Task 5 study area, no effects on 303d listed resources would be anticipated.

There is also the potential for the release of pollutants such as oil, fuel, and other petroleum products from equipment and staging areas during construction. Releases of pollutants could be mobilized through water runoff into surface water resources, thereby diminishing water quality.

Floodplains – Task 5 Project

No short-term effects on floodplains are anticipated to result from construction activities associated with the Task 5 project. Construction activities occurring in floodplains in the Task 5 study area may include temporary placement of fill material, and equipment, but are not anticipated to result in temporary rises in base flood elevations that might increase flooding. In addition, work within surface waters would occur during the in-water work window (July 15 through August 15), when water levels are typically low and flooding is unlikely to occur.

> ***Base Flood Elevation*** *is the elevation to which floodwater is anticipated to rise during the base flood. The Base Flood Elevation is the regulatory requirement for the elevation or flood proofing of structures, and is used to determine flood insurance premiums.*
>
> ***Base flood*** *is a flood event having a one percent chance of being equaled or exceeded in any given year. This term is used in the National Flood Insurance Program to indicate the minimum level of flooding to be used by a community in its floodplain management regulations and correlates to the 100-year flood event.*

Long-term Effects

Surface Water Resources – Task 5 Project

Long-term construction effects would include the placement of permanent fill in surface waters. This would require Clean Water Act (CWA) Section 404 and 401 authorizations for the discharge of fill material into waters of the United States, as discussed further in Section 6.2. The majority of fill placed for the Task 5 project, would consist of pervious materials, such as sub-ballast and ballast rock, for construction of the new third main line. These materials would allow precipitation and runoff to continue to infiltrate the ground and recharge surface water flows in the Task 5 study area. The long-term infiltration of water runoff would continue to decrease peak flows during storm events, thereby contributing to reductions in flooding compared to impervious surfaces such as pavement or concrete. As a result, the placement of these fill materials is not expected to alter surface hydrology from existing conditions. The existing single (36-inch diameter) culvert that conveys unnamed tributary 3 under the main line tracks would be replaced with a fish passable culvert (proposed to be comprised of two 60-inch culverts and a box culvert, plus an open stream channel) that would increase available surface hydrology by conveying sufficient flows to allow for year- round fish passage.

Stormwater treatment facilities are not proposed for the Task 5 project as Ecology does not consider railroad ballast to be a pollution-generating source (Ecology 2012a). The pervious nature of the ballast material allows for infiltration of water runoff containing potential pollutants (e.g., oil drips and leaching of wood preservatives from railroad ties), thereby reducing potential pollutants entering surface water resources; consequently, no changes to water quality would occur for surface water resources in the Task 5 study area.

Floodplains – Task 5 Project

Within the Task 5 study area, the Task 5 project includes the permanent placement of approximately 15,000 cubic yards of material in floodplains. For the new third main line, this includes fill in Wetland B, which acts as stormwater conveyance for the city of Kalama. Effects on wetlands are discussed in Section 4.4.3.2.1. The fill placement in Wetland B would affect stormwater conveyance capacity and could result in flooding; however, as described in Section 5.0, hydraulic modeling indicates that base flood elevations would be maintained by implementing the mitigation measure of expanding Wetland B. Therefore, no long-term effects on floodplains are anticipated. Additional information related to floodplains for the Task 5 project is provided in Section 5.0 and Appendix C.

Summary of Effects

Construction of the Task 5 project would result in short-term effects on water quality from increased turbidity levels and potential releases of pollutants into surface waters. However, minimization measures and BMPs would be implemented to minimize or eliminate effects on water quality. For example, a stormwater pollution prevention plan would be implemented to minimize sediment and spills from entering surface water and applying chemicals such as fertilizers and pesticides in accordance with sound practices to avoid loss of chemicals to stormwater runoff. The entire list of minimization measures and BMPs applicable to water resources are described in Appendix M. The Task 5 project is not anticipated to alter water quality from existing conditions. Replacement of the culvert at unnamed tributary 3 with a larger culvert would allow for more water at a lower velocity through the culvert and reduce the potential for flooding. No short- or long-term effects on floodplains in the Task 5 study area are anticipated because fill placement in the floodplain is not expected to increase base flood elevations.

4.3.3.2.2 Task 6 Project

Short-term Effects

Surface Water Resources – Task 6 Project

The short-term effects from construction under the Task 6 project would be similar to those described for the Task 5 project. Work within the Coweeman River would occur either in one construction season during an extended work window (July 1 through October 31) or in two, shorter, consecutive construction seasons (July 1 through August 31) in the Coweeman River. These two options provide flexibility which may be required in the event that conditions do not accommodate work completion within a single, extended window. Work within surface waters of Owl Creek would occur during the approved work window (July 16 through September 15). A Biological Assessment was prepared and submitted to NMFS to evaluate potential effects to ESA-listed fish species. The longer in-water work window on the Coweeman River would allow for completion of in-water construction activities within a single construction season. However, should field conditions (such as storms and high water) not work to accommodate completion of the work within a single season, two consecutive work windows would be requested from NMFS, and conditions/best management practices established and adhered to for the work. The in-water work window options are included in the Biological Assessment and would be confirmed as part of the Biological Opinion to be issued by NMFS for the Task 6 project. The Coweeman and Cowlitz Rivers are both listed on the 303d list as impaired due to elevated temperatures. Task 6 project activities would not affect the temperature levels of either river; therefore, no 303d related effects are anticipated.

Floodplains – Task 6 Project

Similar to the short-term effects described for the Task 5 project, construction activities occurring in floodplains in the Task 6 study area may include temporary placement of fill material, cofferdams, and equipment. In addition to the CWA Section 404 and 401 authorizations required for temporary placement of fill in the Coweeman River and Owl Creek, a Rivers and Harbors Act Section 10 permit from the U.S. Army Corps of Engineers (Corps) would be required for work in the Coweeman River; a Section 408 permit may be required as well. Temporary fill materials are not anticipated to result in temporary rises in base flood elevations in Owl Creek that might increase flooding. Construction of the Coweeman River Bridge crossing would include temporary placement of fill material, such as cofferdams and construction pads, and equipment in the Coweeman River floodplain and floodway. Construction would occur during a single, low water season (July 1 through October 31); therefore, temporary rises in the Coweeman River base flood elevation would not be expected. Excavation along the north bank of the Coweeman River would be associated with construction of the north abutment for the new Coweeman River Bridge crossing. This excavation would be minor and would not result in a change to flood protection associated with the Coweeman River; the north abutment and the associated modifications of the levees would maintain the integrity of the levees and would not result in a change to flood protection around the Coweeman River. Additional information related to floodplains for the Task 6 project is provided in Appendix E.

Long-term Effects

Surface Water Resources – Task 6 Project

Long-term effects on surface water resources for the Task 6 project would be similar to those described for the Task 5 project.

Floodplains – Task 6 Project

Long-term effects on floodplains from operations for the Task 6 project would be similar to those described for the Task 5 project. The Task 6 project would include the placement of approximately 100,000 cubic yards of material in floodplains within the study area. Of the total amount of fill placed in the floodplain, a small portion (approximately 100 cubic yards) would be placed in the Coweeman River floodway to construct new bridge abutments and piers. Modeling conducted for the Task 6 project indicates that a slight increase in the Coweeman River base flood elevation, less than 0.1 foot, could result from fill placement in the Coweeman River floodway. However, this fill placement in the floodway would not impact the regulatory base flood elevation established by FEMA. This is primarily because fill placement would not decrease the available capacity of the floodplain to convey surface flows that could cause flooding. The balance of the fill would be installed along the rail corridor length, to accommodate the third main track. Further, analysis is being conducted with the Portland District of the Corps with respect to levee modification and final configuration. Additional information related to floodplains for the Task 6 project is provided in Appendix E.

Summary of Effects

Construction of the Task 6 project would result in short-term effects on water quality from increased turbidity levels and potential releases of pollutants into surface waters. However, minimization measures and BMPs would be implemented to minimize or eliminate effects on water quality. For example, a stormwater pollution prevention plan would be implemented to minimize sediment and spills from entering surface water, and applying chemicals, such as fertilizers and pesticides, in accordance with sound practices to avoid leaching of chemicals into surface waters from stormwater runoff. The entire list of minimization measures and BMPs applicable to water resources are described in Appendix M. The Task 6 project is not anticipated to alter surface hydrology or water quality from existing conditions; therefore, no long-term effects are anticipated. No short- or long-term effects on floodways and floodplains are anticipated because the Task 6 project would not permanently alter or raise the base flood elevations for the floodplains in the Task 6 study area beyond the regulatory base flood elevations established by FEMA. Construction activities associated with the Task 6 project would not change the flood protection associated with the Coweeman River.

4.4 Wetlands

This section characterizes the wetlands in the Task 5 and Task 6 study areas and describes the potential effects on wetlands that could result from the alternatives.

Wetlands in Washington are rated from Category I to Category IV, with Category I wetlands having the highest functionality and Category IV having the lowest.

Category I wetlands *represent unique or rare wetland types, are more sensitive to disturbance, are relatively undisturbed, or provide a high level of functionality.*

Category II wetlands *are difficult, though not impossible, to replace and provide high levels of some functions.*

Category III wetlands *have a moderate level of function and occur more commonly. Generally these wetlands are smaller and less diverse than Category I and II wetlands.*

Category IV wetlands *have the lowest level of functionality and are often heavily disturbed.*

4.4.1 Study Area and Methodology

4.4.1.1 Study Area

The Task 5 and Task 6 study areas for field delineation of wetlands are limited to the BNSF Railway right-of-way for the Task 5 and Task 6 projects, respectively. Wetlands and streams extending outside of the Task 5 and Task 6 study areas were not formally delineated, but were assessed based on observations of characteristics from the BNSF Railway right-of-way and information obtained from existing documents, studies, maps, and aerial photographs.

4.4.1.2 Methodology

Wetlands were delineated within the Task 5 and Task 6 study areas in January 2013 using the methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (Environmental Laboratory 2010). Each wetland was rated using

Ecology's *Washington State Wetland Rating System for Western Washington* (Ecology 2006) to determine the wetland category, which is used primarily for determining mitigation requirements. In addition, a general assessment of functions was completed using the WSDOT *Wetland Functions Characterization Tool for Linear Projects* (Null, Skinner, and Leonard 2000). Wetland boundaries and data points were flagged in the field, surveyed by a licensed surveyor, and mapped for purposes of this analysis. Additional details regarding the methods for delineating and evaluating wetlands in the Task 5 and 6 study areas are provided in the Wetland and Stream Delineation Reports in Appendices B and D, respectively. Once wetlands were identified, the effects on wetlands were assessed by comparing the surveyed wetland boundaries to the proposed footprints of the Task 5 and Task 6 project areas for each alternative to determine potential encroachments in the study area and to determine if any project activities would degrade wetland function or quality.

4.4.2 Affected Environment

4.4.2.1 Task 5 Project

Thirteen wetlands were identified in the Task 5 study area, as shown in Figure 5., in Section 4.3, and summarized in Table 3. Additional information regarding the wetland vegetation, soils, hydrology, and functions is provided in Appendix B. The wetlands are primarily located between arterial roads and highways and the BNSF Railway rail line. Two wetlands are associated with the Kalama River and its side channels, and one wetland adjoins Schoolhouse Creek. None of the wetlands are Category I wetlands. Four wetlands are Category II wetlands (Wetlands A, B, EE, and F) based on moderate to high scores for hydrology, water quality, and habitat. The remaining wetlands were rated as Category III (Wetlands BB, C, D, E, G, H, I, J, and K) with low to moderate levels of hydrologic, water quality, and habitat functions.

Table 3. Wetland Acreage by Category within the Task 5 Study Area

Wetland Category [a]	Number of Wetlands	Wetland Size in BNSF Railway Right-of-Way (acres)	Hydrogeomorphic (HGM) Classification [b]	Cowardin Classification [c]	Dominant Vegetation
Category I	0	0	N/A	N/A	N/A
Category II	4	8.1	Depressional and Riverine	PFO/PSS	Black cottonwood, red alder, willow, red osier dogwood, reed canarygrass
Category III	9	1.2	Depressional	PFO/PSS/PEM	Oregon white oak, willow, red osier dogwood, reed canarygrass
Category IV	0	0	N/A	N/A	N/A
Total	13	9.3			

Notes:

[a] *Rating according to Ecology (2006).*

[b] *HGM classification according to Ecology (2006). Depressional wetlands occur in depressions where elevations within the wetland are lower than in the surrounding landscape; movement of surface water and shallow subsurface water is toward the lowest point in the depression. Riverine wetlands occur in valleys associated with stream or river channel and are frequently flooded by overbank flow from the stream or river.*

[c] *Cowardin et al. (1979) or National Wetland Inventory Class based on vegetation: PFO = Palustrine Forested; PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent.*

4.4.2.2 Task 6 Project

Eleven wetlands were identified in the Task 6 study area, as shown in Figure 7 and Figure 8, above in Section 4.3, and summarized in Table 4. Additional information regarding the wetland vegetation, soils, hydrology, and functions is provided in Appendix D. Similar to wetlands in the Task 5 study area, the wetlands in the Task 6 study area are primarily located between arterial roads/highways and the BNSF Railway rail line. Some of the higher-quality wetlands are associated with waterbodies such as the Coweeman River and Owl Creek. One wetland is a Category I wetland (Wetland K) based on high scores for water quality, hydrology, and wetland functions; three wetlands are Category II wetlands (Wetlands F, H, and J) based on moderate to high scores for hydrology, water quality, and habitat. The remaining seven wetlands were rated as Category III wetlands (Wetlands A, B, C, D, E, G, and I) with low to moderate levels of hydrology, water quality, and habitat functions.

Table 4. Wetland Acreage by Category within the Task 6 Study Area

Wetland Category [a]	Number of Wetlands	Wetland Size in BNSF Railway Right-of-Way (acres)	Hydrogeomorphic (HGM) Classification [b]	Cowardin Classification [c]	Dominant Vegetation
Category I	1	7.3	Riverine	PAB/PEM/PSS/ PFO	Oregon ash, red osier dogwood
Category II	3	8.3	Depressional and Riverine	PAB/PEM/PSS/ PFO	Black cottonwood, Douglas spirea, Nootka rose, reed canarygrass, yellow flag iris
Category III	7	9.3	Depressional and Riverine	R1EM/ PAB/PEM/PSS/ PFO	Black cottonwood, Oregon ash, Douglas spirea, red osier dogwood, reed canarygrass, tall scouring rush
Category IV	0	0	N/A	N/A	N/A
Total	11	24.9			

Notes:

[a] *Rating according to Ecology (2006).*

[b] *HGM classification according to Ecology (2006). Depressional wetlands occur in depressions where elevations within the wetland are lower than in the surrounding landscape; movement of surface water and shallow subsurface water is toward the lowest point in the depression. Riverine wetlands occur in valleys associated with stream or river channel and are frequently flooded by overbank flow from the stream or river.*

[c] *Cowardin et al. (1979) or National Wetland Inventory Class based on vegetation: PAB = Palustrine Aquatic Bed; PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; R1EM = riverine tidal emergent.*

4.4.3 Environmental Consequences

4.4.3.1 No Build Alternative

If the Task 5 and Task 6 projects are not built, Amtrak's *Cascades* and *Coast Starlight* passenger train service would continue to use the existing BNSF Railway rail line through Kalama and Kelso. The No Build Alternative includes only continuation of minor maintenance and repair activities necessary to keep the existing BNSF Railway rail line operational. There would also be no increase in intercity passenger rail service. Maintenance and repair activities could lead to a release of pollutants such as oil, fuel, or other petroleum products from equipment used into wetlands. Releases of pollutants could be mobilized through water runoff into wetlands. Maintenance and repair activities would occur infrequently; therefore, the likelihood of a release of pollutants would be low.

4.4.3.2 Build Alternative

4.4.3.2.1 Task 5 Project

Short-term Effects

Construction activities for the Task 5 project would result in a short-term loss of wetland functions associated with habitat and water quality. Construction of staging areas and temporary access roads, and vegetation removal for construction access, could lead to minor erosion and temporarily increased sedimentation in wetlands, resulting in decreased water quality and reduced habitat availability. Dewatering of isolated areas for in-water work required for construction may cause local, temporary changes in wetland hydrology. Accidental fuel and oil leaks and improperly handled construction stormwater could also result in short-term effects on wetlands from impaired water quality, damage to wetland vegetation, and diminished wildlife habitat. Damaged or temporarily cleared vegetation would decrease the ability of wetlands to reduce water velocities during storm events. Once construction is completed, temporary fill would be removed from wetlands, pre-existing elevations would be restored, and revegetation would occur. Full functionality in all temporarily affected wetlands would return once temporarily cleared vegetation regrows (within 1 year for emergent vegetation and 5 years or more for shrubs and trees).

Long-term Effects

Long-term effects from construction of the Task 5 project would result in the permanent loss of 3.6 acres of wetlands, including 3.0 acres of Category II wetlands, as shown in Table 5. Permanent loss would occur from placement of pervious materials, such as sub-ballast and ballast rock, and extension of existing culverts in wetlands. The permanent loss of wetlands in the Task 5 project area would affect the ability of the wetlands to perform hydrologic and water quality functions. Habitat functions and availability for wildlife species use would also decrease. Table 5 shows the loss of wetlands by category for Task 5.

Stormwater treatment facilities are not proposed for the Task 5 project as railroad ballast is not considered by Ecology to be a pollution-generating source (Ecology 2012a). The pervious nature of the ballast material allows for infiltration of water runoff containing potential pollutants (e.g., oil drips and leaching of wood preservatives from railroad ties), thereby reducing potential pollutants entering wetlands; consequently, no changes to water quality would occur for wetlands in the Task 5 study area.

As described in Section 4.3.3.2.1, the Task 5 project would not modify the surface hydrology in the Task 5 study area. The majority of fill placed would be pervious materials that would allow precipitation and runoff to continue to infiltrate the ground and recharge wetlands in the Task 5 study area.

Table 5. Estimate of Permanent Wetland Effects by Category, Task 5 Project

Wetland Category	Number of Wetlands	Permanent Wetland Effect (acres)
Category I	0	0
Category II	4	3.0
Category III	9	0.6
Category IV	0	0
Total Permanent Wetland Effects	13	3.6

Summary of Effects

Temporary effects on wetlands during construction of the Task 5 project would result from increased sedimentation and placement of temporary fill, which would temporarily decrease water quality and reduce habitat availability. Temporary construction effects on wetland vegetation would decrease the ability of the wetland to reduce water velocities during storm events. However, minimization measures and BMPs would be implemented to minimize or eliminate effects on wetlands. For example, disturbed areas would be stabilized with native grass and plant species following construction to minimize sedimentation and stabilizing exposed soils to prevent erosion. The entire list of minimization measures and BMPs applicable to wetlands are described in Appendix M. Once construction is completed, temporary fill would be removed from wetlands, and pre-existing elevations would be restored.

Long-term construction effects of the Task 5 project would include permanent placement of fill in 3.6 acres of wetlands, which would decrease wetland functions related to flood water conveyance and habitat functions in the Task 5 study area. These long-term permanent effects from construction would be mitigated through purchase of mitigation bank credits as described in Section 5.0. Long-term operation of the Task 5 project would not result in changes to recharge of wetlands or water quality functions from current conditions.

4.4.3.2.2 Task 6 Project

Short-term Effects

Construction activities for the Task 6 project would result in a short-term loss of wetland functions associated with habitat and water quality. Ground disturbance would result in minor erosion of disturbed soils into wetlands and buffer areas, temporarily impairing vegetation and habitat as described for the Task 5 project. Short-term effects from other construction activities under the Task 6 project would be similar to those described for the Task 5 project.

Long-term Effects

Long-term effects from construction of the Task 6 project would result in the permanent loss of 6.8 acres of wetlands, the majority of which would be Category III wetlands, as shown in Table 6. Permanent construction effects and long-term operational effects on wetlands under the Task 6 project would be similar to those described for the Task 5 project.

Table 6. Estimate of Permanent Wetland Effects by Category, Task 6

Wetland Category	Number of Wetlands	Permanent Wetland Effect (acres)
Category I	1	1.9
Category II	3	2.3
Category III	7	2.6
Category IV	0	0
Total Permanent Wetland Effects	11	6.8

Summary of Effects

Temporary effects on wetlands during construction of the Task 6 project would result from increased sedimentation and placement of temporary fill, which would temporarily decrease water quality and reduce habitat availability. Temporary construction effects on wetland vegetation would decrease the ability of the wetland to reduce water velocities during storm events. However, minimization measures and BMPs would be implemented to minimize or eliminate effects on wetlands. For example, disturbed areas would be stabilized with native grass and plant species following construction to minimize sedimentation and stabilizing exposed soils to prevent erosion. The entire list of minimization measures and BMPs applicable to wetlands are described in Appendix M. Once construction is completed, temporary fill would be removed from wetlands, and pre-existing elevations would be restored.

Long-term construction effects of the Task 6 project would include permanent placement of fill in approximately 6.8 acres of wetlands, which would reduce wetland size and decrease wetland functions related to flood water conveyance and habitat functions in the Task 6 study area. These long-term permanent effects from construction would be mitigated through purchase of mitigation bank credits and fee acquisition of wetland properties for permanent preservation as described in Section 5.0. Long-term operation of the Task 6 project would not result in changes to recharge of wetlands or water quality functions from current conditions.

4.5 Ecological Resources and Threatened & Endangered Species

Ecological resources described in this section include vegetation, fish, and wildlife (including ESA-listed species), and essential fish habitat (EFH). This section characterizes the ecological resources in the Task 5 and Task 6 study areas and describes the potential effects that could result from the alternatives.

4.5.1 Study Area and Methodology

4.5.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of ecological resources, ESA-listed species, and EFH correspond to the Task 5 and Task 6 action areas for the Biological Assessments, provided in Appendix F and Appendix G. The Task 5 study area is approximately 1,100 feet from the edge of the proposed project footprint in the Task 5 project area, and the Task 6 study area extends approximately 2.2 miles to 6 miles from the edge of the proposed footprint in the Task 6 project area. The Task 5 and Task 6 study areas are intended to capture the area of disturbance by project activities that would affect ecological resources, ESA-listed species, and EFH. The project activity that extends the farthest and has the potential to affect the most habitat and species is related to construction equipment noise due to the ease of which noise travels through the air and underwater. The Task 5 project would include the use of loud equipment such as an auger drill rig, bulldozer, and rock drill during construction. The Task 6 project would include the use of the same equipment as the Task 5 project and would add the use of an impact pile driver. Due to pile driving activities and the associated noise levels that would be generated during construction, the Task 6 study area around the Coweeman River is larger than the Task 5 study area.

4.5.1.2 Methodology

During the Section 7 ESA consultation process, one of the following determinations would be made regarding the project's potential effects to ESA-listed species/critical habitat:

No effect*: There would be no effects to ESA-listed species/critical habitat, positive or negative.*

May Affect, but Not Likely to Adversely Affect*: All effects are either beneficial, insignificant (undetectable, not measured, or cannot be evaluated) or extremely unlikely.*

May Affect, and is Likely to Adversely Affect*: ESA-listed species/critical habitat are likely to be exposed to the action or its consequences and respond negatively to the exposure.*

Ecological resources, including ESA-listed species and EFH, were identified and evaluated through review of mapped and written information. Specifically, the vegetation, fish, and wildlife (both listed and non-listed species) found in the Task 5 and Task 6 study areas were identified using Washington Department of Fish and Wildlife (WDFW) datasets; species lists from U.S. Fish and Wildlife Service (USFWS) and NMFS; rare plant datasets (current and historic) from the Washington State Department of Natural Resources Natural Heritage Program; and personal communications with WDFW, USFWS, NMFS, the Cowlitz Indian Tribe, and the Center for Natural Lands Management. Aerial photography, soils and vegetation geodata mapping, and site visits were performed to observe and document ecological conditions and habitat types in the Task 5 and Task 6 study areas. In addition, the Washington State Noxious Weed Control Board (WSNWCB) list of noxious plant species (2013) was reviewed. Noxious weeds are nonnative, invasive species that contribute to the loss of agricultural production or ecological diversity. Vegetation, fish, and wildlife identified in the Task 5 and Task 6 study areas were analyzed to determine the effects that project activities for the No Build and Build Alternatives would have on each resource. Potential short-term and long-term effects were assessed by comparing the habitat information for species in the project area to determine if habitat quality would be degraded and by evaluating whether the project would directly affect individuals of any species in the project area.

For ESA-listed species and designated critical habitat the effects analysis determines if the project will have “no effect”, “may affect but is not likely to adversely affect”, or “may affect and is likely to adversely affect”. The effects described below are detailed in the Biological Assessments for the Task 5 and Task 6 projects (Appendix F and G). The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), determines whether or not the project “may adversely affect” designated EFH for relevant commercially, federally managed fisheries species within the Task 5 and Task 6 study areas. The EFH assessment is presented in detail in Appendix F and G and summarized below.

4.5.2 Affected Environment

4.5.2.1 Task 5 Project

4.5.2.1.1 Vegetation – Task 5 Project

Vegetation in the Task 5 study area varies between the BNSF Railway right-of-way and other undeveloped areas in the Task 5 study area. Within the BNSF Railway right-of-way is generally bare ground or sparse vegetation, with weeds and invasive species such as Himalayan blackberry and Scotch broom. In undeveloped areas within the greater Task 5 study area, the vegetation includes disturbed, weedy communities typical of unmaintained residential or industrial areas; mixed scrub-shrub to forested upland communities; and wetland and riparian communities. Noxious weeds were found in the Task 5 study area and include reed canarygrass, Himalayan blackberry, and Scotch broom. No ESA-listed plant species are known to occur in the Task 5 study area.

4.5.2.1.2 Fish – Task 5 Project

Within the Task 5 study area, unnamed tributaries 2 and 3, and Schoolhouse Creek (see Figure 5., above) contain fish species that are primarily resident species and typically include suckers, rainbow trout, and mountain whitefish. These are not ESA-listed fish species. The habitat in the Task 5 study area is suitable for other non-listed species of fish; however, presence has not been documented. As described in Section 4.3.2.1.1, none of these surface waters are identified as impaired on Ecology’s 303d list and would not limit available habitat for fish.

Unnamed tributary 3 and Schoolhouse Creek (see Figure 5., above) also have documented occurrences of two ESA-listed fish species: Lower Columbia River coho Evolutionary Significant Unit (ESU) (federally listed as threatened) and Lower Columbia River steelhead Distinct Population Segment (DPS) (federally listed as threatened). Critical habitat for Lower Columbia River steelhead DPS and proposed critical habitat for Lower Columbia River coho (NMFS, January 14, 2013) are also present in these two streams within the Task 5 study area. Additional information regarding ESA-listed fish species is provided in Appendix F.

Pacific salmon EFH is within the Task 5 study area because Chinook and coho are present in unnamed tributaries 2 and 3, and Schoolhouse Creek (see Figure 5., above). No groundfish or pelagic species EFH is in the Task 5 study area. Additional information regarding EFH is provided in Appendix F.

4.5.2.1.3 Wildlife – Task 5 Project

Wildlife habitat in the Task 5 study area varies between the BNSF Railway right-of-way and other undeveloped areas in the Task 5 study area. Wildlife habitat is generally of low value (for example, disturbed and weedy communities) and limits the support available to wildlife species compared to higher value habitat (for example, undisturbed forested riparian area). Field observations indicate that the Task 5 study area provides habitat for smaller mammals such as beaver, squirrel, rabbit, raccoon, coyote, and river otter. Beaver signs (that is, chewed tree trunk/branch ends) were noted in the vicinity of unnamed tributary 3 in the Task 5 study area but were estimated to be between 2 and 5 years old. The Task 5 study area also provides a variety of suitable habitat types that support birds; these habitat types include wetlands, scrub-shrub, forest, and grasslands. Numerous bird species have been documented in the Task 5 study area; these birds either inhabit or pass through the Task 5 study area, including cavity nesting ducks, wading birds, woodpeckers, raptors, and songbirds.

One ESA-listed wildlife species is documented in the Task 5 study area: Columbian white-tailed deer Columbia River DPS (federally listed as endangered). A population of Columbian white-tailed deer Columbia River DPS has been relocated by the USFWS west of the Task 5 study area to Cottonwood Island within the Columbia River. Radio-collared Columbian white-tailed deer are documented as far south as the Kalama River near the northern end of Task 5 study area (USFWS 2014). Additional information regarding ESA-listed wildlife species is provided in Appendix F.

4.5.2.2 Task 6 Project

4.5.2.2.1 Vegetation – Task 6 Project

Similar to the Task 5 project, vegetation in the Task 6 study area varies between the BNSF Railway right-of-way and other undeveloped areas in the Task 6 study area. Vegetation within the BNSF Railway right-of-way generally consists of bare ground or is sparsely vegetated with weeds and invasive species such as Himalayan blackberry and Scotch broom. In undeveloped areas within the greater Task 6 study area, the vegetation includes disturbed, weedy communities typical of unmaintained residential or industrial areas; mixed scrub-shrub to forested upland communities; and wetland and riparian communities. Dominant riparian and wetland species include black cottonwood, red alder, Oregon ash, red-osier dogwood, rose, willow, and reed canarygrass. No ESA-listed plant species are known to occur in the Task 6 study area.

Weed species are prevalent throughout the Task 6 study area, including several listed on the Washington State Noxious Weed List (WSNWCB 2013). Himalayan blackberry, English ivy, Scotch broom, and yellow archangel are common weeds in upland areas in the Task 6 study area. Reed canarygrass, Himalayan blackberry, and yellow flag iris are common weeds in wetlands in the Task 6 study area.

4.5.2.2.2 Fish – Task 6 Project

Within the Task 6 study area, the Cowlitz River, Coweeman River, and Owl Creek (see Figure 7 and Figure 8, above) contain fish species that are primarily resident species and typically include rainbow trout, mountain whitefish, and largemouth bass. These fish species are not ESA-listed species. The habitat in the Task 6 study area is suitable for other non-listed species of fish; however, presence has not been documented. As described in Section 4.3.2.2.1, the Cowlitz River and the Coweeman River are identified as impaired due to elevated temperature on Ecology's 303d list, and Owl Creek is not listed as impaired by Ecology. Therefore, the Cowlitz and Coweeman Rivers increased temperatures would limit the suitable fish habitat available in the river. The Cowlitz River, Coweeman River, and Owl Creek have documented occurrences of several ESA-listed fish species and critical habitat, which are summarized in Table 7. Detailed information regarding occurrence of ESA-listed fish species and EFH in the Task 6 study area is provided in Appendix G.

Pacific salmon EFH is within the Task 6 study area because Chinook and coho are present in the Cowlitz River, Coweeman River, and Owl Creek (see Figure 7 and Figure 8, above). No groundfish or pelagic species EFH is in the Task 6 study area. Additional information regarding EFH is provided in Appendix G.

Table 7. ESA-Listed Fish Species in the Task 6 Study Area.

Common Name	Scientific Name	ESU or DPS[a]	Federal Status[b]	Designated Critical Habitat
Coho salmon	*Oncorhynchus kitsutch*	Lower Columbia River ESU	Threatened	Proposed – In Study Area
Chinook salmon	*Oncorhynchus tshawytscha*	Lower Columbia River ESU	Threatened	Designated – In Study Area
Chum salmon	*Oncorhynchus keta*	Columbia River ESU	Threatened	Designated – In Study Area
Steelhead	*Oncorhynchus mykiss*	Lower Columbia River ESU	Threatened	Designated – In Study Area
Bull trout	*Salvelinus confluentus*	Coastal Recovery Unit ESU	Threatened	Designated – Not in Study Area
Pacific eulachon	*Thaleichthys pacificus*	Southern DPS	Threatened	Designated – In Study Area
North American green sturgeon	*Acipenser medirostris*	Southern DPS	Threatened	Designated – In Study Area

Notes:

[a] *ESU = Evolutionarily Significant Unit; DPS = Distinct Population Segment*

[b] *Listing status of species under the ESA.*

4.5.2.2.3 Wildlife – Task 6 Project

Habitat conditions in the Task 6 study area are generally similar to the habitat available in the Task 5 study area. However, a large wetland complex associated with the Columbia River and its tributary, Owl Creek, is partially within the southern portion of the Task 6 study area. This wetland complex supports large wintering and breeding concentrations of waterfowl. Wetlands in the Task 6 study area also provide suitable habitat for breeding amphibians because these wetlands have sufficient seasonal ponding during amphibian breeding windows to allow egg-laying and rearing of tadpoles.

One ESA-listed wildlife species is documented in the Task 6 study area: Columbian white-tailed deer Columbia River DPS (federally listed as endangered). A population of Columbian white-tailed deer Columbia River DPS has recently been established by USFWS west of the Task 6 study area on Cottonwood Island within the Columbia River, with the USFWS relocating these deer in 2010, 2013, and 2014. A female Columbian white-tailed deer was observed in the BNSF Railway right-of-way within the Task 6 project area in August 2013. Two other federally-listed threatened species: marbled murrelet and streaked horned lark and their associated critical habitat have not been documented in the Task 6 study area. However, it is assumed that marbled murrelet may be present in the Task 6 study area based on their nesting requirements and forest canopy present in the Task 6 study area. Streaked horned lark are not assumed to be present in the Task 6 study area. Additional information regarding ESA-listed wildlife species is provided in Appendix G.

4.5.3 Environmental Consequences

4.5.3.1 No Build Alternative

If the Task 5 and Task 6 projects are not built, Amtrak's *Cascades* and *Coast Starlight* passenger train service would continue to use the existing BNSF Railway rail line through Kalama and Kelso. The No Build Alternative includes only continuation of minor maintenance and repair activities necessary to keep the existing BNSF Railway rail line operational, and existing land uses would remain the same. Therefore, there would be no effects on ecological resources, including ESA-listed species and EFH, if the Task 5 and Task 6 projects are not constructed.

4.5.3.2 Build Alternative

4.5.3.2.1 Task 5 Project

Short-term Effects

Vegetation – Task 5 Project

Removal of vegetation during grading and clearing activities in the Task 5 study area would be limited because little vegetation is present in the BNSF Railway right-of-way. Vegetation that would be affected by construction activities consists of sparse weedy species with a mix of emergent shrubs and trees at the base of the existing railroad embankment. These species are relatively common species that would reestablish following the completion of construction activities. Construction activities would also provide opportunity for the introduction of noxious weeds that typically favor disturbed site conditions and are often inadvertently brought to the site on construction equipment. Vegetation removal would also temporarily affect water quality within the streams and wetlands through increased erosion and sedimentation. Water quality effects on these resources are described in Section 4.3.3.2.1.

Fish – Task 5 Project

Temporary effects on fish populations, both ESA-listed and non-listed, from construction activities could occur from temporary fill, water quality disturbances, and dewatering activities. Fill in streams would reduce available habitat for fish and other aquatic species, including prey species. Sedimentation into streams from surface water runoff or in-water work, as described in Section 4.3.3.2.1, could temporarily increase turbidity levels that cause mortality of fish and their prey species (for example, invertebrates) as well as interrupt fish foraging activities and movement, thereby temporarily decreasing the overall survival of fish species.

As previously stated in Section 4.3.3.2.1, there is also the potential for the release of pollutants such as oil, fuel, and other petroleum products from equipment and staging areas during construction. Releases of pollutants could be mobilized through water runoff into streams. Such chemicals may affect fish and their prey species.

In-water work (anticipated to occur during low-water periods from July 15 through October 31) within unnamed tributary 3, which contains ESA-listed fish species, would include dewatering and isolation of work areas. Although this work would minimize exposure of fish to increased turbidity levels, it would require that fish be removed from the isolated area prior to construction occurring in the stream. Handling of fish may result in direct mortality or elevated stress levels. No underwater pile driving activities are proposed for work in any of the streams, and other construction-related noise would not exceed existing noise levels within the streams or exceed levels that would cause harm to fish species.

Based on the effects described to ESA-listed species and as described in the Biological Assessment presented in Appendix F, FRA concluded that the construction of the Task 5 project *may affect, and is likely to adversely affect* Lower Columbia River coho ESU, Lower Columbia River steelhead DPS, and critical habitats associated with both species. This determination requires consultation with the NMFS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. This consultation process is ongoing.

As described in the Biological Assessment in Appendix F, the construction of the Task 5 project *may adversely affect* Pacific salmon EFH within the Task 5 study area. Coho salmon are known to be present in unnamed tributary 3 and the streambed would be affected by the culvert extension; therefore, the Task 5 project would require authorization from NMFS under the Magnuson-Stevens Act.

Wildlife – Task 5 Project

The removal of vegetation during construction would have varying effects on wildlife. More mobile species could likely move away from the project area and relocate to other vegetated areas in the vicinity, while less mobile wildlife, such as amphibians and reptiles, may not be able to relocate from the project area at the onset of construction activities. Temporarily cleared vegetation would result in temporary reduction in habitat availability on the rail corridor. Disturbances from increased human presence or construction activities would be temporary and unlikely to permanently affect wildlife.

Construction-related noise would increase over existing conditions and would potentially temporarily affect wildlife species using the Task 5 study area. Based on the noise attenuation calculations presented in the Task 5 Biological Assessment (Appendix F), construction noise, primarily from rock drills, bulldozers, and auger drill rigs, would decrease to existing noise levels approximately 1,100 feet from the Task 5 study area. Wildlife affected by the noise would likely be temporarily displaced and move to other habitat areas in the vicinity.

FRA concluded that the construction of the Task 5 project *may affect, and is likely to adversely affect* Columbian white-tailed deer Columbia River DPS due to elevated noise levels during construction in and adjacent to the Task 6 study area. Elevated noise levels would likely cause these species to move out of the study area temporarily but they would be expected to return after construction is completed. This determination requires consultation with the USFWS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects.

Long-term Effects

Vegetation – Task 5 Project

Permanent removal of vegetation would be minimal and would not alter the overall vegetative communities in the Task 5 study area. Vegetation removal in relation to wetland functions is addressed in Section 4.4.3.2.1, and wildlife is addressed below.

Fish – Task 5 Project

As described in Section 4.3.3.2.1, the Task 5 project would not modify the surface hydrology in the Task 5 study area with the exception of unnamed tributary 3 (described below), and infiltration of water runoff would continue to be available to recharge streams and maintain habitat available for fish. Stormwater treatment facilities are not proposed for the Task 5 project as railroad ballast is not considered a pollution-generating source by Ecology.

The existing 36-inch diameter culvert that conveys unnamed tributary 3 under the main line tracks would be replaced with a fish passable culvert, presently conceived to be comprised of two 60-inch culverts and a box culvert and construction of a natural stream channel at the confluence with the Columbia River. The existing narrow culvert creates streambed instability upstream by allowing water to form a backwater pool during peak flow events. It also increases the volume and velocity of water discharge through the culvert downstream. Both of these processes can lead to erosion in the streambed that removes the small sized gravel preferred by ESA-listed fish species during spawning. The high velocities also inhibit the ability of ESA-listed fish species to migrate up and downstream. The proposed larger culvert would decrease the instability, erosion, and water velocity and increase fish passage by providing a larger opening to convey water at lower velocities, and providing a natural stream bed that matches the upstream and downstream stream profile to facilitate easier fish passage.

Based on the effects to ESA-listed species described in the Biological Assessment presented in Appendix F, it was concluded that the operation of the Task 5 project *may affect, and is likely to adversely affect*

Lower Columbia River coho ESU, Lower Columbia River steelhead DPS, and critical habitats associated with both species. This determination requires consultation with NMFS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. This consultation process is ongoing.

Wildlife – Task 5 Project

Vegetation removal would decrease available habitat for wildlife use in the Task 5 study area, but other similar habitat is available within the Task 5 study area that wildlife could use. Disturbances from increased passenger rail activities may increase the likelihood of animal mortality due to train strikes, but the increase in rail traffic would be minor compared to existing rail traffic and the probable increase in strikes would also be minor.

During Section 7 consultation, the USFWS indicated that the four additional proposed passenger train trips would increase the probability of deer-train strikes with Columbia white-tailed deer. This increased probability of deer-train strikes is considered an *adverse effect* on Columbian white-tailed deer Columbia River DPS. This determination requires consultation with the USFWS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. This consultation process is ongoing.

Summary of Effects

Short-term effects on vegetation would occur as a result of vegetation removal during project construction that would temporarily affect water quality and may result in the introduction of noxious weeds to the project area. Permanent removal of vegetation would not alter the overall vegetative communities in the Task 5 study area. The removal of vegetation would have little effect on wildlife because species would likely relocate to other vegetated areas in the vicinity until construction is complete. However, minimization measures and BMPs would be implemented to minimize or eliminate effects on ecological resources. For example, existing and established vegetation would be trimmed, not grubbed, to the minimum necessary for work access and safety in order to minimize the amount of vegetation removed. The entire list of minimization measures and BMPs applicable to ecological resources are described in Appendix M.

Temporary and permanent fill in streams during construction would reduce available aquatic habitat, and water quality could be temporarily impaired due to increases in turbidity that would affect aquatic species. Releases of pollutants during construction could be mobilized into streams and affect fish and their prey species. Construction-related in-water work would include dewatering and isolation of work areas that would require fish handling and may result in elevated stress levels or direct mortality. Based on the effects described, the Task 5 project *may affect, and is likely to adversely affect,* Lower Columbia River coho ESU, Lower Columbia River steelhead DPS, and critical habitat associated with both species. The construction of the Task 5 project *may adversely affect* Pacific salmon EFH within the Task 5 study area. Coho salmon are known to be present in unnamed tributary 3 and the streambed would be affected by the culvert replacement; therefore, the Task 5 project would require authorization from NMFS under the Magnuson-Stevens Act.

These effects would be minimized or eliminated through the implementation of BMPs and minimization measures. For example, during in-water work, the work site would be isolated using coffer dams and dewatering to decrease turbidity or other pollutants from entering surface waters as well as removing fish in the work area. The entire list of minimization measures and BMPs applicable to ecological resources are described in Appendix M.

During construction, human disturbances would be unlikely to affect wildlife because species are accustomed to maintenance activities. Disturbances from increased passenger rail activities during operations may increase the probability of animal mortality due to train strikes, but the increase in rail traffic would be minor compared to existing rail traffic. Construction noise levels are expected to be higher than existing conditions, and wildlife affected by the noise would likely move to other available habitat areas in the vicinity until construction is complete. Based on the effects described, the Task 5 project would result in an *adverse effect* on Columbian white-tailed deer Columbia River DPS within the Task 5 study area.

4.5.3.2.2 Task 6 Project

Short-term Effects

Vegetation – Task 6 Project

The short-term effects on vegetation from the Task 6 project would be similar to those described for the Task 5 project.

Fish – Task 6 Project

The short-term effects on fish from the Task 6 project would be similar to those described for the Task 5 project. Unique to the Task 6 project is the construction of a new bridge over the Coweeman River. This would include installation of piers within the OHWM of the Coweeman River using impact pile driving methods. Impact pile driving for the bridge piers would occur in de-watered areas where fish have been removed. There is the potential for “sound flanking”, where the sound wave from pile driving in the dewatered substrate would travel through the substrate and back into the water column. This could result in temporary elevated in-water noise levels in the Coweeman and Cowlitz rivers. Fish species, including ESA-listed species, could be temporarily exposed to noise levels that would cause harm, but not result in mortality. As described for the Task 5 project, dewatering and isolation would occur during in-water work. However, not all of the inundated areas where fish are presumed to be present in Owl Creek and the associated Wetland F can logistically be dewatered and isolated. This is a result of the mucky nature of the soils, which are not strong enough to maintain a dewatering structure. Therefore, the rock (that is, washed quarry spalls) that would be placed for permanent fill would be placed when fish may be present. This would result in fish mortality from direct contact with fill material and the increased turbidity levels that cause mortality of fish and their prey species (for example, invertebrates) as well as would interrupt fish foraging activities and movement.

As stated in Section 4.3.2.2.1, work within the Coweeman River would occur during either an extended in-water work window in one construction season (anticipated to occur from July 1 through October 31) or a shorter in-water work window over two construction seasons (anticipated to occur from July 1 through August 31). These two options provide flexibility to accommodate unforeseen weather events or other conditions, and would allow the contractor to meet the overall construction schedule. The extended in-water work window is approximately 8 weeks longer than the typical in-water work window for the Coweeman River and would allow for completion of in-water construction activities within one construction season, which would provide for an overall reduction in construction effects which may occur with the shorter in-water work window over two construction seasons. The in-water work window duration and option was requested from NMFS during ESA Section 7 consultation.

Based on the effects described in the Biological Assessment presented in Appendix G, FRA/WSDOT concluded that the Task 6 project *may affect, and is likely to adversely affect* Lower Columbia River Chinook ESU, Columbia River chum ESU, Lower Columbia River coho ESU, Lower Columbia River steelhead DPS, and critical habitat associated with the Lower Columbia River Chinook ESU, Columbia River chum ESU, and Lower Columbia River steelhead DPS. Critical habitat for the Lower Columbia coho ESU has been proposed, but is not designated. If critical habitat is designated before project construction, the Task 6 project *may affect and is likely to adversely affect* critical habitat.   These determinations require consultation with the NMFS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. Construction of the Task 6 project would have *no effect* on Coastal Puget Sound bull trout, Columbia River eulachon southern DPS, and the North American green sturgeon Southern DPS or their designated critical habitats. The consultation process is ongoing.

As described in the Biological Assessment in Appendix G, the construction of the Task 6 project *may adversely affect* Pacific salmon EFH within the Task 6 study area. The project has the potential to affect water quality during construction and effect suitable foraging and rearing habitat; therefore, the Task 6 project would require authorization from NMFS under the Magnuson-Stevens Act.

Wildlife – Task 6 Project

The short-term effects on wildlife from the Task 6 project would be similar to those described for the Task 5 project. Construction noise, primarily from rock drills, bulldozers, auger drill rigs, and impact pile drivers, would decrease to existing noise levels between 1.3 miles and 5.8 miles from the Task 6 project area, depending on topographical barriers. Wildlife affected by the temporary noise increase would likely move to other habitat areas in the vicinity.

Based on the effects described in the Biological Assessment presented in Appendix G, FRA/WSDOT concluded that the construction of the Task 6 project *may affect, and is likely to adversely affect* Columbian white-tailed deer Columbia River DPS due to elevated noise levels during construction in and adjacent to the Task 6 study area. Elevated noise levels would likely cause these species to move out of the study area temporarily but they would be expected to return after construction is completed. This determination requires consultation with the USFWS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. Construction *may affect, but is not likely to adversely affect* marbled murrelet and streaked horned lark due to construction activities and elevated noise levels in and adjacent to the Task 6 study area. This determination requires consultation with the USFWS under Section 7 of the ESA. Construction would have *no effect* on critical habitat for marbled murrelet and *no effect* on streaked horned lark and critical habitat.

Long-term Effects

Vegetation – Task 6 Project

The long-term effects on vegetation from the Task 6 project would be similar to those described for the Task 5 project.

Fish – Task 6 Project

The long-term effects on fish from the Task 6 project would be similar to those described for the Task 5 project. The placement of approximately 5.7 acres of permanent fill for the Task 6 project would result in the loss of aquatic habitat. This loss would include approximately 2.8 acres of fish-accessible habitat associated with the Coweeman River (1.3 acres of which is permanently inundated habitat suitable for juvenile fish forage and rearing) and approximately 2.9 acres of fish-accessible habitat associated with Owl Creek (1.5 acres of which are suitable for juvenile forage and rearing). The new bridge over the Coweeman River would increase shading within the lower reaches of the Coweeman River, creating habitat that may provide additional concealment than what is currently available to species that prey on ESA-listed species.

Based on the effects described in the Biological Assessment presented in Appendix G, FRA/WSDOT concluded that the Task 6 project *may affect, and is likely to adversely affect* Lower Columbia River Chinook ESU, Columbia River chum ESU, Lower Columbia River coho ESU, Lower Columbia River steelhead DPS, and critical habitat associated with the Lower Columbia River Chinook ESU, Columbia River chum ESU, and Lower Columbia River steelhead DPS. Critical habitat for the Lower Columbia coho ESU has been proposed, but is not designated. If critical habitat is designated before the project commences, the Task 6 project *may affect and is likely to adversely affect* critical habitat. These determinations require consultation with the NMFS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. Construction of the Task 6 project would have *no effect* on Coastal Puget Sound bull trout, Columbia River eulachon southern DPS, and the North American green sturgeon Southern DPS or their designated critical habitats. The consultation process is ongoing.

As described in the Biological Assessment in Appendix G, the Task 6 project *may adversely affect* Pacific salmon EFH within the Task 6 study area. The project could have permanent effects on permanent and seasonally inundated suitable migration, forage, and rearing habitat; therefore, the Task 6 project would require authorization from NMFS under the Magnuson-Stevens Act.

Wildlife – Task 6 Project

The long-term effects on wildlife from the Task 6 project would be similar to those described for the Task 5 project. As described in the Biological Assessment presented in Appendix G, the USFWS indicated that four additional proposed passenger train trips would increase the probability of deer-train strikes with Columbia white-tailed deer. This increased probability of deer-train strikes is considered an *adverse effect* on Columbian white-tailed deer Columbia River DPS. This determination requires consultation with the USFWS under Section 7 of the ESA, which would result in the issuance of a Biological Opinion on the potential effects. The consultation process is ongoing.

Summary of Effects

Short-term effects on vegetation would occur as a result of vegetation removal during project construction that would temporarily affect water quality and may result in the introduction of noxious weeds to the project area. Permanent removal of vegetation would not alter the overall vegetative communities in the Task 6 study area. The removal of vegetation would have little effect on wildlife because species would likely relocate to other vegetated areas in the vicinity until construction is complete. However, minimization measures and BMPs would be implemented to minimize or eliminate effects on ecological resources. For example, existing and established vegetation would be trimmed, not grubbed, to the minimum necessary for work access and safety in order to minimize the amount of vegetation removed. The entire list of minimization measures and BMPs applicable to ecological resources are described in Appendix M.

Temporary and permanent fill in streams during construction would reduce available aquatic habitat, and water quality could be temporarily impaired due to increases in turbidity that would affect aquatic species. Releases of pollutants during construction could be mobilized into streams and affect fish and their prey species. Construction-related in-water work would include dewatering and isolation of work areas that would require fish handling and may result in direct mortality or elevated stress levels. Based on the effects described, the Task 6 project *may affect and is likely to adversely affect* Lower Columbia River Chinook ESU, Columbia River chum ESU, Lower Columbia River coho ESU, Lower Columbia River steelhead DPS, and critical habitat associated with Lower Columbia River Chinook ESU, Columbia River chum ESU, Lower Columbia River steelhead DPS. If critical habitat is officially designated prior to construction, the Task 6 project would have a *may affect and is likely to adversely affect* determination for proposed Lower Columbia River coho critical habitat. The Task 6 project would have *no effect* on Coastal Puget Sound bulltrout and Columbia River eulachon southern DPS or critical habitat for either species.

As described in the Biological Assessment in Appendix G, the construction and operation of the Task 6 project *may adversely affect* Pacific salmon EFH within the Task 6 study area. The project has the potential to effect water quality during construction and could have effects to suitable foraging and rearing habitat; therefore, the Task 6 project would require authorization from NMFS under the Magnuson-Stevens Act.

These effects would be minimized or eliminated through the implementation of BMPs and minimization measures. For example, during in-water work, the work site would be isolated using coffer dams and dewatering to decrease turbidity or other pollutants from entering surface waters as well as removing fish in the work area. Vibratory pile driving methods would be used, where possible, to minimize underwater noise levels and effects to fish species from driving pile associated with the Coweeman River Bridge. The entire list of minimization measures and BMPs applicable to ecological resources are described in Appendix M. In addition, mitigation to offset impacts to fish habitat would include the replacement of two undersized culverts at the private access road at MP 100.29, and the Owl Creek Sand and Gravel Company access road at MP 101.6. This mitigation would enhance connectivity between fish bearing streams and associated wetlands and improve overall water quality and available habitat. Mitigation is further described in Section 5.0.

During construction, human disturbances would be unlikely to affect wildlife because species are accustomed to maintenance activities. Disturbances from increased passenger rail activities during operations may increase the likelihood of animal mortality due to train strikes, but the increase in rail traffic would be minor compared to existing rail traffic. Construction noise levels are expected to be higher than existing conditions, and wildlife affected by the noise would likely move to other available habitat areas in the vicinity until construction is complete. Based on the effects described, the Task 6 project *may affect and is likely to adversely affect* Columbian white-tailed deer Columbia River DPS *may affect, but is not likely to adversely affect* marbled murrelet and streaked horned lark. The Task 6 project would have *no effect* on critical habitat for streaked horned lark or marbled murrelet.

4.6 Energy and Climate Change

This section evaluates the short- and long-term energy consumption and related GHG emissions from the Task 5 and Task 6 projects, and describes the potential effects of the alternatives on these resources. This section also addresses potential effects of climate change on the Task 5 and Task 6 projects.

Greenhouse gases (GHGs) *are gases in the Earth's atmosphere that absorb and emit radiation within the thermal infrared range. Common GHGs include water vapor, carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons.*

4.6.1 Study Area and Methodology

4.6.1.1 Study Area

In accordance with WSDOT's *Guidance for Project-Level Greenhouse Gas and Climate Change Evaluations* (WSDOT 2012a) and *Guidance – Project Level Greenhouse Gas Evaluations under NEPA and SEPA* (WSDOT 2013a), the Task 5 and Task 6 study areas for this analysis would be the Task 5 and Task 6 project areas, respectively. Most of the energy consumption would be fuel and electricity used to construct the Task 5 and Task 6 projects or for operational features within the Task 5 and Task 6 project rights-of-way, such as signals.

4.6.1.2 Methodology

Energy consumption and GHG emissions (which contribute to potential climate change) from the Task 5 and Task 6 projects would come from two primary sources: energy consumed and GHGs generated during construction of the Task 5 and Task 6 projects, and energy consumed and GHGs generated during operation of Amtrak trains. The GHG emissions in the study area would be compared to the GHG emissions at the state level.

4.6.1.2.1 Short-term Energy Use and GHG Emissions Methodology

The analysis of short-term energy use and GHG emissions considers the amount of energy that would be required for and GHG emissions expected from the construction of the Task 5 and Task 6 projects. Construction energy use for the Task 5 and Task 6 projects was calculated using the California Department of Transportation methodology that correlates the cost of a generic highway construction project to energy use (California Department of Transportation 1983). This methodology allows for the calculation of energy use based solely on the expected cost of the Task 5 and Task 6 projects. It assumes that 5.920 million British thermal units (MBtu) would be consumed for every dollar spent on each of the projects. This would represent the energy required to obtain raw materials, manufacture and transport supplies, and construct the facility. This methodology does not include specific calculations for rail projects; however, the types of work and materials used are similar and can reasonably be assumed to be equivalent.

It was assumed that all energy used to construct the Task 5 and Task 6 projects would be provided by diesel fuel, which has higher carbon dioxide equivalent (CO_2e) emissions than gasoline. Based on the total energy requirement expected for the Task 5 and Task 6 projects, the total amount of diesel fuel was calculated assuming that for every 139 MBtu of energy required, 1 gallon of diesel fuel would be consumed (California Department of Transportation 1983). Total GHG emissions are reported as the total CO_2e emissions that would be expected from every gallon of diesel fuel burned. The three major GHGs that would be emitted are CO_2, methane (CH_4), and nitrous oxide (N_2O). Therefore, the next step was to calculate the total CO_2e emissions using the amount of diesel fuel required for the Task 5 and Task 6 projects and the expected CO_2e GHG emissions anticipated for every gallon of diesel fuel consumed (10.3074 kilograms/gallon [kg/gal]). Table 8 presents the emissions that would be expected from 1 gallon of diesel fuel burned, which are referred to as emission factors (The Climate Registry 2013a, 2013b). To convert CH_4 and N_2O into CO_2e, the global warming potential of each gas was compared to the global warming potential of CO_2 (that is, one unit of CH_4 warms the atmosphere at 21 times the rate of CO_2). In other words, every unit of CH_4 emitted is the equivalent of 21 units of CO_2. As shown in Table 8, the expected CO_2e emissions for all three gases would be 10.3074 kg/gal of diesel fuel burned.

Table 8. CO_2 Equivalents and Emission Factors per 1 Gallon of Diesel Fuel

Greenhouse Gas	Emission Factor (kg/gal)	Global Warming Potential	CO_2 Equivalent Emission Factor[a] (kg CO_2e/gal)
Carbon Dioxide (CO_2)	10.21	1	10.21
Methane (CH_4)	0.0008	21	0.0168
Nitrous Oxide (N_2O)	0.00026	310	0.0806
		Total	10.3074

Note:

[a] *Emission factors from The Climate Registry (2013, 2013b).*

4.6.1.2.2 Long-term Energy Use and GHG Emissions Methodology

Freight Trains

As described in Section 4.15.3.1, the number of freight trains operating along the main line in the Task 5 and Task 6 study areas is anticipated to increase from 40 to 62 for both the No Build Alternative and Build Alternative. This increase is included in this analysis to establish a baseline for energy use and GHG emissions. The GHG emissions for freight trains is estimated by evaluating the fuel efficiency of the freight trains, which is based on the overall tonnage that a freight train is carrying, for a typical freight train operating in the Task 5 and Task 6 study areas. For purposes of analysis in this EA, a typical freight train is assumed to have five locomotives (each weighing 197 tons) and 100 cars (each weighting 143 tons). The total weight of each freight train was estimated to be 15,285 tons. The fuel efficiency (estimated to be 480 ton-miles/gallon) was then compared to the total weight to determine the amount of fuel required. Next, the total CO_2e emissions were calculated using the amount of diesel fuel required for the Task 5 and Task 6 projects and the expected CO_2e GHG emissions anticipated for each gallon of diesel fuel consumed. The same conversation factor to CO_2e GHG, 10.3074 kg/gal, is used.

Passenger Trains

The analysis of long-term energy use and GHG emissions considers the amount of energy that would be required for and GHG emissions expected from the operation of Amtrak trains under the Task 5 and Task 6 projects. Energy use for operation of Amtrak trains in the Task 5 and Task 6 study areas was calculated by determining the expected fuel efficiency of trains currently operating in the Task 5 and Task 6 study areas. This fuel efficiency was then compared to the total distance that trains would be required to travel through the Task 5 and Task 6 study areas to determine the total amount of fuel required. Next, the total CO_2e emissions were calculated using the amount of diesel fuel required for the Task 5 and Task 6 projects and the expected CO_2e GHG emissions anticipated for each gallon of diesel fuel consumed. The same conversation factor to CO_2e GHG, 10.3074 kg/gal, is used.

4.6.2 Affected Environment

4.6.2.1 Task 5 Project

Detailed fuel consumption data are not available at the county level, so the affected environment for the Task 5 project was evaluated using Washington state-level reference data. Statewide quarterly fuel consumption for the transportation sector in Washington State in 2009 was approximately 2.54 billion gallons of gasoline and approximately 595 million gallons of diesel fuel used for on-highway diesel engines for trucks and cars, as well as off-highway diesel engines such as railroad locomotives (WSDOT 2010). Electrical energy is used in the BNSF Railway right-of-way to operate switches, crossing guards, and communication devices. Electricity required for operation of switches, crossing guards, and communication devices would be supplied by Cowlitz County Public Utility District No. 1.

The Amtrak *Cascades* travels through the Task 5 study area as it makes four daily round trips between Portland and Seattle. In addition, the Amtrak *Coast Starlight* travels through the Task 5 study area on its daily round trip between Los Angeles and Seattle. Information for current trip distance within the Task 5 study area, fuel and energy use, and current GHG emissions is shown in Table 9. The estimated fuel efficiency of a train traveling between Portland and Seattle was calculated as part of the *Pacific Northwest Rail Corridor, Washington State Segment – Columbia River to the Canadian Border, Program Environmental Assessment* (WSDOT 2009a). It was determined that the average fuel economy for an operating train is approximately 0.7 mile per gallon (mpg). Information for the number of freight trains operating in the Task 5 study area, fuel and energy use, and current GHG emissions is also shown in Table 9.

Table 9. Daily Train Travel and Existing Estimated GHG Emissions in the Task 5 Study Area

Train Travel Through the Task 5 Study Area	Freight Trains	Task 5 Project Passenger Trains	Total
Daily Freight Trains one-way trips	40	--	
Distance through the Task 5 study area (miles)	4.1	4.1	
Total weight of all freight trains (tons)	611,400	--	
Total ton-miles for all freight trains (ton-miles)	2,506,740		
Freight train fuel use at 480 ton-miles/gallon (gallons)	5,222	--	
Daily Amtrak *Cascades* one-way trips	--	8	
Daily Amtrak *Coast Starlight* one-way trips	--	2	
Total distance for all daily trips through the Task 5 study area (miles)	--	41.0	
Passenger train fuel use at 0.7 mpg (gallons)	-	58.6	
Energy use (MBtu)	725,910	8,141.0	734,051
GHG emissions (MT CO_2e)	53.83	0.6037	54.44

Note:
mpg = miles per gallon; MBtu = million British thermal units; MT = metric tons; CO_2e = carbon dioxide equivalent

Including all vehicular sources (for example, trucks, cars, and trains), the total annual GHG emissions in Washington State are approximately 95.8 million metric tons (MT) of CO_2e (Ecology 2012b).

4.6.2.2 Task 6 Project

The fuel consumption data at the state level, electrical energy use in the BNSF Railway right-of-way, and Amtrak *Cascades* and *Coast Starlight* trip information for the Task 6 project would be the same as described for the Task 5. Information for current trip distance within the Task 6 study area, fuel and energy use, and current GHG emissions is shown in Table 10. Information for the number of freight trains, fuel and energy use, and current GHG emissions is also shown in Table 10.

Table 10. Daily Train Travel and Existing Estimated GHG Emissions in the Task 6 Study Area

Train Travel Through the Task 6 Study Area	Freight Trains	Task 6 Project Passenger Trains	Total
Daily Freight Trains one-way trips	40	--	
Distance through the Task 6 study area (miles)	4.75	4.75	
Total weight of all freight trains (tons)	611,400	--	
Total ton-miles for all freight trains (ton-miles)	2,904,150	--	
Freight train fuel use at 480 ton-miles/gallon (gallons)	6,050	--	
Daily Amtrak *Cascades* one-way trips	--	8	
Daily Amtrak *Coast Starlight* one-way trips	--	2	
Total distance for all daily passenger trips through the Task 6 study area (miles)	--	47.5	
Fuel use at 0.7 mpg (gallons)	--	67.8	
Energy use (MBtu)	840,993	9,432.0	850,425
GHG emissions (MT CO_2e)	62.36	0.6994	63.06

Note:
mpg = miles per gallon; MBtu = million British thermal units; MT = metric tons; CO_2e = carbon dioxide equivalent

4.6.3 Environmental Consequences

4.6.3.1 No Build Alternative

The estimated energy use and GHG emissions for passenger rail reported in Table 9 and Table 10 are assumed to be representative of the No Build Alternative for the Task 5 and Task 6 projects, respectively. However, under the No Build Alternative, energy use and GHGs generated would increase because of the anticipated increase in freight trains operating along the rail line (see Section 4.15.3.1). As depicted in Table 11 and Table 12, the number of freight trains is anticipated to increase from 40 to 62. Minor maintenance and repair activities along the existing rail line would occur as part of the No Build Alternative. Amtrak operations would remain the same; there would be no increase in Amtrak passenger rail service under the No Build Alternative. The energy use and GHGs generated from minor maintenance and repair activities would be negligible compared to current uses along this portion of the rail corridor.

Table 11. Daily Train Travel and Existing Estimated GHG Emissions in the Task 5 Study Area

Train Travel Through the Task 5 Study Area	Freight Trains (baseline)	Freight Trains (2030 Scenario)
Daily Freight Trains one-way trips	40	62
Distance through the Task 5 study areas (miles)	4.1	4.1
Total weight of all freight trains (tons)	611,400	947,670
Total ton-miles for all freight trains (ton-miles)	2,506,740	3,885,447
Freight train fuel use at 480 ton-miles/gallon (gallons)	5,222	8,094
Energy use (MBtu)	725,910	1,125,160
GHG emissions (MT CO_2e)	53.83	83.44

Note:
MBtu = million British thermal units; MT = metric tons; CO_2e = carbon dioxide equivalent

Table 12. Daily Train Travel and Existing Estimated GHG Emissions in the Task 6 Study Area

Train Travel Through the Task 5 Study Area	Freight Trains (baseline)	Freight Trains (2030 Scenario)
Daily Freight Trains one-way trips	40	62
Distance through the Task 5 study areas (miles)	4.75	4.75
Total weight of all freight trains (tons)	611,400	947,670
Total ton-miles for all freight trains (ton-miles)	2,904,150	4,501,432
Freight train fuel use at 480 ton-miles/gallon (gallons)	6,050	9,377
Energy use (MBtu)	840,993	1,303,539
GHG emissions (MT CO_2e)	62.36	96.66

Note:
MBtu = million British thermal units; MT = metric tons; CO_2e = carbon dioxide equivalent

4.6.3.2 Build Alternative

4.6.3.2.1 Task 5 Project

Short-term Effects

There is a correlation between the dollar cost of a project and energy consumed; thus, the energy consumed and the resulting GHG emissions can be estimated based on the total cost of the project. The total estimated cost to construct the Task 5 project is approximately $39 million (based on 2013 costs). Using the methodology described in Section 4.6.1.2, above, construction of the Task 5 project would require 231,224,343 MBtu of energy and would generate 17,146 MT CO_2e of GHG emissions. The CO_2e emissions would represent 0.0017 percent of the total GHGs emitted in Washington State (that is, 95.8 million MT CO_2e) (Ecology 2012b). This would not represent a substantial contribution to GHG emissions in Washington State or the Task 5 project.

Long-term Effects

The construction of a third main line track, sidings, and related signal and switching systems would support an increase in Amtrak *Cascades* frequency between Portland and Seattle from 4 round trips to 6, which would increase total passenger train trips through the Task 5 study area to 14 daily one-way trips. Operation of facilities associated with the railroad (for example, switches and crossing guards) would require minimal additional energy over that already consumed by BNSF Railway and Amtrak operations and would not be anticipated to contribute substantially to GHG emissions. There would also be a negligible increase in energy use and GHG emissions from the anticipated increase in freight train activity; however, this change is not considered as part of this analysis because it is anticipated to occur under both the No Build and Build Alternatives.

Table 13 compares the energy required and GHG emissions anticipated for the Task 5 project and the No Build Alternative. Over the course of 1 year, the Task 5 project would require 1,188,805 MBtu of additional energy and would result in 88.15 MT CO_2e of additional GHG emissions when compared to the No Build Alternative. The CO_2e emissions would be only 0.000092 percent of the total GHGs emitted in Washington State (that is, 95.8 million MT CO_2e) (Ecology 2012b). This would not represent a substantial contribution to GHG emissions in Washington State or the Task 5 project area and thus would not contribute substantially to the advancement of potential climate change. Any changes in fuel consumption or GHG emissions that would result from changes in the efficiency with which trains operate on the railway would be negligible.

Summary of Effects

There would be no substantial change in short- or long-term fuel consumption, energy use, or GHG emissions in Washington State from the Task 5 project. The potential increase in energy use and GHG emissions would be minimized by adhering to minimization measures and BMPs. For example, idling equipment would be limited to the extent practicable and delivery of materials would be schedule at off-peak hours to minimize travel time and allow trucks to travel to the site at fuel efficient speeds. The entire list of minimization measures and BMPs applicable to energy and climate change are described in Appendix M. The Task 5 project would not contribute substantially to potential climate change.

4.6.3.2.2 Task 6 Project

Short-term Effects

The total estimated cost to construct the Task 6 project is approximately $81 million (based on 2013 costs). Using the methodology described in Section 4.6.1.2 above, construction of the Task 6 project would require 479,872,000 MBtu of energy and would generate 35,500 MT CO_2e of GHG emissions. The CO_2e emissions would represent approximately 0.0037 percent of the total GHGs emitted in Washington State (that is, 95.8 million MT CO_2e) (Ecology 2012b). This would not represent a substantial contribution to GHG emissions in Washington State or the Task 6 project area and thus would not contribute substantially to potential climate change.

Table 13. Task 5 Project Operational Energy Use Comparison to the No Build Alternative

Train Travel Through the Task 5 Study Area	Freight Trains (2030 Scenario)	No Build Alternative Passenger Trains	Task 5 Project Passenger Trains	Total No Build Alternative	Total Build Alternative
Distance through the Task 5 study area (miles)	4.1	4.1	4.1		
Daily Freight Trains one-way trips	62	--	--		
Total weight of all freight trains (tons)	947,670	--	--		
Total ton-miles for all freight trains (ton-miles)	3,885,447	--	--		
Freight train fuel use at 480 ton-miles/gallon (gallons)	8,094	--	--		
Daily Amtrak *Cascades* trips	--	8	12		
Daily Amtrak *Coast Starlight* trips	--	2	2		
Total distance for all daily passenger trips through the Task 5 study area (miles)	--	41.0	57.4		
Fuel use at 0.7 mpg (gallons)	--	58.6	82.0		
Daily energy use (MBtu)	1,125,160	8,141.0	11,398.0	1,133,301	1,136,558
Daily GHG emissions (MT CO_2e)	83.44	0.6037	0.8452	84.0437	84.2852
Annual difference in energy use (Task 5 Project minus No Build MBtu)				+1,188,805.0	
Annual difference in GHG emissions (Task 5 Project minus No Build MT CO_2e)				+88.15	

Note:
mpg = miles per gallon; MBtu = million British thermal units; MT = metric tons; CO_2e = carbon dioxide equivalent

Long-term Effects

Operation of Amtrak trains under the Task 6 project would be the same as described for the Task 5 project. Table 14 compares the energy required and GHG emissions anticipated for the Task 6 project and the No Build Alternative. Over the course of 1 year, the Task 6 project would require 1,377,145 MBtu of additional energy and would result in 102.1 MT CO_2e of additional GHG emissions when compared to the No Build Alternative. The CO_2e emissions would represent approximately 0.00011 percent of the total GHGs emitted in Washington State (that is, 95.8 million MT CO_2e) (Ecology 2012b). This would not represent a substantial contribution to GHG emissions in Washington State or the Task 6 project area and thus would not contribute substantially to the advancement of potential climate change. Any changes in fuel consumption or GHG emissions that would result from changes in the efficiency with which trains operate on the railway would be negligible. Additionally, any changes in fuel consumption or GHG emissions resulting from potential changes in the future number of vehicles on the road would be negligible.

Table 14. Task 6 Project Operational Energy Use Comparison to the No Build Alternative

Train Travel Through the Task 6 Study Area	Freight Trains (2030 Scenario)	No Build Alternative Passenger Trains	Task 6 Project Passenger Trains	Total No Build Alternative	Total Build Alternative
Distance through the Task 5 study area (miles)	4.75	4.75	4.75		
Daily Freight Trains one-way trips	62	--	--		
Total weight of all freight trains (tons)	947,670	--	--		
Total ton-miles for all freight trains (ton-miles)	4,501,432	--	--		
Freight train fuel use at 480 ton-miles/gallon (gallons)	9,377	--	--		
Daily Amtrak *Cascades* trips	--	8	12		
Daily Amtrak *Coast Starlight* trips	--	2	2		
Total distance for all daily passenger trips through the Task 5 study area (miles)	--	47.5	66.5		
Fuel use at 0.7 mpg (gallons)	--	67.8	95		
Daily energy use (MBtu)	1,303,539	9,432	13,205	1,312,971	1,316,744
Daily GHG emissions (MT CO_2e)	96.66	0.6995	0.9792	97.3595	97.6392
Annual difference in energy use (Task 5 Project minus No Build MBtu)				+1,377,145.0	
Annual difference in GHG emissions (Task 5 Project minus No Build MT CO_2e)				+102.1	

Note:
mpg = miles per gallon; MBtu = million British thermal units; MT = metric tons; CO_2e = carbon dioxide equivalent

Summary of Effects

There would be no substantial change in short- or long-term fuel consumption, energy use, or GHG emissions in Washington State from the Task 6 project. The potential increase in energy use and GHG emissions would be minimized by adhering to minimization measures and BMPs. For example, idling equipment would be limited to the extent practicable and delivery of materials would be schedule at off-peak hours to minimize travel time and allow trucks to travel to the site at fuel efficient speeds. The entire list of minimization measures and BMPs applicable to energy and climate change are described in Appendix M. The Task 6 project would not contribute substantially to potential climate change.

4.6.3.2.3 Effects of Changing Climate on the Task 5 and Task 6 Projects

FRA and WSDOT acknowledge that effects of climate change may alter the function, sizing, and operations of transportation facilities. Therefore, in addition to considering GHG emissions, FRA and WSDOT consider adaptation of transportation facilities to the changing climate. To ensure that facilities can function as intended for their planned lifespan, facilities should be designed to perform under the variable conditions expected as a result of climate change. For example, drainage culverts may need to be resized to accommodate more intense rainfall events or increased sediment flows due to glacial thawing.

The climate projections indicate that Washington State is likely to experience some or all of the following effects over the next 50 to 100 years:

- Increased temperature, leading to more frequent extreme heat events, worsened air quality, and glacial melting
- Sea-level rise, coastal erosion, and salt water intrusion
- Changes in the volume and timing of precipitation resulting in reduced snow pack, increased erosion, and more frequent and severe flooding
- Ecological effects of a changing climate, including the spread of disease, altered plant and animal habitats, and negative effects on human health and well-being.

WSDOT's *Climate Impacts Vulnerability Assessment Report* (WSDOT 2011b) indicates that State Route 411 near the project area has the potential to be highly affected by river flooding and sea level rise. Interstate 5 through the project area is projected to have a low vulnerability to climate-related impacts. FRA and WSDOT considered this information on climate change with regard to preliminary design as well as the potential for changes in the surrounding natural environment. The Task 5 and Task 6 projects are designed to last more than 50 years. As part of standard design, the Task 5 and Task 6 projects have incorporated features that would provide greater resilience and function with the potential effects brought on by climate change. These include modifying and extending existing culverts and armoring portions of the rail line to protect against scouring. However, because the Build Alternative is primarily expansion of existing infrastructure, options such as relocating the rail line to higher ground to protect against sea level rise would not be feasible.

4.7 Noise

This section characterizes the existing noise levels in the Task 5 and Task 6 study areas and describes the potential effects on the existing noise environment that could result from the alternatives.

4.7.1 Study Area and Methodology

4.7.1.1 Study Area

The Task 5 and Task 6 study areas for the noise analysis extend 500 feet from either side of the centerline of the middle track within the Task 5 and Task 6 project areas, respectively. Noise effects were evaluated at noise-sensitive receivers within the 500-foot FRA noise assessment screening distance for projects within an existing railroad corridor in quiet suburban/rural areas. Beyond this distance, there is very limited potential for noise impacts due to the decrease (that is, the loss of sound energy) of noise levels as distance from the noise source decreases.

4.7.1.2 Methodology

Noise Fundamentals

Noise impacts are evaluated based on the criteria defined in FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2012) and the noise prediction methodologies in the Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment* (FTA 2006). FRA uses FTA methods for noise impact assessment. Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that have the potential to affect human response are intensity, frequency, and variation with time, as described below:

- ***Intensity.*** The intensity is related to how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. This intensity is perceived as the loudness of the sound.
- ***Frequency.*** The frequency content of noise is related to the tone or pitch of the sound and is expressed in terms of cycles per second (called hertz [Hz]). Because the sensitivity of human hearing varies with frequency, a weighting system is commonly used when measuring environmental noise. The A-weighting system provides a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels and are expressed in decibel notation as "dBA." Typical A-weighted sound levels for ground transportation and other sources are shown in Figure 11.
- ***Variation with Time.*** Because environmental noise fluctuates from moment to moment, it is common practice to describe noise exposure from all events over a period of time as a single number. This is called the "equivalent" sound level (L_{eq}), which is measured over a specified period of time (typically 1 hour or 24 hours). Hourly L_{eq} can be used to calculate the cumulative noise exposure over a 24-hour period. This is known as the day-night sound level (L_{dn}). L_{dn} is the L_{eq} for a 24-hour period; however, it also includes a 10-decibel penalty imposed on noise that occurs during nighttime hours (between 10:00 p.m. and 7:00 a.m.) because people are generally more annoyed by noise at night than during the day.

Equivalent sound level (L_{eq}) *is an expression as a single number of the cumulative noise exposure from all events in an area over a specific period of time. L_{eq} takes into account the fact that noise levels can fluctuate widely over time.*

Day-night sound level (L_{dn}) *is the L_{eq} for a 24-hour period. It includes a 10-decibel penalty for noise that occurs at night to reflect the increased impact of nighttime noise.*

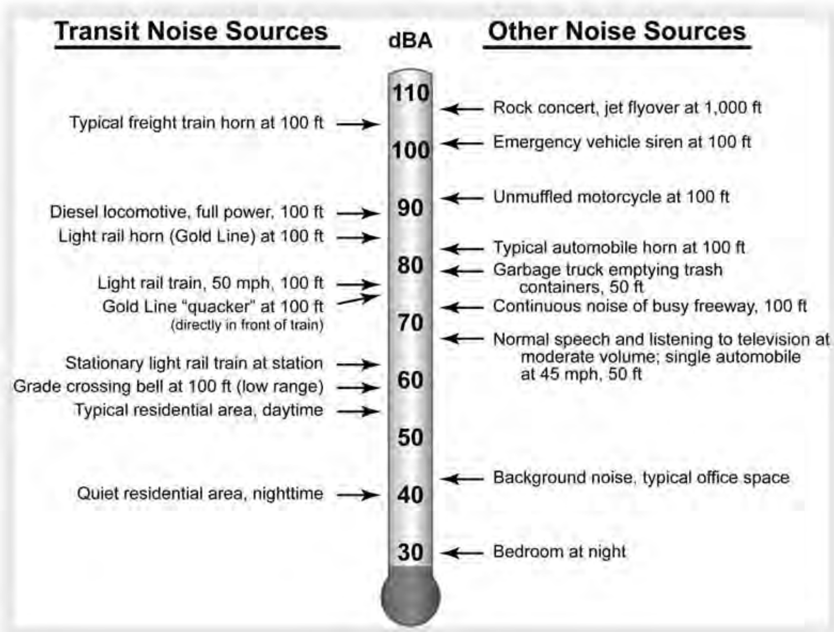

Figure 11. Typical Outdoor and Indoor Noise Levels (FTA 2006)

Short-term Effects Noise Methodology

The analysis of short-term effects from noise considers the effects from construction of the Task 5 and Task 6 projects. Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the construction contractor's discretion; consequently, the specific equipment and process to be used are unknown. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment or activities. While the noisiest construction activity is typically related to impact pile driving, for most construction projects, the noise from equipment utilizing diesel engines represent the dominant noise source. This is particularly true of engines without sufficient muffling. This analysis considers the general types of construction equipment that would be necessary and the typical noise levels generated by the equipment.

FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2012) does not establish standardized numeric criteria for the evaluation of construction noise impacts. Therefore, the analysis of impacts in this EA considers existing noise levels, noise levels anticipated during construction, and sensitive adjacent land uses. Sensitive adjacent land uses can include residential zones, churches, schools, and parks. Noise impacts would be expected if construction noise levels were substantially greater than existing noise levels, constant throughout the period of construction, and more than temporary in nature.

Long-term Effects Noise Methodology

The analysis of long-term effects from noise considers the effects from the operation of trains under the Task 5 and Task 6 projects. The primary component of noise from passenger and freight train operations is the diesel propulsion engine, wheel/rail noise, and horn noise. The methodology for evaluating noise impacts from operations was based on methodology established in FTA's *Transit Noise and Vibration Impact Assessment* (FTA 2006). The FRA noise impact criteria are based on comparing existing noise levels with future noise levels associated with the Task 5 and Task 6 projects. Existing noise levels are established by measuring the ambient noise level and the noise levels from passenger and freight train operations in the affected environment at noise-sensitive receivers. Ambient noise levels were measured over 48 hours (long-term) in some locations and 30 minutes (short-term) in other locations. The short-term monitoring was performed where long-term monitoring was not practical or where short-term data were used to supplement nearby long-term monitoring results.

The noise prediction models used to evaluate noise from operations are based on formulas provided in FTA's *Transit Noise and Vibration Impact Assessment* (FTA 2006). These formulas were modified using the on-site noise measurements that were taken to establish existing noise exposure at the noise-sensitive receivers. The noise modeling of the future conditions under the Build Alternative were adjusted to include the noise reduction provided by continuous welded rail at those locations of track where it would be installed as part of both a separate project and the Build Alternative.

FTA defines three levels of noise impacts (no impact, moderate impact, and severe impact) across three land use categories (Category 1 [highly noise sensitive, non-residential], 2 [residential], and 3 [industrial]). Figure 12 presents the relationship between existing noise exposure and noise exposure increase as a result of a project relative to the resulting impacts.

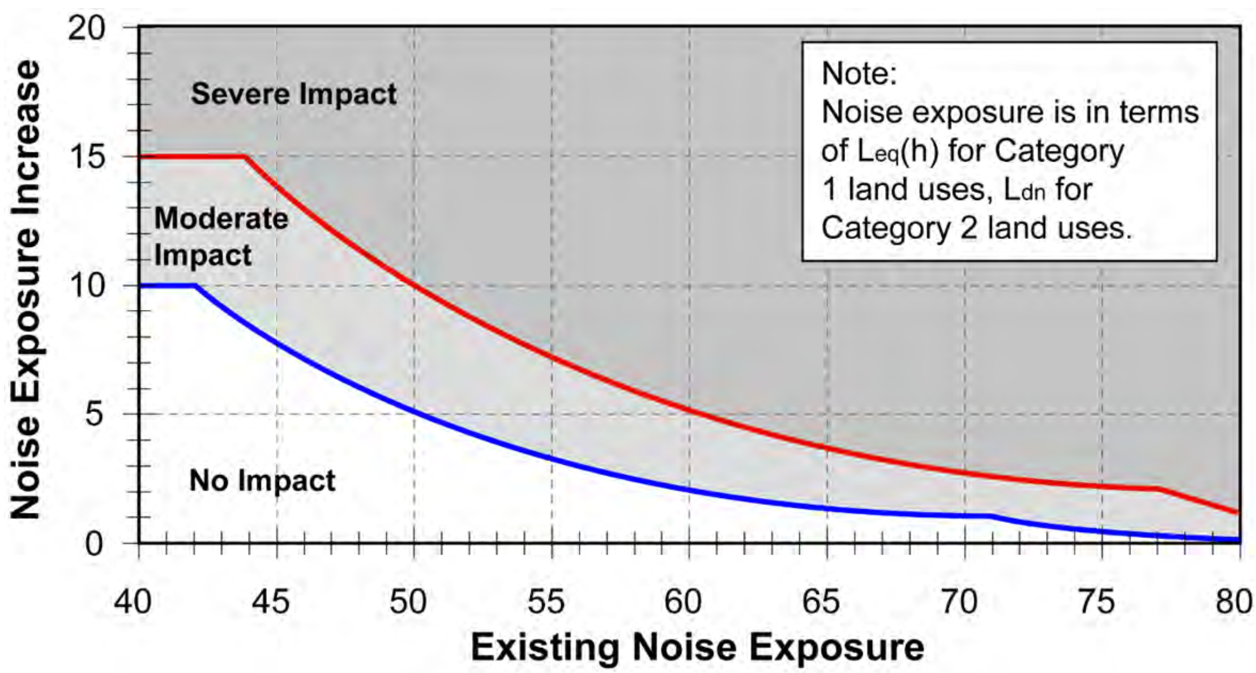

Figure 12. FTA Noise Impact Criteria (FTA 2006)

4.7.2 Affected Environment

Within the study areas for Task 5 and Task 6, noise-sensitive lands uses were identified and grouped into clusters (denoted by a letter indicating the land use type [R for residential, P for park, etc.] and a number) that are represented by noise monitoring locations (denoted by the letter M and a number). Each cluster is representative of several residences that would be approximately the same distance from the rail corridor. They would also be influenced by train speeds and other operational parameters related to future train operations.

4.7.2.1 Task 5 Project

For Task 5, the locations of the clusters and buildings included in each cluster, as well as the noise monitoring locations, are shown in Figure 13 and Figure 14.

Measurements of noise in the Task 5 study area were taken in April 2013 to document the existing noise exposure at the noise-sensitive receivers. The following types of measurements were taken:

- ***Ambient Noise.*** The ambient noise measurements consisted of short-term attended measurements at one noise monitoring location (M-7) and long-term, 24-hour, unattended noise measurements at one noise monitoring location (M-8). Site M-7 is adjacent to Louis Rasmussen Day Use Park (P-1); site M-8 is adjacent to a residential cluster (R-11).
- ***Train Noise.*** The noise from Amtrak and freight trains was measured at one location (T-5), which is adjacent to a residential cluster (R-12). The noise measurements included train horns and at-grade crossing bells.

Ambient Noise

In the Task 5 study area, land use includes industrial and port facilities, including timber processing facilities, a marina, a park, and several single family homes. A detailed description of the land use in the Task 5 study area is provided in Section 4.10.2.1.

Ambient noise levels were monitored at sites M-7 and M-8. The sites were chosen based on land use, existing noise sources, proximity to the rail line, and each site's ability to represent nearby noise-sensitive land uses. Short-term on-site monitoring was performed for a period of 30 minutes at M-7, which is located in the approximate north-south center of Louis Rasmussen Day Use Park (P-1), near one of the park pavilions. Traffic on I-5 and passing trains are the primary source of noise at M-7. Long-term on-site monitoring was performed over a period of 48 hours at M-8, which is located on the east side of the rail line along Dupont Road near a residential cluster (R-11), and is dominated by noise from traffic on I-5 and passing trains. While traffic on low-volume local roads played a minor role in the noise at M-7, the effect at M-8 is virtually nonexistent. Table 15 and Table 16 list each monitoring site, the approximate distance of that site from the centerline of the middle track, the land use type, the type of measurement, and the measured noise level at that site.

Figure 13. Noise and Vibration Sensitive Land Uses: Cluster P-1

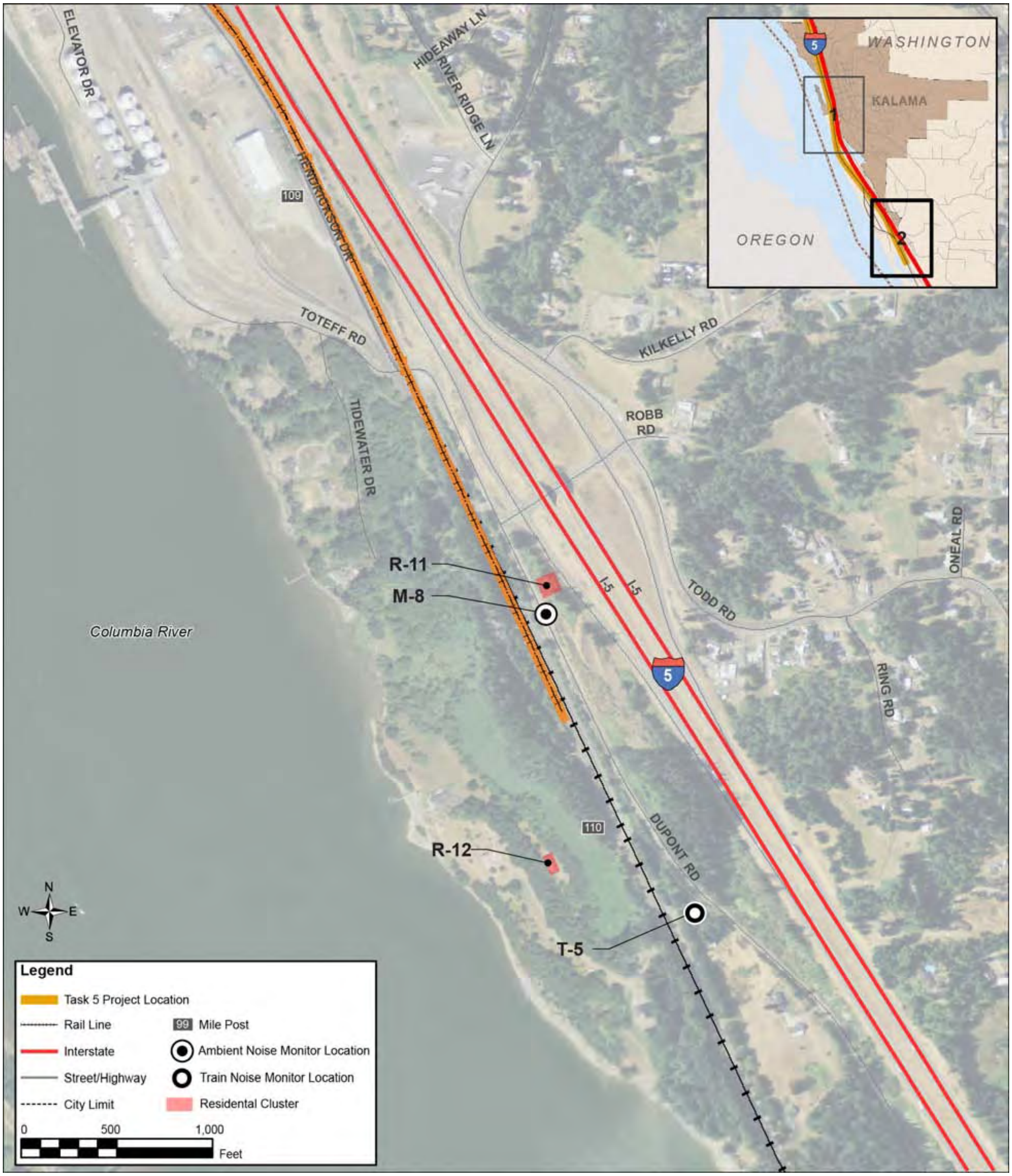

Figure 14. Noise and Vibration Sensitive Land Uses: Clusters R-11 and R-12

Table 15. Summary of Short-Term (30-Minute) Noise Measurements

Site	Location	Type of Land Use	Distance to Centerline of Track (feet)	Start Date	Start Time	L_{eq} (dBA)	L_{dn} (dBA)
M-7	380 West Marine Drive	Park (P-1)	140	4/24/2013	4:32 p.m.	66.8	74.2[a]

Note:

[a] *Projected L_{dn} levels for short-term monitoring sites have been calculated using formulas and methods in the FRA* Transit Noise and Vibration Impact Assessment *(FRA 2006) and comparison with other nearby long-term noise monitoring sites.*

Table 16. Summary of 24-Hour Noise Measurements

Site	Location	Type of Land Use	Distance to Centerline of Track (feet)	Start Date	Start Time	Sound Level (dBA)		
						L_{eq} (day)	L_{eq} (night)	L_{dn}
M-8	MP 110 (Dupont Road south of I-5 Robb Road Exit)	Undeveloped near single family residential (R-11)	50	4/24/2013	4:19 p.m.	69.7	73.8	79.7

Train Noise

Noise predictions from existing passenger and freight train operations were estimated using the noise measurements of existing train operations. Existing train operations are described further in Section 4.15.3.1, and include 10 passenger trains and 40 freight trains per day. The noise monitoring locations were attended to note the train characteristics such as speed, direction, and number of locomotives and cars. These measurements were conducted at site T-5, which is near a residential cluster (R-12) along the Task 5 study area (see Figure 14, above). The results from the measurements are presented in Table 17.

Table 17. Measured Train Noise Levels

Site	Location	Distance to Near Track (feet)	Amtrak	BNSF Railway Freight
			Noise Level L_{max}[a] (dBA)	Noise Level L_{max}[a] (dBA)
T-5	227 Dupont Road (R-12)	115	83	88

Note:

[a] *L_{max} is the highest root mean squared (RMS) sound pressure level within the measuring period. RMS is a measure of the magnitude of the varying noise source quantity.*

4.7.2.2 Task 6 Project

For Task 6, the locations of the clusters and buildings included in each cluster, as well as the noise monitoring locations, are shown in Figure 15 and Figure 16.

Measurements of noise in the Task 6 study area were taken in April 2013 to document the existing noise exposure at the noise-sensitive receivers. The following types of measurements were taken:

- ***Ambient Noise.*** The ambient noise measurements consisted of short-term attended measurements at three noise monitoring locations (M-3, M-4, and M-6) and long-term, 24-hour, unattended noise measurements at three noise monitoring locations (M-1, M-2, and M-5).
- ***Train Noise.*** The noise from Amtrak and freight trains was measured at four locations (T-1, T-2, T-3, and T-4). The noise measurements included train horns and at-grade crossing bells.

Ambient Noise

In the Task 6 study area, land use includes single and multifamily dwelling units, commercial and light industrial uses, a golf course, and an airport. A detailed description of the land use in the Task 6 study areas is provided in Section 4.10.2.2.

Ambient noise levels were monitored at sites M-1 through M-6. The sites were chosen based on land use, existing noise sources, proximity to the rail line, and each site's ability to represent nearby noise-sensitive land uses. Short-term on-site monitoring was performed for a period of 30 minutes at three of the sites (M-3, M-4, and M-6), and long-term on-site monitoring was performed over a period of 48 hours at the other three sites (M-1, M-2, and M-5). The short-term monitoring was performed at locations where long-term monitoring was not practical or where short-term data were used to supplement nearby long-term monitoring results. Details on each monitoring location are provided below:

- M-1 was chosen to establish existing noise levels at the multifamily residences located at the intersection of Mill Street and 1st Avenue South (R-1 through R-4) in the northern portion of the Task 6 study area. These homes have a direct line of sight to the rail line, which includes an at-grade crossing within 100 feet of some of these homes. Traffic on South Pacific Avenue is a contributing noise source at M-1, but the primary source of contributing noise is train horns and bells at the nearby crossing at Mill Street. Traffic on Mill Street and 1st Avenue South is infrequent, and noise from traffic sources is overshadowed by trains operating in the Task 6 study area.
- M-2 was chosen to establish existing noise levels in the front yard of the home that is attached to the Stop 'N Shop convenience store located on the southeast corner of the intersection of South Pacific Avenue and Yew Street (R-6). This home also faces the rail line and the at-grade crossing at Yew Street. Roadway traffic is the primary contributor to the noise environment. M-2 is very close to the at-grade crossing at Yew Street, so train horns and bells are also factors in the noise environment.
- M-3 was chosen to establish existing noise levels in the front yard of the home located at the southeast corner of the intersection of South Pacific Avenue and Olive Street (R-7). This home faces the rail line, but there is no crossing within 1,500 feet of the home. Roadway traffic contributes more than train traffic to the noise environment at M-3.
- M-4 and M-5 were chosen to establish existing noise levels in the residential area that lies between the rail line and the Cowlitz River to the west (R-8, R-8A, R-9, R-9A, and R-9B). M-4 and M-5 experience virtually no traffic noise; however, they are located approximately 0.5 mile northeast of

the Southwest Washington Regional Airport, so overhead airplane noise from small planes can be more readily heard. However, the flights that were observed occurred fairly infrequently.

- M-6 was selected to establish noise levels at the southernmost homes in the Task 6 study area (R-10), which are circumscribed by the Three Rivers Golf Course (I-1) and the rail line, and are located near the Southwest Washington Regional Airport. M-6 experiences virtually no traffic noise; however, it experiences aircraft noise comparable to that experienced at M-4 and M-5.

Table 18 and Table 19 list each monitoring site, the approximate distance of that site from the centerline of the middle track, the land use type, the type of measurement, and the measured noise level at that site.

Table 18. Summary of Short-Term (30-Minute) Noise Measurements

Site	Location	Type of Land Use	Distance to Centerline of Track (feet)	Start Date	Start Time	L_{eq} (dBA)	L_{dn} (dBA)
M-3	202 Olive Street	Single family residence (R-7)	125	4/24/2013	10:35 a.m.	62.1	69.5[a]
M-4	131 Olive Street	Single family residence (R-8A)	530	4/24/2013	11:20 a.m.	58.0	65.4[a]
M-6	2325 South Pacific Avenue	Single family residence (R-10) and Golf Course (I-1)	175	4/24/2013	2:45 p.m.	58.2	65.6[a]

Note:

[a] *Projected L_{dn} levels for short-term monitoring sites have been calculated using formulas and methods in the FRA* Transit Noise and Vibration Impact Assessment *(FRA 2006) and comparison with other nearby long-term noise monitoring sites.*

Table 19. Summary of 24-Hour Noise Measurements

Site	Location	Type of Land Use	Distance to Centerline of Track (feet)	Start Date	Start Time	Sound Level (dBA)		
						L_{eq} (day)	L_{eq} (night)	L_{dn}
M-1	913 South Pacific Avenue	Multifamily residences (R-1 to R-4)	105	4/24/2013	10:00 a.m.	71.5	72.7	79.1
M-2	1400 South Pacific Avenue	Single family residence (R-6)	135	4/24/2013	11:00 a.m.	76.0	76.6	83.0
M-5	190 Milwaukee Place	Single family residences (R-9, R-9A, R-9B)	135	4/24/2013	12:10 p.m.	61.0	62.2	68.6

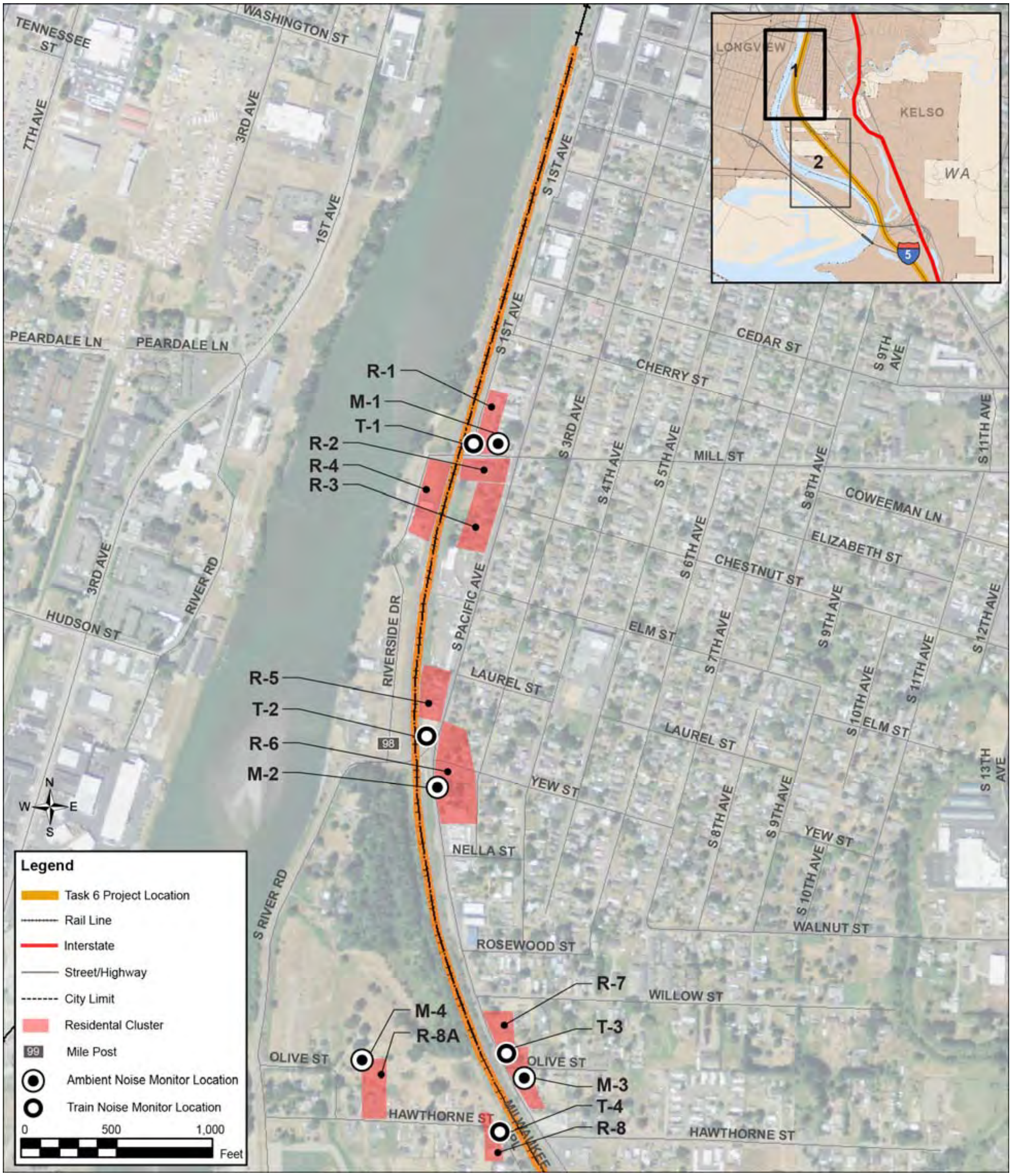

Figure 15. Noise and Vibration Sensitive Land Uses: Clusters R-1 through R-6

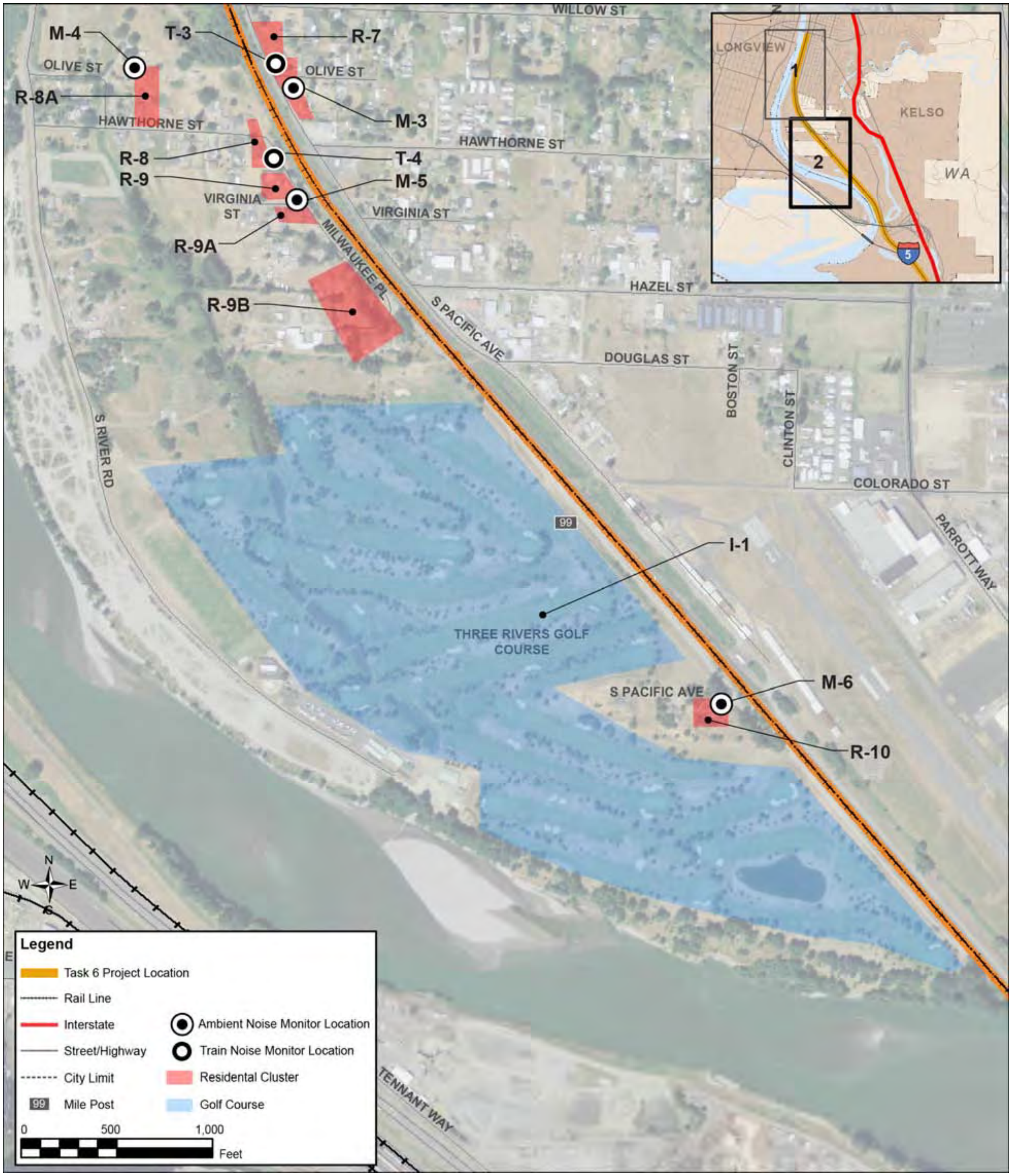

Figure 16. Noise and Vibration Sensitive Land Uses: Clusters R-7 through R-10 and I-1

Train Noise

Noise predictions from existing passenger and freight train operations were estimated using the noise measurements of existing train operations. Existing train operations are described further in Section 4.15.3.1, and include 10 passenger trains and 40 freight trains per day. The noise monitoring locations were attended to note the train characteristics such as speed, direction, and number of locomotives and cars. These measurements were conducted at four sites that are near residential locations along the Task 6 study area, some of which were near grade crossings to capture the sound of the train horns and grade crossing bells. Site T-1 is representative of the train noise along South Pacific Avenue at residential receivers R-1 through R-4. Sites T-2 and T-3 are representative of the train noise at residential receivers R-5 and R-7, respectively, along South Pacific Avenue. Site T-4 is representative of the train noise at residential receiver R-8. The results from the measurements are presented in Table 20.

Table 20. Measured Train Noise Levels

Site	Location	Distance to Near Track (feet)	Amtrak	BNSF Railway Freight
			Noise Level L_{max} (dBA)	Noise Level L_{max} (dBA)
T-1	913 South Pacific Avenue (R-1 through R-4)	115	107	112
T-2	1307 South Pacific Avenue (R-5)	65	106	109
T-3	1630 South Pacific Avenue (R-7)	125	95	78
T-4	167 Hawthorne Street (R-8)	115	84	87

4.7.3 Environmental Consequences

4.7.3.1 No Build Alternative

Daily operations of the No Build Alternative were assumed to be the same as existing rail operations described in Section 4.15.3.1, and include 10 passenger trains and 40 freight trains per day. Noise levels would remain similar to existing conditions. The Task 5 and Task 6 projects would not be constructed; therefore, they would not create any new noise impacts. Minor maintenance and repair activities along the existing rail line would continue to occur as part of the No Build Alternative; these activities would generate intermittent construction noise and would negligibly affect the existing noise environment.

4.7.3.2 Build Alternative

4.7.3.2.1 Task 5 Project

Short-term Effects

Under the Task 5 project, the first construction activity would be the fill and grading or excavation of the existing right-of-way. These activities would require the use of graders, dump trucks delivering fill material to the construction site, earthmovers, excavators, and compactors. Later construction would include activities such as installing track, fastening the rail to the ties, dumping ballast on the finished track, and tamping the ballast. Fill, grading, and excavation activities would generate higher noise levels than later construction activities (HDR 2014). Construction noise was projected by estimating a construction scenario and the percentage of time during operating hours that the equipment would operate under full power for the equipment being used. Table 21 shows categories of equipment that would likely be used and the typical noise generated by this equipment.

Table 21. Construction Equipment Noise Levels – Task 5 Project

Equipment	Sound Level at 50 Feet Under Full Load (dBA)
Excavator, Grader, Mobile crane	85
Dump truck	84
Ballast tamper	83
Generator	82
Compactor, Earthmover (bulldozer, front-end loader, etc.)	80

Source: USDOT 2006

Construction noise would be temporary and would vary widely both spatially and temporally over the course of Task 5 project construction. Based on a typical construction scenario for ballast-and-tie track construction, construction noise would be 80 to 82 dBA at a distance of 50 feet from the source of the noise. Although residences are located 100 to 200 feet from the project area, this temporary noise would be heard and has the potential of being intrusive to nearby residents. However, because various pieces of equipment would be turned off, idling, or operating at less than full power at any given time and because construction machinery is typically used to complete a short-term task at any given location, daytime noise levels would generally be less than the predicted levels. In addition, vehicle noise would result from delivery of fill material during the construction period. Such noise would be temporary, lasting only throughout the construction period.

While the majority of Task 5 project construction would take place during the daytime, certain construction activities, such as laying of rail and deliveries of rail and track materials to the site by train, could occur during nighttime hours. In addition, grading, excavation, and compaction activities could start as early as 5:00 a.m. and extend to 10:00 p.m. during the summer months. However, given that construction noise is intermittent, the noisiest activities would occur away from noise-sensitive receivers, including residences. Additionally, there is a reduction in perceptible sound for noise-sensitive receivers farther away from construction activities; therefore, no substantial short-term noise effects would be anticipated during construction.

Construction activities associated with the culvert replacement at unnamed tributary 3 would generate noise that could disturb users in the Louis Rasmussen Day Use Park. However, construction would generally occur during the fall season and weekdays when fewer people use the park, which would minimize the number of potential users exposed to the noise. Noise levels would not be anticipated to substantially affect user enjoyment or use of the park.

Long-term Effects

The primary components of noise from passenger and freight train operations are the diesel propulsion engine, wheel/rail noise, and horn noise. Secondary sources, such as vehicle air conditioning and other ancillary equipment, would sometimes be audible but are not expected to be major factors. For the purpose of analysis, daily rail operations of 62 freight trains and 14 passenger trains are assumed to be equally distributed on the new third main line track and the other two existing main line tracks (see Section 4.15.3.1). It was also assumed that there would be an equal number of freight trains per hour throughout the 24 hours of a day (approximately 2.5 trains per hour). Passenger trains were assumed to operate only during daytime hours and were equally distributed over the 15 daytime hours, from 7:00 a.m. to 10:00 p.m. (approximately 1 train per hour).

The change in existing L_{dn} noise levels under the Task 5 project would be in the range of a decrease of 0.4 dBA to an increase of 0.7 dBA, as shown in Table 22. This decrease in noise at P-1 is due to the relocation of the track work further from the park. The increase in noise at receiver R-12 is due to an increase in the daily train operations. Because the existing noise levels are relatively high, even a marginal increase in noise due to the Task 5 project would result in minor impacts. According to noise criteria used in this analysis, the Task 5 project would not result in moderate or severe impacts at any of the residential receivers. These results are representative of the noise impacts expected throughout the Task 5 study area. Consequently, no long-term noise impacts are predicted in the Task 5 study area.

Table 22. Noise Impacts – Task 5 Project

Cluster No.	Land Use	Closest Cross Street	Number of Units	Closest Noise Measurement Site	L_{dn} (dBA)					No. of Impacts	
					Existing	Build	Change in Noise due to Project[b]	FRA Impact Threshold[a]			
								Mod.	Severe	Mod.	Severe
R-11	Single Family Residence	Dupont Road	1	M-8	71.4	71.4	0.0	0.89	2.58	0	0
R-12	Single Family Residence	Dupont Road	1	M-8	70.0[c]	70.7	0.7	1.05	2.76	0	0
P-1[d]	Park	Marine Drive	—	M-7	68.0	67.4	-0.4	2.95	6.27	0	0

Notes:

[a] *FRA impact threshold (2012) for Category 2 land uses in terms of increase in existing noise with the project noise.*

[b] *Change in noise due to project is the difference in train noise facilitated by the improvements in the existing rail corridor.*

[c] *Because the M-8 monitor was approximately 50 feet from the near track, and the setback distance of these receivers are over 100 feet from the track, the existing levels were adjusted for the setback distance.*

[d] *Cluster P-1 is a Category 3 land use. Noise levels and FRA impact thresholds (2012) for this receiver are 1-hour L_{eq} (dBA).*

Summary of Effects

Short-term, minor, adverse noise effects for residents and park users would occur for the Task 5 project from temporary noise generated during construction. A long-term, marginal increase in noise would occur from operation of trains under the Task 5 project. These effects would be minimized by adhering to minimization measures and BMPs. For example, stationary construction equipment would be located as far as possible from noise-sensitive sites and nighttime construction would be avoided in residential neighborhoods to the extent practicable. The entire list of minimization measures and BMPs applicable to noise are described in Appendix M. No moderate or severe impacts are projected to occur. Consequently, no significant noise impacts are predicted in the Task 5 study area.

4.7.3.2.2 Task 6 Project

Short-term Effects

The construction activities and construction equipment for the Task 6 project would be the same as described for the Task 5 project; however, the Task 6 project would also include pile driving activities associated with the Coweeman River Bridge. Pile driving would result in noise of up to 95 dBA at a distance of 50 feet from the source of the noise (DOT 2006). Although the nearest residence is approximately 0.5 miles to the northwest, pile driving activities would still be heard by those residences. Other construction noise along the entire project area would be 80 to 82 dBA at a distance of 50 feet from the source of the noise and would be heard by nearby residences as described for Task 5. Short-term, minor, adverse noise effects for residents would occur for the Task 6 project from temporary noise generated during construction. However, no substantial short-term noise effects would be anticipated during construction of the Task 6 project.

Long-term Effects

The assumptions regarding the operation of passenger and freight trains would be the same as described for the Task 5 project.

The future train noise under the Task 6 project would be reduced because of the installation of continuous welded rail (under a separate project) in the area of receiver R-10. BNSF Railway recently replaced the rails in this area only on Main 2 (currently the easternmost main line) in two sections: from about MP 97.2 to MP 97.7 (north of the Kelso Longview Amtrak Station to about Mill Street) and from about MP 99.2 to MP 99.9 (near the pass-through culvert to points south).

The change in existing L_{dn} noise levels under the Task 6 project would be in the range of a decrease of 7.1 dBA to an increase of 0.9 dBA at the residential receivers, as shown in Table 23. These decreases in noise are due to the relocation of the existing crossover away from receivers R-9 and R-9A. The increase in noise at receiver R-10 is due to the new main line track under the Task 6 project that would move a third of the train traffic closer to this receiver. According to noise criteria used in this analysis, the Task 6 project would not result in moderate or severe impacts at any of the residential receivers. These results are representative of the noise impacts expected throughout the Task 6 study area. Consequently, no long-term noise impacts are predicted in the Task 6 study area.

Table 23. Noise Impacts – Task 6 Project

Cluster No.	Land Use	Closest Cross Street	Number of Units	Closest Noise Measurement Site	L_{dn} (dBA) Existing	L_{dn} (dBA) Build	L_{dn} (dBA) Change in Noise due to Project[b]	FRA Impact Threshold[a] Mod.	FRA Impact Threshold[a] Severe	No. of Impacts Mod.	No. of Impacts Severe
R-1	Multifamily Residence	Mill Street	6	M-1	79.1	79.1	0.0	0.17	1.43	0	0
R-2	Multifamily Residence	Mill Street	4	M-1	80.5	80.6	0.1	0.13	1.13	0	0
R-3	Single Family Residence	Mill Street	8	M-1	79.5	79.5	0.0	0.16	1.37	0	0
R-4	Single Family Residence	Mill Street	3	M-1	80.0	80.0	0.0	0.14	1.25	0	0
R-5	Single Family Residence	River Road	5	M-2	85.4	85.4	0.0	0.04	0.39	0	0
R-6	Single Family Residence	River Road	8	M-2	83.0	83.0	0.0	0.07	0.64	0	0
R-7	Single Family Residence	Olive Street	8	M-3	69.5	69.5	0.0	1.08	2.83	0	0
R-8	Single Family Residence	Hawthorne Street	2	M-3	69.9	69.9	0.0	1.06	2.78	0	0
R-8A	Single Family Residence	Milwaukee Place	3	M-4	65.4	65.4	0.0	1.37	3.56	0	0
R-9	Single Family Residence	Milwaukee Crossover	3	M-5	68.6	61.5	-7.1	1.13	2.97	0	0
R-9A[c]	Single Family Residence	Milwaukee Crossover	3	M-5	68.2	61.5	-6.7	1.13	2.97	0	0
R-9B	Single Family Residence	Milwaukee Place	3	M-5	60.4	59.6	-0.8	1.26	3.31	0	0

Table 23. Noise Impacts – Task 6 Project

Cluster No.	Land Use	Closest Cross Street	Number of Units	Closest Noise Measure-ment Site	L_{dn} (dBA) Existing	Build	Change in Noise due to Project[b]	FRA Impact Threshold[a] Mod.	Severe	No. of Impacts Mod.	Severe
R-10	Single Family Residence	S Pacific Avenue	2	M-6	65.6	66.5	0.9	1.35	3.52	0	0
I-1 [d]	Golf Course	S Pacific Avenue	1	M-6	58.1	59.0	0.9	3.80	7.72	0	0

Notes:

[a] *FRA impact threshold (2012) for Category 2 land uses in terms of increase in existing noise with the project noise.*

[b] *Change in noise due to project is the difference in train noise facilitated by the improvements in the existing rail corridor.*

[c] *Receiver R-9A is located within 200 feet of the existing crossover near Milwaukee Place similar to receiver R-9. However, unlike receiver R-9, there is no existing siding track near R-9A.*

[d] *Cluster I-1 is a Category 3 land use. Noise levels and FRA impact thresholds (2012) for this receiver are 1-hour L_{eq} (dBA).*

Summary of Effects

Short-term, minor, adverse noise effects for residents would occur for the Task 6 project from temporary noise generated during construction. A long-term, marginal increase in noise would occur from operation of trains under the Task 6 project. These effects would be minimized by adhering to minimization measures and BMPs. For example, stationary construction equipment would be located as far as possible from noise-sensitive sites and nighttime construction would be avoided in residential neighborhoods to the extent practicable. The entire list of minimization measures and BMPs applicable to noise are described in Appendix M. No moderate or severe impacts are projected to occur. Consequently, no significant noise impacts are predicted in the Task 6 study area.

4.8 Vibration

This section characterizes the existing groundborne vibration levels in the Task 5 and Task 6 study areas and describes the potential effects on the existing vibration environment that could result from the alternatives.

4.8.1 Study Area and Methodology

4.8.1.1 Study Area

The Task 5 and Task 6 study areas for the vibration analysis extend 600 feet from either side of the centerline of the middle track within the Task 5 and Task 6 project areas, respectively. Vibration effects were evaluated at vibration-sensitive receivers within 600 feet of the track centerline because beyond this distance, there is very limited potential for vibration impacts.

4.8.1.2 Methodology

Vibration impacts are evaluated based on the criteria defined in FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2012) and the vibration prediction methodologies in FTA's *Transit Noise and Vibration Impact Assessment* (FTA 2006).

Short-term Effects Vibration Methodology

The analysis of short-term effects from vibration considers the effects from construction of the Task 5 and Task 6 projects. FRA provides guidelines for assessing impacts from vibration during construction that focus on damage to buildings. In addition, FRA provides guidelines for minimizing the potential for damage to several types of buildings from construction vibration, as shown in Table 24. The thresholds are presented in terms of both peak particle velocity (PPV) and root mean square (RMS) vibration velocity. If these thresholds are exceeded, there is risk of building damage, and an impact would be anticipated due to vibration.

> ***Peak particle velocity (PPV)*** *is the maximum instantaneous positive or negative peak of the vibration signal.*
>
> ***Root mean square (RMS) vibration velocity*** *is the average of the vibration signal over a period of time.*

Table 24. Building Construction Vibration Damage Criteria

Building Category	PPV[a] (in/sec)	Approximate Lv[b] (VdB)
I. Reinforced–concrete, steel, or timber	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FRA 2012

Notes:

[a] *PPV = peak particle velocity*

[b] *Lv = Root mean square (RMS) vibration velocity in decibels (VdB), using a decibel reference of 1 micro-inch per second (µin/sec) and assuming a crest factor of 4.*

Long-term Effects Vibration Methodology

The analysis of long-term effects from vibration considers the effects from the operation of trains under the Task 5 and Task 6 projects. One potential community effect from the proposed Task 5 and Task 6 projects is vibration that is transmitted from the tracks through the ground into adjacent houses. This is referred to as groundborne vibration. When evaluating human response, groundborne vibration is usually expressed in terms of decibels using the RMS vibration velocity. RMS is defined as the average of the squared amplitude of the vibration signal. To avoid confusion with sound decibels, the abbreviation VdB is used for vibration decibels. All vibration decibels in this EA use a decibel reference of 1 micro-inch/second (µin/sec.).

The potential adverse effects of rail groundborne vibration include:

- ***Perceptible Building Vibration.*** Perceptible building vibration is when building occupants feel the vibration of the floor or other building surfaces. Experience has shown that the threshold of human perception is around 65 VdB and that vibration that exceeds 75 to 80 VdB may be intrusive and annoying to building occupants.
- ***Rattle.*** The building vibration can cause rattling of items on shelves and on walls as well as various rattling and buzzing noises from windows and doors.
- ***Reradiated Noise.*** The vibration of room surfaces radiates sound waves that may be audible to humans. This is referred to as groundborne noise. When audible groundborne noise occurs, it sounds like a low-frequency rumble. For a surface rail system such as the proposed Task 5 and Task 6 projects, the groundborne noise is usually masked by the normal airborne noise radiated from the train and the rails.
- ***Damage to Building Structures.*** Although it is conceivable that vibration from a rail system could cause damage to fragile buildings, the vibration from rail systems is usually one to two orders of magnitude below the most restrictive thresholds for preventing building damage. Therefore, the vibration impact criteria focus on human annoyance, which occurs at much lower amplitudes than does building damage.

Figure 17 shows typical vibration levels from rail and non-rail sources as well as the human and structural response to such levels.

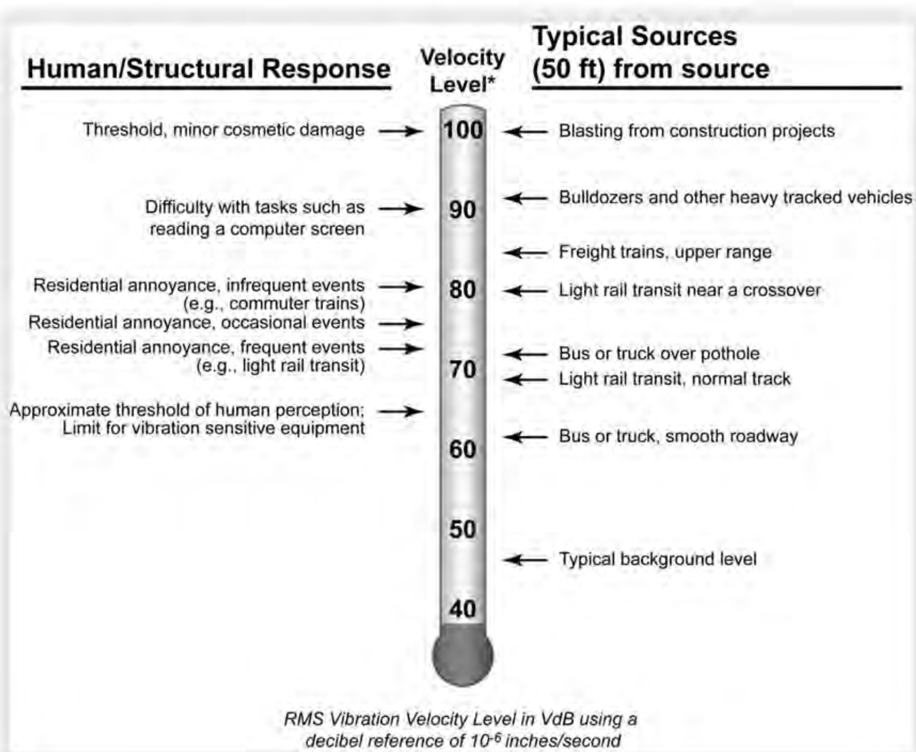

Figure 17. Typical Vibration Levels (FTA 2006)

The potential vibration impact from rail operations was assessed based on the increase in the future train operations under the Task 5 and Task 6 projects as compared to the existing conditions. As described in FTA's *Transit Noise and Vibration Impact Assessment* guidance (FTA 2006), for heavily used rail corridors (that is, more than 12 trains per day) where there is not a significant increase in the number of vibration-producing events (that is, a doubling of train volumes), then there would be additional impact only if the Task 5 and Task 6 projects' vibration would be 3 VdB, the FRA threshold for impact (2012), or more than the existing vibration.

4.8.2 Affected Environment

4.8.2.1 Task 5 Project

Groundborne vibration in the Task 5 study area originates from Amtrak and BNSF Railway freight trains operating along the existing rail corridor. Measurements of vibration in the Task 5 study area were taken in April 2013 to document the existing vibration environment and determine the vibration emissions of the existing Amtrak and BNSF Railway freight train operations. The vibration from Amtrak and BNSF Railway freight trains was measured at one residential location in the Task 5 study area (see Figure 14, above). The existing train vibration levels measured at site T-5 are below the FRA impact threshold of 72 VdB for residences. The results from the measurements are presented in Table 25.

Table 25. Measured Train Vibration Levels

Site	Location	Distance to Near Track (feet)	Amtrak Vibration Level L_{max} (VdB)	BNSF Railway Freight Vibration Level L_{max} (VdB)
T-5	227 Dupont Road	115	59	59

4.8.2.2 Task 6 Project

Groundborne vibration in the Task 6 study area originates from Amtrak and BNSF Railway freight trains operating along the existing rail corridor. Measurements of vibration in the Task 6 study area were taken in April 2013 to document the existing vibration environment and determine the vibration emissions of the existing Amtrak and BNSF Railway freight train operations. The vibration from Amtrak and BNSF Railway freight trains was measured at four residential locations in the Task 6 study area: Sites T-1, T-2, T-3, and T-4 (see Figure 15 and Figure 16, above). The results from the measurements are presented in Table 26.

Table 26. Measured Train Vibration Levels

Site	Location	Distance to Near Track (feet)	Amtrak Vibration Level L_{max} (VdB)	BNSF Railway Freight Vibration Level L_{max} (VdB)
T-1	913 South Pacific Avenue	115	78	86
T-2	1307 South Pacific Avenue	65	85	88
T-3	1630 South Pacific Avenue	125	73	82
T-4	167 Hawthorne Street	115	77	86

4.8.3 Environmental Consequences

4.8.3.1 No Build Alternative

Daily operations of the No Build Alternative were assumed to be the same as existing rail operations. Vibration levels would remain similar to existing conditions. The Task 5 and Task 6 projects would not be constructed; therefore, they would not create any new vibration impacts. Minor maintenance and repair activities along the existing rail line would continue to occur as part of the No Build Alternative; these activities would generate intermittent construction vibrations and would negligibly affect the existing environment.

4.8.3.2 Build Alternative

4.8.3.2.1 Task 5 Project

Short-term Effects

Construction activities that could generate high vibration levels include using jackhammers, using tracked vehicles such as bulldozers, pile driving, and blasting. No blasting would occur for the Task 5 project. No exceedances of the FRA vibration damage risk criteria would be anticipated during construction; therefore, no short-term vibration impacts would occur.

Long-term Effects

The trains operating in the Task 5 study area would not result in a change to the existing vibration level in the Task 5 study area for the three modeled clusters, as shown in Table 27. According to vibration criteria used in this analysis, the Task 5 project would not result in impacts at any of the residential receivers. These results are representative of the vibration impacts expected throughout the Task 5 study area. Consequently, no long-term vibration impacts are predicted in the Task 5 study area.

Table 27. Vibration Impacts

Cluster No.	Land Use	Closest Cross Street	Number of Units	Maximum Vibration Level – VdB				Impact
				Existing	No Build Alternative	Task 5 Project	Net Change in Vibration Level	
R-11	Single Family Residence	Dupont Road	1	56.3	56.3	56.3	0.0	—
R-12	Single Family Residence	Dupont Road	1	52.3	52.3	52.3	0.0	—
P-1[a]	Park	Marine Drive	—	—	—	—	—	—

Note:

[a] *Cluster P-1 is a park that is not considered by FRA as a vibration-sensitive land use.*

Summary of Effects

The Task 5 project would not result in short- or long-term vibration impacts.

4.8.3.2.2 Task 6 Project

Short-term Effects

The short-term vibration effects for the Task 6 project would be the same as described for the Task 5 project; however, the Task 6 project would also include pile driving activities associated with the Coweeman River Bridge. Pile driving would not occur near any sensitive receptors, as the nearest receptor is approximately 0.5 miles to the northwest. No exceedances of the FRA vibration damage risk criteria would be anticipated during construction; therefore, no short-term vibration impacts would occur.

Long-term Effects

The trains operating in the Task 6 study area would result in a change to the existing vibration levels in the Task 6 study area, ranging from a decrease of 10.0 VdB to an increase of 1.1 VdB, as shown in Table 28. These changes are due to the reduced distance between the proposed third main line track and the existing residences as a result of the Task 6 project. However, the Task 6 project is not projected to result in any long-term vibration impacts because the vibration levels do not exceed the existing levels by more than 3 VdB, the FRA threshold for impact (2012), at any of the receivers. These results are representative of the vibration impacts expected throughout the Task 6 study area. The FRA impact threshold is based on maximum vibration levels of a single train passby and does not consider increases in train operations. However, even with the increase in train operations, no effect from vibration would be expected. The FRA impact threshold does not apply to outdoor receivers (for example, Cluster P-1).

Table 28. Vibration Impacts

Cluster No.	Land Use	Closest Cross Street	Number of Units	Maximum Vibration Level – VdB				Impact
				Existing	No Build Alternative	Task 6 Project	Net Change in Vibration Level	
R-1	Multifamily Residence	Mill Street	6	79.7	79.7	79.7	0.0	—
R-2	Multifamily Residence	Mill Street	4	83.2	83.2	83.2	0.0	—
R-3	Single Family Residence	Mill Street	8	81.3	81.3	81.3	0.0	—
R-4	Single Family Residence	Mill Street	3	82.3	82.3	82.3	0.0	—

Table 28. Vibration Impacts

Cluster No.	Land Use	Closest Cross Street	Number of Units	Maximum Vibration Level – VdB				Impact
				Existing	No Build Alternative	Task 6 Project	Net Change in Vibration Level	
R-5	Single Family Residence	River Road	5	83.2	83.2	83.2	0.0	—
R-6	Single Family Residence	River Road	8	77.6	77.6	77.6	0.0	—
R-7	Single Family Residence	Hawthorne Street	8	78.6	78.6	78.6	0.0	—
R-8	Single Family Residence	Hawthorne Street	2	79.7	79.7	79.7	0.0	—
R-8A	Single Family Residence	Hawthorne Street	3	61.6	61.6	61.6	0.0	—
R-9	Single Family Residence	Milwaukee Crossover	3	87.6	87.6	77.6	-10.0	—
R-9A	Single Family Residence	Milwaukee Crossover	3	85.5	85.5	77.6	-7.9	—
R-9B	Single Family Residence	Milwaukee Place	3	70.9	70.9	71.9	0.9	—
R-10	Single Family Residence	South Pacific Avenue	2	72.6	72.6	73.7	1.1	—
I-1[a]	Golf Course	South Pacific Avenue	—	—	—	—	—	—

Note:

[a] *Cluster I-1 is a golf course that is not considered by FRA as a vibration-sensitive land use.*

Summary of Effects

The Task 6 project would not result in short- or long-term vibration impacts.

4.9 Hazardous Materials

> ***Hazardous materials*** *or substances, hazardous wastes, or contaminated environmental media, including soils, surface water, and groundwater, may be present within the study area and could potentially result in effects on human health and the environment during construction activities or long-term operation activities. Hazardous materials effects include potential historic spills or dumping along the rail line as well as effects from nearby properties that may have impacted soil, surface water, and groundwater.*

This section characterizes the Task 5 and Task 6 study areas with regard to the presence of hazardous materials, presents an analysis of potential effects of hazardous materials on the Task 5 and Task 6 projects, and describes potential effects of alternatives on hazardous materials.

4.9.1 Study Area and Methodology

4.9.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of hazardous materials include 0.25 mile on either side of the Task 5 and Task 6 project areas. The 0.25-mile offset for the Task 5 and Task 6 study areas allows for evaluation of the right-of-way, as well as nearby properties that could reasonably affect the right-of-way, through release of hazardous materials or petroleum products. For example, contamination could migrate through groundwater, air dispersion, or soil erosion from large industrial properties that may border the right-of-way, even if the site address is located some distance away from the right-of-way.

4.9.1.2 Methodology

Historic land use, geologic information, and regulatory records were reviewed to identify land uses or business operations that may have used hazardous materials and had the potential to contaminate soil or groundwater. Sites identified as having potential hazardous materials releases were further evaluated to assess the potential for these releases to migrate and impact the Task 5 and Task 6 study areas. The evaluation was conducted through desktop analyses, including review of federal, state, and local databases and aerial photography provided by a database search company, Environmental Data Resources, Inc. (EDR). In addition, the evaluation was supplemented by windshield surveys through the Task 5 and Task 6 study areas, with reconnaissance of the Task 5 and Task 6 project areas and the surrounding vicinity from public rights-of-way. Sites of concern were screened to identify potentially contaminated sites that may affect the environment during construction, create substantial construction impacts, or incur cleanup liability. Sites were then screened to eliminate sites that pose low risk. Sites that remained after screening were assigned a risk level based on the probable extent of contamination. These moderate and high risk sites were evaluated to determine whether there may be an effect that cannot be reasonably minimized. Site risk level categories include the following:

- ***Low:*** The risk of encountering contamination is low.
- ***Moderate:*** The risk of potential contamination to exist on the site is probable, yet if encountered, the contamination is straightforward to manage.
- ***High:*** The risk of extensive and/or highly toxic contamination is known or suspected to exist on the site.

4.9.2 Affected Environment

4.9.2.1 Task 5 Project

Five sites were identified as having a moderate risk and one site was identified as having a high risk to construction activities within the Task 5 study area, as shown in Table 29. These moderate and high risk sites include effects from current and former industrial properties with documented contamination of soil and groundwater from nearby leaking underground storage tanks (LUSTs) and other hazardous material releases (EDR 2013a, 2013b). Appendix H contains a map (Figure H-1) showing the location of the sites of concern as well as background data on each site.

Table 29. Hazardous Materials Sites of Concern – Task 5 Study Area

Site Name	Risk Category	Distance	Regulatory Listings of Concern	Contamination Concern
Columbia Fiber Ltd. Longview Fiber Yard (Site No. 1)	Moderate	1,000 feet west (downgradient) of BNSF Railway right-of-way	Leaking Underground Storage Tank (LUST) Underground Storage Tank (UST) Confirmed and Suspected Contaminated Site List (CSCSL)	Soil and groundwater contamination from petroleum products has been confirmed. This site has a LUST listing from 1992. One UST was closed in place at the site; the condition of the tank and the potential for impacted soil and/or groundwater are unknown. The potential for groundwater effects is due to the tidal influence of the nearby Columbia River.
North Star Yachts Kalama/Absolute Concrete Colors (Site No. 2)	Moderate	1,000 feet west (downgradient) of BNSF Railway right-of-way	Resource Conservation and Recovery Act (RCRA) Generator CSCSL Voluntary Cleanup Program (VCP)	Soil and groundwater contamination from petroleum products has been confirmed. This site has been a hazardous waste generator since 1996 and is a common tenant with Site No. 3, below. The potential for groundwater effects is due to the tidal influence of the nearby Columbia River.
North Star Yachts/All Pure Chemical Co/ Hannah Boat Works (Site No. 3)	Moderate	1,000 feet west (downgradient) of BNSF Railway right-of-way	RCRA Generator Emergency Response Notification System (ERNS)	This site has been a hazardous waste generator since at least 1986. The site has a history of chemical releases and is a common tenant with Site No. 2, above. The potential for groundwater effects is due to the tidal influence of the nearby Columbia River.

Table 29. Hazardous Materials Sites of Concern – Task 5 Study Area

Site Name	Risk Category	Distance	Regulatory Listings of Concern	Contamination Concern
Emerald Kalama Chemical LLC/ Kalama Chemical Inc./ Noveon Kalama Chemical (Site No. 4)	High	200 feet west (downgradient) of BNSF Railway right-of-way at the closest point	Comprehensive Environmental Response, Compensation, and Liability Information System - No Further Remedial Action Planned (CERC-NFRAP) RCRA Corrective Action (CORRACTS) RCRA Generator CSCSL Engineering and Institutional Controls UST ERNS Hazardous Site Listing (HSL) Hazardous Materials Incident Report System (HMIRS) Historical Records	This site has operated as a chemical production plant since 1962. Confirmed releases of hazardous materials to soil and groundwater include toluene, benzene, diphenyl oxide, phenol, benzoic acid, arsenic, and copper. Groundwater generally flows north and west, away from the project area. The site has an extensive history of chemical spills and releases. The potential for groundwater effects is due to the tidal influence of the nearby Columbia River.
Chemtrade Performance Chemicals Kalama Plant (Site No. 5)	Moderate	150 feet west (downgradient) of BNSF Railway right-of-way	RCRA Generator CSCSL VCP LUST Historical Records	Soil and groundwater contamination from metals has been confirmed. The site has an extensive history as an industrial property and was first identified as a shingle mill in 1908. The potential for groundwater effects is due to the tidal influence of the nearby Columbia River.
Hazel Mae Merz Station (Site No. 6)	Moderate	300 feet east (upgradient) of BNSF Railway right-of-way	CSCSL No Further Action (NFA) VCP	This site reported a release of petroleum products in 1990 and received a conditional NFA status from the Washington State Department of Ecology in April 1999. In general, sites receiving NFA status prior to 2000 may have residual contamination remaining above current Model Toxics Control Act Method A cleanup levels.

Sources: EDR 2013a, 2013b

4.9.2.2 Task 6 Project

Six moderate risk sites were identified within the Task 6 study area, as shown in Table 30. No high risk sites were identified within or near the Task 6 study area. These moderate risk sites include documented contamination of soil and groundwater from nearby LUSTs and other hazardous materials releases, as well as long-term historic use of properties near the Task 6 study area for industrial purposes (EDR 2013a, 2013b). Appendix H contains a map (Figure H-2) showing the location of the sites of concern.

Table 30. Hazardous Materials Sites of Concern – Task 6 Study Area

Site Name	Risk Category	Distance	Regulatory Listings of Concern	Contamination Concern
Arco 4093 (Site No. 1)	Moderate	850 feet east (upgradient) of BNSF Railway right-of-way	Confirmed and Suspected Contaminated Site List (CSCSL) Leaking Underground Storage Tank (LUST) Underground Storage Tank (UST) Voluntary Cleanup Program (VCP)	Soil and groundwater contamination from petroleum has been confirmed. This site reported a LUST incident in 1992.
Wilson Oil Inc. Kelso/Chevron 96789 (Site No. 2)	Moderate	850 feet east (upgradient) of BNSF Railway right-of-way	Resource Conservation and Recovery Act (RCRA) Generator UST CSCSL No Further Action (NFA) VCP	This site reported a LUST incident in 1990 and received a conditional NFA status from the Washington State Department of Ecology in October 1998. One UST was closed in place at the site; the condition of the tank and the potential for impacted soil and/or groundwater are unknown. In general, sites receiving NFA status prior to 2000 may have residual contamination remaining above current Model Toxics Control Act Method A cleanup levels.
Troy Property (Site No. 3)	Moderate	830 feet east (upgradient) of BNSF Railway right-of-way	CSCSL LUST UST Historical Records	Historic use of the property was as a machine shop in the 1950s and 1960s. A LUST incident was reported in 1990; soil contamination from petroleum has been confirmed. One UST was closed in place at the site; the condition of the tank and the potential for impacted soil and/or groundwater are unknown.
Polacek Brothers (Site No. 4)	Moderate	810 feet east (upgradient) of BNSF Railway right-of-way	UST Historical Records	One UST was closed in place at the site; the condition of the tank and the potential for impacted soil and/or groundwater are unknown. Historic use of the property was for auto repair/auto service.
Quick Check 10/ Astro No. 713 (Site No. 5)	Moderate	Immediately adjacent to the east (upgradient) of BNSF Railway right-of-way	UST CSCSL NFA VCP	The site reported a LUST incident in 1998 and received a conditional NFA status from Ecology in September 1998. In general, sites receiving NFA status prior to 2000 may have residual contamination remaining above current Model Toxics Control Act Method A cleanup levels.

Table 30. Hazardous Materials Sites of Concern – Task 6 Study Area

Site Name	Risk Category	Distance	Regulatory Listings of Concern	Contamination Concern
1113 South Pacific Avenue, Kelso, WA (Site No. 6)	Moderate	Immediately adjacent to the east (upgradient) of BNSF Railway right-of-way	Historical Records	This site was identified as a filling station with gasoline storage tanks in the 1956 and 1961 Sanborn Fire Insurance Maps. No additional information about the site and associated tanks was identified.

Sources: EDR 2013a, 2013b

4.9.3 Environmental Consequences

4.9.3.1 No Build Alternative

Minor maintenance and repair activities along the existing rail line would occur as part of the No Build Alternative. The current commodity mix hauled by BNSF Railway, which may include hazardous materials, would continue to be transported along the existing rail line. Existing conditions, including storage of hazardous materials at sites of concern, transport of hazardous materials through the project area by vehicle, and currently impacted soil and groundwater from sites of concern would persist under the No Build Alternative, and no adverse effects would be anticipated.

4.9.3.2 Build Alternative

4.9.3.2.1 Task 5 Project

Short-term Effects

Short-term effects would be expected during construction of the Task 5 project if contaminated soil, sediment, or groundwater were encountered. Contaminated soil or groundwater could result in public health or environmental effects caused by the release and spread of contaminated soil, sediment, or groundwater; by altering the flow of or generating contaminated groundwater if dewatering is required; and by creating pathways for contamination to migrate through the soil column. Contaminants in airborne particulates can migrate off-site in dust particles and may cause an exposure concern.

The six sites of concern found within the Task 5 study area are unlikely to affect or be affected by construction activities. Task 5 project Sites No. 1 through No. 5, with known groundwater contamination, are west and downgradient of the railroad right-of-way; however, groundwater in the area may be tidally influenced, causing potentially contaminated groundwater to flow toward the railroad right-of-way. Task 5 project Site No. 6 is east and upgradient of the railroad right-of-way; therefore, contaminated groundwater has the potential to migrate toward the railroad right-of-way. However, in general, earthwork activities are shallow and not likely to reach groundwater. None of the sites of concern are located within the railroad right-of-way; therefore, it is unlikely that contaminated soils would be encountered. However, contaminated soil from unreported spills may be encountered during construction activities. Proposed construction activities would not affect ongoing remediation activities at any of the sites of concern.

Accidental hazardous materials spills or releases from construction activities, equipment, or materials may also occur.

Long-term Effects

No long-term effects from the Task 5 project are anticipated because the project would not increase the potential for exposure to hazardous materials from the transport or accidental release of hazardous materials. Amtrak *Cascades* trains operating in the Task 5 study area would not be carrying hazardous materials in bulk. The current commodity mix hauled by BNSF Railway freight trains, which may include hazardous materials, would continue to be transported through the Task 5 study area. Therefore, the Task 5 study area would experience no increase in the transport of hazardous materials due to the Build Alternative, and the risk of a hazardous materials incident would be comparable to current conditions. Proposed operational activities would not affect ongoing remediation activities at any of the hazardous materials sites of concern. Accidental hazardous materials spills or releases from operational activities, equipment, or materials may occur but would be comparable to current conditions.

Summary of Effects

Short-term effects would be expected during construction of the Task 5 project if contaminated soil, sediment, or groundwater were encountered; however, these effects would be minimized by adhering to minimization measures and BMPs. For example, a project-specific hazardous materials plan would be implemented to manage potential hazardous material effects from unreported spills. The entire list of minimization measures and BMPs applicable to hazardous materials are described in Appendix M. No long-term effects from the Task 5 project are anticipated because the project would not increase the potential for exposure to hazardous materials from the transport or accidental release of hazardous materials. Accidental hazardous materials spills or releases from operational activities, equipment, or materials may occur but would be comparable to current conditions.

4.9.3.2.2 Task 6 Project

Short-term Effects

The short-term effects under the Task 6 project would be similar to those described for the Task 5 project. Earthwork activities are shallow and not likely to reach known contaminated groundwater associated with any of the sites of concern found within the Task 6 study area. Contaminated soil from unreported spills may be encountered during construction activities. Proposed construction activities would not affect ongoing remediation activities at any of the hazardous materials sites of concern.

Long-term Effects

The long-term effects under the Task 6 project would be similar to those described for the Task 5 project.

Summary of Effects

Short-term effects would be expected during construction of the Task 6 project if contaminated soil, sediment, or groundwater were encountered; however, these effects would be minimized by adhering to minimization measures and BMPs. For example, a project-specific hazardous materials plan would be implemented to manage potential hazardous material effects from unreported spills. The entire list of minimization measures and BMPs applicable to hazardous materials are described in Appendix M. No long-term effects from the Task 6 project are anticipated because the project would not increase the potential for exposure to hazardous materials from the transport or accidental release of hazardous materials. Accidental hazardous materials spills or releases from operational activities, equipment, or materials may occur but would be comparable to current conditions.

4.10 Land Use, Recreation, and Section 6(f) Resources

This section characterizes the land uses and recreation areas in the Task 5 and Task 6 study areas and presents an analysis of potential effects on these resources that could result from the alternatives.

4.10.1 Study Area and Methodology

4.10.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of land use and recreation include up to 0.25 mile on either side of the Task 5 and Task 6 project areas, which captures the area of potential disturbance by project construction and provides for an understanding of the land use pattern of adjacent areas that could be affected by the proposed projects. Although portions of the city of Longview are within the 0.25 mile study area for the Task 6 project, they are on the west side of the Columbia River and are therefore distant from the project area. These portions of Longview would not experience any effects on land use or recreation and were thus excluded from the analysis.

4.10.1.2 Methodology

Potential effects on land use could occur from the Task 5 and Task 6 projects if they were found to be inconsistent with existing land use plans; by causing disturbance to an existing land use during construction, or from full or partial acquisition of a property. Potential effects on recreational resources could occur from the Task 5 and Task 6 projects through direct physical changes to or changes to the public's enjoyment of recreational resources. Physical changes could include construction within the resource boundaries or other physical changes that could affect the character of the resource. Effects to the publics' enjoyment of the resources could result from aesthetic changes in or near the park or from noise that interferes with visitor experience within the resource. Potential effects of the Task 5 and Task 6 projects on land use and recreation were evaluated based on current land uses, available maps, and applicable land use plans and policies. Applicable land use plans and policies for the Task 5 project include those for the city of Kalama, Cowlitz County, and the Port of Kalama; for the Task 6 project, they include the city of Kelso and Cowlitz County. Land use plans and policies have been established to manage growth and development within the Task 5 and Task 6 study areas. Appendix I, Table I-1, provides a brief description of the land use plans and policies applicable to the Task 5 and Task 6 study areas.

The land uses were compared to the alternatives to determine the potential effects on current or future development and recreation opportunities, and to evaluate whether the alternatives are consistent with applicable plans, policies, and regulations. In addition, potential effects on land use and recreation were analyzed by reviewing information available on the websites for Cowlitz County, the cities of Kalama and Kelso, the Port of Kalama, and the Cowlitz-Wahkiakum Council of Governments; conducting a site inspection; and interviews with planning staff in the affected jurisdictions.

Potential recreation sites that may have been purchased or developed with Land and Water Conservation Fund Act (LWCFA) dollars were determined by reviewing existing information from websites and the Washington State Recreation and Conservation Office Project Information System. Effects on the Section 6(f) resources present in the Task 5 and Task 6 study areas were determined by comparing the projects' design information with data on the existing Section 6(f) resources. An effect would be anticipated on Section 6(f) resources if the Task 5 or Task 6 project would convert a Section 6(f) site to another use other than for which it was funded for a period of longer than 6 consecutive months.

> ***Section 6(f)*** *of the Land and Water Conservation Fund Act (LWCFA) provides protection for parks acquired or developed with LWCF grants. The LWCFA was established to provide funding opportunities to develop and preserve outdoor recreational resources. Section 6(f) properties are recreation resources created or improved with funds from the LWCFA. Land purchased with these funds cannot be converted to a nonrecreational use without coordination with the U.S. Department of the Interior, National Park Service and mitigation that includes replacement of the quality and quantity of land used.*

4.10.2 Affected Environment

4.10.2.1 Task 5 Project

4.10.2.1.1 Land Use – Task 5 Project

The Task 5 study area is located in Cowlitz County, primarily within the city of Kalama and a small portion of unincorporated Cowlitz County, as shown in Figure 18. The Task 5 study area includes a variety of land uses, including heavy port industrial development managed by the Port of Kalama, recreation, commercial businesses, and residential homes. I-5 parallels the Task 5 study area adjacent to the railroad right-of-way.

Cowlitz County

Cowlitz County is a rural county with five incorporated cities, including the city of Kalama. The Cowlitz County Comprehensive Plan provides guidance for future growth and development of the county; however, the current version of the plan does not designate specific land uses for the county (Cowlitz County 1981). Undesignated land use within the portion of the Task 5 study area within unincorporated Cowlitz County includes industrial, recreational, and residential areas.

City of Kalama

The city of Kalama is located along the Columbia River, and the majority of the Task 5 study area is located within the city of Kalama. The city's Comprehensive Plan designates industrial, highway commercial, multifamily residential, single family residential, and central business land uses in the Task 5 study area (City of Kalama 2005). The Task 5 study area is divided by I-5, and only those areas west of the highway are likely to be affected by the Task 5 project. West of I-5, the zoning classification is industrial. A portion of the industrial zoning has a public/quasi-public overlay where the marina and public park are located (City of Kalama 2007).

Port of Kalama

Along the riverfront of the Columbia River within the Task 5 study area is the Port of Kalama industrial area. The Port of Kalama Comprehensive Plan provides guidance for the development and use of this land (Port of Kalama 2010). The Port of Kalama property also includes the recreational marina and public park located along the Columbia River (Port of Kalama 2013).

4.10.2.1.2 Recreation – Task 5 Project

Numerous recreation opportunities exist within the Task 5 study area. The Port of Kalama recreational marina provides 222 boat slips and associated marine support facilities. Surrounding the marina are walking and bicycle trails along the Columbia River, picnic areas, decks, a public boat launch, and public beaches. Adjacent to the marina are two parks operated by the Port of Kalama: Marine Park and Louis Rasmussen Day Use Park. Together, the parks cover approximately 10 acres along the shoreline of the Columbia River and include recreation opportunities. Marine Park includes picnic shelters and open space. Louis Rasmussen Day Use Park includes a playground; basketball, volleyball, and tennis courts; horseshoe pits; and picnic areas. The Kalama Marina Trail system borders these parks along the Columbia River. All of these resources are adjacent and west of the project area, operated by the Port of Kalama, and are open to the public.

4.10.2.1.3 Section 6(f) Resources – Task 5 Project

One LWCFA property is located in the Task 5 study area: the Port of Kalama – Kalama Boat Basin 70 (identified as the Marina in Figure 18), and the co-located Marine Park and Louis Rasmussen Day Use Park. LWCF funding was used to purchase approximately 14 acres for the facility, including over 1,000 feet of Columbia River shoreline. The Port of Kalama developed the 14 acre site for recreational facilities, including a 222-slip marina on the Columbia River. Marine Park includes picnic shelters and open space. Louis Rasmussen Day Use Park includes a playground; basketball, volleyball, and tennis courts; horseshoe pits; and picnic areas. The Kalama Marina Trail system borders these parks along the Columbia River. The Washington State Recreation and Conservation Office, the administrator of LWCF grants on behalf of the National Park Service, has confirmed that the area of the Louis Rasmussen Day Use Park affected by the replacement of the unnamed tributary 3 culvert was not purchased or improved using LWCFA funds and is, therefore, not a Section 6(f) resource.

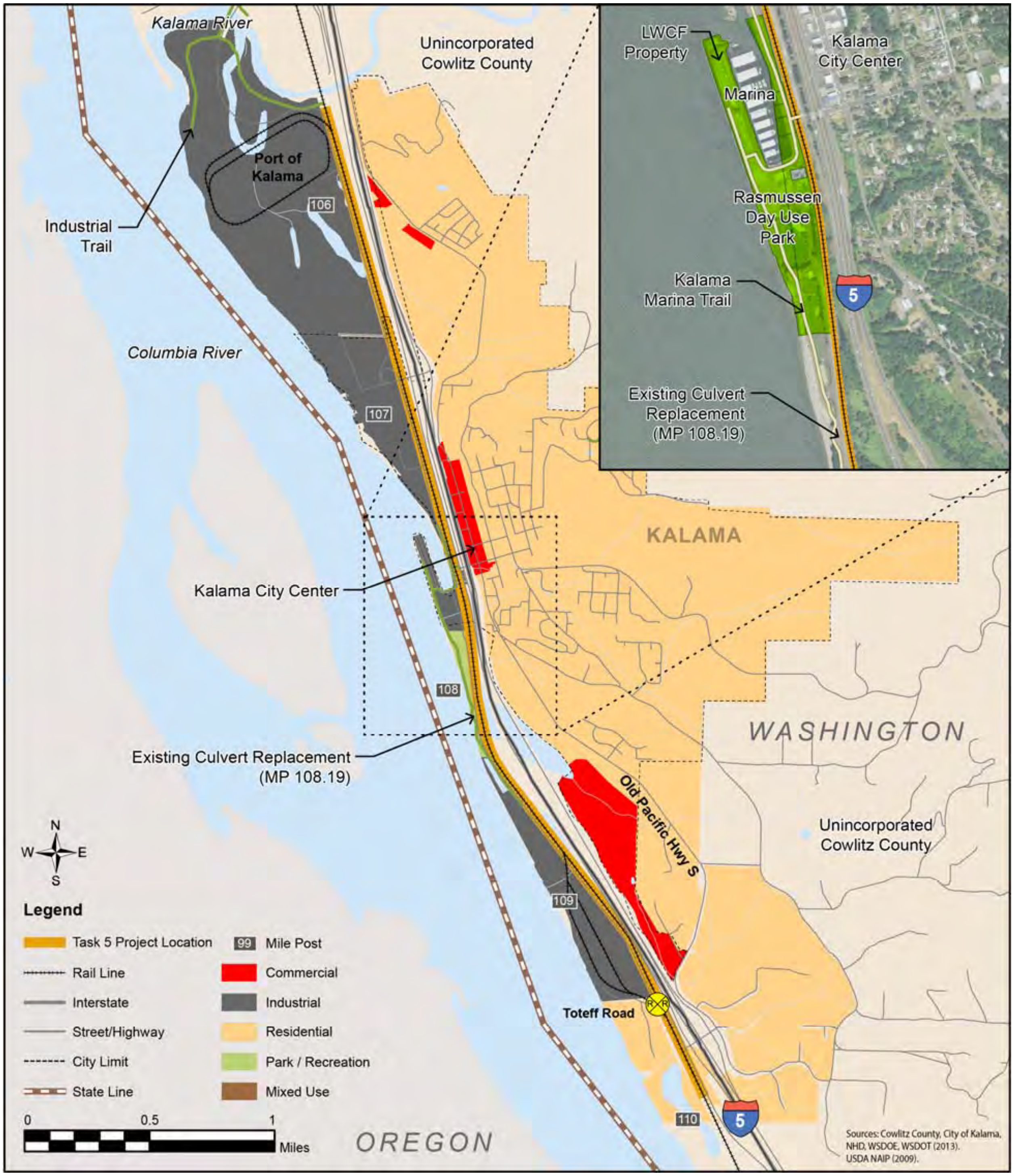

Figure 18. Land Use in the Task 5 Study Area

4.10.2.2 Task 6 Project

4.10.2.2.1 Land Use – Task 6 Project

The Task 6 study area is located in Cowlitz County, primarily within the city of Kelso, as shown in Figure 19. Additionally, portions of the Task 6 study area are located within unincorporated Cowlitz County. The Task 6 study area includes a variety of land uses, including residential homes, commercial businesses, the Three Rivers Golf Course, the Southwest Washington Regional Airport, and industrial areas.

Cowlitz County

Cowlitz County is a rural county with five incorporated cities, including the cities of Kelso and Longview (see Section 4.10.2.2.1 for addition detail). The southern portion of the Task 6 study area is located within unincorporated Cowlitz County and includes low-density residential development, vacant land, and public lands.

City of Kelso

The portion of the Task 6 study area located in the city of Kelso includes a diverse group of land uses. The city's Comprehensive Plan designates commercial, high-density residential, industrial, low-density residential, and open space land uses in the Task 6 study area (City of Kelso 1980). The Kelso-Longview Amtrak Station is located within the central business district of Kelso and is surrounded by commercial development. South of the central business district, the Task 6 study area includes multifamily and single family residences with public access to the Cowlitz River. Further south, single family homes border the private Three Rivers Golf Course. East of the golf course and the railroad right-of-way is the Southwest Washington Regional Airport.

4.10.2.2.2 Recreation – Task 6 Project

Numerous recreation opportunities exist within the Task 6 study area. Parallel to and outside of the railroad right-of-way is the publicly-owned Cowlitz River Trail system that consists of a paved trail. The publicly-owned Coweeman River Trail system is also located within the Task 6 study area and follows the Coweeman River levee (Cowlitz-Wahkiakum Council of Governments 2010). The privately-owned, but open to the public, Three Rivers Golf Course lies in the Task 6 study area immediately adjacent to the west of the railroad right-of-way.

4.10.2.2.3 Section 6(f) Resources – Task 6 Project

No Section 6(f) resources are located within the Task 6 study area.

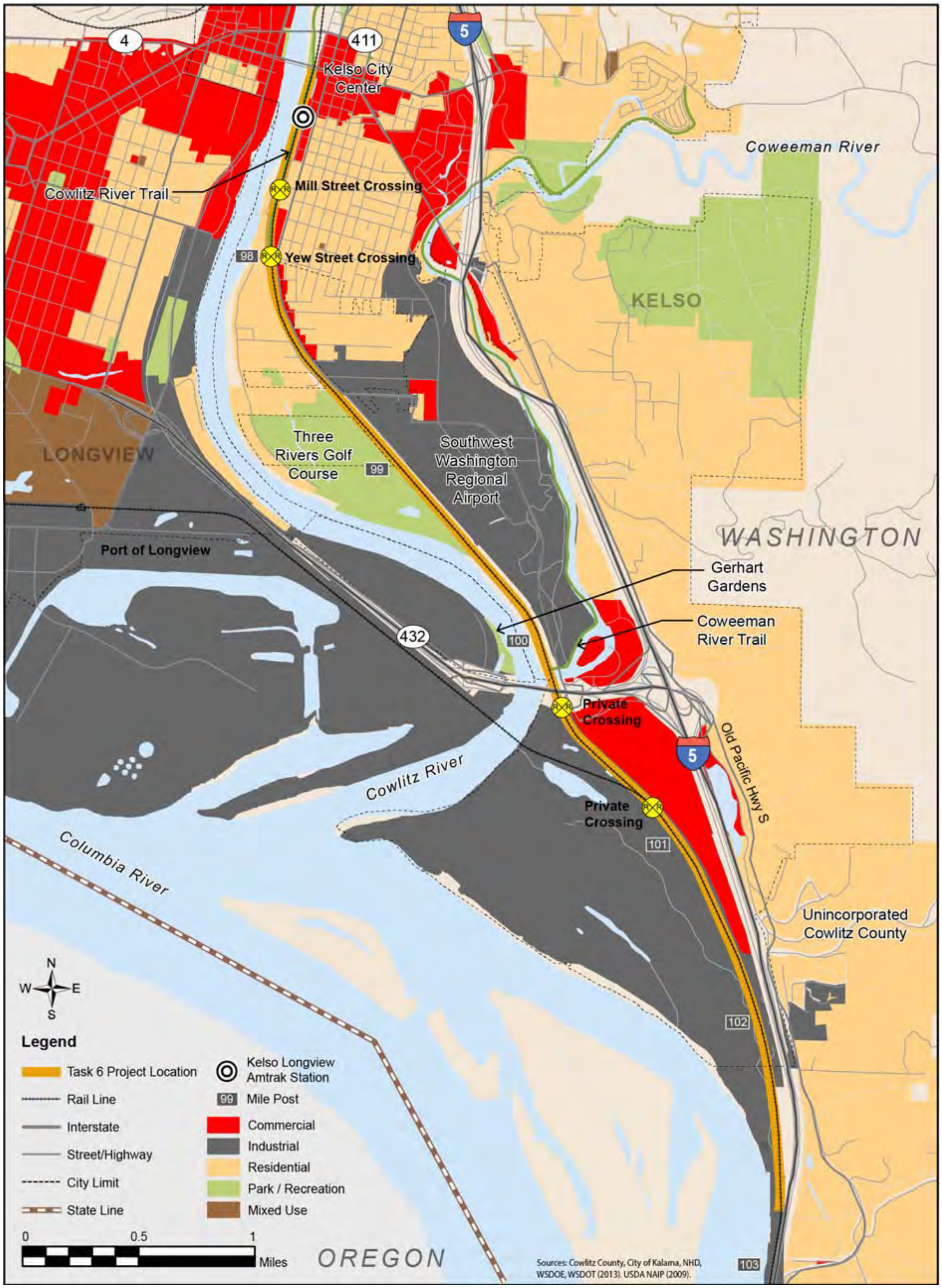

Figure 19. Land Use in the Task 6 Study Area

4.10.3 Environmental Consequences

4.10.3.1 No Build Alternative

If the Task 5 and Task 6 projects are not built, Amtrak's *Cascades* and *Coast Starlight* passenger train service would continue to use the existing BNSF Railway rail line through Kalama and Kelso. The No Build Alternative includes only continuation of minor maintenance and repair activities necessary to keep the existing BNSF Railway rail line operational, and existing land uses would remain the same. Projected changes in land use within the study areas are off the rail corridor related to other port improvements, but no other proposals or projects have been identified that would have a direct effect on the corridor. Therefore, no effects on land use or recreation would occur if the Task 5 and Task 6 projects are not constructed. There would be no effects on Section 6(f) resources under the No Build Alternative because no Section 6(f) resources would be converted to another use.

4.10.3.2 Build Alternative

4.10.3.2.1 Task 5 Project

Short-term Effects

Land Use – Task 5 Project

No short-term effects on land use would be anticipated from construction activities associated with the Task 5 project. Construction activities would take place within the existing railroad right-of-way with the exception of a small sliver along the eastern edge of Wetland B (see Section 4.3.3.2.1). Removal of material to offset the fill material placed in this wetland would require a temporary construction easement from the city of Kalama. However, this easement and activities occurring in this wetland, in addition to the other construction activities associated with the Task 5 project, would not alter any existing land uses, be inconsistent with existing land use plans, or require acquisition of any property.

Recreation – Task 5 Project

A short-term effect would occur from construction noise that would temporarily disturb enjoyment of the parks and trails adjacent to the railroad right-of-way and unnamed tributary 3. However, construction noise would be short-term and temporary, would dissipate as the distance from construction activities increases, and would not be anticipated to be in a single location for an extended period of time. In addition, construction would generally occur during the fall season (in the later part of the July 1 to October 31 in-water work window) and weekdays when fewer people use the park, which would minimize the number of potential users exposed to the noise.

Construction activities associated with the culvert replacement at unnamed tributary 3 would have a short-term effect on Louis Rasmussen Day Use Park. Construction activities would require temporary closure of the beach, parking area, and Hendrickson Drive within the construction site of unnamed tributary 3 fish-passable culverts. A temporary construction easement may be required from the Port of Kalama at Louis Rasmussen Day Use Park. These closures would occur during an approximately 3 to 4 week construction period during the low visitation season in the fall (in the later part of the July 1 to October 31 in-water work window) and on weekdays. Hendrickson Drive and the parking area would be temporarily closed for approximately 2 weeks. Alternative access routes to the park and parking are available both north and south of the construction site. Following construction, both the road and the parking lot would be restored to pre-construction conditions. A traffic control plan, notification, and signage would be implemented during construction to minimize impacts to adjacent property owners, businesses, and park users.

During construction of the box culvert outfall and natural stream, the beach would be temporarily closed for approximately one week. Alternative access to the beach north and south of the construction site would be available. In addition, temporary closure of the beach is anticipated to occur after construction through Hendrickson Drive and the parking lot is complete, thereby allowing beach access via the parking lot and nearby stairs.

The Queen of the West sternwheeler uses the beach in the southern portion of the park for passengers to disembark for a bus tour and day trip to Mount St Helens. Construction activities would be approximately 800 feet north of where passengers disembark; therefore, construction of the unnamed tributary 3 culvert replacement would not be anticipated to affect boat landings. Bus loading and unloading would also be unaffected by construction as buses utilize a parking area further south, which would not be affected during construction. It is known that this area is popular for fishing, and there would be a temporary cessation of this activity during the construction period.

Although there would be short-term effects to the park and park access during construction, construction activities would not adversely affect park users or activities. Discussions with the Port of Kalama regarding the potential effects of the proposed culvert installation on the park during construction are ongoing. The park would also be a Section 4(f) resource and construction of the culverts at unnamed tributary 3 would require evaluation under Section 4(f) as described in Section 4.12.3.2.1.

Section 6(f) Resources – Task 5 Project

No physical changes would occur within Section 6(f) resources within the Task 5 study area; therefore, there would be no effect on Section 6(f) resources. Long-term Effects

Land Use – Task 5 Project

The Task 5 project would be consistent with all applicable land use plans and policies and would not affect future development opportunities of property adjacent to the railroad right-of-way. The Task 5 project would not result in any regional or local changes to adjacent land use. The proposed Task 5 project is intended to meet existing demand and is not anticipated to induce additional growth in the Task 5 study area; therefore, no long-term effects are anticipated.

Recreation – Task 5 Project

The Task 5 project would not result in any permanent changes in the accessibility to, demand for, or public enjoyment of recreational opportunities in the Task 5 study area. Due to their proximity, the recreation resources in the Task 5 project area are currently subject to noise. The additional trains operating along the rail line would not substantially increase train noise to the detriment of the public's enjoyment of the resources.

The new box culvert outfall and natural stream channel for unnamed tributary 3 would block driver access to the beach south of unnamed tributary 3; however, driving is not legally allowed in this area. The culvert and outfall would not hinder access along the beach, as a portion of the beach would be maintained as a continuous sandy beach passage between the more westerly parking area and the daylighted culvert to allow users to travel north and south along the beach (Figure 20).

The placement of the culvert and stream outfall at unnamed tributary 3 is expected to result in an aesthetic enhancement to Louis Rasmussen Day Use Park. The existing culvert outflows to the Columbia River through an exposed corrugated steel pipe surrounded by rip-rap. Replacement of the culvert and creation of a more natural outfall along the beach would enhance the appearance of the park (Figure 20). For safety, a culvert gate would be placed over the box culvert outfall to prevent pedestrian access.

The Port of Kalama's unpublished master plan describes future improvements to the park. However, no improvements are proposed in the beach area of unnamed tributary 3 (JD Walsh 2013a; 2013b); however, walkway and parking area improvements are proposed to improve park circulation. The proposed improvements at unnamed tributary 3 would not conflict with those proposed circulation improvements.

Figure 20. Rendering of the Conceptual Design for the Box Culvert Outfall and Natural Stream Channel at Unnamed Tributary 3

Therefore, no long-term adverse effects on recreation within the Task 5 study area are anticipated. Discussions with the Port of Kalama regarding the proposed design for this culvert replacement and potential long-term effects on the park are ongoing. The park would also be a Section 4(f) resource and construction of the culverts at unnamed tributary 3 would require evaluation under Section 4(f) as described in Section 4.12.3.2.1.

Section 6(f) Resources – Task 5 Project

The Task 5 project would not result in permanent physical changes, displacement of existing land uses or acquisition of property, or conversion of the Section 6(f) resources. Therefore, no long-term effects on Section 6(f) resources are anticipated.

Summary of Effects

The Task 5 project would not result in short-term effects to land use or Section 6(f) resources within the Task 5 study area. The Task 5 project would result in short-term, minor effects to recreational users at the Louis Rasmussen Day Use Park during construction of the culvert replacement at unnamed tributary 3. Temporary closures of Hendrickson Drive, parking area, and beach at unnamed tributary 3 would affect access north and south of the construction site. However, alternative access is available and construction would occur during the fall and weekdays during low visitation.

The Task 5 project would not result in long-term effects on land use, recreation, or Section 6(f) resources within the Task 5 study area.

4.10.3.2.2 Task 6 Project

Short-term Effects

Land Use – Task 6 Project

No short-term effects on land use would be anticipated from construction activities associated with the Task 6 project because all construction would take place within the existing right-of-way. The short-term effects of the Task 6 project on land use would be the same as those described for the Task 5 project.

The Task 6 project would be located partly adjacent to and within approximately 200 feet of the runway at the Southwest Washington Regional Airport. Under 49 CFR 77, the FAA is to be notified via Form 7460-1 of proposed construction activities that would take place within 20,000 feet of an airport with a runway of greater the 3,200 feet in length and which exceed a 100 to 1 imaginary surface height from the runway. The 100 to 1 ratio establishes a threshold of one foot of height for every 100 feet of horizontal distance. For the Task 6 project, this means that since the project would be approximately 200 feet from the runway, the project would require FAA notification because construction equipment would exceed 2 feet in height at that distance. Therefore, Form 7460-1 would be submitted to the FAA to document the proposed activities. The FAA would review the submittal and make a determination regarding any potential hazards associated with the project. Although the project is close to the runway, the proposed project and construction would have a low profile, similar to existing activities and are not anticipated to effect airport operations.

Recreation – Task 6 Project

The short-term effects from the Task 6 project on recreation would be the same as those described for the Task 5 project.

Section 6(f) Resources – Task 6 Project

No Section 6(f) resources are located within the Task 6 study area; therefore, no impacts would be expected.

Long-term Effects

Land Use – Task 6 Project

The long-term effects from the Task 6 project on land use would be the same as those described for the Task 5 project.

Recreation – Task 6 Project

The long-term effects from the Task 6 project on recreation would be the same as those described for the Task 5 project.

Section 6(f) Resources – Task 6 Project

No Section 6(f) resources are located within the Task 6 study area; therefore, no impacts would be expected.

Summary of Effects

The Task 6 project would not result in short- or long-term effects on land use, recreation, or Section 6(f) resources within the Task 6 study area.

4.11 Cultural Resources

This section characterizes the cultural resources in the Task 5 and Task 6 study areas and describes the potential effects that could result from the alternatives.

*The term **cultural resources** encompasses archaeological sites, Native American cultural resources, traditional cultural properties (TCPs), historic buildings and structures, historic districts, historic landscapes, and other valued cultural resources.*

***Historic properties** is a technical term from the National Historic Preservation Act (NHPA) of 1966 (16 USC 470f) that denotes properties that have recognized significance. Historic properties are defined as places listed in or eligible for listing on the National Register of Historic Places (NRHP). These properties can include districts, sites, buildings, structures, objects, and landscapes significant in American history, prehistory, architecture, archaeology, engineering, and culture. The three main types of historic properties are (1) archaeological resources, (2) traditional cultural properties, and (3) resources of the historic built environment.*

*The **Area of Potential Effect** (APE) is geographic area or areas which an undertaking may directly or indirectly cause alternations in the character or use of historic properties. The APE is three dimensional including auditory, visual and ground disturbing activities. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.*

4.11.1 Study Area and Methodology

4.11.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of cultural resources are the Areas of Potential Effect (APEs), which extend 75 feet from the centerline of the existing rail line for the Task 5 and Task 6 projects. In addition, the Task 5 study area includes lands in the vicinity of unnamed tributary 3, which would include properties outside the BNSF ROW, under Hendrickson Drive and in parklands, and parking owned by the Port of Kalama.

4.11.1.2 Methodology

Several cultural resource surveys have been conducted within the APEs for the Task 5 and Task 6 projects. A Cultural Resources Discipline Report was prepared in 2003 for the Kelso – Martin's Bluff Rail Project NEPA/SEPA Preliminary Draft Environmental Impact Statement, which incorporates the Task 5 and Task 6 project area (WSDOT 2003a). Cultural resource surveys, including archaeological investigations and historic property inventories, were also undertaken in the Task 5 and Task 6 study areas in 2002, 2003, and 2006 (Western Shore Heritage Services, Inc. 2002, Jones and Stokes 2003, ICF Jones and Stokes 2003, ICF Jones and Stokes 2006). FRA and WSDOT conducted a supplemental survey of National Register of Historic Places (NRHP)-eligible properties located within the Task 6 APE in 2013 (see Appendix J). Effects of the Task 5 and Task 6 projects were determined by comparing the projects' design information with data on the existing cultural resources present in the Task 5 and Task 6 study areas.

WSDOT, on behalf of FRA, has consulted with the Cowlitz Indian Tribe, Confederated Tribes of Grand Ronde Community, Confederated Tribes of the Umatilla, Confederated Tribes of Warm Springs, Nez Perce Tribe, and the Yakama Nation on the Task 5 and Task 6 project APEs and potential for impacts on cultural resources, including traditional cultural properties (TCPs). In addition, WSDOT conducted agency coordination with representatives of state and local entities with an interest in cultural resources, as described in Section 6.0. Additional information about agency coordination and tribal consultation is provided in Section 6.0, Appendix J, and Appendix N.

4.11.2 Affected Environment

4.11.2.1 Task 5 Project

No archaeological resources, historic structures, or TCPs have been identified within the APE for the Task 5 project. Based on field observations and the level of disturbance from similar rail construction and modification projects, the APE was determined to have a low probability for pre-contact or significant archaeological resources (Western Shore Heritage Services, Inc. 2002, Jones and Stokes 2003, ICF Jones and Stokes 2003, ICF Jones and Stokes 2006). Several village sites and traditional use areas have been identified in the ethnographic and historic record, including the Tyakhanakshikh, Kawimin, Cathlahaws, and Kalama village sites located near but not within the Task 5 project APE (Thorsgard, Harrelson, and Edwards 2013). No sites listed on or eligible for listing on the NRHP have been identified within the Task 5 project APE (see Appendix J).

4.11.2.2 Task 6 Project

No archaeological resources or TCPs have been identified within the APE for the Task 6 project. Based on field observations and the level of disturbance from similar rail construction and modification projects, the Task 6 APE was determined to have a low probability for pre-contact or significant archaeological resources (Western Shore Heritage Services, Inc. 2002, Jones and Stokes 2003, ICF Jones and Stokes 2003, ICF Jones and Stokes 2006). The TCPs described above, near Task 5 but not within the established APE, are in the vicinity of the Task 6 project APE. Mount Coffin (Yee-eh-mas-tee) and Coffin Rock are located to the west of the Task 6 project APE on the Columbia River and have been identified in the ethno-historical record as significant landforms (Thorsgard, Harrelson, and Edwards 2013, Boyd 2011). Survey charts from the first European expedition up the lower Columbia River in 1792 by Wm. Broughton of the HMS Chatham identified these locations and made note of their use by native people (Boyd 2011).

The Confederated Tribes of the Grand Ronde Community have identified the lower stretch of the Columbia River and the mouth of the Cowlitz River as a significant cultural landscape and continue to practice traditional ceremonial activities in this area. Canoe journeys through this area provide an opportunity to educate tribal youth on the cultural importance of the landscape and reinforce the cultural identity of the Grand Ronde Community. The mouth of the Cowlitz River is approximately one mile southwest of the Task 6 study area.

Twenty-one NRHP-eligible properties were identified and evaluated within the Task 6 project APE (Jones and Stokes 2003). FRA and WSDOT revisited these properties in a 2013 field review and updated the historic property inventory records (see Appendix J). Twenty of these properties were evaluated and have been determined not eligible for listing on the NRHP (see Appendix J).

The Coweeman River Bridge (Bridge No. 100.1) was evaluated in 2003 as not eligible for listing on the NRHP (WSDOT 2003a). However, FRA reevaluated the 1911 steel truss bridge in 2013 and determined the structure eligible for listing on the NRHP per Criterion C for type, period, and method of construction (see Appendix J). The bridge has remained unaltered from its original construction and appears much as it did when built over 100 years ago on the Northern Pacific Railroad main line.

4.11.3 Environmental Consequences

4.11.3.1 No Build Alternative

If the Task 5 and Task 6 projects are not built, Amtrak's *Cascades* and *Coast Starlight* passenger train service would continue to use the existing BNSF Railway rail line. The No Build Alternative includes only continuation of minor maintenance and repair activities necessary to keep the existing BNSF Railway rail line operational. Therefore, there would be no impacts on archaeological resources, historic structures, or TCPs if the Task 5 and Task 6 projects are not constructed.

4.11.3.2 Build Alternative

4.11.3.2.1 Task 5 Project

Short-term Effects

No historic structures or TCPs were identified in the Task 5 project APE. The Washington State Department of Archaeology and Historic Preservation (DAHP) concurred with the determination of no historic properties affected for the Task 5 project on June 15, 2009 (see Appendix J).

Replacement of the unnamed tributary 3 culvert would include a jack and bore pit and trenching to install the proposed culverts beneath the rail line, Hendrickson Drive, and parking lot. These activities would occur to a depth of 25 feet below ground surface and would therefore likely encounter native soils that may contain archaeological resources. The construction of the box culvert outfall and natural stream channel along the beach area would require shallow excavation that would also encounter native soils that may contain archaeological resources. In consultation with DAHP, archaeological testing would occur prior to construction to assist in determining if archaeological resources are present. To minimize potential effects to archaeological resources during construction of the culvert replacement at unnamed tributary 3, an inadvertent discovery plan would be developed in coordination with DAHP and the affected Tribes. A letter to DAHP and the Tribes describing the changes to the project and the associated change to the APE, and requesting their comments was circulated on July 24, 2014 (Appendix J).

Long-term Effects

No historic structures or TCPs were identified in the Task 5 project APE. DAHP concurred with the determination of no historic properties affected for the Task 5 project on June 15, 2009 (see Appendix J). No long-term effects on archaeological resources in the area of unnamed tributary 3 would be expected to result from the Task 5 project. A letter to DAHP and the Tribes describing the changes to the project and the associated change to the APE, and requesting their comments was circulated on July 24, 2014 (Appendix J).

Summary of Effects

The Task 5 project would have no short-term or long-term adverse effects on historic structures or TCPs. DAHP concurred with the determination of no historic properties affected for the Task 5 project on June 15, 2009. Short-term effects may occur to archaeological resources if any are discovered, during construction of the culvert replacement at unnamed tributary 3. In consultation with DAHP, archaeological testing would occur prior to construction to assist in determining if archaeological resources are present. To minimize potential effects to archaeological resources during construction of the culvert replacement at unnamed tributary 3, an inadvertent discovery plan would be developed in coordination with DAHP and the affected Tribes.

No long-term effects on archaeological resources in the area of unnamed tributary 3 would be expected to result from the Task 5 project. A letter to DAHP and the Tribes describing the changes to the project and the associated change to the APE was circulated on July 24, 2014. Additional information about tribal consultation and agency coordination is provided in Section 6.0, Appendix J, and Appendix N.

4.11.3.2.2 Task 6 Project

Short-term Effects

No archaeological resources or TCPs were identified in the Task 6 project APE; therefore, the Task 6 project is not expected to have short-term effects on archaeological resources or TCPs. The DAHP concurred with the determination of no adverse effect on historic properties) for the Task 6 project on August 20, 2013 (see Appendix J). The DAHP also concurred with the determination that the construction of a pedestrian walkway on the existing Coweeman River Bridge would not result in an adverse effect on the bridge on April 17, 2014 (see Appendix J). Therefore, the Task 6 project is not anticipated to have short-term adverse effects on historic properties.

Long-term Effects

No archaeological resources or TCPs were identified in the Task 6 project APE; therefore, the Task 6 project would not have long-term effects on archaeological resources or TCPs. The Task 6 project would permanently alter the viewshed of the Coweeman River Bridge, a historic resource; however, past highway development in the area has previously altered the viewshed, and public access to the Coweeman River Bridge is prohibited. Construction of the new railroad bridge would not impact the character or use of the historic bridge and therefore would have no long-term adverse effects on the bridge. DAHP concurred with the determination of no adverse effect on cultural resources for the Task 6 project on August 20, 2013 (see Appendix J). The DAHP also concurred with the determination that the construction of a pedestrian walkway, handrails, and lighting on the existing Coweeman River Bridge would not result in an adverse effect on the bridge on April 17, 2014 (see Appendix J).

Summary of Effects

The Task 6 project would have no short-term or long-term adverse effects on archaeological resources, historic structures, or TCPs. DAHP concurred with the determination of no adverse effect on historic properties (including the NRHP-eligible Coweeman River Bridge) for the Task 6 project on August 20, 2013 (see Appendix J). Additional information about tribal consultation and agency coordination is provided in Section 6.0, Appendix J, and Appendix N.

4.12 Section 4(f) Resources

This section characterizes the Section 4(f) resources in the Task 5 and Task 6 study areas and describes the potential effects that could result from the alternatives.

Projects using federal funds or requiring a permit or license from the U.S. Department of Transportation (USDOT) must meet the requirements of Section 4(f) of the USDOT Act of 1966 (49 USC 303). ***Section 4(f)*** *protects significant public parks, recreation lands, wildlife and waterfowl refuges, and public and private historic sites from being "used" in transportation projects carried out or funded by modal administrations of USDOT, including FRA.*

Direct uses *occur when a Section 4(f) resource is permanently incorporated into a transportation facility (for example, property acquisition) or there is a temporary occupancy of land (for example, construction easement) that adversely affects the Section 4(f) resource.*

Constructive uses *occur when a project's proximity to a Section 4(f) resource results in effects that are so severe that the activities, features, or attributes of Section 4(f) resources are substantially impaired.*

A ***de minimis*** *impact involves the use of Section 4(f) property that is generally minor in nature. A de minimis impact is one that, after taking into account avoidance, minimization, mitigation and enhancement measures, results in no adverse effect to the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f).*

4.12.1 Study Area and Methodology

4.12.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of Section 4(f) resources correlate to the study areas in this EA for land use and recreation, and for cultural resources. Please refer to Sections 4.10.1.1 and 4.12.1.1.

4.12.1.2 Methodology

Public parks and recreation areas were identified through mapping and field visits as part of the evaluation of land use and recreation described in Section 4.10. Potential historic sites that may be eligible for protection under Section 4(f) were identified as part of the evaluation for cultural resources described in Section 4.11. Effects of the Task 5 and Task 6 projects were evaluated by comparing the projects' design information with data on Section 4(f) resources within or adjacent to the Task 5 and Task 6 study areas to determine whether any direct or constructive uses of those resources would occur during construction or operation of the Task 5 and Task 6 projects.

4.12.2 Affected Environment

4.12.2.1 Task 5 Project

As described in Section 4.10, two parks operated by the Port of Kalama are located in the Task 5 study area: Marine Park and Louis Rasmussen Day Use Park; these two parks qualify as Section 4(f) resources. No historic properties or wildlife or waterfowl refuges are present in the Task 5 study area.

4.12.2.2 Task 6 Project

Two parks that qualify as Section 4(f) resources are located within the Task 6 study area: the Cowlitz River Trail system and the Coweeman River Trail system. No wildlife or waterfowl refuges are present in the Task 6 study area.

One historic property is located in the Task 6 study area; the Coweeman River Bridge is NRHP-eligible and thus protected by Section 4(f).

4.12.3 Environmental Consequences

4.12.3.1 No Build Alternative

If the Task 5 and Task 6 projects are not built, Amtrak's *Cascades* and *Coast Starlight* passenger train service would continue to use the existing BNSF Railway rail line. The No Build Alternative includes only continuation of minor maintenance and repair activities necessary to keep the existing BNSF Railway rail line operational, and existing land uses would remain the same. Therefore, there would be no direct or constructive uses of Section 4(f) resources if the Task 5 and Task 6 projects are not constructed.

4.12.3.2 Build Alternative

4.12.3.2.1 Task 5 Project

Short-term Effects

Construction activities associated with the culvert replacement at unnamed tributary 3 would have short-term effects on Louis Rasmussen Day Use Park as described in Section 4.10.3.2.1. Access to the park would be maintained during construction. Discussions with the Port of Kalama regarding the proposed design and potential effects on the park during construction are ongoing.

A temporary construction easement may be required from the Port of Kalama at the Louis Rasmussen Day Use Park. Temporary construction noise would be generated near the parks, although it would dissipate as the distance from construction activities increases, and would move along the corridor as construction moves. Further, the 4(f) uses adjacent to the existing rail corridor are not of a type which is sensitive to noise. Access to the parks may be constrained during construction, but will not be closed. Therefore, these short-term effects would not substantially impair the activities, features, or attributes of the Section 4(f) resource.

Long-term Effects

As described in Section 4.10.3.2.1, the placement of the culvert and stream outfall at unnamed tributary 3 is expected to result in an aesthetic enhancement to Louis Rasmussen Day Use Park. The existing culvert flows to the Columbia River through an exposed corrugated steel pipe surrounded by rip-rap. Replacement of the culvert and creation of a more natural appearance along the beach would enhance the appearance of the park.

The replacement of the culvert and stream outfall would be anticipated to result in a *de minimis* Section 4(f) impact to the park, as it would not adversely affect the activities, features, or attributes of the park. Discussions with the Port of Kalama regarding the potential long-term effects on the park are ongoing. The public will have an opportunity to provide input on the potential effects to the park resource.

No historic properties or wildlife or waterfowl refuges are present in the Task 5 study area.

Summary of Effects

Construction activities would result in a temporary closure of Louis Rasmussen Day Use Park. Access to the park would be maintained during construction. Replacement of the existing unnamed tributary 3 culvert would be anticipated to result in a *de minimis* Section 4(f) finding to the park as it would not adversely affect the activities, features, or attributes of the park. Potential for long-term beneficial effects would be expected from the enhancement or unnamed tributary 3 within the park.

4.12.3.2.2 Task 6 Project

Short-term Effects

No acquisitions or construction easements of Section 4(f) properties are proposed as part of the Task 6 project; therefore, no short-term direct uses of Section 4(f) resources would occur. Construction activities would be located relatively far from the Cowlitz River Trail and Coweeman River Trail systems, and would not affect activities, features, or attributes of these Section 4(f) resources. As described in Section 4.11.3.2.2, the Task 6 project was determined to have no adverse effect on the Coweeman River Bridge.

Long-term Effects

The Task 6 project would not include acquisition of any part of the Cowlitz River Trail system or the Coweeman River Trail system, and would not substantially impair the activities, features, or attributes of these Section 4(f) resources. However, the addition of a new walkway, handrails, and lighting to the NRHP-eligible Coweeman River Bridge could represent a permanent incorporation of a property protected by Section 4(f).   FRA and WSDOT determined that these new features would not result in an adverse effect to the historic property and referred that finding to the DAHP for their review and concurrence, in accordance with Section 106. DAHP reviewed the proposed additions to the bridge, and provided FRA with a letter concurring with FRA's finding of no adverse effect (April 15, 2014 –refer to Appendix J).   Based on this finding, supported by DAHP's letter, FRA finds that the Task 6 project would have a *de minimis* impact on the Coweeman River Bridge.

Summary of Effects

The Task 6 project would not permanently incorporate any property protected by Section 4(f) or result in any effects that would substantially impair the features, activities, or attributes that makes a property eligible for protection. Therefore, Task 6 would not result in a use of any Section 4(f) property.

4.13 Socioeconomics and Environmental Justice

This section characterizes the socioeconomic conditions and environmental justice populations in the Task 5 and Task 6 study areas and describes the potential effects that could result from the alternatives.

Title VI of the Civil Rights Act of 1964, requires all recipients of federal funds to demonstrate how they have ensured their actions do not discriminate against minorities and low income populations. This process is known as environmental justice and is part of the environmental documentation completed under the National Environmental Policy Act. U.S. Department of Transportation (DOT) Order 5610.2(a) describes how the objectives of environmental justice are integrated into DOT actions.

4.13.1 Study Area and Methodology

4.13.1.1 Study Area

The Task 5 and Task 6 study areas for analysis of socioeconomics and environmental justice were determined based on the extent of surrounding neighborhoods and community services, natural and human-made barriers, and available census data. U.S. Census Bureau census tracts that cross the Task 5 and Task 6 project areas represented the best available data for existing socioeconomic conditions and environmental justice populations. The census tracts extend from 0.25 mile to several miles from the Task 5 and Task 6 project areas. Census tract 16 was used for the Task 5 study area, and census tracts 3, 10, 11, 12, 17, and 21 were used for the Task 6 study area, as shown in Figure 21. For the socioeconomics and environmental justice analysis, these study areas were compared to the data at the county level (described in Section 4.13.1.2, below).

4.13.1.2 Methodology

Potential socioeconomic effects were determined by evaluating whether the alternatives would result in changes to employment levels; displace local businesses or people; limit access to public services; result in changes to demographics, land use patterns, or neighborhoods; or affect community connectivity or cohesion.

Demographic and economic data were collected from the U.S. Census Bureau and local jurisdictions. U.S. Census Bureau data were used to summarize population and demographic data for minority or low-income populations. If the Task 5 or Task 6 study area were to have a higher proportion of minority or low-income populations than the overall county population, then they would be identified as environmental justice populations. There would be effects on environmental justice populations if the alternatives were to result in any disproportionately high and adverse effects. This is determined based on whether an adverse effect is appreciably greater for the environmental justice population than for the population as a whole.

Additionally, U.S. Census Bureau data were used to summarize population and demographic data for Limited English Proficiency (LEP) populations (that is, populations of individuals over 5 years old who speak English "less than very well"). English proficiency was determined using the data that described linguistically isolated populations, meaning that these persons describe themselves as having little ability to understand and speak English and having little to no ability to write in English. If a person is

Figure 21. Socioeconomics and Environmental Justice Study Areas

linguistically isolated, that individual would meet the LEP criteria and public outreach to LEP populations would be conducted.

4.13.2 Affected Environment

Socioeconomic elements are part of the built environment and include people, places, and features that affect the quality of life for people living and working in the Task 5 and Task 6 study areas. This section summarizes community character, community connectivity and cohesion, public services, and economic conditions, as well as environmental justice populations, of the Task 5 and Task 6 study areas. Both the Task 5 and Task 6 study areas are located in Cowlitz County and have similar community and demographic characteristics; however, the Task 6 study area, closer to Kelso, is more densely populated. In addition, communities, commercial areas, and industrial facilities share some of the same amenities and services, such as the Kelso-Longview Amtrak Station and the Southwest Washington Regional Airport.

4.13.2.1 Task 5 Project

4.13.2.1.1 Socioeconomics

4.13.2.2 Community Character

The Task 5 project is located within the city of Kalama and unincorporated Cowlitz County. The community is characterized by rural development, development within the city of Kalama, the Columbia River and its associated ports, businesses and infrastructure (including railroad facilities), and recreational opportunities. Based on a windshield survey, the Task 5 study area contains few residences directly adjacent to the Task 5 project area except off of Toteff Road between the rail line and the Cowlitz River. Land use includes heavy port industrial, recreational, commercial, and residential, and is described in detail in Section 4.10.2.1. I-5 parallels the railroad right-of-way, effectively separating the Task 5 project area from the commercial center of the city of Kalama and most residential areas. The neighborhoods east of I-5 have a rural feel, with low-density neighborhoods separated by large distances. The Columbia and Kalama rivers, industrial businesses, railroads, as well as the existing highway infrastructure, are visible from the neighborhoods to the east.

Community Connectivity and Cohesion

The existing rail line and I-5 limit community connectivity to residential areas, the Port of Kalama marina, and the recreational area near West Marine Drive and North Hendrickson Drive. The railroad and interstate act as a barrier and divide the eastern portion of the city from the western portion and limit travel between the two portions of the city. There is one at-grade crossing connecting the two portions of the city at Toteff Road; occasionally, vehicular traffic is delayed because of train operations. The neighborhoods east of I-5 are mostly situated at higher elevations than the rail corridor and the interstate and overlook the railroad facilities, interstate, and port. The neighborhoods, public services, and the commercial center of town are connected by arterial and local roads along the east side of the interstate. Many community activities occur at the Kalama community building east of I-5, which hosts groups such as the Lion's Club and the Garden Club (Smee 2013).

Public Services

Within the Task 5 study area, there are two schools, four religious facilities, two fire stations, one library, and one recreational facility. No medical facilities, daycare facilities, public transportation, or Amtrak stations are in the Task 5 study area. Public services are discussed in detail in Section 4.16.2.1.1.

Economic Conditions

The most consistent information for economic conditions was available at the county level and was acquired and applied to this analysis. Cowlitz County is located on the Columbia River, adjacent to the Portland/Vancouver metropolitan area. The county has two active ports, a productive wood-products industry, two paper mills, a diverse manufacturing base, and good rail and interstate linkages. In the late 1970s, there were 6,400 timber jobs in the county, and a third of all jobs were in manufacturing. The county's per capita income was close to the state average and above the national average. Since then, timber and manufacturing employment has declined, and wages and income have not kept up with the rest of the nation.

During the recent recession (approximately 2008 to 2010), Cowlitz County lost 9 percent of its non-farm employment. Its unemployment rate topped 14 percent (not seasonally adjusted) before easing downward at the end of 2010. Employment growth improved in 2010, aided by construction projects on new investments: a new grain terminal, a new steel pipe plant, and two new Wal-Marts. However, hiring stagnated in 2011 (Washington State Employment Security Department 2013a). The most recent statistics (preliminary, not yet seasonally adjusted) for March 2013 show that Cowlitz County had an unemployment rate of 11.1 percent compared to 7.3 percent for Washington and 7.6 percent for the United States. The Washington State Employment Security Department currently lists Cowlitz County as a "Distressed Area" with a 3-year average unemployment rate of 12.0 percent (January 2010 to December 2012) (Washington State Employment Security Department 2013b). Distressed areas are counties where the 3-year unemployment rate is at least 20 percent higher than the statewide average.

4.13.2.2.1 Environmental Justice Populations

Demographics for race, and income and poverty level in the Task 5 study area (that is, census tract 16) are summarized in the following subsections. If the Task 5 study area were to have a higher proportion of minority or low-income populations than the overall county population, then they would be identified as environmental justice populations. There would be effects on environmental justice populations if the alternatives were to result in any disproportionately high and adverse effects. This is determined based on whether an adverse effect is appreciably greater for the environmental justice population than for the population as a whole. Figure 21, above, illustrates the census tract used to evaluate demographics in the Task 5 study area.

Race

Population and race statistics for census tract 16, evaluated for the Task 5 project, are summarized in Table 31 and shown in Figure 22. The data show that the Task 5 study area has a lower concentration of minority persons than Cowlitz County.

Table 31. County and Study Area Population and Percent Minority

Area	Total Population	White, Not-Hispanic	Minority	Percentage Minority	Compared to County
Cowlitz County	102,138	87,539	14,599	14.29	N/A
Census Tract 16	6,642	5,959	683	10.28	Lower

Source: U.S. Census Bureau 2013

Table 32 presents more detailed race statistics for Cowlitz County and the Task 5 study area. The majority of the population in the county and the Task 5 study area is white. Hispanic or Latino populations represent the most significant part of the minority population in the county and the Task 5 study area. According to the county's draft comprehensive plan, the Hispanic or Latino population has increased by 87 percent since 2000, from 4,231 to 7,902 Hispanic or Latino people (Cowlitz County 2013b). The proportions of Hispanic or Latino, Black or African American, or American Indian or Alaska Native are lower than at the county level. However, the Asian and Pacific Islander populations in census tract 16 are higher and would therefore constitute an environmental justice population in the Task 5 study area.

Table 32. County and Task 5 Study Area Race Statistics

Area	White Alone	Hispanic or Latino (of any race)	Black or African American	American Indian or Alaska Native	Asian	Pacific Islander	Some Other Race	Two or More Races
Cowlitz County	87,539 (85.7%)	7,902 (7.7%)	454 (0.44%)	1,086 (1.1%)	1,334 (1.3%)	165 (0.16%)	77 (0.08%)	3,581 (3.5%)
Census Tract 16	5,959 (89.7%)	309 (4.7%)	5 (0.08%)	36 (0.54%)	115 (1.7%)	62 (0.93%)	14 (0.21%)	142 (2.1%)

Source: U.S. Census Bureau 2013

Income and Poverty Level

Income was reviewed in the Task 5 study area to identify persons at or below the poverty level. Income and poverty level data on median household income were summarized from the ACS 2007-2011 5-year estimates, the most recent available data at the block group level. The ACS data show that the 2011 median household income for Cowlitz County was $46,461, with 17.5 percent of persons below poverty level. Washington State, by comparison, had a 2011 median household income of $58,890, with 12.5 percent of persons below poverty level. Income data were available at the block group level, so those data were used in the summary below.

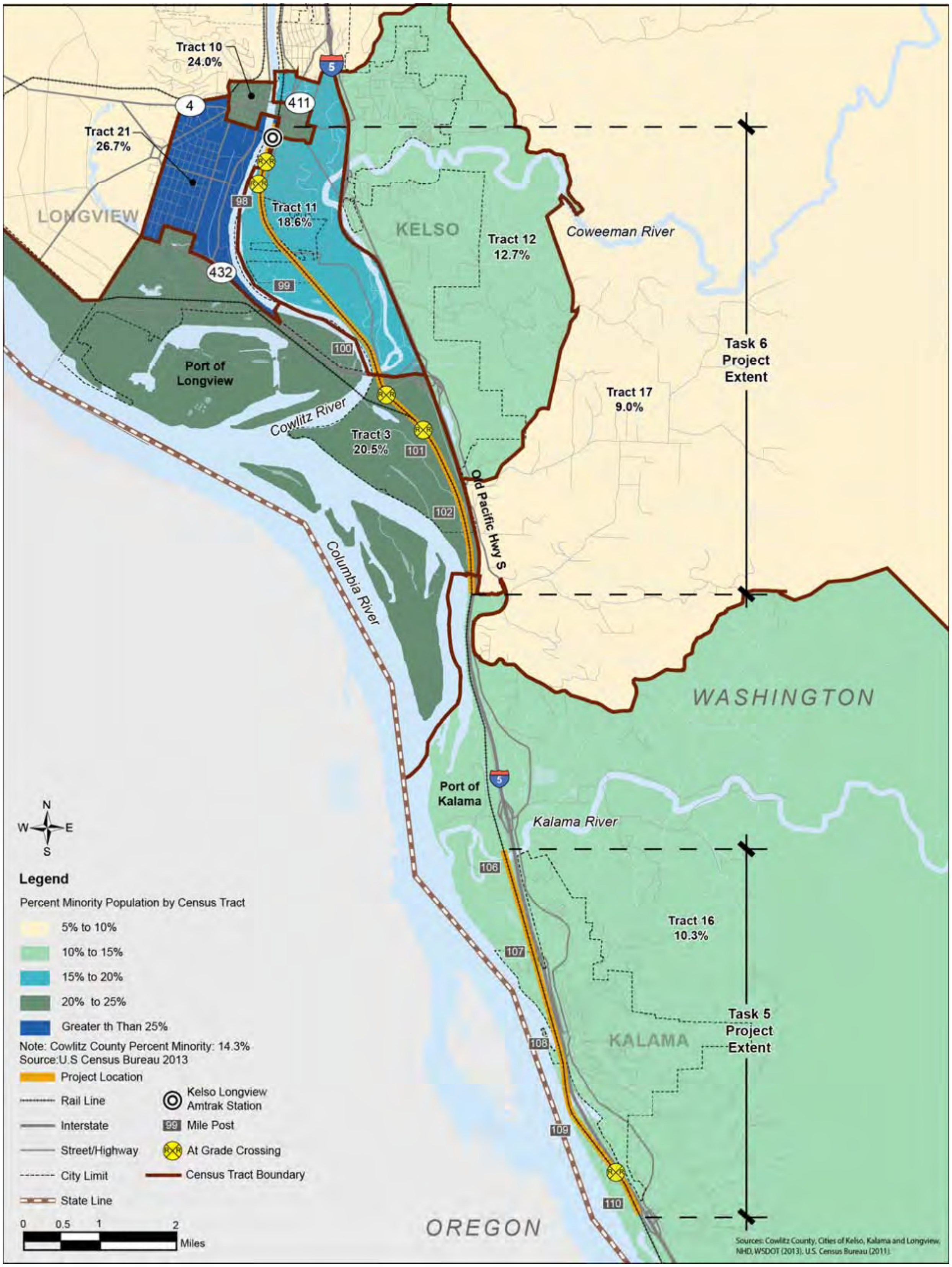

Figure 22. Minority Populations by Census Tract

Figure 23. Persons Below Poverty Level by Census Tract

When the median household income is averaged for all block groups within the Task 5 study area, the average median household income is $51,399, higher than the county average. Block group 2, at the northern end of the Task 5 study area, is the only block group lower than the county average at $40,625. Table 33 summarizes 2010 ACS median household income for the block groups that intersect the Task 5 study area.

Table 33. 2010 ACS Median Household Income Data by Block Group – Task 5

Census Tract	Block Group	Total Population	Median Household Income	Compared to County
16	2	1,014	$40,625	Lower
	3	1,415	$49,767	Higher
	4	1,631	$68,179	Higher
	5	1,365	$47,024	Higher
Totals for Task 5		5,425	Average: $51,399	Higher

Source: U.S. Census Bureau 2010

The county-level data were used as a threshold for comparison to the census tract data. Similar to the median income comparison above, Table 34 and Figure 23 show that census tract 16 has a lower percentage of persons living below the poverty line than Cowlitz County as a whole. Consequently, there is no low-income environmental justice population in the Task 5 study area.

Table 34. 2012 ACS Persons Below Poverty Level Data by Census Tract – Task 5

Area	Total Population	Persons Below Poverty Level	Persons Below Poverty Level (%)
Cowlitz County	100,661	18,047	17.9
Census Tract 16	6,534	511	7.8

Source: U.S. Census Bureau 2013

Environmental Justice Populations

Based on the analyses of race and income and poverty levels, census tract 16 in the Task 5 study area is considered an environmental justice population.

4.13.2.2.2 Limited English Proficiency

Proficiency in the English language was reviewed for the Task 5 study area to identify LEP populations. The American Community Survey (ACS) 2008-2012 5-year estimate information, the most recent available, was used to identify these populations in the Task 5 study area. English proficiency was determined using the data that described linguistically isolated populations, meaning that these persons describe themselves as having little ability to understand and speak English and having little to no ability to write in English. Figure 24 shows that there is no linguistic isolation for people in the Task 5 study area; therefore, no outreach to LEP populations was necessary for the Task 5 project.

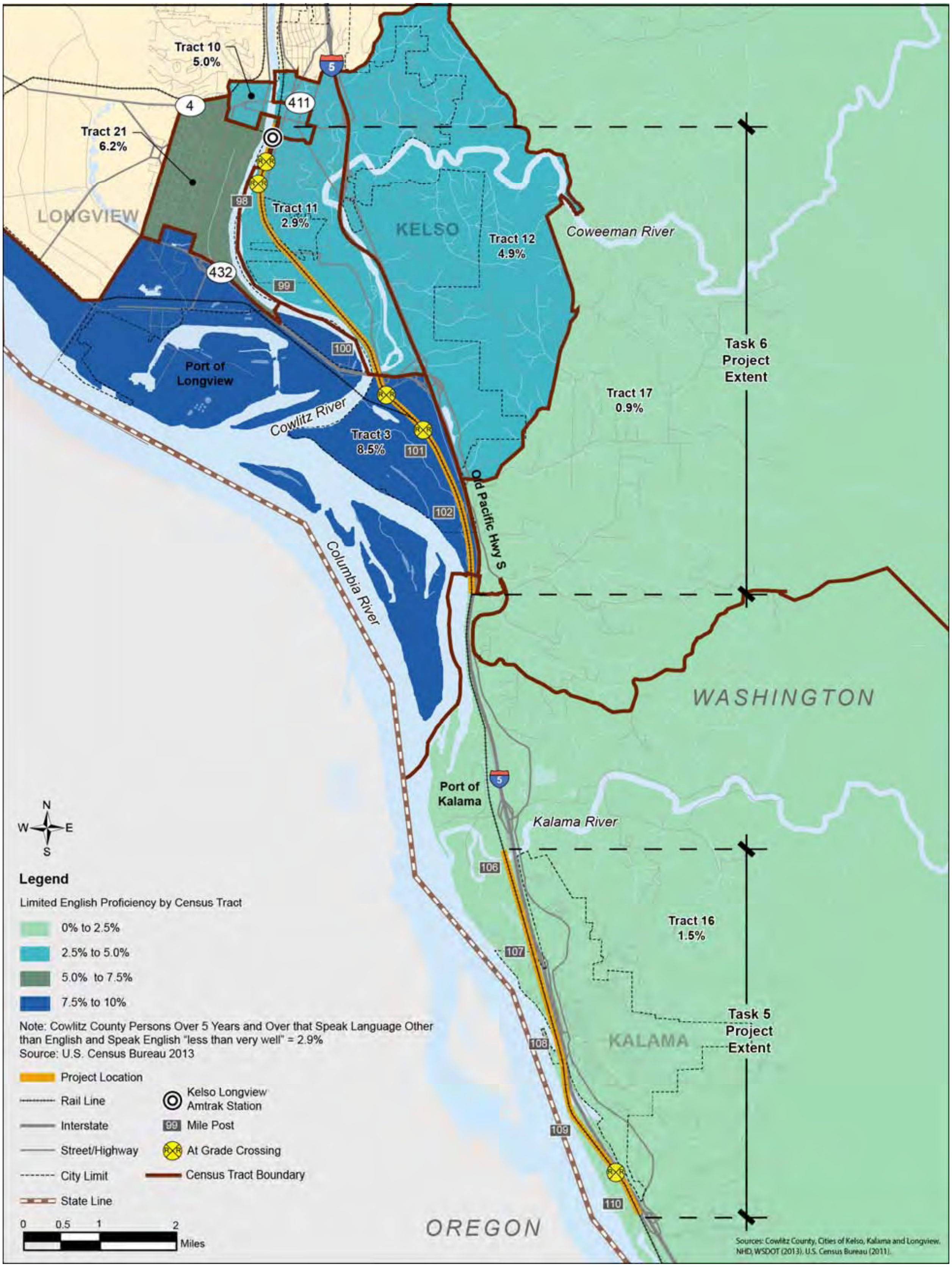

Figure 24. Limited English Proficiency by Census Tract

Table 35. Task 5 Study Area Limited English Proficiency

Area	Population 5 years and over	Language Spoken at Home		
		Speak English only (%)	Speak language other than English (%)	Speak English "less than very well" (%)
Cowlitz County	95,556	92.6	7.4	2.9
Census Tract 16	6,184	95.4	4.6	1.5

Source: U.S. Census Bureau 2013

4.13.2.2.3 Elderly and Handicapped Populations

Within the Task 5 study area, 14.9 percent of the population is 65 years and older, and 14.7 percent of the total population are persons with handicaps (U.S. Census Bureau 2013). The U.S. Census defines persons with handicaps as having hearing, vision, cognitive, ambulatory, self-care, or independent-living difficulties.

4.13.2.3 Task 6 Project

4.13.2.3.1 Socioeconomics

4.13.2.4 Community Character

The Task 6 project is located primarily within the city of Kelso and unincorporated Cowlitz County. The community is characterized by the Columbia, Cowlitz, and Coweeman rivers and the business and recreation they provide, including trails along the Cowlitz and Coweeman rivers. The railroad corridor is a key characteristic of the communities. Land use in the Task 6 study area within the city of Kelso includes industrial, commercial, recreational open space, and residential, and is described in detail in Section 4.10.2.2. The Task 6 study area extends into a small portion of the city of Longview, where land uses include residential, commercial, recreational, industrial, and vacant land. The Task 6 study area includes the Columbia, Cowlitz, and Coweeman rivers, which support the Port of Longview industrial facilities. The southern portion of the Task 6 study area is located within unincorporated Cowlitz County and includes low-density residential development, vacant land, and public lands.

Community Connectivity and Cohesion

The neighborhoods in Kelso adjacent to the Task 6 project area are well connected by arterial and local roads. The roads provide access to the central business district, the trails, and several small businesses and stores along North and South Pacific Avenues. In the northern portion of the Task 6 study area, there is a small portion of Kelso along the Cowlitz River that is separated from the rest of Kelso by the existing rail line. In the southern portion of the Task 6 study area, the rail line separates the Southwest Washington Regional Airport from the Three Rivers Golf Course. Along the entire length of the railroad, access is maintained between the eastern and western portions of the city by at-grade crossings at Mill Street and Yew Street; occasionally, vehicular traffic is delayed because of train operations. The neighborhoods in Kelso east of I-5 are connected to each other and to commercial and public services via South Kelso Drive and other arterials and local roads. The connectivity in the portions of the city of Longview within the Task 6 study area are also generally good, with access to neighborhoods, public services, and commercial areas via 1st Avenue Northwest, Cowlitz Way, and other arterial and local roads.

Public Services

Within the Task 6 study area, there are three schools, two daycare centers, one university, three religious facilities, and three recreational facilities. No police stations, fire stations, hospitals, or libraries are found in the Task 6 study area. The Kelso-Longview Amtrak Station and the Columbia County Rider offer regional transportation; the community Urban Bus System provides local bus service; and the Southwest Washington Regional Airport provides regional air service. Public services are discussed in detail in Section 4.16.2.4.1.

Economic Conditions

The economic conditions for the Task 6 study area are the same as described for the Task 5 study area.

4.13.2.4.1 Environmental Justice Populations

Demographics for race, and income and poverty level in the Task 6 study area are summarized in the following subsections. The six census tracts used to evaluate demographics in the Task 6 study area are shown in Figure 21, above. If the Task 6 study area were to have a higher proportion of minority or low-income populations than the overall county population, then they would be identified as environmental justice populations. There would be effects on environmental justice populations if the alternatives were to result in any disproportionately high and adverse effects. This is determined based on whether an adverse effect is appreciably greater for the environmental justice population than for the population as a whole.

Census tract 11, in the northern portion of the Task 6 study area, includes neighborhoods directly adjacent to the railroad right-of-way. Census tracts 12 and 17 include residential areas east of I-5, and census tracts 3 and 21 include the Port of Longview, industrial areas, and the residential area just south of Allen Street, all west of the Columbia River. Census tract 10 is a fairly small part of the Task 6 study area in the northern portion (Figure 21).

Race

Population and race statistics of the census tracts evaluated for the Task 6 project are summarized in Table 36 and shown in Figure 22, above. The data show that the Task 6 study area has a higher concentration of minority persons than Cowlitz County.

The data show that the Task 6 study area has a higher concentration of minority persons than Cowlitz County. Census tract 11, in the northern portion of the Task 6 study area, includes neighborhoods directly adjacent to the railroad right-of-way. Census tracts 12 and 17 include residential areas east of I-5, and census tracts 3 and 21 include the Port of Longview, industrial areas, and the residential area just south of Allen Street, all west of the Columbia River. Census tract 10 is a fairly small part of the Task 6 study area in the northern portion (see Figure 21, above). The higher concentrations of minorities in the neighborhoods in census tracts 3, 10, 11, and 21 constitute environmental justice populations.

Table 36. County and Task 6 Study Area Population and Percent Minority

Area	Total Population	White, Not-Hispanic	Minority	Percentage Minority	Compared to County
Cowlitz County	102,138	87,539	14,599	14.29	N/A
Census Tract 3	556	442	114	20.50	Higher
Census Tract 10	1,244	945	299	24.04	Higher
Census Tract 11	5,354	4,359	995	18.58	Higher
Census Tract 12	4,250	3,709	541	12.73	Lower
Census Tract 17	5,206	4,734	472	9.07	Lower
Census Tract 21	4,473	3,276	1,197	26.76	Higher
Task 6 Study Area Total	21,083	17,465	3,618	17.16	Higher overall

Source: U.S. Census Bureau 2013.

Table 37 presents more detailed race statistics for Cowlitz County and the Task 6 study area. The majority of the population in the county and the Task 6 study area is white. Hispanic or Latino populations represent the most significant part of the minority population in the county and the Task 6 study area, and have increased by 88 percent since 2000 (Cowlitz County 2013b). The higher concentrations of minorities in the neighborhoods in census tracts 3, 10, 11, and 21 constitute environmental justice populations.

Income and Poverty Level

Income was reviewed in the Task 6 study area to identify persons at or below the poverty level. Income and poverty level data on median household income were summarized from the ACS 2007-2011 5-year estimates, the most recent available data at the block group level. Recent, comparable poverty data at the block group level were not readily available, so the data are listed for the census tracts. The ACS data show that the 2011 median household income for Cowlitz County was $46,461, with 17.5 percent of persons below poverty level. Washington State, by comparison, had a 2011 median household income of $58,890, with 12.5 percent of persons below poverty level. Income data were available at the block group level, so those data were used in the summary below.

When the median household income is averaged for all block groups within the Task 6 study area, most of the Task 6 study area has a median household income below the county average, with the exception of census tracts 12 and 17, which are east of I-5 and extend well beyond the Task 6 study area. Table 38 summarizes 2010 ACS median household income for the block groups that intersect the Task 6 study area.

Table 37. County and Task 6 Study Area Race Statistics

Area	White Alone	Hispanic or Latino (of any race)	Black or African American	American Indian or Alaska Native	Asian	Pacific Islander	Some Other Race	Two or More Races
Cowlitz County	87,539 (85.71%)	7,902 (7.74%)	454 (0.44%)	1,086 (1.06%)	1,334 (1.31%)	165 (0.16%)	77 (0.08%)	3,581 (3.51%)
Census Tract 3	442 (79.50%)	86 (15.47%)	0 (0.0%)	3 (0.54%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	25 (4.50%)
Census Tract 10	945 (75.96%)	294 (23.63%)	0 (0.0%)	5 (0.40%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Census Tract 11	4,359 (81.42%)	498 (9.30%)	124 (2.32%)	95 (1.77%)	86 (1.61%)	0 (0.0%)	0 (0.0%)	192 (3.59%)
Census Tract 12	3,709 (87.27%)	349 (8.21%)	22 (0.52%)	57 (1.34%)	23 (0.54%)	0 (0.0%)	0 (0.0%)	90 (2.12%)
Census Tract 17	4,734 (90.93%)	182 (3.50%)	1 (0.02%)	63 (1.21%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	226 (4.34%)
Census Tract 21	3,276 (73.24%)	538 (12.03%)	86 (1.92%)	81 (1.81%)	78 (1.74%)	65 (1.45%)	0 (0.0%)	349 (7.80%)

Source: U.S. Census Bureau 2013

Table 38. 2010 ACS Median Household Income Data by Block Group – Task 6

Census Tract	Block Group	Total Population	Median Household Income	Compared to County
3	1	509	$17,955	Lower
10	1	761	$22,357	Lower
	2	465	$13,967	Lower
11	2	626	$24,942	Lower
	3	830	$19,732	Lower
	4	767	$33,344	Lower
	5	1,107	$36,500	Lower
	6	674	$15,870	Lower
	7	908	$32,227	Lower
12	3	1,320	$55,688	Higher
17	5	1,995	$79,318	Higher
21	3	1,229	$33,125	Lower
Totals for Task 6		12,205	Average: $32,472	Lower

Source: U.S. Census Bureau 2010

The county-level data were used as a threshold for comparison to the census tract data. Similar to the median income comparison above, Table 39 and Figure 23 show that four of the six census tracts that intersect the Task 6 study area have higher percentages of persons living below the poverty level than Cowlitz County as a whole. Because these four census tracts have poverty levels higher than the county overall, they would be considered environmental justice populations.

Table 39. 2012 ACS Persons Below Poverty Level Data by Census Tract – Task 6

Area	Total Population	Persons Below Poverty Level	Persons Below Poverty Level (%)
Cowlitz County	100,661	18,047	17.9
Census Tract 3	547	271	49.5
Census Tract 10	1,244	442	35.5
Census Tract 11	5,354	1,642	30.7
Census Tract 12	4,241	610	14.4
Census Tract 17	5,161	435	8.4
Census Tract 21	3,763	1,549	41.2
Total Task 6 Study Area	20,310	5,949	24.3

Sources: U.S. Census Bureau 2013

Environmental Justice Populations

Based on the analyses of race, LEP, and income and poverty levels, census tracts 3, 10, 11, and 21 in the Task 6 study area are considered environmental justice populations.

4.13.2.4.2 Limited English Proficiency

Proficiency in the English language was reviewed for the Task 6 study area to identify LEP populations. The ACS 2008-2012 5-year estimate information, the most recent available, was used to identify these populations in the Task 6 study area (Table 40). English proficiency was determined using the data that described linguistically isolated populations, meaning that these persons describe themselves as having little ability to understand and speak English and having little to no ability to write in English.

Table 40. Task 6 Study Area Limited English Proficiency

Area	Population 5 years and over	Language Spoken at Home		
		Speak English only (%)	Speak language other than English (%)	Speak English "less than very well" (%)
Cowlitz County	95,556	92.6	7.4	2.9
Census Tract 3	494	83.2	16.8	8.5
Census Tract 10	1,149	89.9	10.1	5.0
Census Tract 11	4,840	90.8	9.2	2.9
Census Tract 12	4,081	92.6	7.4	4.9
Census Tract 17	4,968	97.9	2.1	0.9
Census Tract 21	4,193	84.9	15.1	6.2

Source: U.S. Census Bureau 2013

Figure 24 above shows that there is some linguistic isolation for people in the Task 6 study area. Compared to the county, the Task 6 study area has communities with a higher concentration of people who speak English "less than very well." Residents are predominately white and non-Hispanic, but there are census tracts with relatively high concentrations of minorities. According to the Public Involvement

Plan-Tasks 5 and 6 (WSDOT 2013b), over one-fifth of households in census tract 3 speak Spanish at home; this same census tract has a relatively high proportion of residents who report that they do not speak English "very well" (16.5 percent). Therefore, postcard notices for public outreach meeting were translated into Spanish and distributed to social service agencies that serve Spanish speaking constituencies.

4.13.2.4.3 Elderly and Handicapped Populations

Within the Task 6 study area, 17.6 percent of the population is 65 years and older, and 24.5 percent of the total population are persons with handicaps (U.S. Census Bureau 2013). The U.S. Census defines persons with handicaps as having hearing, vision, cognitive, ambulatory, self-care, or independent-living difficulties.

4.13.3 Environmental Consequences

4.13.3.1 No Build Alternative

Under the No Build Alternative, the Task 5 and Task 6 projects would not be constructed, and no improvements would be made to the rail corridor or the existing intercity passenger rail service. Minor maintenance and repair activities along the existing rail line would continue to occur. There would be no effect on socioeconomics or environmental justice populations in the Task 5 and Task 6 study areas. Existing conditions would remain unchanged.

4.13.3.2 Build Alternative

4.13.3.2.1 Task 5 Project

Short-term Effects

Socioeconomics – Task 5 Project

Construction employment associated with the Task 5 project is expected to be limited and specialized. While there would be some benefit for employment, income, and local expenditures during construction due to housing, food, and entertainment expenditures by construction crews, this benefit would be temporary and is not likely to be substantial. No temporary displacement of existing land uses during construction would occur because the construction activities would be located within existing railroad right-of-way. Therefore, no disruption to local businesses is anticipated. No changes to demographics or land use patterns are anticipated.

The Task 5 project would have short-term, minor effects on neighborhoods and businesses adjacent to the rail line during construction. Construction effects would be minor and would temporarily affect normal, daily activities due to increased traffic and congestion in surrounding areas. It is anticipated that there would be minimal short-term effects on public services from construction of the Task 5 project. There would be slight delays for emergency response vehicles and private vehicles during track construction at at-grade crossings; however, these delays would be temporary, and alternative access points are available. Further, in accordance with WAC 480-62-305, local communities would be notified at least 10 days in advance of any work that could potentially disrupt traffic flow at crossings. This would reduce access to public services during construction; however, any reductions in access would be temporary and would be avoided by rerouting traffic as necessary. Any disruptions to community connectivity or cohesion would be minor and temporary.

All construction would occur within the existing railroad right-of-way. Construction noise would temporarily disturb residences, businesses, and recreation areas within the vicinity of the Task 5 project. Truck traffic would increase through the Task 5 study area during construction; however, the trucks would follow existing truck routes and are not anticipated to affect traffic levels. No blasting would occur for the Task 5 project.

Environmental Justice Populations – Task 5 Project

The short-term effects described under Socioeconomics would also affect environmental justice populations in the Task 5 study area. However, these effects are expected to be temporary and limited to the duration of construction activities (approximately 2 years). Further, these effects and the effects described throughout this EA would not be appreciably greater for environmental justice populations than for the population as a whole. Both the environmental justice populations and the population as a whole would experience any potential effects equally. Therefore, no disproportionately high or adverse effects on environmental justice populations would result from construction of the Task 5 project. The Task 5 project meets the requirements of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and the U.S. Department of Transportation (USDOT) Order 5610.2(a), Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Elderly and Handicapped Populations – Task 5 Project

Construction activities associated with the Task 5 project would not affect elderly persons or persons with handicaps in the Task 5 study area. Construction activities would not improve or eliminate any existing barriers to access or use by elderly persons and persons with handicaps throughout the Task 5 study area; therefore, no short-term effects are anticipated.

Long-term Effects

Socioeconomics – Task 5 Project

The Task 5 project is not anticipated to have long-term effects on local businesses or economic conditions. The Task 5 project would not result in changes to economic conditions or businesses and would not affect property values given that the rail corridor already exists and is used for passenger and freight rail service. No right-of-way acquisitions are required, and no known encroachments exist in the Task 5 study area; therefore, no residential or business relocations are expected for the Task 5 project.

The Task 5 project would not cause a direct change in demographics, land use patterns, neighborhoods, or other related community characteristics. The Task 5 project would continue to use the existing railroad right-of-way that was constructed and has been in service since the late 1800s. The operation of trains under the Task 5 project would result in increased noise levels of up to 0.7 dBA higher than the existing conditions, which would not alter community characteristics (see Section 4.7.3.2.1). The Task 5 project would not result in any vibration impacts because the Task 5 project vibration levels would not exceed the existing levels by 3 VdB or more, the FRA threshold for perceptibility and impact, at any of the residential or recreational receivers.

The Task 5 project improvements are within existing railroad right-of-way; therefore, most community cohesion factors like transportation would experience only minor effects that are not anticipated to contribute to changes in community cohesion. From a land use perspective, the minor increase in delays during non-peak hours would also delay access to Marine Park, Louis Rasmussen Day Use Park, and the industrial properties for the Task 5 project. Because these delays are experienced already with the existing rail line, the minor increase in delays would not affect community cohesion.

With the new main line track improvements, the Toteff Road crossing is projected to improve queue length by almost 50 vehicles during peak hours for the Task 5 project. The crossing would continue to have a LOS higher than the county's standard and is not expected to affect community cohesion.

No public services would be displaced by the Task 5 project, and public services would continue to be available to individuals in the Task 5 study area. No effects on public services are anticipated because the Task 5 project would not result in any increased demand for or delayed access to public services. As there would only be a minor increase in train traffic levels and alternative access is available, it is not anticipated that there would be an effect on emergency response times.

Environmental Justice Populations– Task 5 Project

The long-term effects described under Socioeconomics would also affect environmental justice populations in the Task 5 study area. These effects and the effects described throughout this EA would not be appreciably greater for environmental justice populations than for the population as a whole. Both the environmental justice populations and the population as a whole would experience any potential effects equally. Therefore, these effects would not be disproportionately high or adverse on environmental justice populations. The Task 5 project meets the requirements of Executive Order 12898 and USDOT Order 5610.2(a).

Elderly and Handicapped Populations – Task 5 Project

The Task 5 project would increase mobility for elderly persons and persons with handicaps in the Task 5 study area through increased passenger rail service. The Task 5 project would not improve or eliminate any existing barriers to access or use by elderly persons and persons with handicaps throughout the Task 5 study area; therefore, no effects are anticipated.

Summary of Effects

The Task 5 project would result in temporary and minor effects on socioeconomic resources. Any short-term effects on employment, income, and local expenditures; neighborhoods and businesses adjacent to the rail line; public services; and community connectivity and cohesion would be temporary and minor. Construction noise would temporarily disturb residences, businesses, and recreational areas within the vicinity of the Task 5 project. The Task 5 project is not anticipated to result in long-term effects on local businesses, economic conditions, or public services, and would not cause a direct change in the demographics, land use patterns, neighborhoods, or other related community characteristics. The Task 5 project improvements are within existing railroad right-of-way; therefore, most community cohesion factors like transportation would experience only minor effects that are not anticipated to contribute to changes in community cohesion. These effects would be minimized by adhering to minimization measures and BMPs. For example, a traffic control plan would be developed in coordination with local jurisdictions to minimize traffic delays and periodic lane and/or access revisions.

The Task 5 project would affect environmental justice populations in the Task 5 study area; however, no disproportionately high or adverse effect on environmental justice populations would result from the Task 5 project. The Task 5 project meets the requirements of Executive Order 12898 and USDOT Order 5610.2(a), as it is supported by Title VI of the Civil Rights Act. There would be no change to existing barriers to access or use by elderly persons and persons with handicaps.

4.13.3.2.2 Task 6 Project

Short-term Effects

Socioeconomics – Task 6 Project

The short-term effects on socioeconomics during construction of the Task 6 project would be similar to those described for the Task 5 project. Construction employment associated with the Task 6 project is expected to be limited and specialized. The Task 6 project would have minor effects on neighborhoods and businesses adjacent to the rail line during construction. Construction noise would temporarily disturb residences, businesses, and recreational areas in the vicinity of the Task 6 project. There would be no blasting for the Task 6 project. Pile driving would be required for construction of the new bridge across the Coweeman River; however, no noise- or vibration-sensitive receivers are located nearby, and no effects would be anticipated. Truck traffic would increase through the study area during construction; however, the trucks would follow existing truck routes and are not anticipated to affect traffic levels.

Environmental Justice Populations – Task 6 Project

The short-term effects described under Socioeconomics would also affect environmental justice populations in the Task 6 study area. However, these effects are expected to be temporary and limited to the duration of construction activities (approximately 2 years). Further, these effects would not be appreciably greater for environmental justice populations than for the population as a whole. Therefore, no disproportionately high or adverse effects on environmental justice populations would result from construction of the Task 6 project. The Task 6 project meets the requirements of Executive Order 12898 and USDOT Order 5610.2(a), as it is supported by Title VI of the Civil Rights Act.

Elderly and Handicapped Populations – Task 6 Project

Short-term effects on elderly persons and persons with handicaps associated with construction of the Task 6 project would be the same as those described for the Task 5 project.

Long-term Effects

Socioeconomics – Task 6 Project

Long-term effects on socioeconomics associated with the Task 6 project would be similar to those described for the Task 5 project. No public services would be displaced by the Task 6 project, and public services would continue to be available to individuals in the Task 6 study area.

The Task 6 project would not cause a direct change in demographics, land use patterns, neighborhoods, or other related community characteristics. The Task 6 project would continue to use the existing railroad right-of-way that was constructed and has been in service since the late 1800s. The operation of trains under the Task 6 project would result in increased noise levels of up to 0.9 dBA higher than the existing conditions, which would not alter community characteristics (see Section 4.7.3.2.2). The Task 6 project would not result in any vibration impacts because the Task 6 project vibration levels would not exceed the existing levels by 3 VdB or more, the FRA threshold for perceptibility and impact, at any of the residential or recreational receivers.

The Task 6 project improvements are within existing railroad right-of-way; therefore, most community cohesion factors like transportation would experience only minor effects that are not anticipated to contribute to changes in community cohesion. Railroad crossings at Mill Street, Yew Street, and the private crossings at MP 100.29 and MP 101.64 are projected to have a peak period traffic queue length equal to the existing condition. All of the crossings would continue to have a LOS higher than the county's standard and are not expected to affect community cohesion.

Environmental Justice – Task 6 Project

The long-term effects described under Socioeconomics would also affect environmental justice populations in the Task 6 study area. However, these effects would not be disproportionately high or adverse on environmental justice populations. The Task 6 project meets the requirements of Executive Order 12898 and USDOT Order 5610.2(a), as it is supported by Title VI of the Civil Rights Act.

Elderly and Handicapped Populations – Task 6 Project

Long-term effects on elderly persons and persons with handicaps associated with the Task 6 project would be the same as those described for the Task 5 project.

Summary of Effects

The Task 6 project would result in temporary and minor effects on socioeconomic resources. Any short-term effects on employment, income, and local expenditures; neighborhoods and businesses adjacent to the rail line; public services; and community connectivity and cohesion would be temporary and minor. Construction noise would temporarily disturb residences, businesses, and recreational areas in the vicinity of the Task 6 project. The Task 6 project is not anticipated to result in long-term effects on local businesses, economic conditions, or public services, and would not cause a direct change in the demographics, land use patterns, neighborhoods, or other related community characteristics. The Task 6 project improvements are within existing railroad right-of-way; therefore, most community cohesion factors like transportation would experience only minor effects that are not anticipated to contribute to changes in community cohesion. These effects would be minimized by adhering to minimization measures and BMPs. For example, a traffic control plan would be developed in coordination with local jurisdictions to minimize traffic delays and periodic lane and/or access revisions.

The Task 6 project would affect environmental justice populations in the Task 6 study area; however, no disproportionately high or adverse effect on environmental justice populations would result from the Task 6 project. The Task 6 project meets the requirements of Executive Order 12898 and USDOT Order 5610.2(a), as it is supported by Title VI of the Civil Rights Act. There would be no change to existing barriers to access or use by elderly persons and persons with handicaps.

4.14 Aesthetics

This section characterizes the visual landscape in the Task 5 and Task 6 study areas and presents analysis of the potential effects on aesthetics that could result from the alternatives.

4.14.1 Study Area and Methodology

4.14.1.1 Study Area

*A **viewshed** is an area of land, water, or other environmental element that is visible to the human eye.*

The Task 5 and Task 6 study areas include the Task 5 and Task 6 project areas, respectively, and the surrounding viewshed (that is, the areas that could potentially have views of project features or be viewed from the Task 5 and Task 6 project areas). Because the constructed Task 5 and Task 6 projects would be linear and flat and would be developed along an existing rail corridor within a semi-urban environment, the Task 5 and Task 6 study areas for evaluating changes to the viewshed would be relatively small and would not likely extend past 0.5 mile from the Task 5 and Task 6 project areas. Within the Task 5 and Task 6 study areas, the potential changes to the viewshed would be evaluated for passengers traveling along the rail line and for viewers living and working along the rail line.

4.14.1.2 Methodology

The visual resource analysis focuses on the degree of contrast between the Task 5 and Task 6 projects and the surrounding landscape, the location and sensitivity of public viewpoints, the visibility of the Task 5 and Task 6 projects from those viewpoints, and changes in the views from the Task 5 and Task 6 project areas. The presence of natural and cultural resources influences the public's perception of the landscape. The first step in the analysis is to identify representative viewpoints where viewers would likely experience the most visible changes and that would be representative of the overall changes in the Task 5 and Task 6 study areas.

A series of viewpoints were selected that were representative of the types of views that are typical in and near the Task 5 and Task 6 study areas. The representative types of views include various locations along the rail corridor with views of the rail line and locations where drivers and passengers would experience the view from road crossings of the rail line. The viewpoints were chosen because they represent a range of different conditions in the Task 5 and Task 6 study areas and would be locations where the viewer would experience changes to the viewshed.

The visual quality of the view from each viewpoint was evaluated based on FHWA's Visual Impact Assessment for Highway Projects (FHWA 1981). The FHWA methodology was chosen because the potential effects from highway projects are similar to rail projects. The methodology identifies the following three primary characteristics for evaluating visual quality:

- ***Vividness*** describes the strength of the positive impression that the landscape makes on the viewer.
- ***Intactness*** describes whether the scenery in a view has been reduced in quality by changes in the landscape or introduction of human-made elements.
- ***Unity*** describes whether all the elements in a view look coordinated or appropriate with each other.

The existing conditions of each of the three primary characteristics were evaluated at each viewpoint on a scale from 1 (very low visual quality) to 7 (very high visual quality). Next, the existing condition of the view at each viewpoint was compared to the changes expected from implementation of the Task 5 and Task 6 projects. This includes evaluating:

- The ratings for the three primary characteristics (vividness, intactness, and unity) following construction
- How different the landscape would look following construction
- How clearly viewers would be able to see any changes
- How sensitive viewers would likely be to the changes in the views

The effects evaluated at each viewpoint would be representative of how the view could be expected to change in other, similar locations in the Task 5 and Task 6 study areas. Therefore, this evaluation was used as the basis for the evaluation of short- and long-term effects. Short-term effects were evaluated for construction activities, and long-term effects were evaluated for operations. In addition to evaluating the effects on the view from each viewpoint, the potential effects on passengers traveling along the rail line were evaluated.

4.14.2 Affected Environment

4.14.2.1 Task 5 Project

The landscape surrounding the Task 5 study area is a mixture of industrial areas, rural areas, and developed areas within the city of Kalama. At the northern end of the Task 5 study area, the landscape is a mixture of industrial land uses associated with the Port of Kalama. In the middle portion of the Task 5 study area, the landscape is more developed, with commercial and industrial zones and residential areas being the most common. Further south, the landscape becomes less developed, with park and industrial areas along the Columbia River and undeveloped areas immediately adjacent to the rail line.

As described in Section 4.11.2.1, no archaeological resources, historic structures, or TCPs were identified in the Task 5 project APE (see Appendix J).

In many areas, the rail line is generally inconspicuous from the surrounding area, especially when no trains are present. Along most of the rail corridor, there are two, and sometimes three, parallel tracks. The most conspicuous aspect of the rail line, apart from operating trains, is the safety structures (including flashers, signs, and gates). Views of the rail line would be primarily from residents who live near the rail line or view the tracks when crossing the rail line by driving or walking.

Three viewpoints were selected for the Task 5 analysis, as shown in Figure 25. Table 41 presents the visual quality for each viewpoint in the Task 5 study area. The higher the value assigned, the higher the visual quality of the viewpoint. A value of 1 to 2 would be considered low quality; 3 to 5 would be considered medium quality; and 6 to 7 would be considered high quality.

4.14.2.2 Task 6 Project

The landscape surrounding the Task 6 study area is a mixture of developed areas within the city of Kelso and more sparsely developed areas south of the city. It includes urban and industrial settings, undeveloped areas, suburban areas, and residential parks. At the northern end of the Task 6 study area, the landscape is almost entirely developed, with commercial and industrial zones and residential areas being the most common land uses. Further south, the landscape becomes more varied, with residential areas interspersed with undeveloped areas, a golf course, and industrial areas. Similar to Task 5, in many parts of the Task 6 study area, the rail line is generally inconspicuous from the surrounding area. The most conspicuous aspect of the rail line, apart from operating trains, is the safety structures (including flashers, signs, and gates). Views of the rail line would primarily be from residents who live near the rail line or view the tracks when crossing the rail line by driving or walking.

As described in Section 4.11.2.2, no archaeological resources or TCPs were identified in the Task 6 project APE (see Appendix J). The Coweeman River Bridge is eligible for listing on the NRHP.

Four viewpoints were selected for the Task 6 analysis, as shown in Figure 26. Using FHWA's Visual Impact Assessment for Highway Projects methodology (1981), the existing visual quality from each viewpoint was evaluated on a scale of 1 to 7 for the three primary characteristics: vividness, intactness, and unity. Table 42 presents the visual quality for each viewpoint in the Task 6 study area. The higher the value assigned, the higher the visual quality of the viewpoint. A value of 1 to 2 would be considered low quality; 3 to 5 would be considered medium quality; and 6 to 7 would be considered high quality.

Figure 25. Key Viewpoints in or near the Task 5 Study Area

Task 5 Project – Key Viewpoint #1

This photograph was taken looking southeast from an overlook to the east of the Task 5 project area. I-5 and the rail line are the prominent visual elements in the view. The rail line is unscreened from the highway in this location and is visible to drivers. On the horizon are industrial facilities along the Columbia River. This viewpoint would be typical for residents living in the hills surrounding Kalama and for vehicles traveling along Old Pacific Highway.

Task 5 Project – Key Viewpoint #2

This photograph was taken looking to the north from North Hendrickson Road in between I-5 and industrial facilities along the Columbia River. The rail line is screened from I-5 by vegetation. The industrial facilities have an uninterrupted view of the rail line. This viewpoint would be typical for vehicles traveling along North Hendrickson Road and employees at the industrial facilities.

Task 5 Project – Key Viewpoint #3

This photograph was taken looking north from the intersection of the rail line, Port Road, and Toteff Road. I-5 is to the east of the rail line; a developed industrial area is to the west. Approximately 0.5 mile to the west is a residential development that is completely screened from the rail line by thick vegetation. This viewpoint is typical of the views that drivers, passengers, and pedestrians would experience at at-grade crossings.

Table 41. FHWA Visual Quality Values – Task 5

Characteristic	Key Viewpoints for the Task 5 Project		
	No. 1	No. 2	No. 3
Vividness	5	2	2
Intactness	4	2	2
Unity	3	1	1
Average Score	4	1.7	1.7

Figure 26. Key Viewpoints in the Task 6 Study Area

Task 6 Project – Key Viewpoint #1

This photograph was taken from the Kelso-Longview Amtrak Station, looking toward the southeast. The train station is located in downtown Kelso in an area of commercial and residential development. The rail line parallels the Cowlitz River to the west and the city of Kelso to the east. The tracks are elevated from the surrounding area and are generally screened from surrounding residential and commercial development by existing vegetation.

Task 6 Project – Key Viewpoint #2

This photograph was taken looking northeast near single family residences approximately 150 feet from the rail line. The elevated rail roadbed features prominently in the landscape. The homes found in this area are not particularly well-screened from the rail line. Some trees screen the rail line, but most residents have clear views of the rail line from their homes and yards.

Task 6 Project – Key Viewpoint #3

This photograph was taken looking to the southeast from the at-grade crossing of South River Road and the rail line. The west side of the rail line is thickly vegetated. The east side of the rail line contains a combination of commercial and residential zones with little screening from the rail line. This viewpoint is typical of the views that drivers, passengers, and pedestrians would experience at at-grade crossings.

Task 6 Project – Key Viewpoint #4

This photograph was taken from the east of the confluence of the Coweeman River and the Cowlitz River. The existing railroad crosses the Coweeman River via the NRHP-eligible railroad truss bridge in the foreground of the photograph. The SR 432 bridge crossing of the Cowlitz River crosses through the middle of the picture. A new bridge, in addition to the two existing bridges, would be constructed to the east of the existing railroad truss bridge. The viewshed is a mixture of undeveloped land and industrial land uses.

Table 42. FHWA Visual Quality Values – Task 6

Characteristic	Key Viewpoints for the Task 6 Project			
	No. 1	No. 2	No. 3	No. 4
Vividness	2	2	2	3
Intactness	2	2	3	2
Unity	2	3	3	4
Average Score	2	2.3	2.7	3

4.14.3 Environmental Consequences

4.14.3.1 No Build Alternative

The visual resources in the Task 5 and Task 6 study areas would remain unchanged under the No Build Alternative. Train operations would continue along the existing rail corridor, and existing conditions would persist. Minor maintenance and repair activities along the existing rail line would continue to occur as part of the No Build Alternative. A negligible increase in trains backing up along the rail line would be expected due to the expected increase in train traffic; however, this increase would not noticeably alter the existing visual conditions. No effects on visual resources would be anticipated.

4.14.3.2 Build Alternative

4.14.3.2.1 Task 5 Project

Effects at Key Viewpoints

The primary change at the key viewpoints in the Task 5 study area would be from the addition of the third main line. The third main line would be evident from all three viewpoints; however, it would not substantially alter the existing views. Therefore, the low to medium visual quality of the existing conditions would remain the same.

Short-term Effects

The short-term effects from construction of the Task 5 project on visual resources would be minor and temporary. Construction activities to add the third main line would not last for more than a few days at any given location along the line as construction progresses. Within the construction right-of-way, construction equipment and materials needed for construction would be visible. Construction activities at at-grade crossings would take longer than construction along the rail line; however, they would also be temporary. Construction materials and equipment would be staged within the right-of-way. No cultural resources are anticipated to be affected by the aesthetic changes described above. The DAHP concurred with the determination of no effect on historic properties in June 2009 (see Appendix J). No TCPs were identified within the Task 5 study area; therefore, no aesthetic effects on TCPs would occur.

Long-term Effects

Implementation of the Task 5 project would result in permanent physical changes to the built environment, including the addition of a third main line track, retaining and crash walls, and signals. The overall long-term effects on the visual environment from the introduction of these improvements would be minor at any given location.

The addition of the third main line track and turnouts would result in minor long-term visual effects. Construction would require permanently clearing existing vegetation and expanding the rail roadbed to accommodate the new track and turnouts. The Task 5 project would result in a minor change to the existing visual character of the rail corridor by expanding the area maintained as an active rail line within the right-of-way. When viewed from nearby (less than 50 feet), the change would be noticeable; however, from further away, the third set of tracks and turnouts would not occupy a substantially larger part of the view than the existing features. New signals installed along the rail corridor would not substantially change the character or quality of the view. Retaining and crash walls installed along the corridor would contrast with the existing visual character of the environment; however, views of the walls would be limited and would not result in a substantial visual effect. Passengers traveling on the rail line would not experience markedly different views from current conditions.

No cultural resources are anticipated to be affected by the aesthetic changes described above. DAHP concurred with the determination of no effect on historic properties in June 2009 (see Appendix J). No TCPs were identified within the Task 5 study area; therefore, no aesthetic effects on TCPs would occur.

The construction of culvert replacement and outfall at unnamed tributary 3 would result in a long-term beneficial effect to the visual environment at Louis Rasmussen Day Use Park. The current culvert outflows to the Columbia River through a steel pipe surrounded by rip-rap. Replacement of the culvert and creation of a natural outfall along the beach would enhance the natural appearance of the park (Figure 20) from its current state.

Summary of Effects

Short-term effects on visual resources in the Task 5 study area would be minor and temporary if the Task 5 project is implemented. Implementation of the Task 5 project would result in permanent physical changes to the built environment, including the addition of a third main line track, retaining and crash walls, and signals. The overall long-term effects on the visual environment from the introduction of these improvements would be minor at any given location and would be minimized by adhering to minimization measures and BMPs. For example, vegetation would be maintained at the edge of the railroad right-of-way to screen the rail line from potential viewers.

4.14.3.2.2 Task 6 Project

Effects at Key Viewpoints

The changes anticipated at the key viewpoints in the Task 6 study area would be the same as those described for the Task 5 project with the exception of a change in the viewpoint by the historic Coweeman River Bridge, as discussed below.

Short-term Effects

Short-term effects for the Task 6 project would be nearly identical to those described for the Task 5 project. The construction of a new railroad bridge west of the historic Coweeman River Bridge would not result in adverse visual effects on the historic bridge. Past highway development in the area has altered the viewshed, and public access to the Coweeman River Bridge is prohibited. Further, construction of the new railroad bridge would not impact the character or use of the historic bridge. Therefore, construction of the new bridge would have no adverse effect on the Coweeman River Bridge. The DAHP concurred with the determination of no adverse effect in August 2013 (see Appendix J).

Long-term Effects

Long-term effects for the Task 6 project would be nearly identical to those described for the Task 5 project. The view of a new bridge near the historic Coweeman River Bridge would not result in adverse visual effects on the historic bridge, as discussed under Short-term Effects, above.

Summary of Effects

Short-term effects on visual resources in the Task 6 study area would be minor and temporary if the Task 6 project is implemented. Implementation of the Task 6 project would result in permanent physical changes to the built environment, including the addition of a third main line track, a siding, bridges, and signals. The overall long-term effects on the visual environment from the introduction of these improvements would be minor at any given location and would be minimized by adhering to minimization measures and BMPs. For example, vegetation would be maintained at the edge of the railroad right-of-way to screen the rail line from potential viewers.

4.15 Transportation

This section characterizes existing transportation facilities and operations in the Task 5 and Task 6 study areas and describes potential effects associated with the alternatives.

4.15.1 Study Area and Methodology

4.15.1.1 Study Area

The Task 5 and Task 6 study areas include the Task 5 and Task 6 project areas, respectively, including the at-grade crossing at Toteff Road in the Task 5 study area and the at-grade crossings at Mill Street and Yew Street as well as the private crossings at MP 100.29 and MP 101.64 in the Task 6 study area. These locations could be affected by the proposed additional train passbys. Traffic operations analysis at I-5 is not included because there would be no physical or operational effects on the interstate corridor.

4.15.1.2 Methodology

Roadway traffic analysis involved assessing traffic volume and turning movement data at each at-grade crossing. Roadway traffic was then evaluated to determine how the road system would work today (year 2014) and how the roads would operate in the future (year 2030) for each alternative. To determine roadway conditions, current and future traffic volumes on roadways were modeled (both with and without the Task 5 and Task 6 projects), and those modeled volumes were then used to calculate intersection delay (that is, the average time in seconds that vehicles wait before moving through an intersection) and vehicle queue length at intersections adjacent to the at-grade crossings.

The models measured the effects of rail operations on delay and vehicle queue lengths on roadways and intersections in the Task 5 and Task 6 study areas. Intersection delay is expressed as LOS using methods established by the Transportation Research Board's *Special Report 209: Highway Capacity Manual* (1994). Vehicle queue lengths were analyzed to determine both average and maximum queue lengths. Analysts also evaluated the effects on pedestrian and bicycle traffic.

> *A **queue length** is the distance that vehicles extend back from an intersection while waiting to move through. Queue lengths are typically longest during morning and afternoon peak hours.*
>
> *The **peak hours** are the time of day when the highest amount of vehicles travel on the roadway network. The morning peak period is 7:00 a.m. to 9:00 a.m., and afternoon peak period is 4:00 p.m. to 6:00 p.m.*

Traffic data were derived from two previous studies within the Task 5 and Task 6 study areas: the *Kelso-Martin's Bluff Rail Project Environmental Impact Study: Traffic Impact Analysis* (WSDOT 2003b) and the *Toteff Road Crossing Traffic Impact Analysis* (WSDOT 2009b). Data from these studies remains useful because average daily traffic volumes in the Task 5 and Task 6 study areas have not grown since the analysis from the previous studies was completed. In fact, based on traffic data published in the WSDOT Annual Traffic Report (2012b), there has been a 17 percent decrease in average daily traffic between 2003 and 2012 along SR 4 just north of Mill Street associated with Task 6.

4.15.2 Affected Environment

4.15.2.1 Task 5 Project

BNSF Railway owns the rail corridor through the Task 5 study area. I-5 runs north-south paralleling the rail corridor on its east side. The Port of Kalama is adjacent to the Task 5 study area.

> ***LOS** ranges from 'A' to 'F,' with the letter A describing the least amount of congestion and best operations, and the letter F indicating the highest amount of congestion and worst operations. For study area jurisdictions, LOS D or better is an acceptable standard for intersection function; LOS E or LOS F represents unacceptable intersection function.*

Intersection LOS was reviewed for the Toteff Road at-grade crossing during peak hours. Based on the location of the Toteff Road crossing, the intersections most likely impacted by the project were at Robb Road and the I-5 northbound and southbound ramp terminals. The previous traffic analyses show that in the existing morning peak hour, the Task 5 study area intersections at Robb Road near the Toteff Road crossing operate at a high level of service (LOS A or B). The Cowlitz County urban area has a standard of LOS D. Queue length analysis of the crossing indicates there are fewer than 36 vehicles that may queue within the Task 5 study area. These values represent the total combined number of vehicles for both directions at each crossing.

The existing afternoon peak hour LOS is shown in Table 43; the intersections continue to operate at LOS A or B. Additional information regarding the queue length analysis is provided in Appendix K.

Table 43. Task 5 Project Existing Afternoon Peak Hour Level of Service

Intersection	Traffic Control	Seconds of Delay per Vehicle	Existing Level of Service
Robb Rd/I-5 SB Ramp	One-way stop	11.2	LOS B
Robb Rd/I-5 NB Ramp	One-way stop	9.8	LOS A

There are no sidewalks or bike lanes present in the Task 5 study area; these only exist well west of the rail corridor in the Kalama recreational areas. Pedestrians and bicyclists are permitted to cross the rail line at all at-grade crossings.

4.15.2.2 Task 6 Project

The existing rail and highway network is the same as described for the Task 5 project. The Port of Longview is adjacent to the Task 6 study area.

Intersection LOS was reviewed for intersections in the proximity of each of the at-grade crossings in the Task 6 study area during peak hours. The locations of the at-grade crossings are shown in Figure 3. The results of the previous traffic analyses show that in the existing morning peak hour, the Task 6 study area intersections operate at a high level of service (LOS B). The Cowlitz County urban area has a standard of LOS D. The existing afternoon peak hour LOS is shown in Table 44. Queue length analysis of the crossings indicates there are fewer than nine vehicles that may queue within the Task 6 study area. These values represent the total combined number of vehicles for both directions at each crossing. Additional information regarding the queue length analysis is provided in Appendix K.

Table 44. Task 6 Project Existing Afternoon Peak Hour Level of Service

Intersection	Traffic Control	Seconds of Delay per Vehicle	Existing Level of Service
Mill St/South Pacific Ave	Two-way stop	12.4	LOS B
Yew St/South Pacific Ave	Two-way stop	11.5	LOS B

There are no sidewalks or bike lanes present in the Task 6 study area. Pedestrians and bicyclists are permitted to cross the rail line at all at-grade crossings.

4.15.3 Environmental Consequences

4.15.3.1 No Build Alternative

Minor maintenance and repair activities along the Task 5 and Task 6 project areas would occur as part of the No Build Alternative. These activities are minor and temporary and would not be expected to result in short- or long-term effects on transportation. The No Build Alternative would not affect pedestrians, bicyclists, or Amtrak stations.

Under the No Build Alternative, traffic volumes would increase and intersection delay is projected to increase by no more than 10 seconds by 2030 in the Task 5 study area and by no more than 2 seconds by 2030 in the Task 6 study area. All intersections would continue to operate at a high level of service (LOS B or C) and above the Cowlitz County standard of LOS D. The No Build Alternative 2030 afternoon peak hour LOS is shown in Table 45.

Table 45. Task 5 and Task 6 Projects No Build Alternative 2030 Afternoon Peak Hour Level of Service

Intersection	Traffic Control	Seconds of Delay per Vehicle	Existing Level of Service
Mill St/South Pacific Ave	Two-way stop	16.4	LOS C
Yew St/South Pacific Ave	Two-way stop	13.3	LOS B
Robb Rd/I-5 SB Ramp	One-way stop	10.4	LOS B
Robb Rd/I-5 NB Ramp	One-way stop	19.2	LOS C

4.15.3.2 Build Alternative

4.15.3.2.1 Task 5 Project

Short-term Effects

Short-term effects on transportation would be anticipated under the Task 5 project, from the movement of construction materials through the study area and are described in further detail in the following sections.

Railroad Traffic

No short-term effects on railroad traffic would be anticipated from the construction of the Task 5 project. This is due to the physical and operational constraints imposed by daily passenger and freight rail service, which leave few time windows for rail delivery, and therefore, none is assumed. Given the amount of time needed to transport materials to the construction site, there is little track or track time available to accommodate the use of freight-based construction rail traffic. It is therefore assumed that the likely method of transporting construction material would be by truck. Additional construction rail traffic would negatively affect existing rail operations due to the additional trains and lower train speeds on the main line tracks that would further congest the main line tracks (HDR 2014).

Construction activities associated with the culvert replacement at unnamed tributary 3 beneath the main line tracks would require all trains to temporarily slow down through this area for approximately 2 weeks. The temporary decrease in speed would not affect freight or passenger train schedules.

Vehicular Traffic

Implementation of the Task 5 project would result in short-term, negligible, adverse effects on vehicular traffic in the Task 5 study area. Material proposed to be removed (approximately 105,000 cubic yards) from the site would be transported via truck to approved spoil sites. This quantity would be expected to require 5,230 trucks. Fill material (approximately 94,000 cubic yards) would be hauled to the site via truck. This quantity would be expected to require 4,700 trucks. The typical work day would include a daily total of 30 truck trips over one 12-hour shift. If these trips were evenly distributed, that would equate to a maximum of three in-and-out trips during any given hour, including traffic peak hours. Truck routes would be established along existing routes capable of carrying trucks. The Task 5 project could have up to on-corridor four locations where material would be delivered. Based on these assumptions, particularly that there would be only several truck trips during any given hour during a typical work day spread out over several locations, there likely would not be any major traffic effects during construction (HDR 2014). This would reduce traffic delays and queues at the intersections and railroad crossings during construction. The construction traffic volumes would be sufficiently low that any effect would be negligible.

As described in Section 4.10.3.2.1, construction activities associated with the culvert replacement at unnamed tributary 3 would have a short-term effect on Louis Rasmussen Day Use Park. Construction activities would require temporary closure of the beach, parking area, and Hendrickson Drive within the construction site of unnamed tributary 3. These closures would occur during an approximately 3 to 4 week construction period for the culvert during the low visitation season in the fall and on weekdays. Hendrickson Drive and the parking area would be temporarily closed for approximately 2 weeks. Alternative access routes to the park and parking are available both north and south of the construction site. Following construction, both the road and the parking lot would be restored to pre-construction conditions. A traffic control plan, notification, and signage would be implemented during construction to minimize temporary effects to adjacent property owners, businesses, and park users.

During construction of the box culvert outfall and natural stream, the beach would be temporarily closed for approximately one week. Alternative access to the beach north and south of the construction site is available. In addition, temporary closure of the beach is anticipated to occur after construction through Hendrickson Drive and the parking lot is complete, thereby allowing beach access via the parking lot and nearby stairs.

Long-term Effects

Railroad Traffic

Implementation of the Task 5 project would result in long-term, beneficial effects on railroad traffic in the Task 5 study area. Constructing a third main line track and installing higher speed turnouts in the

Task 5 project area would improve the flow of passenger trains through the area. Table 46 details the existing and future rail operations on the route for the Toteff Road area.

Table 46. Task 5 Project Existing and Future Daily Rail Operations

Traffic Source	Number of Trains		
	No Build Alternative (2014)	No Build Alternative (2030)	Build Alternative (2030)
Freight (BNSF Railway)	40	62	62
Amtrak *Cascades*	8	8	12
Amtrak *Coast Starlight*	2	2	2
Totals	50	72	76

Vehicular Traffic

Implementation of the Task 5 project would result in long-term, negligible, adverse effects on vehicular traffic in the Task 5 study area. The increase in Amtrak passenger service in the Task 5 project area would increase the number of short-term roadway blockages by the additional four passenger trains crossing throughout the day as compared to the No Build Alternative. None of the train crossings would occur during peak hours. The WSDOT Peak Hour Report (2012c) illustrates lower traffic volumes outside of the morning and afternoon peak hours. Therefore, the operations during the day would have less of an impact when compared with the peak hour analysis, which includes the gate operation and train crossing duration. The 2030 morning and afternoon peak hour roadway volumes would be the same for the No Build and Build Alternatives, but the additional blockages would cause an increase in the number of time periods that roadways are blocked under the Task 5 project. The 2030 annual average daily traffic would remain low, with volumes below 2,000 vehicles per day, which is significantly less than the typical two-lane capacity of 10,000 vehicles per day. No new at-grade highway or rail crossings are planned, and no at-grade crossings would be closed under the Task 5 project.

In 2030, queue lengths are anticipated to remain constant between the No Build and Build alternatives with the addition of two round trip Amtrak *Cascades* trains under the Task 5 project. At Toteff Road, the queue length, when compared to the No Build Alternative, would be reduced during nonpeak hours because of improved train operations between Kalama and Harvest States. The average number of vehicles stopped at Toteff Road is provided in Table 47. These numbers represent the total number of vehicles from each direction during the afternoon peak hour.

Table 47. Average Number of Total Vehicles Stopped – Afternoon Peak Hour – Task 5 Project

Crossing	Average Number of Stopped Vehicles		
	No Build Alternative (2014)	No Build Alternative (2030)	Build Alternative (2030)
Toteff Road	36	58	10

Under the Task 5 project, roadway traffic volumes would remain the same as under the No Build Alternative. Within the Task 5 study area, all intersections within the proximity of the at-grade crossings would continue to operate at a high level of service (LOS B). All analyzed intersections would continue to operate above the Cowlitz County urban area level of service standard (LOS D). The Task 5 project afternoon peak hour LOS is shown in Table 48.

Table 48. Task 5 Project Afternoon Peak Hour Level of Service

Intersection	Traffic Control	Seconds of Delay per Vehicle	Existing Level of Service
Robb Rd/I-5 SB Ramp	One-way stop	10.4	LOS B
Robb Rd/I-5 NB Ramp	One-way stop	19.2	LOS C

Summary of Effects

Short-term effects would be anticipated during construction of the Task 5 project from the movement of construction materials through the study area and construction of the culvert replacement at unnamed tributary 3. Construction materials would likely be shipped via truck, with individual shipments spread out over a 12-hour period; thus, any resulting traffic delays or queues at intersections and railroad crossings would be negligible. The temporary decrease in speed during construction of the culvert replacement at unnamed tributary 3 would not affect freight or passenger train schedules. Temporary closure of Hendrickson Drive would occur for approximately 2 weeks; alternative routes are available north and south of the construction site. A traffic control plan, notification, and signage would be implemented during construction to minimize effects to adjacent property owners, businesses, and park users.

Implementation of the Task 5 project would result in long-term, beneficial effects on railroad traffic in the Task 5 study area. Construction of the third main line track and installation of higher speed turnouts would improve the flow of passenger trains through the area during operation of the Task 5 project. No new at-grade highway or rail crossings are planned, and no at-grade crossings would be closed under the Task 5 project. Implementation of the Task 5 project would result in long-term, negligible, adverse effects on vehicular traffic in the Task 5 study area. The increase in Amtrak passenger service in the Task 5 project area would increase the number of short-term roadway blockages by the additional four passenger trains crossing throughout the day as compared to the No Build Alternative. However, overall, the effects of the Task 5 project on transportation would be minimal.

4.15.3.2.2 Task 6 Project

Short-term Effects

The short-term effects from the Task 6 project would be similar to those described for the Task 5 project.

Railroad Traffic

The short-term effects on railroad traffic from the Task 6 project would be the same as those described for the Task 5 project.

Vehicular Traffic

Implementation of the Task 6 project would result in short-term, negligible, adverse effects on vehicular traffic in the Task 6 study area. Material proposed to be removed (approximately 16,000 cubic yards) from the site would be transported via truck to approved spoil sites. This quantity would be expected to require 800 trucks. Fill material (approximately 252,000 cubic yards) would be hauled to the site via truck. This quantity would be expected to require 12,590 trucks. The typical work day would include a daily total of 30 truck trips over one 12-hour shift. If these trips were evenly distributed, that would equate to a maximum of three in-and-out trips during any given hour, including traffic peak hours. Truck routes would be established along existing routes capable of carrying trucks. The Task 6 project could have up to eight locations where material would be delivered. Based on these assumptions, particularly that there would be only several truck trips during any given hour during a typical work day spread out over several locations, there likely would not be any major traffic effects during construction (HDR 2014). This would reduce traffic delays and queues at the intersections and railroad crossings during construction. The construction traffic volumes would be sufficiently low that any effect would be negligible.

Long-term Effects

Railroad Traffic

Implementation of the Task 6 project would result in long-term, beneficial effects on railroad traffic in the Task 6 study area. Constructing a third main line track and installing higher speed turnouts in the Task 6 project area would improve the flow of passenger trains through the area. Table 49 details the existing and future rail operations on the route for the Mill Street, Yew Street, and private crossing areas.

Table 49. Task 6 Project Existing and Future Daily Rail Operations

Traffic Source	Number of Trains		
	No Build Alternative (2014)	No Build Alternative (2030)	Build Alternative (2030)
Freight (BNSF Railway)	40	62	62
Amtrak *Cascades*	8	8	12
Amtrak *Coast Starlight*	2	2	2
Totals	50	72	76

Vehicular Traffic

Implementation of the Task 6 project would result in long-term, negligible, adverse effects on vehicular traffic in the Task 6 study area. The increase in Amtrak passenger service in the Task 6 project area would increase the number of short-term roadway blockages by the additional four passenger trains crossing throughout the day as compared to the No Build Alternative. None of the train crossings would be scheduled during peak hours. The WSDOT Peak Hour Report (2012c) illustrates lower traffic volumes outside of the morning and afternoon peak hours. Therefore, the operations during the day would have less of an impact when compared with the peak hour analysis. The short-term roadway blockage duration would be approximately 370 seconds, which includes the gate operation and train crossing duration. The 2030 morning and afternoon peak hour roadway volumes would be the same for the No Build and Build Alternatives, but the additional blockages would cause an increase in the overall time roadways are blocked for the Task 6 project.

In 2030, queue lengths are anticipated to remain constant with the addition of two round trip Amtrak *Cascades* trains under the Task 6 project. The additional service would occur outside of the peak hour and thus would not increase queue lengths at the at-grade crossings. The average number of vehicles stopped at each crossing is provided in Table 50. These numbers represent the total number of vehicles from each direction during the afternoon peak hour.

Table 50. Average Number of Total Vehicles Stopped – Afternoon Peak Hour – Task 6 Project

Crossing	Average Number of Stopped Vehicles		
	No Build Alternative (2014)	No Build Alternative (2030)	Build Alternative (2030)
Mill Street	9	33	33
Yew Street	7	25	25
Private Crossing at MP 100.29	1	3	3
Private Crossing at MP 101.64	1	3	3

Under the Task 6 project, roadway traffic volumes would remain the same as under the No Build Alternative. Within the Task 6 study area, all intersections within the proximity of the at-grade crossings would continue to operate at a high level of service (LOS A or B). Under the Task 6 project, the average annual daily traffic volumes on the analyzed crossings would be significantly less than the typical two-lane capacity of 10,000 vehicles per day. All analyzed intersections continue to operate above the Cowlitz County urban area level of service standard (LOS D). The Task 6 project afternoon peak hour LOS is shown in Table 51.

Table 51. Task 6 Project Afternoon Peak Hour Level of Service

Intersection	Traffic Control	Seconds of Delay per Vehicle	Existing Level of Service
Mill St/South Pacific Ave	Two-way stop	16.0	LOS C
Yew St/South Pacific Ave	Two-way stop	11.5	LOS B

Summary of Effects

Short-term effects would be anticipated during construction of the Task 6 project from the movement of construction materials through the study area. Construction materials would likely be shipped via truck, with individual shipments spread out over a 12-hour period; thus, any resulting traffic delays or queues at intersections and railroad crossings would be negligible.

Implementation of the Task 6 project would result in long-term, beneficial effects on railroad traffic in the Task 6 study area. Construction of the third main line track and installation of higher speed turnouts would improve the flow of passenger trains through the area during operation of the Task 6 project. No new at-grade highway or rail crossings are planned, and no at-grade crossings would be closed under the Task 6 project. Implementation of the Task 6 project would result in long-term, negligible, adverse effects on vehicular traffic in the Task 6 study area. The increase in Amtrak passenger service in the Task 6 project area would increase the number of short-term roadway blockages by the additional four passenger trains crossing throughout the day as compared to the No Build Alternative. However, overall, the effects of the Task 6 project on transportation would be minimal.

4.16 Public Services, Utilities, and Safety

This section characterizes existing public services and utilities in the Task 5 and Task 6 study areas and describes potential effects associated with the alternatives. Public safety concerns associated with the Task 5 and Task 6 project areas are also discussed.

> ***Public services and utilities*** *consist of the systems, services, and physical structures that enable modern communities and lifestyle. These systems are wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as urban or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. Public services include police, fire, schools, churches, recreational facilities, and medical facilities. Utilities include telecommunications, power, gas, water, and stormwater, solid waste, sewer, and wastewater systems.*
>
> ***Safety*** *addresses health and safety of both workers and the public during construction of the projects and their subsequent operation.*

4.16.1 Study Area and Methodology

4.16.1.1 Study Area

The Task 5 and Task 6 study areas for public services and utilities include the existing public services and utilities found in the areas adjacent to the Task 5 and Task 6 projects, respectively. Effects on safety would generally be limited to the immediate area surrounding the proposed Task 5 and Task 6 projects; therefore, the safety analysis identifies potential effects on human health and safety within 500 feet of the Task 5 and Task 6 project areas.

4.16.1.2 Methodology

The identification of potential effects on public services and utilities relies on identifying the current levels of service and capacity for existing public services and utilities, and comparing those to the expected short- and long-term infrastructure requirements of the proposed facilities. The safety analysis evaluates whether the Task 5 and Task 6 projects would substantially increase the risks of accident or injury to construction personnel or the local community, or hinder the ability to respond to an emergency. Additionally, the analysis considers the public safety risks at at-grade crossings in the Task 5 and Task 6 study areas. The number of accidents anticipated at at-grade crossings is calculated using USDOT methodology that assigns each intersection a hazard rating based on the size of the road, traffic levels, and the number of railroad tracks, and takes into account the number of historical accidents at the intersection.

4.16.2 Affected Environment

4.16.2.1 Task 5 Project

4.16.2.1.1 Public Services – Task 5 Project

Public services in the Task 5 study area, including educational services, police and emergency services, recreational facilities, and religious facilities are depicted on Figure 27. No medical facilities are located within the Task 5 study area. There are no local transportation facilities, including bus stations, airports, or train stations, in the Task 5 study area.

4.16.2.2 Utilities – Task 5 Project

Utilities in the Task 5 study area include water, wastewater, stormwater, solid waste, electricity, natural gas, and telecommunications. The utilities are described in greater detail in Appendix L. Numerous utility lines cross the railroad right-of-way. The approximate locations of known utility lines in the Task 5 study area are included in Appendix L, Table L-1. The full set of potential utility line conflicts would be developed during final design of the Task 5 project.

4.16.2.3 Safety – Task 5 Project

Safety and security in the Task 5 study area is accomplished through the combined facilities and services of the rail companies (that is, Amtrak and BNSF Railway), local police departments, and other local emergency service providers. The rail companies operating on the rail line assume responsibility for rail line safety and security. Public safety is maintained through right-of-way fencing and road crossing safety systems. The following road crossings exist in the Task 5 study area:

- Toteff Road is an at-grade crossing and has active warning systems (that is, gates and flashing lights).
- Oak Street is a grade-separated crossing, with the road crossing the rail line via an overpass.
- A pedestrian bridge crosses the rail line at Elm Street.

Over the last 15 years, no accidents between roadway vehicles and trains have been reported at the Toteff Road Crossing. The last reported incident at Toteff Road occurred in 1997 (FRA 2013).

4.16.2.4 Task 6 Project

4.16.2.4.1 Public Services – Task 6 Project

Public services in the Task 6 study area, including educational services, police and emergency services, recreational facilities, and religious facilities are depicted on Figure 28. No medical facilities are located within the Task 6 study area. The Amtrak *Cascades* passenger train passes through the Task 6 study area and can be accessed at the Kelso-Longview Amtrak Station. The closest airport is the Southwest Washington Regional Airport, which is located immediately south of Kelso. The Columbia County Rider

Figure 27. Public Services in the Task 5 Study Area

Figure 28. Public Services in the Task 6 Study Area

offers regional bus service from the Kelso-Longview Amtrak Station (Columbia County Rider 2013). The Community Urban Bus System provides local bus service in Kelso and Longview.

4.16.2.5 Utilities – Task 6 Project

Utilities in the Task 6 study area include water, wastewater, stormwater, solid waste, electricity, natural gas, and telecommunications. The utilities are described in greater detail in Appendix L. Numerous utility lines cross the railroad right-of-way. The approximate locations of known utility lines in the Task 6 study area are included in Appendix L, Table L-2. The full set of potential utility line conflicts would be developed during final design of the Task 6 project.

4.16.2.6 Safety – Task 6 Project

Safety and security in the Task 6 study area is accomplished through the combined facilities and services of the rail companies (that is, Amtrak and BNSF Railway), local police departments, and other local emergency service providers. The rail companies operating on the rail line assume responsibility for rail line safety and security. Public safety is maintained through right-of-way fencing and road crossing safety systems. The following road crossings exist in the Task 6 study area:

- Mill Street, Yew Street, and a private BNSF Railway road near Tennant Way (MP 100.29) are at-grade crossings with active warning systems (that is, gates and flashing lights).
- South Pacific Avenue is a grade-separated crossing, with the road crossing under the railroad via a tunnel.
- Washington SR 432 crosses over the railroad via a highway overpass.
- A private, unprotected (that is, no flashers or signals) BNSF Railway road crosses the rail line at grade west of I-5 and the intersection of Old Pacific Highway and Brookside Drive (MP 101.64).

Over the last 15 years, no accidents between roadway vehicles and trains have been reported at Yew Street, Mill Street, or the private road west of I-5 and the intersection of Old Pacific Highway and Brookside Drive. The last reported incidents occurred in 1994 at Yew Street and 1990 at Mill Street. No incidents have ever been reported at the private road by Old Pacific Highway. In 2011, a collision between a private vehicle and a freight train occurred at the private BNSF Railway road near Tennant Way. Following that accident, the crossing was upgraded to include active warning system elements, including flashing lights and gates (FRA 2013).

4.16.3 Environmental Consequences

4.16.3.1 No Build Alternative

The public services and utilities in the Task 5 and Task 6 study areas would remain unchanged by the minor maintenance and repair activities associated with the No Build Alternative.

Under the continuation of existing conditions, approximately 0.10 accidents per year would be expected at the Toteff Road crossing; 0.13 accidents at the Mill Street crossing; 0.11 accidents at the Yew Street crossing; and 0.05 accidents at the private crossing, based on the expected number of average daily train crossings and predicted annual accident frequencies.

4.16.3.2 Build Alternative

4.16.3.2.1 Task 5 Project

Short-term Effects

No increases in demand for public services, such as educational, medical, or religious facilities are anticipated; therefore, no short-term effects on public services are expected. The Task 5 project would not result in increased demand on utilities in the Task 5 study area during construction. Utility conflicts within the right-of-way would require relocation, deepening, or hardening utility lines, as appropriate. This would result in temporary disruptions in service; however, the construction contractor would minimize effects by coordinating with local utilities prior to any disruptions. It is anticipated that there would be minimal short-term effects on public services from the Task 5 project during construction. There would be slight delays for emergency response vehicles and private vehicles during track construction at at-grade crossings; however, these delays would be temporary. Further, in accordance with WAC 480-62-305, local communities would be notified at least 10 days in advance of any work that could potentially disrupt traffic flow at crossings. Disruptions in traffic flow would result in reduction in access to public services during construction; however, any reductions in access would be temporary and could be avoided by rerouting traffic as required.

No short-term effects on public or worker safety would be expected from the Task 5 project during construction. Public and worker safety would be maintained by adhering to a job-specific Safety Action Plan developed by the construction contractor prior to groundbreaking. This plan would provide a complete safety program, including risk identification procedures, emergency response plan, safety communication, and other safety initiatives. Additionally, this plan would comply with FRA's On-Track Safety Program (49 CFR 214.303), which affords on-track safety to all workers whose duties are performed on the railroad.

Long-term Effects

No long-term effects on public services are anticipated because the Task 5 project would not result in increased demand for or delayed access to public services. As there would only be a minor increase in train traffic levels, it is not anticipated that there would be an effect on emergency response times.

A track or train malfunction would potentially cause a train to block the crossing at Toteff Road for an indefinite period of time; however, the probability of this occurrence, coupled with an emergency situation, is extremely low and therefore is not anticipated to affect emergency response times. Further, traffic would be rerouted to other crossings if immediate access were required.

No long-term effects are anticipated for utilities because utility owners requiring access to buried or aerial utilities for maintenance and upgrades would continue to have access. There would not be any increased demand for utilities during operations, and no effect on the availability of utilities is anticipated.

No long-term effects on pedestrian or driver safety would be anticipated during operations. The existing at-grade crossing at Toteff Road would be expanded to accommodate the new track. The pedestrian bridge crossing at Elm Street and the grade-separated crossing at Oak Street would not be affected by the Task 5 project. The safety levels at these crossings would be maintained.

Under the Task 5 project, 0.13 accidents per year at the Toteff Road crossing are projected to occur based on the expected number of average daily train crossings and predicted annual accident frequencies. As discussed in Section 4.17.3.1, this would be a negligible increase of 0.03 accidents per year over the No Build Alternative.

Summary of Effects

The Task 5 project would not result in short- or long-term effects on utilities or public services because no change in demand is anticipated. Utility conflicts within the right-of-way would require relocation, deepening, or hardening utility lines, as appropriate. This could result in temporary disruptions in service; however, effects would be minimized by adhering to minimization measures and BMPs. For example, construction would be coordinated with utility purveyors to confirm conflicts, implement strategies to avoid or minimize service disruptions, and provide public notification of service interruptions or disruptions. The entire list of minimization measures and BMPs applicable to utilities or public services is presented in Appendix M. No short- or long-term effects on public or worker safety would be anticipated.

4.16.3.2.2 Task 6 Project

Short-term Effects

The short-term effects on public services, utilities, and safety would be the same as described for the Task 5 project.

Long-term Effects

No long-term effects on public services are anticipated because the Task 6 project would not result in increased demand for or delayed access to public services. As there would only be a minor increase in train traffic levels, it is not anticipated that there would be an effect on emergency response times.

A track or train malfunction would potentially cause a train to block the crossing at Mill Street or Yew Street for an indefinite period of time; however, the probability of this occurrence, coupled with an emergency situation, is extremely low and therefore is not anticipated to affect emergency response times. Further, traffic would be rerouted to other crossings if immediate access were required.

No long-term effects are anticipated for utilities because utility owners requiring access to buried or aerial utilities for maintenance and upgrades would continue to have access. There would not be any increased demand for utilities during operations, and no effect on the availability of utilities is anticipated.

No long-term effects on pedestrian or driver safety would be anticipated during operations. The existing at-grade crossings at Mill Street, Yew Street, and the private road (MP 100.29), and the grade-separated tunnel crossing at South Pacific Avenue would be expanded to accommodate the new track. The safety levels at these crossings would be maintained. The Washington SR 432 highway overpass would not be affected during operations. The unprotected BNSF Railway road crossing would continue to be maintained as an unprotected crossing; however, access is restricted to BNSF Railway employees. The safety level at these crossings would be maintained.

Under the Task 6 project, 0.16 accidents at the Mill Street crossing; 0.15 accidents at the Yew Street crossing; and 0.07 accidents at the private crossing are projected to occur based on the expected number of average daily train crossings and predicted annual accident frequencies. As discussed in Section 4.16.3.1, this would be a negligible increase of 0.03 accidents per year at the Mill Street crossing; 0.04 accidents per year at the Yew Street crossing; and 0.02 accidents per year at the private crossing over the No Build Alternative.

Summary of Effects

The Task 6 project would not result in short- or long-term effects on utilities or public services because no change in demand is anticipated. Utility conflicts within the right-of-way would require relocation, deepening, or hardening utility lines, as appropriate. This could result in temporary disruptions in service; however, effects would be minimized by adhering to minimization measures and BMPs. For example, construction would be coordinated with utility purveyors to confirm conflicts, implement strategies to avoid or minimize service disruptions, and provide public notification of service interruptions or disruptions. The entire list of minimization measures and BMPs applicable to utilities or public services is presented in Appendix M. No short- or long-term effects on public or worker safety would be anticipated.

4.17 Indirect Effects

As described in the NEPA implementing regulations, indirect effects occur as a result of a project, but take place later in time or are further removed in distance from the project. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. This section characterizes potential indirect effects associated with the alternatives.

4.17.1 Study Area and Methodology

4.17.1.1 Study Area

The Task 5 and Task 6 study areas established for each resource area were used to consider the potential for indirect effects.

4.17.1.2 Methodology

The analysis of indirect effects considers whether the No Build or Build Alternatives would indirectly effect economic, population, or housing growth within the surrounding environment. Economic, population, and housing growth are triggered by a number of complex, interacting factors, including, but not limited to, existing and planned infrastructure, natural resources availability, climate, and economic opportunities. The Task 5 and Task 6 projects are located within an existing rail corridor and urban area. As such, FRA and WSDOT considered whether the No Build or Build Alternatives would facilitate an increase in growth or development. Information used to support the conclusions of this analysis was derived from the direct effects for each resource area. The indirect effects that might occur at a later time or further in distance as a result of the direct effects of the alternatives were then forecasted.

4.17.2 No Build Alternative

Minor maintenance and repair activities along the existing rail line would continue to occur as part of the No Build Alternative. However, the No Build Alternative would have no indirect environmental effects. The existing conditions in the Task 5 and Task 6 study areas would remain unchanged.

4.17.3 Build Alternative

4.17.3.1 Task 5 Project

FRA and WSDOT determined that the Task 5 project is not likely to induce any economic, housing, or population growth in the Task 5 study area. The proposed improvements to the rail line and crossings would not be anticipated to create future jobs, would not improve local utility infrastructure, or create future economic opportunities. Therefore, the Task 5 project would not be anticipated to result in indirect effects on any resources due to the proposed improvements to the rail line and crossings. No permanent jobs would be created, as jobs would be created only temporarily during construction activities and would be anticipated to be filled by locally available resources; therefore, no individuals are anticipated to move to the area as a result of the Task 5 project.

The Task 5 project uses an existing right-of-way rather than creating a new rail corridor. Because there would be no new Amtrak stops within the corridor, individuals using passenger trains would continue to travel through the Task 5 project area to their destinations in the same way as the current Amtrak intercity passenger train service. Generally, intercity passenger rail transports passengers between well-defined urban centers while other passenger rail or mass-transit modes may transport passengers from an urban center to suburban areas. Growth and development in the Task 5 study area would likely occur as forecasted and planned by each jurisdiction regardless of Task 5 project implementation because transportation is only one of the many complex factors that affect and influence the location and extent of urban and rural growth.

As the Task 5 project would not be anticipated to result in any economic, housing, or population growth near the project area, there would not be anticipated to be any indirect effects.

Summary of Effects

The Task 5 project is not likely to directly or indirectly affect growth or land use patterns. Growth and development in the Task 5 study area would occur as forecasted and planned by each jurisdiction regardless of Task 5 project implementation. FRA and WSDOT did not identify any indirect effects from the proposed improvements to the rail line or the crossings. No substantial indirect effects would be expected to any of the resource areas analyzed.

4.17.3.2 Task 6 Project

The indirect effects for the Task 6 project would be the same as described for the Task 5 project.

Summary of Effects

As summarized for the Task 5 project, the Task 6 project is not likely to directly or indirectly affect growth or land use patterns. Growth and development in the Task 6 study area would occur as forecasted and planned by each jurisdiction regardless of Task 6 project implementation. FRA and WSDOT did not identify any indirect effects from the proposed improvements to the rail line or the crossings. No substantial indirect effects would be expected from any of the resource areas analyzed.

4.18 Cumulative Effects

This section describes potential cumulative effects associated with the Build Alternative.

4.18.1 Study Area and Methodology

Cumulative effects include past, present, and reasonably foreseeable future actions within the Task 5 and Task 6 study areas that, together with the Task 5 and Task 6 projects, may have a cumulative effect on the environment. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Past and present actions affecting environmental resources are reflected in the existing conditions of the Task 5 and Task 6 study areas. The cumulative effects study areas for Task 5 and Task 6 are presented in Figure 29. Reasonably foreseeable future actions include those that are being implemented or have been implemented recently, including planned and funded transportation improvements, and other local and regional infrastructure proposals.

4.18.1.1 Guidance on Cumulative Effects Assessment

In identifying and analyzing potential cumulative effects, FRA and WSDOT used joint guidance issued by WSDOT, FHWA Washington Division, and USEPA Region 10 titled *Guidance on Preparing Cumulative Impact Analyses* (Joint Guidance) (2008). In addition, FRA and WSDOT used CEQ guidance titled *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) and *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ 2005).

The Joint Guidance outlines the following eight steps for identifying and assessing cumulative effects:

1. Identify the resources that may have cumulative effects to consider in the analysis.
2. Define the study area and time frame for each affected resource.

3. Describe the current status and historical context for each.
4. Identify direct and indirect effects that may contribute to a cumulative effect.
5. Identify other historic, current, and reasonably foreseeable future actions that may affect resources.
6. Assess potential cumulative effects on each resource; determine magnitude and significance.
7. Report the results.
8. Assess and discuss potential mitigation issues for all adverse effects.

FRA and WSDOT relied on the affected environment section of each of the resources studied in this EA, several of the regional and local planning documents referenced in Section 4.10.2, Land Use and Recreation, and the assessment of direct and indirect effects of the Task 5 and Task 6 project alternatives to complete Joint Guidance Steps 1 through 4. FRA and WSDOT then used Joint Guidance Steps 5 through 8 to assess the potential for cumulative effects associated with the Task 5 and Task 6 projects. The result of this assessment is summarized later in this section.

4.18.1.2 Scope of Cumulative Effects Assessment

Cumulative effects are considered for the Build Alternative. Consistent with the Joint Guidance (WSDOT, FHWA, and USEPA 2008) and CEQ guidance (1997, 2005), FRA and WSDOT did not consider cumulative effects on resources that would not be directly or indirectly affected by the Build Alternative. If minimization measures were to be implemented to reduce effects on a resource, the cumulative effects analysis considered only the net effect on the resource (that is, the condition of the resource after the minimization measures were implemented). The cumulative effects analysis did not assess a resource if the effects of the Task 5 and Task 6 projects would be fully mitigated (that is, reduced to no effect).

As described in the effects analyses in this EA, the Build Alternative would have no direct or indirect effects on geology and soils, air quality, energy, hazardous materials, land use and recreation, Section 6(f) resources, Section 4(f) resources, cultural resources, socioeconomics, public services, or utilities. Therefore, FRA and WSDOT determined that the Task 5 and Task 6 projects would not contribute to a cumulative effect on these resources.

There is a potential for direct and/or indirect effects of the Build Alternative on water resources, wetlands, ecological resources, threatened and endangered species, aesthetics, and transportation. Therefore, FRA and WSDOT evaluated whether the Task 5 and Task 6 projects would contribute to a cumulative effect on these resources.

The geographic boundaries for the cumulative effects assessment were typically based on the Task 5 and Task 6 study areas used for the analysis of direct effects on each resource. In some cases, the Task 5 and Task 6 study areas were expanded to include a larger geographic area, with the understanding that certain activities outside of the Task 5 and Task 6 study areas could contribute to cumulative effects on resources within the Task 5 and Task 6 study areas.

Analysts reviewed regional land use and transportation development patterns to determine temporal boundaries for the cumulative effects assessment. To characterize future actions that could potentially affect resources in the Task 5 and Task 6 study areas, FRA and WSDOT looked to the planning horizons used by local agencies in their comprehensive planning efforts, including the cities of Kalama, Kelso, and Longview, as well as the Ports of Kalama and Longview. The various local planning efforts used different planning horizons that fall between 2020 and 2040.

4.18.1.3 Reasonably Foreseeable Future Actions

In developing the list of reasonably foreseeable future actions, FRA and WSDOT applied the following criteria from the Joint Guidance (WSDOT, FHWA, and USEPA 2008):

- Is the project included in a financially constrained plan (for example, a capital improvement program)?
- Is it permitted or in the permitting process?
- How reasonable is it to assume that the project will be constructed?
- Is the action identified as high priority?

FRA and WSDOT examined the funded improvement projects in the State Transportation Improvement Program and contacted BNSF Railway, Cowlitz County, the cities of Kalama and Kelso, and the Ports of Kalama and Longview to identify reasonably foreseeable future actions that could affect resources in the Task 5 and Task 6 study areas. In addition, analysts reviewed the State Freight Rail Plan (WSDOT 2009c) and current project proposals within the Task 5 and Task 6 study areas under review by the Corps. Analysts also sought regional data and studies prepared by Cowlitz County; the cities of Kalama, Kelso, and Longview; and the Ports of Kalama and Longview. Table 52 lists these actions. The general locations of the reasonably foreseeable future actions with respect to the locations of the Task 5 and Task 6 projects are shown in Figure 29.

Table 52. Reasonably Foreseeable Future Actions

Action	Responsible Entity	Time Frame
1. Millennium Bulk Terminals – Longview (MBTL) (Port of Longview)	MBTL	In planning stage (NEPA EIS and Corps permit application)
2. West Main Street Realignment (Kelso)	WSDOT	In State Transportation Improvement Program: 2013
3. Yew Street Reconstruction Phase I (Kelso)	WSDOT	In State Transportation Improvement Program: 2015
4. City of Kelso Railroad Crossing Study	City of Kelso	In planning stage
5. Southwest Washington Regional Airport West Side Hangar Development Project	City of Kelso	In planning stage (EA)
6. Port of Kalama/Temco, LLC Terminal Expansion	Port of Kalama/Temco LLC	Expansion in progress, expected completion in early 2014
7. Task 4 – Toteff Siding Extension	WSDOT	In environmental review stage; construction expected to begin in late 2014

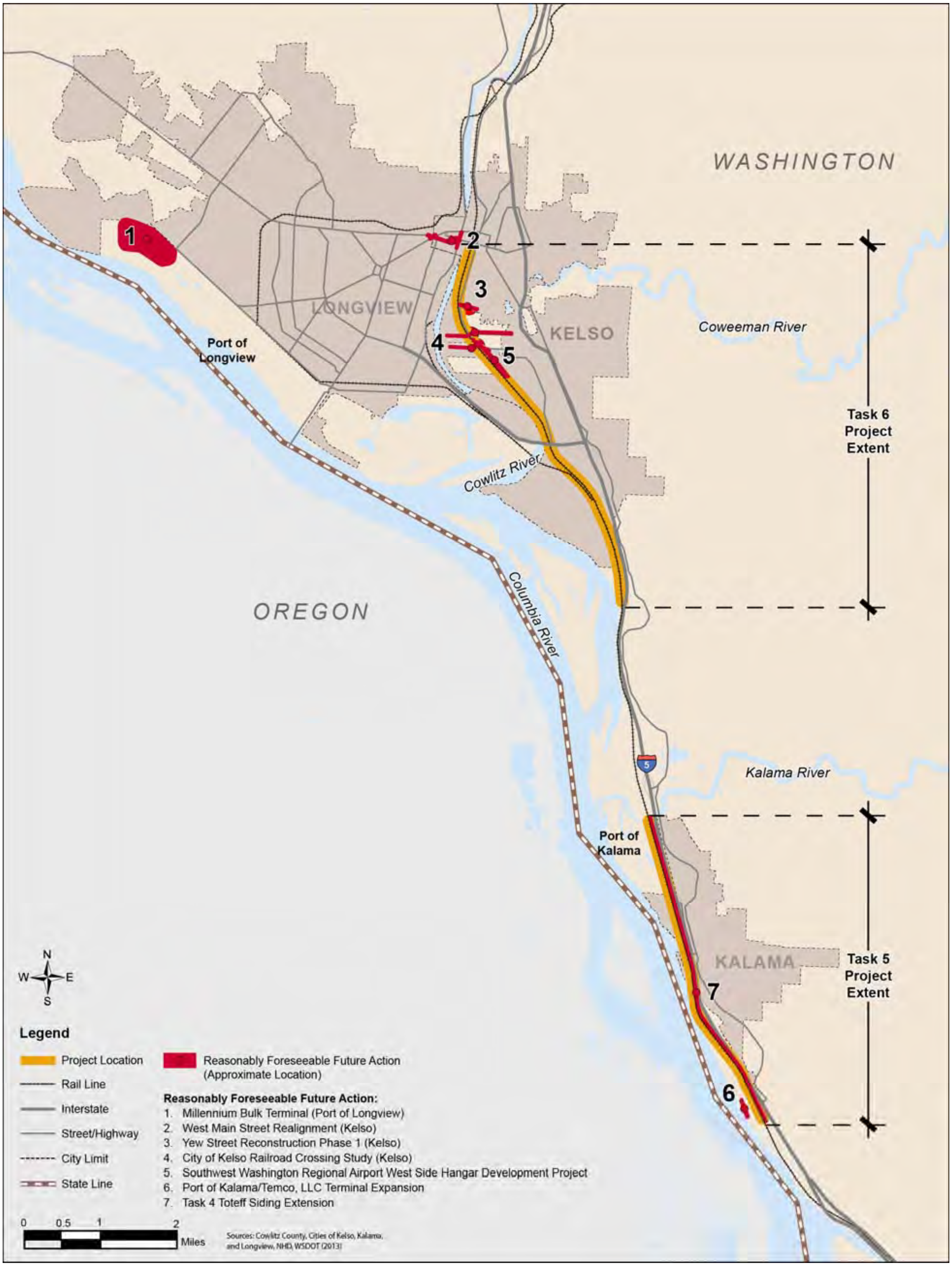

Figure 29. Reasonably Foreseeable Future Actions

Land use and development trends within the region and the Task 5 and Task 6 study areas are summarized in Section 4.10.2. As discussed, growth in the Task 5 and Task 6 study areas is generally slow compared to more urbanized areas of the state. Land use changes and economic development that might be linked to the reasonably foreseeable future actions listed in Table 52 are generally consistent with the local comprehensive plans and other relevant land use plans and policies, or would obtain authorizations for exemptions from the appropriate governing body(ies).

In addition to the plans and policies in place to manage growth in accordance with Washington's Growth Management Act, there are management plans for fish recovery, forest conservation, watershed protection, floodplain function, habitat diversity, and other natural resources. These plans support a long-range plan for natural resources recovery in the Task 5 and Task 6 study areas. The cumulative natural resources effects of this project are described in the context of those plans.

The Millennium Bulk Terminals – Longview (MBTL) project (Project #1) proposes a coal export terminal at the site of the former Reynolds Aluminum smelter in Cowlitz County (Gaines 2012). The terminal would cover approximately 190 acres of an existing industrial site and ultimately export up to 48.5 million tons of coal annually (Gaines 2012). It would include rail improvements to connect the terminal to the main line railroad; however, those locations have not been identified.

FRA and WSDOT reviewed the best available information about the MBTL project to determine its contribution to a cumulative effect with the resources potentially affected by the Build Alternative, as described in the analysis of cumulative effects provided below. The EIS being prepared for the MBTL project would evaluate the potential cumulative effects of that project with other reasonably foreseeable future actions, including the Kelso Martin's Bluff Improvement Projects.

The roadway improvements listed in Table 52 (that is, West Main Street Realignment [Project #2]; Yew Street Reconstruction Phase I [Project #3]; and City of Kelso Railroad Crossing Study involving both Hawthorne Street and Hazel Street [Project #4]) are all proposed to address existing traffic and transportation issues in Kelso. These projects would result in a cumulative operational improvement effect on transportation but would not affect other resources affected by the Kelso Martin's Bluff Improvement Projects because the transportation improvement projects would occur along existing, previously disturbed roadways.

The Southwest Washington Regional Airport West Side Hangar Development Project (Project #5) is proposed to improve safety at the airport by relocating taxiway and hangar facilities to meet Federal Aviation Administration design criteria. The Draft EA for the West Side Hangar Development Project determined that there would be no effects on fish, wildlife and plants, floodplains, wetlands, water quality, noise, light, air quality, socioeconomics, environmental justice communities, children's environmental health and safety, and cultural resources. Some property acquisition would be required, and as a result, some residents would be relocated (City of Kelso 2013c). The Build Alternative would not result in direct, indirect, or cumulative effects on land use; thus, this reasonably foreseeable future action is not discussed further in the analysis of cumulative effects.

The expansion of the Temco LLC Terminal at the Port of Kalama (Project #6) was proposed to increase the grain shipping capacity of the terminal. Construction of the expansion began in early 2013 and, when completed in 2014, the terminal would include additional storage silos, new rail lines, and new conveyors. The project would result in a cumulative effect on freight rail transportation, but would not affect other resources affected by the Task 5 and Task 6 projects because the project is separated geographically from the Task 5 and Task 6 projects.

The Toteff Siding Extension Project (Project #7) is proposed to construct rail infrastructure improvements to alleviate freight and passenger rail congestion in the vicinity of the Port of Kalama. The proposal includes upgrades to existing track components as well as installation of new track and rail bed. All rail work would be within the existing railway right-of-way. Work would also include upgrading a public at-grade crossing. The Project is anticipated to affect wetlands and Schoolhouse Creek. Mitigation would occur at an offsite location within the watershed. No other impacts are anticipated.

4.18.2 Cumulative Effects

The Build Alternative is not likely to contribute to significant adverse cumulative effects. The potential cumulative effects for each resource area are discussed below.

4.18.2.1 Water Resources and Wetlands

The Task 5 and Task 6 projects would have direct effects on channel morphology and floodplains at the Coweeman River and Owl Creek crossings, which would contribute to a cumulative effect. The lower 4 miles of the Coweeman River subbasin were historically a large floodplain, but development in the Kelso area and construction of I-5 have resulted in channelization and diking. In addition, deposits from the 1980 Mount St. Helens eruption filled much of the Coweeman River floodplain. As a result, the floodplain and tributaries in the Coweeman/Owl Creek area are now highly disconnected from the river floodplains (Lower Columbia Fish Recovery Board 2006). Most future development in the area, including the reasonably foreseeable future actions listed in Table 52, is likely to occur in the previously urbanized area of the floodplain, and the lower Coweeman River would continue to be maintained in its current channel with dikes and levees. The Build Alternative's development would be coordinated with the Corps to ensure the channel position is maintained for flood protection, which is consistent with the management goals for the river.

Development in the Owl Creek subbasin has also altered natural flow in that drainage. Although not as urbanized as the lower Coweeman River, the channel position of Owl Creek is managed for purposes of flood control and infrastructure stability (that is, I-5 and rail) consistent with Corps requirements for streamflow management.

The MBTL project would not contribute to cumulative effects on the Coweeman River or Owl Creek because the MBTL project is approximately 6 miles northwest of both water bodies and in a separate sub-basin watershed. However, the MBTL project would involve work in or adjacent to the Columbia River and associated shorelines, including dredging and pile driving (Gaines 2012). This would contribute to a cumulative effect on Columbia River watershed. The MBTL project would be subject to CWA and

Ecology shoreline permitting requirements, as appropriate, which would require implementation of BMPs and adherence to other restrictions to minimize potential effects on water resources.

The wetland losses (approximately 3.6 and 6.8 acres for Task 5 and Task 6, respectively) associated with Build Alternative construction would be mitigated through compensatory mitigation in accordance with the Corps permit under CWA Section 404. Although the losses attributed to the Build Alternative would contribute to past and future wetland losses, creating a potential for a cumulative effect, it is the intent of the compensatory mitigation to compensate for the Task 5 and Task 6 project effects.

The project proponent anticipates that the MBTL project would result in the fill of approximately 24 to 30 acres of wetlands (Gaines 2012). The MBTL project also would be subject to CWA Section 404 permit conditions and compensatory mitigation requirements, reducing its potential to contribute to a cumulative effect. The Toteff Siding Extension Project (Project #7 in Table 52) is also anticipated to affect wetlands; this impact would also require compensatory mitigation.

With regulatory oversight, cumulative wetland losses due to present and future actions would be offset through mitigation requirements. Therefore, because of regulatory requirements to mitigate all adverse effects to these resources, the Build Alternative would not result in an adverse cumulative effect on wetlands.

4.18.2.2 Ecological Resources and Threatened and Endangered Species

Much of the natural environment of the Task 5 and Task 6 study areas and their surroundings has been disturbed by existing development and human activities. The Build Alternative would have a minor, short-term construction effect on the vegetation along the BNSF Railway right-of-way, but it would not lead to long-term effects because the vegetation is successional and is not important for habitat. There would be no long-term operational effects on aquatic habitat (including ESA-listed fish species and EFH) from the addition of a pier in the Coweeman River under the Build Alternative, and it would not affect management of the river for long-term goals related to fish and wildlife habitat improvements. The Build Alternative, therefore, would not contribute to a cumulative effect on aquatic life, including ESA-listed fish species and EFH.

The MBTL project would contribute to a cumulative effect on ecological resources or threatened and endangered species. The MBTL project would be located on an existing industrial site, which would minimize the potential for effects on wildlife or vegetation; however, the MBTL project would involve work in and/or adjacent to the Columbia River and associated shorelines, including identified critical habitat areas (Gaines 2012). This would contribute to a cumulative effect on the Columbia River because the MBTL and the Build Alternative are in the Columbia River watershed. The MBTL project proponent does not presently anticipate these effects to be substantial (Gaines 2012). The MBTL project would be subject to federal and state regulations and permitting requirements related to fish and aquatic habitat that would likely result in minimization of potential effects on ecological resources or threatened and endangered species.

There are no reasonably foreseeable future actions that would contribute to a cumulative effect on vegetation in the Task 5 and Task 6 study areas; therefore, no cumulative effect on vegetation would occur. There are no reasonably foreseeable future actions in connected terrestrial habitat that would contribute to a cumulative effect on wildlife, including ESA-listed wildlife species.

4.18.2.3 Aesthetics

The Build Alternative is located within an existing rail corridor and would have minor, short-term construction effects on visual quality. FRA and WSDOT considered the Build Alternative's effects on aesthetic resources in combination with other current and future projects in the Task 5 and Task 6 study areas and determined that no cumulative effect on visual quality would occur. The MBTL project would be located outside of the Build Alternative viewshed and thus would not contribute to a cumulative effect in that area.

4.18.2.4 Transportation

The Build Alternative would not affect vehicle traffic on local roads. Increased Amtrak service would increase the number of times the at-grade railroad crossings would be blocked, but these occurrences would not affect LOS or queuing (see Section 4.15.3). Therefore, the Build Alternative would not result in significant cumulative effects on transportation.

The MBTL project and the Port of Kalama Terminal Expansion project would result in increased freight traffic through the Task 5 and Task 6 study areas, which would also increase the number of times the railroad crossings would be blocked and contribute to an non-significant cumulative effect on local transportation corridors. The roadway improvement projects proposed in Projects #2 through #4 (see Table 52) would improve roadway flow and potentially reduce traffic in the city of Kelso. These roadway improvements could offset potentially adverse impacts from the MBTL and Port of Kalama Terminal Expansion Project. The Build Alternative would not be likely to contribute to a significant cumulative effect on transportation.

4.18.2.5 Summary of Effects

When considered with past, present, and reasonably foreseeable future actions, the Build Alternative would not be expected to contribute to a significant adverse cumulative effect on any resources. The Build Alternative would not contribute to a cumulative effect on water resources, ecological resources or threatened or endangered species, aesthetics, or transportation. With regulatory oversight, cumulative wetland losses due to present and future actions would be offset through mitigation requirements. The Build Alternative would not contribute to an adverse cumulative effect on wetlands.

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5.0 Mitigation, Minimization Measures, and Best Management Practices

This section describes the mitigation, minimization measures, and BMPs that would be implemented to minimize or eliminate effects on environmental resources. Mitigation measures are those measures required to offset permanent adverse effects. In addition, the project design was refined to avoid or minimize effects, as discussed in Section 3.3.

***Mitigation** refers to the restoration, establishment, enhancement, or in certain circumstances preservation of wetlands, streams, or other aquatic resources for the purpose of offsetting unavoidable effects.*

***Minimization measures** are actions or steps taken to ensure that effects are minimized to the extent possible.*

***Best management practices (BMPs)** are methods or techniques found to be the most effective and practical means in the industry to avoid or minimize effects.*

***Mitigation Bank Credits** are units of restored, created, enhanced, or preserved land. These credits may be purchased (that is, debited) to offset impacts incurred at a project development site. Ratios are typically used to establish the credit/debit system. For example, 1 acre of impacted wetland (that is, a debit) may be offset through the purchase of 2 acres of credit at the mitigation bank.*

5.1 Mitigation

The proposed mitigation described below has been preliminarily approved by the USACE as part of the USACE Rivers and Harbors Act (RHA) Section 10 and CWA 404/401 permitting process. Although minor changes to the mitigation and quantities may occur during the permitting and final design processes, the overall mitigation concept, goals, and expected benefits presented below would remain unchanged.

5.1.1 Floodplains

- **Task 5 –** The placement of fill in Wetland B for the new third main line track would reduce stormwater conveyance capacity that could result in flooding. To maintain the current stormwater conveyance capacity, Wetland B would be expanded to offset the placement of the fill material.

5.1.2 Wetlands

- **Task 5 –** The 3.6 acres of wetlands that would be permanently affected by the Task 5 project would require wetland mitigation to offset unavoidable wetland losses, through the preservation, creation, rehabilitation, or enhancement of wetlands within the watershed. Mitigation for the permanent wetland effects is anticipated to occur through the purchase of 4.38 acres of wetland mitigation bank credits at the Columbia River Wetland Mitigation Bank in Vancouver, Washington. The purchased credits would be for a combination of emergent, scrub-shrub and forested wetland areas within the mitigation bank that provide a variety habitat types for wildlife.
- **Task 6 –** The 6.8 acres of wetlands that would be permanently affected by the Task 6 project would be mitigated through a combination of the purchase of wetland mitigation bank credits at the Coweeman River Mitigation Bank, and fee acquisition of wetland properties for permanent preservation.

- The Coweeman River Mitigation Bank is located approximately 3.0 miles upstream from the Coweeman River Bridge, in Cowlitz County. The goal of the bank is to provide wetland functions through reestablishment, creation, and enhancement, as well as, restore and create riparian habitat and off-channel rearing and refuge habitat for aquatic species. The bank is anticipated to be approved and in service by early 2015. The credit/debit ratios would be determined and purchased at that time, at a ratio approved by the USACE. The number of credits purchased from the bank would be no less than 5.3 credits.
- The project would acquire and permanently preserve approximately 50 acres of high-value wetlands which provide important fish and wildlife habitats in the project area. Specifically, lands in the vicinity of Owl Creek and the confluence of the Cowlitz River and Columbia River would be pursued for preservation. Preservation agreements would be developed in coordination with the WDFW and Cowlitz Indian Tribe, to identify the responsible entity to manage the preserved lands. The parameters to be applied for the selection of lands to be acquired include:
    - Providing priority, high value aquatic habitats identified by the WDFW and Wildlife and Cowlitz Indian Tribe for the lower Coweeman River, Cowlitz River, and Owl Creek watersheds
    - Providing maximized opportunities for wetland or off-channel restoration and floodplain connectivity by local, state, tribal, or federal agencies
    - Providing suitable habitat for multiple threatened or endangered species.

5.1.3 Threatened and Endangered Fish Species

- **Task 6 –** Several measures are proposed to offset effects to threatened and endangered fish habitats, including:
    - Approximately 0.5 acre of Wetland H would be restored to offset the temporary wetland effects from construction of the additional track crossing at the Coweeman River. As part of the restoration, Wetland H would be enhanced by grading the bottom of the wetland to eliminate topographic high spots that might otherwise inhibit water movement between the Coweeman River, Wetland H, and Wetland I. In addition, removing the high spots would allow for a year round connection between these three features. The increased movement of water and year round connection would improve access for juvenile salmonids into the forage and rearing habitat within Wetland H and I during low water periods of the year (typically in late summer). The restored area within Wetland H would also be planted with native emergent and shrub plantings to prevent erosion from the grading activities.
    - At the private access road at MP 100.29, the two existing, narrow culverts would be replaced with a larger, wider culvert. The existing and proposed culvert connects Wetland I with Wetland H and the Coweeman River. The new culvert would be designed

in accordance with the NMFS *Anadromous Salmonid Passage Facility Design* guidelines and WDFW *Water Crossing Design Guidelines*. These guidelines require that culverts provide fish passage through designs that reduce water velocity by designing a wider culvert, create a natural stream bottom in the culvert, and match the upstream and downstream topographies to allow fish easier access through the culvert. Replacement of this culvert would result in the following associated improvements:

    - Improved access for aquatic species from Wetland H to approximately 6.94 acres of suitable forage and rearing habitat within Wetland I.
    - Improved hydrologic and tidal exchange between the Coweeman River and Wetlands H and I, thereby improving water quality within off channel forage and rearing habitat.

- Replacement of an existing, narrow culvert under the Owl Creek Sand and Gravel Company access road at MP 101.60, connecting Wetlands J to Owl Creek and Wetland K, with a larger, wider culvert for fish passage. This culvert, which has been identified by the WDFW as a partial barrier to fish passage, would also be designed following the WDFW *Water Crossing Design Guidelines*. Replacement of this culvert would result in the following associated improvements:
    - Improved access from Owl Creek to approximately 3.4 acres of suitable forage and rearing habitat within Wetland J.
    - Improved hydrologic and tidal exchange between Owl Creek and Wetlands J and K, thereby improving water quality within off channel forage and rearing habitat.
    - Removing a hydrologic break between Wetlands J and K which would result in increasing the connectivity between the two wetlands.
- Removal of an upland berm at MP 101.05, east of the BNSF main line track, would restore a historic hydrologic connection between Owl Creek, Wetlands J and K, and the Coweeman River (including Wetlands H and I). The removal of the berm is being coordinated with WDFW and the Cowlitz Indian Tribe, and would include excavating the upland berm to allow a seasonal connection between the Coweeman River and Owl Creek during high flow events. This restored hydrologic connection would result in the following improvements:
    - Creating a seasonal hydrologic connection between the Coweeman River and Owl Creek basin that would provide access to productive habitats for anadromous salmonids.
    - Restoring the opportunity for juvenile salmonids within the Coweeman River and Cowlitz River to access abundant forage and rearing habitat within the Owl Creek basin.

- Increasing the amount of water moving through Wetlands H and I, thereby improving water quality within the off-channel, forage and rearing habitat provided by both wetlands.
- Creating approximately 0.2 acres of wetland connecting Wetland H and I.

Taken together, these mitigation measures would result in the following benefits for threatened and endangered fish species:

- Enhancement of Wetland H, installation of fish passable culverts, and removal of the upland berm would increase access to suitable off-channel, forage and rearing habitat for juvenile salmonids.
- Removing the upland berm would restore seasonal habitat during high flows in the Coweeman River and Owl Creek.
- Removing the upland berm would increase the available off-channel, forage and rearing habitat in Owl Creek.
- Replacing the culverts at MP 100.29 and 101.60 with wider and larger fish passable culverts would increase water movement through the off-channel habitats and improve water quality conditions (e.g., temperature and dissolved oxygen).
- Replacing the culverts at MP 100.29 and 101.60 with wider and larger fish passable culverts would create a single wetland unit along the east side of the main line tracks. This wetland unit is contiguous with the wetland system west of the project study area. Together, the created single wetland unit and the adjacent wetland system would create one large wetland complex with greater overall functions and values.

5.1.4 Summary of Mitigation

Task 5 – Floodplain effects in Wetland B would be mitigated by expansion of Wetland B to offset the placement of fill material. The 3.6 acres of wetlands that would be permanently affected by the Task 5 project would be mitigated through the purchase of 4.38 acres of wetland mitigation bank credits at the Columbia River Wetland Mitigation Bank in Vancouver, Washington.

Task 6 – Effects to wetlands and threatened and endangered fish species would be mitigated through a combination of wetland and habitat mitigation. The 6.8 acres of wetlands that would be permanently affected by the Task 6 project would be mitigated through a combination of the purchase of wetland mitigation bank credits (anticipated at no less than 5.3 credits) at the Coweeman River Mitigation Bank, and fee acquisition of approximately 50 acres of wetland properties for permanent preservation. This mitigation would replace wetland functions, and restore and create riparian and off-channel rearing and refuge habitat for aquatic species. Threatened and endangered fish species mitigation would include replacement of culverts at MP 100.29 and 101.60 with fish passable culverts, removal of an upland berm at MP 101.05, and restoration of Wetland H. These improvements would improve hydrologic connections between the Coweeman River, Owl Creek, and Wetlands H, I, J, and K thereby improving water quality and access for salmonids to foraging and rearing habitat.

The minimization measures and BMPs listed in Appendix M, Table M-1, are practices, techniques, methods, processes, and activities commonly accepted and used throughout the construction and railroad industries that would be implemented to comply with applicable permits and other regulatory requirements, such as the National Pollution Discharge Elimination System Construction Stormwater General Permit, and that provide an effective and practicable means of preventing or minimizing the environmental effects of an action.

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6.0 Coordination and Consultation

Public involvement and agency coordination, including tribal consultation, for the Task 5 and Task 6 projects are summarized in the following sections.

6.1 Public Involvement

Coordination with the public, community organizations, stakeholders, and other interested parties is critical to the successful adoption of this EA. In consultation with FRA, WSDOT hosted a public outreach workshop on June 19, 2013, from 5:00 to 7:00 p.m. The workshop was held so the public could learn about the proposed Task 5 and Task 6 projects (including project benefits and timeline), provide comments on the proposed projects, ask questions of project staff, and learn how FRA and WSDOT are assessing the environmental effects of the proposed projects. FRA and WSDOT advertised the public outreach workshop through a variety of methods:

- Email notification to the project contact list and social service providers near the Task 5 and Task 6 project areas
- Postcard mailing to 6,500 residents and property owners near the Task 5 and Task 6 project areas
- Spanish language postcard to social service agencies that serve Spanish-speaking constituents near the Task 5 and Task 6 project areas
- Project website notification
- Posters posted in community locations
- Media advisory to local newspapers
- Alerts via WSDOT social media outlets

The public outreach workshop was open to all members of the public and was attended by 18 people. The public was given the opportunity to provide comments during the workshop and through mail or email following the workshop. A total of five comments were received from the public during and following the public outreach workshop.

The comments centered on means of effectively communicating the benefits of the Task 5 and Task 6 projects to the public (for example, setting up project displays in the Kelso-Longview Rail Station); concerns about the safety of pedestrians and access for emergency vehicles; requests for making the public meetings accessible to those without access to motor vehicles; and questions about the engineering details of the Task 5 and Task 6 projects. Appendix N contains additional details regarding the comments received. FRA and WSDOT considered comments and input from this meeting as they developed the analysis for this EA.

Following publication of this EA, WSDOT, in coordination with FRA, will hold one public hearing to provide opportunities for public comment on the EA. WSDOT will advertise the public hearing and subsequent decision by:

- Placing a legal advertisement in a newspaper of record to notify the public of the EA comment period and hearing date.
- Mailing postcards to notify residents within or adjacent to the Task 5 and Task 6 project areas of the comment period and public hearing.
- Updating the website and providing e-newsletter updates to subscribers with information on the comment period and hearing.
- Notifying the public that the EA document is available online.

To conduct outreach with Spanish speakers and those with limited English proficiency, WSDOT will translate the postcard mailing into Spanish and conduct outreach with local social service providers to inform them about the meeting.

The public will be afforded the opportunity to provide written and verbal comments at the public hearing and to submit written comments via email or regular mail. Display boards and other public hearing materials would be uploaded to the WSDOT website for those unable to attend the public hearing. FRA and WSDOT will consider all substantive comments before making any decision on the Project.

6.2 Agency Coordination

FRA and WSDOT held a workshop to discuss the proposed action with agency stakeholders on June 19, 2013. Attendees included representatives from numerous state and local entities, including the city of Kalama, city of Kelso, city of Longview, Cowlitz-Wahkiakum Council of Government, Washington Utilities and Transportation Commission, Ecology, Cowlitz County, Port of Kalama, and Port of Longview. The purpose of the meeting was to allow attendees the opportunity to review the conceptual design and draft purpose and need statements for each of the Task 5 and Task 6 projects, and to comment on the proposed action. Participants in the agency workshop commented that FRA and WSDOT should consider how the Task 5 and Task 6 projects would affect freight movement along the rail line; asked questions about the construction process; recommended that FRA and WSDOT take into account other transportation work in the area (for example, the Hazel Street improvement project); and raised concerns that the project would have an adverse effect on stormwater drainage from the city of Kalama to the Kalama River. FRA and WSDOT considered comments and input from this meeting during development of this EA. Appendix N contains additional details regarding the comments received.

WSDOT, on behalf of FRA, consulted with the Cowlitz Indian Tribe, Confederated Tribes of Grand Ronde Community, Confederated Tribes of the Umatilla, Confederated Tribes of Warm Springs, Nez Perce Tribe, and the Yakama Nation regarding the proposed Task 5 and Task 6 projects in 2013. The tribes did not raise any concerns related to Task 5 or Task 6 as part of this NEPA process (see Appendix J). Tribal concerns raised during the Task 6 CWA Sections 401 and 404 permitting process are related to ESA-listed fish species and habitat. These concerns are addressed as part of the fish related mitigation described for Task 6 in Section 5.1.3. In addition, tribal consultation is currently ongoing for construction of the culvert replacement at unnamed tributary 3 to identify any tribal concerns.

In compliance with Section 106 of the National Historic Preservation Act, FRA submitted no adverse effect determination letters to DAHP for the Task 5 and Task 6 projects. The DAHP concurred with the determination of no historic properties affected for the Task 5 project on June 15, 2009. The DAHP concurred with the determination of no historic properties affected for the Task 6 project on August 20, 2013 (see Appendix J). Construction of the culvert replacement at unnamed tributary 3 could affect archaeological resources. A letter to DAHP and the Tribes describing the changes to the project and the associated change to the APE, and requesting their comments was circulated on July 24, 2014 (Appendix J).

Meetings with NMFS and USFWS to discuss the ESA consultation and potential effects of the Task 5 and Task 6 projects have been ongoing since March 2013. In compliance with Section 7 of the ESA, FRA and WSDOT completed a biological evaluation for the Task 5 and Task 6 projects to document potential project effects on ESA-listed species and designated critical habitat. The assessment indicated that the Task 5 and Task 6 projects would be constructed entirely within the existing right-of-way of the established rail corridor within a developed region with high ambient noise and human activity levels. The assessment concluded that the Task 5 and Task 6 projects would affect several federally listed fish and wildlife species, designated critical habitat for several fish species, and EFH under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996. Consultation is currently ongoing with NMFS and USFWS and would be completed prior to completion of the FRA NEPA process.

Implementation of the Task 5 and Task 6 projects would include the placement of fill into wetlands and streams; therefore, CWA Section 401 and 404 permits from Ecology and the Corps would be required. To offset unavoidable direct effects, as regulated under Sections 401 and 404 of the federal CWA, compensatory mitigation consistent with the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (40 CFR 230, 19594-19705) is being proposed. Discussions with the Corps and Ecology regarding Task 5 and Task 6 project affects and associated compensatory mitigation are ongoing. Additionally, a RHA Section 10 permit from the USACE would be required for work in the Coweeman River. The RHA Section 10 permit would be processed concurrently with the CWA Section 401 and 404 permit. Permits for both Task 5 and Task 6 are expected to be issued in 2015 after completion of the FRA NEPA process.

Construction activities associated with the culvert replacement at unnamed tributary 3 would be anticipated to result in a *de minimis* Section 4(f) impact to the park, as they would not adversely affect the activities, features, or attributes of the park. The placement of the culvert and stream outfall at unnamed tributary 3 could result in long-term beneficial aesthetic effects on Louis Rasmussen Day Use Park. Replacement of the culvert and creation of a natural outfall along the beach would enhance the natural appearance of the park and provide a recreation opportunity to park users. Discussions with the Port of Kalama regarding the design and potential effects on the park are ongoing. The Port of Kalama has raised concerns regarding the short- and long-term effects of unnamed tributary 3 on public safety, the operations of the Queen of the West sternwheeler, and future park expansions. These concerns are addressed in Section 4.10.3.2.1 and coordination with the Port of Kalama is ongoing. The public would have an opportunity to provide input on the potential effects and Section 4(f) evaluation.

One LWCFA property is located in the Task 5 study area: the Port of Kalama – Kalama Boat Basin 70 and the co-located Marine Park and Louis Rasmussen Day Use Park. LWCF funding was used to purchase approximately 14 acres for the facility, including over 1,000 feet of Columbia River shoreline. WSDOT coordinated with the Washington State Recreation and Conservation Office (RCO) that administers the LWCF on behalf of the National Park Service. The RCO confirmed that the area of the Louis Rasmussen Day Use Park at unnamed tributary 3 is not a Section 6(f) resource.

7.0 List of Preparers

The table below provides information about those individuals who collaboratively prepared this EA for FRA on behalf of WSDOT.

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Appendices

The following appendices are available under separate cover:

Appendix A: Laws, Regulations, and Permits

Appendix B: Wetland and Stream Delineation: Task 5

Appendix C: Floodplain Analysis: Task 5

Appendix D: Wetland and Stream Delineation: Task 6

Appendix E: Floodplain Analysis: Task 6

Appendix F: Biological Assessment: Task 5

Appendix G: Biological Assessment: Task 6

Appendix H: Hazardous Materials Sites of Concern, Records Database, and Historical Sources

Appendix I: Applicable Land Use Plans and Policies

Appendix J: DAHP Concurrence and Tribal Consultation

Appendix K: Traffic Analysis

Appendix L: Utility Line Conflicts

Appendix M: Best Management Practices and Minimization Measures

Appendix N: Agency Briefing and Public Meeting Summary