3.17. Fish and Wildlife

Existing Conditions

The API consists of aquatic habitats of the Columbia River and nearby terrestrial habitats on both the Washington and Oregon sides of the river.

Aquatic Habitat and Species

The Columbia River provides habitat for a variety of aquatic organisms. However, habitat conditions in the river have been substantially altered from their natural condition through development throughout the watershed. Hydroelectric dams on the Columbia River limit anadromous fish migration and affect resident fish habitat. These dam impoundments reduce flow rates, allow settling of sediments, and control water level elevations as compared to historical free-flowing conditions of the river. The Columbia River at the location of the Project is an impoundment behind the Bonneville Dam, which is located approximately 20 miles west of the existing bridge.

Photo source: Morgan Bond, University of Washington

Chinook salmon use the Columbia River as a migratory route.

The portions of the Columbia River that are within the API are used by several native fish species, including both common species, and species with special regulatory status at either the state or federal level (Exhibit 3-46). These include populations of anadromous salmon, steelhead, and bull trout, which are listed under the federal ESA, and Pacific Lamprey, which is a Washington State priority species. Additional native fish species include white sturgeon, river lamprey, northern pikeminnow, and rainbow trout, among others. Non-native fish species are also common within the waters of the API, and include largemouth bass, smallmouth bass, crappies, and walleye. No invasive aquatic species are known or expected to present in this portion of the Columbia River.

DEFINITIONS

Benthic Habitat: Habitat associated with or occurring on the bottom of a body of water.

Over-Water Coverage: Structures that cast shading onto water.

Shallow-Water Transition Zone: Environments situated between land and deep water.

The reach of the river at the location of the Project serves as a migratory route for salmon, steelhead, and bull trout, between spawning and rearing areas, for foraging, and for outmigration to the Pacific Ocean. The portion of the Lower Columbia River that is downstream of the Bonneville dam within the API also supports several additional special status fish species, including Lower Columbia River and Willamette River stocks of pacific salmon and steelhead, pacific eulachon, and North American green sturgeon. While these species do not occur within the immediate vicinity of the API, they have been included in this document because of the potential for effects associated with changes to the stormwater management associated with the Project.

NOAA Fisheries is responsible for administering the ESA for anadromous salmon and steelhead, and the USFWS administers the ESA for bull trout. The Magnuson-Stevens Act governs impacts to domestic fisheries and fish species; the Project would need to account for potential impacts to fish and fish habitats within the Columbia River. (See Appendix E, Fish and Wildlife Technical Report for more information regarding native fish species.)

Nearshore habitat on the Oregon side at the existing bridge is armored with riprap to prevent erosion, and the resulting nearshore shallow-water transition zone is relatively narrow. The Hood River enters the Columbia River approximately 1,500 feet downstream of the existing bridge. There is a sandbar that has formed at this location that provides a more gradual shallow-water nearshore transition zone. The White Salmon River enters the Columbia River approximately 1.5 miles downstream of the existing bridge on the Washington side of the river. Both the Hood River and White Salmon River support populations of salmon, steelhead, bull trout, and lamprey, and provide habitat for both migrating adults and out-migrating and rearing juveniles.

Exhibit 3-46. Special Status Fish Species with Potential Presence in Project API

Species Name			Federal Status	Oregon Status	Washington Status	Critical Habitat
Common Name	Scientific Name	ESU or DPS*				
Chinook salmon	(*Oncorhynchus tshawytscha*)	Lower Columbia River (LCR) ESU	Threatened	Sensitive	Candidate	Designated
		Upper Willamette River (UWR) ESU	Threatened	Sensitive	Not listed	Designated
		Upper Columbia River (UCR) Spring-Run ESU	Endangered	Sensitive	Candidate	Designated
		Snake River Spring/ Summer-Run ESU	Threatened	Threatened	Candidate	Designated
		Snake River Fall-Run ESU	Threatened	Threatened	Candidate	Designated
Chum salmon	(*Oncorhynchus keta*)	Columbia River ESU	Threatened	Sensitive	Candidate	Designated
Coho salmon	(*Oncorhynchus kisutch*)	LCR ESU	Threatened	Endangered	Not listed	Designated
Sockeye salmon	(*Oncorhynchus nerka*)	Snake River ESU	Endangered	Not listed	Candidate	Designated
Steelhead salmon	(*Oncorhynchus mykiss*)	LCR DPS	Threatened	Sensitive	Candidate	Designated
		UWR DPS	Threatened	Sensitive	Not listed	Designated
		Middle Columbia River DPS	Threatened	Sensitive	Candidate	Designated
		UCR DPS	Endangered	Not listed	Candidate	Designated
		Snake River Basin DPS	Threatened	Sensitive	Candidate	Designated
Bull trout	(*Salvelinus confluentus*)	Columbia River DPS	Threatened	Sensitive	Candidate	Designated
Pacific eulachon (smelt)	(*Thaleichthys pacificus*)	Southern DPS	Threatened	Not listed	Candidate	Designated
North American green sturgeon	(*Acipenser medirostris*)	Southern DPS	Threatened	Sensitive	Not listed	Designated
Pacific Lamprey	(*Lampetra tridentata*)	N/A	Not listed	Not listed	Not listed**	N/A

** ESU = evolutionarily significant unit; DPS = distinct population segment*

*** Pacific Lamprey is not a federal- or state-listed species in Oregon or Washington, but is identified as a WDFW Priority species*

Terrestrial Habitat and Species

A terraced bank rising from the Columbia River to an elevation of approximately 600 feet characterizes the north side of the Columbia River in the City of White Salmon. Nearshore aquatic habitat on the Washington side at the existing bridge consists of sandy shoreline and bedrock outcrops. Wetland habitats on the Washington side provide potentially suitable habitat for a variety of species; however, given the disturbed nature of the wetlands and the degree of habitat fragmentation, the degree of wildlife habitat function is limited. Oregon white oak woodlands and oak/pine mixed forest priority habitats (designated by WDFW) are located along the north shore of the Columbia River and among the bluffs along the City of White Salmon and City of Bingen. A small stand of Oregon white oak woodland is mapped within the API, including the large white oak tree just east of the existing bridge. Vegetation in this area is also encumbered by invasive species. Other priority habitats including cliffs/bluffs, and talus slopes, are also present on the steep bluffs north of SR 14 within the API. In general, these habitats provide potentially suitable habitat for terrestrial species and birds that are accustomed to relatively high levels of human activity.

Terrestrial habitats on the Oregon side of the API are generally of limited quality and function, as these areas have been substantially altered from their natural condition by developed infrastructure. Nevertheless, the terrestrial portions of the API provide potentially suitable habitat for a variety of wildlife species including both common species, and those with special regulatory status. Terrestrial wildlife species that are present within the API include a variety of species that are adapted to and can tolerate a wide range of habitat conditions and are conditioned to living in developed and high-traffic environments (e.g., ground squirrels, rabbits, opossum, raccoons, coyote, various rodents, etc.). In addition to these terrestrial mammals, the forested riparian buffer provides potentially suitable seasonal foraging habitat for beaver and deer, and a variety of species of native bats. Western gray squirrel has been documented within forested habitats in the vicinity of the bridge, and mule and black-tailed deer are regularly documented within the API. Potentially suitable habitat for California mountain kingsnake is also present within the API.

Forested riparian habitats also provide habitat for a variety of resident and migratory birds, including a variety of songbirds, shorebirds, and raptors including bald eagles, peregrine falcon, osprey, and red-tailed hawk. Aquatic and nearshore habitats also provide foraging habitat for a variety of common shorebirds (including great blue heron, Caspian terns, and double-crested cormorants), and a variety of common waterfowl (mallard ducks, pintail, wigeon, merganser, gadwalls, green-winged teal, and Canada goose). The USFWS is responsible for administering the ESA for terrestrial species. Portions of the API do provide potentially suitable habitat for some species with special regulatory status in either Washington or Oregon (Exhibit 3-47); however, no ESA-listed terrestrial species are expected to occur within the API. The Project would be required to comply with the Migratory Bird Treaty Act (MBTA), which protects migratory birds and their habitats from human impacts. Migratory birds likely use the API as foraging habitat and could also nest within forested areas. Raptors including peregrine falcons and bald eagles could also forage within the vicinity but there are no documented nests within the API. The Project is not anticipated to result in a take of migratory birds or bald eagles under the ESA and therefore USFWS permits for these species are not required.

Exhibit 3-47. Special Status Terrestrial Species with Suitable Habitat in Project API

Species Name	Scientific Name	Federal Status	Oregon Status	Washington Status	Critical Habitat Designation
Mammals					
Fisher	*Pekania pennanti*	Proposed	Sensitive	Endangered	N/A
Gray wolf	*Canis lupus*	Endangered*	Not listed	Endangered	Designated
North American wolverine	*Gulo gulo luscus*	Candidate	Threatened	Candidate	N/A
Western gray squirrel	*Sciurus griseus*	Not listed	Sensitive	Threatened	N/A
Mule and black-tailed deer	*Odocoileus hemionus*	Not listed	Not listed	Priority species	N/A
Washington ground squirrel	*Urocitellus washingtoni*	Not listed	Endangered	Candidate	N/A
Birds					
Northern Spotted Owl	*Strix oxxidentalis caurina*	Threatened	Threatened	Endangered	Designated
Yellow billed cuckoo	*Coccyzus americanus*	Threatened	Not listed	Endangered	Proposed
Vaux's swift	*Chaetura vauxi*	Not listed	Not listed	Candidate	N/A
Bald eagle	*Haliaeetus leucocephalus*	Species of concern	Not listed	Not listed	N/A
Peregrine falcon	*Falco peregrinus*	Species of concern	Sensitive	Not listed	N/A
Western grebe	*Aechmophorus occidentalis*	Not listed	Not listed	Candidate	N/A
Amphibians and Reptiles					
California mountain kingsnake	*Lampropeltis zonata*	Not listed	Sensitive	Candidate	N/A
Oregon spotted frog	*Rana pretiosa*	Threatened	Sensitive	Endangered	Designated
Western pond turtle	*Actinemys marmorata*	Not listed	Sensitive	Endangered	N/A

** The gray wolf is protected as endangered under the authority of the federal ESA in Oregon west of highways US 395, OR 78, and US 95 and in Washington west of highways US 97, SR 17, and US 395. These highways are in eastern Oregon and Washington, approximately 100 miles east of the API; thus, the gray wolf is protected as an endangered species in the API.*

Project Impacts and Benefits

No Action Alternative

The No Action Alternative would maintain the current level of impacts to aquatic fish and wildlife species. The current operation of the bridge would continue to impact aquatic fish and wildlife species through exposure to contaminants via the lack of stormwater treatment and weathering of contaminated paint. Under the No Action Alternative, roadway stormwater and spills would continue to discharge directly into the Columbia River, due to the open steel grating of the existing bridge deck. Displacement of the existing benthic habitat and existing overwater coverage at the existing bridge site would continue. In addition, the existing bridge has a greater over-water lighting impact .

Under the No Action Alternative, the existing bridge would continue to deteriorate, and become less safe. This alternative could, therefore, result in impacts to fish and wildlife species and habitats in the immediate vicinity of the bridge and downstream aquatic species and habitats in the case of a catastrophic event that would cause the bridge to collapse into the river.

Build Alternatives

Aquatic Habitat Impacts

Construction of a replacement bridge would result in both temporary and permanent impacts to aquatic habitats within the API. Construction of the Project would require the installation of temporary in-water and over-water work structures including temporary work bridges, temporary piles, cofferdams, drilled shaft casings, and barges. These structures would temporarily displace benthic habitat and temporarily increase overwater shading that would temporarily affect habitat suitability during construction. (See Appendix E, Fish and Wildlife Technical Report, for more detail on impacts to fish and wildlife from the build alternatives.)

The existing bridge would remain in place until the replacement bridge is constructed and operational. Construction of the replacement bridge is anticipated to occur over 3 years; thus, removal of the existing bridge would begin in the fourth year of construction activities. Demolition of the existing bridge would include dismantling of the structure and removal of the in-water foundations via barges and/or temporary work platforms and then transported off-site and disposed of at an upland location. Once foundations have been removed, and all debris has been captured, the substrate would be naturally restored with surrounding sediments. Removing the old foundations from the river would temporarily disturb benthic sediments, could result in temporarily elevated turbidity or pH locally, and present a potential for debris or other deleterious materials to enter the water. Demolition and removal of the existing bridge would be conducted consistent with the impact minimization BMPs described below, to further reduce the potential for impacts to ESA-listed species, non-special status fish species such as white sturgeon, river lamprey, bass, walleye, and rainbow trout, and/or critical habitats to these species.

The replacement bridge under both build alternatives would include the permanent installation of bridge piles and footing that would result in the permanent loss of benthic habitat within the Columbia River. However, the replacement bridge, under both build alternatives, would have fewer in-water piers than the existing bridge, and the removal of the existing bridge and associated riprap armoring would result in a net reduction in permanent impacts to benthic habitat in the API, as portrayed in Exhibit 3-48.

Fill placement within the floodplain can affect aquatic habitat suitability by affecting peak and base flow conditions and by altering hydrodynamic conditions. The extent of functional floodplain habitat below this elevation within the API is relatively limited given the degree of streambank armoring on the Oregon side of the river and the rapid transition to upland riparian habitat on the Washington side of the river. The Project would result in the installation of approximately 8,449 cubic yards of material below the +90.4-foot 100-year floodplain elevation and removal of approximately 13,716 cubic yards of material from the existing bridge, resulting in a net removal of fill material from within the floodplain. This removal would represent a small functional improvement to floodplain and hydrodynamic function at the site; however, given the limited extent of floodplain at the Project site and the highly managed nature of the water levels within the Bonneville pool, the extent of the improvement would be relatively minor.

Lighting on the river surface at night has the potential to impact out-migrating juvenile salmon by increasing their visibility to predatory fish species. Construction of the replacement bridge and removal of the existing bridge would occur during prescribed day-time construction hours and within an IWWW that avoids peak run timing for juvenile salmon. Construction lighting on the river surface would be avoided or very minimal and is not expected to have an impact on out-migrating juvenile salmon.

The replacement bridge under both build alternatives would result in an increase in the quantity of over-water coverage and shading compared to the existing bridge, which can create habitat for predatory species and affect habitat suitability for juvenile salmonids and other aquatic species. Several factors can affect the extent of effect of overwater shading. These include the height of the structure, the orientation of the structure, and the density of the piling. The effects to habitat function from overwater shading would be minimal given the height and open structure of the replacement bridge under both build alternatives. The new structure would be elevated between approximately 20 feet and 94 feet above the water's surface over the length of the bridge. This would greatly reduce the potential impact of shading. The existing bridge is approximately 57 feet above the water. The shading created from the replacement bridge would be constantly moving, and the shape and intensity of the shading would not be a solid dark area but a more diffuse irregular shape. This reduces the extent of the functional impact of the shading.

The replacement bridge would also provide a perching habitat for piscivorous (fish-eating) birds, though the extent of impact is expected to be minimal under all build alternatives. It is expected that the replacement bridge would provide comparable or less perching habitat than is available on the existing bridge, which would be removed under all build alternatives. The steel superstructure of the existing bridge would offer greater opportunities for birds to perch undisturbed, whereas the replacement structure would be open, and would have only limited overhead perching opportunities.

Vegetation and Terrestrial Habitat Impacts

Both build alternatives would result in both temporary and permanent impacts to terrestrial habitats including riparian areas, wetlands, and areas vegetated with native and non-native vegetation. Removal of vegetation during construction would temporarily reduce habitat availability for terrestrial species in the API and could also affect adjacent aquatic habitats. Invasive vegetation would also be removed on the Washington side. Under both build alternatives, native vegetation removal and impacts to terrestrial habitat would be limited in nature and scope.

The area that would be cleared on the Oregon side of the river under both build alternatives is situated in a portion of the API that is largely developed and impervious, and habitat functions in this area are currently limited. On the Washington side of the river, terrestrial habitats would be similarly disturbed, but construction would result in impacts to forested riparian habitat and wetland areas.

Permanent impacts to vegetation would result from the construction of the replacement bridge abutment, retaining walls, and stormwater facilities. Vegetation and wetland impacts would be similar under all build alternatives. Removal of vegetation would result in a reduction of habitat availability for terrestrial species in the API for both common species and species with regulatory status. Impacts to forested vegetation could interrupt habitat corridors for terrestrial and avian species and could reduce perching and nesting habitat. Impacts to forested riparian habitat could affect seasonal foraging habitat for beavers, bats, blue herons, ducks, and osprey. Forested vegetation impacts could also reduce cover for terrestrial species, including species with special regulatory status including Western gray squirrels, black-tailed deer, and California kingsnake.

Vegetation removal and impacts to habitat would be limited in nature and scope. Areas that would be cleared are generally situated in areas that are already fragmented and disturbed as a result of prior development, and habitat functions in these areas are currently limited. Areas temporarily disturbed during construction would be restored upon completion of the Project consistent with state and local regulations. Invasive vegetation removed during construction would be replanted with species native and indigenous to the area.

Over-Water and In-Water Work

For both build alternatives, there would be over-water and in-water work that has the potential to cause both temporary and permanent impact to aquatic habitat suitability for fish and wildlife. In-water work could temporarily disturb sediments and increase turbidity. There would also be a slight potential for leaks and spills of fuel, hydraulic fluids, lubricants, and other chemicals from equipment and storage containers. Demolition of the existing bridge could disturb lead paint and/or asbestos. These potential temporary water quality impacts could directly affect fish in the vicinity or could affect fish habitat function by reducing water quality, reducing visibility, and by reducing habitat for species susceptible to predation. These effects would be temporary and localized, and conditions would return to baseline conditions following the completion of construction.

Isolation of in-water work areas such as cofferdams and drilled shaft casings would require fish salvage, to remove fish from isolated work areas. This activity could result in handling or otherwise disturbing fish or other aquatic species within the area being isolated. The potential for these effects would be appropriately minimized through adherence to BMPs for dewatering and fish salvage.

Terrestrial and under-water noise levels would also be temporarily elevated in portions of the API during construction, particularly during impact pile driving. Elevated underwater noise from impact pile driving could result in impacts to fish and other aquatic species ranging from behavioral disturbance, to injury, or mortality. Elevated terrestrial noise would not result in any injury of any terrestrial or avian species but could result in disturbance.

The Project has been designed to minimize the extent of impacts resulting from pile installation activities by using a vibratory hammer to advance the piles to the extent practicable and limiting impact hammer use to finishing the installation. An underwater bubble curtain or similarly effective noise attenuation device would also be used during all impact pile installation to reduce the effects from underwater noise. In addition, impact and vibratory pile installation would be conducted within the approved in-water work period. The number of impact pile strikes is also limited under both build alternatives to reduce the cumulative effect of elevated underwater noise, and further reduce effects to fish.

Stormwater Treatment

Stormwater runoff from roads conveys a number of pollutants to surface water bodies, sometimes at concentrations that are toxic to fish. The existing bridge deck is approximately 1.9 acres in size and receives no stormwater runoff control or water quality treatment. Currently, any precipitation that hits the bridge deck passes directly to the aquatic environment untreated.

The Project, under all build alternatives, would create new impervious surface, which would generate stormwater pollutants. All build Alternatives would also provide water quality treatment for new and rebuilt impervious surface. All build alternatives would also remove the existing bridge, which would remove a potentially significant point source of untreated stormwater. For these reasons, it is expected that the proposed stormwater treatment scenario under all build alternatives would result in a net benefit to water quality in the API. However, stormwater treatment facilities can be overwhelmed during major storm events, and in these conditions untreated stormwater could discharge to the river, which could affect fish or other aquatic species.

Indirect Impacts and Benefits

Potential indirect benefits from the replacement bridge that could affect fish and wildlife include reduced bridge lighting and improved spill containment.

The net effect to fish and wildlife habitat function from Project lighting would be largely beneficial. Under all build alternatives, the Project would remove the existing light sources on the existing bridge that currently pass through to the water's surface, and the lighting on the replacement bridge would use directional lighting with shielded luminaries to control glare and to direct light onto the bridge deck to the extent practicable. This would reduce the extent of light spillage onto the waters' surface or into the surrounding environment.

The removal and replacement of the existing grated deck would also remove a pathway for petroleum products, and other hazardous materials, to be discharged directly to the Columbia River in the event of spills or accidents. As described above, the existing bridge deck is grated, and spills that occur on the bridge deck pass directly to the aquatic environment. Under all build alternatives, the bridge deck would be solid, which would allow for capture and treatment of stormwater in the event of a spill or accident. This would have the potential to indirectly benefit habitat conditions for fish and wildlife.

Exhibit 3-48. Summary of Impacts and Benefits to Fish and Wildlife

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Aquatic Habitat Impacts	• No change in existing benthic habitat impact, floodplain fill, overwater coverage, or level of avian predation	• Benthic Impacts: ○ 0.48 acres temporary ○ -0.54 acres net permanent (restoration) • Floodplain Fill ○ -0.12 acres of net fill removal • Overwater shading: ○ 4.17 acres (temporary) ○ 3.45 acres (net new permanent) • Reduced avian predation	• Benthic Impacts: ○ 0.48 acres temporary ○ -0.54 acres net permanent (restoration) • Floodplain Fill ○ -0.12 acres net fill removal • Overwater shading: ○ 4.17 acres (temporary) ○ 3.49 acres (net new permanent) • Reduced avian predation
Vegetation and Terrestrial Habitat Impacts	• No new vegetation or terrestrial habitat impacts	• Vegetation Impacts: ○ 3.32 acres (temporary) ○ 2.32 acres (permanent)	• Vegetation Impacts: ○ 4.48 acres (temporary) ○ 0.94 acres (permanent)
Over-water and In-water Work Impacts	• None	• Temporary water quality impacts during construction • Up to 6,000 impact strikes/day (restricted to work window) • Fish salvage activities during work area isolation (restricted to work window)	
Stormwater Impacts	• No change in level of stormwater treatment • Highest pollutant loading alternative	• Water quality treatment for all contributing impervious areas • Reduced pollutant loading and net water quality benefit.	
Indirect Impacts and Benefits	• Highest over-water lighting impact • Continued risk of spills discharging to the Columbia River	• Reduced over-water lighting benefit • Improved spill containment benefit	

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, and/or mitigate construction impacts to fish and wildlife:

General Measures

- All work would be performed according to the requirements and conditions of the regulatory permits issued by federal, state, and local governments.
- A state DOT inspector would be present on site during construction to document consistency with contract and permit requirements.
- The contractor would be required to prepare a Water Quality Protection and Monitoring Plan for conducting water quality monitoring, to satisfy the monitoring and reporting requirements of the 401 Water Quality Certifications that are ultimately issued for the project.
- Work barges would not be allowed to ground out.
- Impacts to MBTA species would be avoided by limiting vegetation removal to outside of the nesting window (March 1 to August 31) when practicable, and/or by conducting nesting surveys as needed to document compliance with MBTA.

Spill Prevention and Pollution Control Measures

- The contractor would be required to prepare and abide by Spill Prevention, Control, and Countermeasures Plan and Pollution Control Plans, that include proactive measures for spill prevention as well as spill response methodologies.
- Applicable spill response equipment and material would be maintained at the job site.
- With the exception of barges and stationary large equipment operating from barges or work platforms, equipment would be fueled and maintained at least 150 feet from the Columbia River using secondary containment to minimize potential for spills or leaks entering the waterway.
- All equipment to be used for construction activities would be cleaned and inspected prior to arriving at the Project site, to ensure no potentially hazardous materials are exposed, no leaks are present, it is free of any aquatic or terrestrial invasive species, and the equipment is functioning properly.
- Any equipment operating in the water would use only vegetable-based oils in hydraulic lines.
- Process water generated on site during construction would be contained and treated to meet applicable water quality standards before entering or re-entering surface waters.
- No paving, chip sealing, or stripe painting would occur during periods of rain or wet weather.
- Staging and temporary access areas would be located whenever practical on areas already covered by impervious surface.

Erosion and Sediment Control Measures

- The contractor would be required to prepare a temporary ESCP to be implemented during Project construction to minimize impacts associated with clearing, vegetation removal, grading, filling, compaction, or excavation
- Clearing limits would be delineated with orange barrier fencing wherever clearing is proposed in or adjacent to a stream/wetland or its buffer and silt fence would be installed as needed to protect surface waters and other critical areas.
- ESCP measures would be inspected on a weekly basis, and maintained and repaired consistent with ODOT requirements
- All exposed soils would be stabilized as directed in measures prescribed in the temporary ESCP.
- Where site conditions support vegetative growth, native vegetation indigenous to the location will be planted in areas temporarily disturbed by construction activities.

Pile Driving and Removal Measures

- A vibratory hammer would be used to drive steel piles to the extent possible, to minimize noise levels.
- A bubble curtain or other similarly effective noise attenuation device would be employed during all impact pile proofing or installation.
- Pile installation would be conducted within the IWWW for the Project (October 1 - March 15).
- A hydroacoustic monitoring plan would be developed and implemented to confirm the effectiveness of the bubble curtain.
- Temporary piles would be removed with a vibratory hammer.
- Piles that are not in an active construction area and are in place 6 months or longer would have cones or other anti-perching devices installed to discourage perching by piscivorous birds.

Fish Capture and Release Measures

- A qualified fishery biologist would conduct and supervise fish capture and release activity to minimize risk of injury to fish.
- A fish salvage report would be prepared and submitted to NOAA Fisheries, USFWS, ODFW, and WDFW following the completion of each in-water work season.
- Attempts to seine and/or net fish would precede the use of electrofishing equipment.
- If electrofishing must be used, it would be conducted consistent with NOAA Fisheries “Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act” (NOAA Fisheries 2000), or most recent version.

Work Area Lighting Measures

- If temporary lighting is required, contractor would use directional lighting with shielded luminaries to control glare and direct light onto work area; not surface waters.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to fish and wildlife:

- Long-term impacts to vegetation and wildlife habitat would be addressed through replanting temporarily disturbed areas with native vegetation, consistent with regulatory requirements.
- The Project would be operated and maintained consistent with applicable federal, state, and local regulatory and permitting requirements.
- Aquatic habitats within navigable waters are subject to USACE requirements for compensatory mitigation (33 CFR Part 332 and 40 CFR Part 230, subpart. J), which requires that the final design and layout of the replacement bridge avoid and minimize the extent of habitat impacts to aquatic habitat to the extent practicable. The Project would comply with these requirements.
- Long-term impacts to water quality from stormwater would be minimized by providing water quality treatment for all new and rebuilt contributing impervious area, and by removing the existing bridge. Stormwater treatment BMPs would be developed for the Project prior to construction and take into account the practices set forth in ODOT and WSDOT standard specifications (00280 Erosion and Sediment Control [ODOT] and 8-01 Erosion Control and Water Pollution Control [WSDOT]). BMPs would be implemented during construction to eliminate the off-site transport of sediment-laden stormwater.
- Impacts to federally-listed species and critical habitats listed under the ESA would be avoided and minimized through adherence to the terms and conditions of the Biological Opinions from NOAA Fisheries and USFWS. A Biological Opinion will be included in Appendix B of the Final EIS/ROD once ESA Section 7 consultation is complete.
- Shoreline and freshwater habitat on the Washington banks are regulated by the City of White Salmon under its Shoreline Master Program. Projects located within 200-feet of a shoreline of statewide significance must meet the no net loss of shoreline functions approval criteria. Impacts to fish and wildlife habitat would be compensated on-site through enhancements if practicable or off-site if necessary. The Project would comply with these requirements.
- In the API in Washington, fish and wildlife conservation areas are regulated by the City of White Salmon under its critical areas ordinance (WSMC 18.10.300). Compensatory mitigation is required to address affected functions by achieving a functional equivalency or improvement and providing similar habitat function. Approval criteria require no net loss of functions or values for any activity impacting a critical area. The Project would comply with these requirements.
- Under the regulation of the Shoreline Master Program and the Critical Areas Ordinance, the Project would be subject to requirements to avoid, minimize, or mitigate for impacts to critical areas, including aquatic habitats, wetlands, and fish and wildlife habitat conservation areas. The Project would comply with these requirements.

Additional detail on fish and wildlife resources is provided in the Fish and Wildlife Technical Report (Appendix E).

3.18. Air Quality and Greenhouse Gases

Existing Conditions

Air quality in the Columbia River Gorge should improve with the implementation of standards relating to vehicle fuel economy and emissions.

Cutting through both the Cascade Range and the Coast Range, the Columbia River offers low-elevation passage of marine air from the Pacific Ocean. As a result, temperatures are generally moderate in the area of the Columbia River Gorge where the existing bridge is located in both summer and winter. Continental air occasionally passes in reverse and produces the more extreme (low in winter and high in summer) temperatures in the western valleys. Average annual rainfall in the Columbia River Basin is about 15 inches to 20 inches.

Under the Clean Air Act, the U.S. EPA has established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide (CO), particulate matter less than 10 micrometers in size (PM_{10}), particulate matter less than 2.5 micrometers in size ($PM_{2.5}$), ozone (O_3), sulfur dioxide (SO_2), lead, and nitrogen dioxide (NO_2). These pollutants are referred to as criteria pollutants. Areas not in NAAQS compliance are deemed nonattainment areas. The API is in attainment for all current NAAQS in both Washington and Oregon as measured by multiple government agency air quality monitors in the area.

In addition to the criteria pollutants, the U.S. EPA also regulates air toxics. Toxic air pollutants are those pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human-made sources, including mobile source air toxics (MSAT) emitted from vehicles. Recent U.S. EPA regulations for vehicle engines and fuels is projected cause overall MSAT emissions to decline substantially over the next several decades. For greenhouse gas (GHG) emissions, the transportation sector (including highways and rail) is the greater contributor of GHGs in Washington and Oregon compared to other sectors (agriculture, industry, electricity production, and residential/commercial buildings).

Project Impacts and Benefits

No Action Alternative

If the bridge were to close in the future when it surpasses its operational life, or if a catastrophic event such as an earthquake or a barge strike occurs prior to the end of its operational life, vehicles would need to detour 21 to 25 miles to an alternative route (Exhibit 3-9), which would cause an increase in vehicle emissions compared to the continued operation of a bridge at its current location. However, there would be no direct impacts to air quality under the No Action Alternative because emissions of most pollutants regulated under NAAQS are expected to be lower than present levels due to federal emission standards, fuel standards, and improved engine technology. Likewise, U.S. EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline substantially over the next several decades, even with an increase in VMT. For direct impacts, 4.0 metric tons of carbon dioxide equivalent (CO_{2e}) annually is estimated from routine maintenance of the existing bridge.

Build Alternatives

Construction-related activities under the build alternatives would result in short-term impacts that include increased particulate matter in the form of fugitive dust, as well as exhaust emissions from material delivery trucks, construction equipment, workers' private vehicles, and any associated traffic delays. Construction impacts to air quality would be short-term in duration and, therefore, would not result in adverse or long-term impacts. During construction, it is anticipated that roughly 70,311 metric tons of CO_{2e} would be emitted throughout the construction duration under the build alternatives from construction equipment and delayed vehicles.

The replacement bridge would not substantially impact air quality during operation. Neither of the build alternatives would substantially increase motor vehicle volumes and would not be expected to substantially impact inter-city vehicle demand or routing of longer distance trips crossing the Columbia River at other bridges. Therefore, the Project has been determined to generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. For direct impacts, 5.0 metric tons of CO_{2e} annually is estimated from routine maintenance of the build alternatives.

Indirect impacts would include GHG emissions from acquiring the materials used to construct the bridge and associated uses, including raw material extraction, raw materials transportation, materials production, and chemical reactions from materials production. Emissions from these activities are included in the construction estimate of 70,311 metric tons of CO_{2e} for all the build alternatives.

As mentioned, the operation of construction equipment and vehicle delays during construction would result in short-term GHG emissions. Direct and indirect impacts on GHG emissions from the Project would include emissions from yearly routine maintenance, emissions associated with the production of materials used in construction, and emissions from vehicle operations on the roadway. GHG emissions from the Project that are not offset could have minor contributions to long-term atmospheric impacts that contribute to climate change.

These impacts would be partially offset by Project-specific design features. Both build alternatives would provide a shared use path, introducing a non-motorized travel option across the Columbia River and, thereby, potentially reducing GHG emissions from vehicular trips; the Project is expected to improve traffic flow on the bridge due to increased speed on the bridge and at the proposed roundabout at the SR 14 intersection; and construction of the Project would prevent the eventual closure of the existing bridge at the end of its operational life or in the event of a catastrophic event, thus preventing an increase in out of direction travel to cross the Columbia River.

Exhibit 3-49 summarizes air quality and GHG impacts by alternative.

Exhibit 3-49. Summary of Impacts and Benefits to Air Quality Resources

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	• No criteria pollutant impacts • No GHG impacts	• Temporary criteria pollutant emissions from construction equipment, dust, and vehicle delays during construction • 70,311 metric tons CO_{2e} from construction equipment and delayed vehicles over the construction period	
Direct Impacts and Benefits	• Decreased criteria pollutant emissions in design year 2045 from vehicle exhaust • Decreased MSAT emissions in design year 2045 from vehicle exhaust • 4.0 metric tons CO_{2e} per year from routine maintenance • No new operational GHG impacts	• Decreased criteria pollutant emissions in design year 2045 from vehicle exhaust • Decreased MSAT emissions in design year 2045 from vehicle exhaust • 5 metric tons CO_{2e} per year from routine maintenance • Operational GHGs partially offset by shared use path and improved traffic flow due to the roundabout on SR 14 and speed limit changes on the bridge	
Indirect Impacts	• No criteria pollutant impacts • No MSAT impacts • No GHG impacts	• No criteria pollutant impacts • No MSAT impacts • GHG emitted from bridge materials production (amount included in Construction Impacts) over the construction period	

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

Construction contractors are required to comply with regulations that apply to the state in which the work is being performed. Work performed in Oregon must comply with Division 208 of Oregon Administrative Rules (OAR) 340, which addresses visible emissions and nuisance requirements. Subsection of OAR 340-208 places limits on fugitive dust that causes a nuisance or violates other regulations. Violations of the regulations can result in enforcement action and fines. The regulation provides that the following reasonable precautions be taken to avoid dust emissions (OAR 340-208, Subsection 210):

- Use of water or chemicals, where possible, for the control of dust in the removal of existing buildings or structures, construction operations, the grading of roads or the clearing of land.
- Application of water or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts.
- Full or partial enclosure of materials stockpiles in cases where application of water or other suitable chemicals are not sufficient to prevent particulate matter from becoming airborne.
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials.
- Adequate containment during sandblasting or other similar operations.
- When in motion, always cover open-bodied trucks transporting materials likely to become airborne.
- The prompt removal from paved streets of earth or other material that does or could become airborne.

In addition, contractors are required to implement air pollution control measures that include vehicle and equipment idling limitations and minimize vehicle track-out and fugitive dust. These measures would be documented in the temporary ESCP that the contractor is required to submit prior to the preconstruction conference. To reduce the impact of construction delays on traffic flow and resultant emissions, road or lane closures should be restricted to non-peak traffic periods when possible.

Long-Term Impacts

No mitigation to long-term impacts are proposed.

Additional detail on air quality resources is provided in the Air Quality Technical Report (Appendix A).

3.19. VISUAL

EXISTING CONDITIONS

The Columbia River as viewed from the City of White Salmon with the City of Hood River and Mt. Hood in the background.

The Hood River Bridge spans the Columbia River and is located within the CRGNSA. The CRGNSA was federally-established to protect the scenic, cultural, natural, and recreational resources of the Columbia River Gorge. The mountains on both sides of the Columbia River offer expansive views of the Columbia River Gorge, but also define the limits from which the existing bridge can be seen. Visual resources in the API are characterized by rim-rock bluffs, sloping-forested hills, open farmland, and semi-arid grasslands surrounded by 4,000-foot-high mountains punctuated by the snow-capped 11,250-foot Mt. Hood, 8,366-foot Mt. St. Helens, and 12,280-foot Mt. Adams.

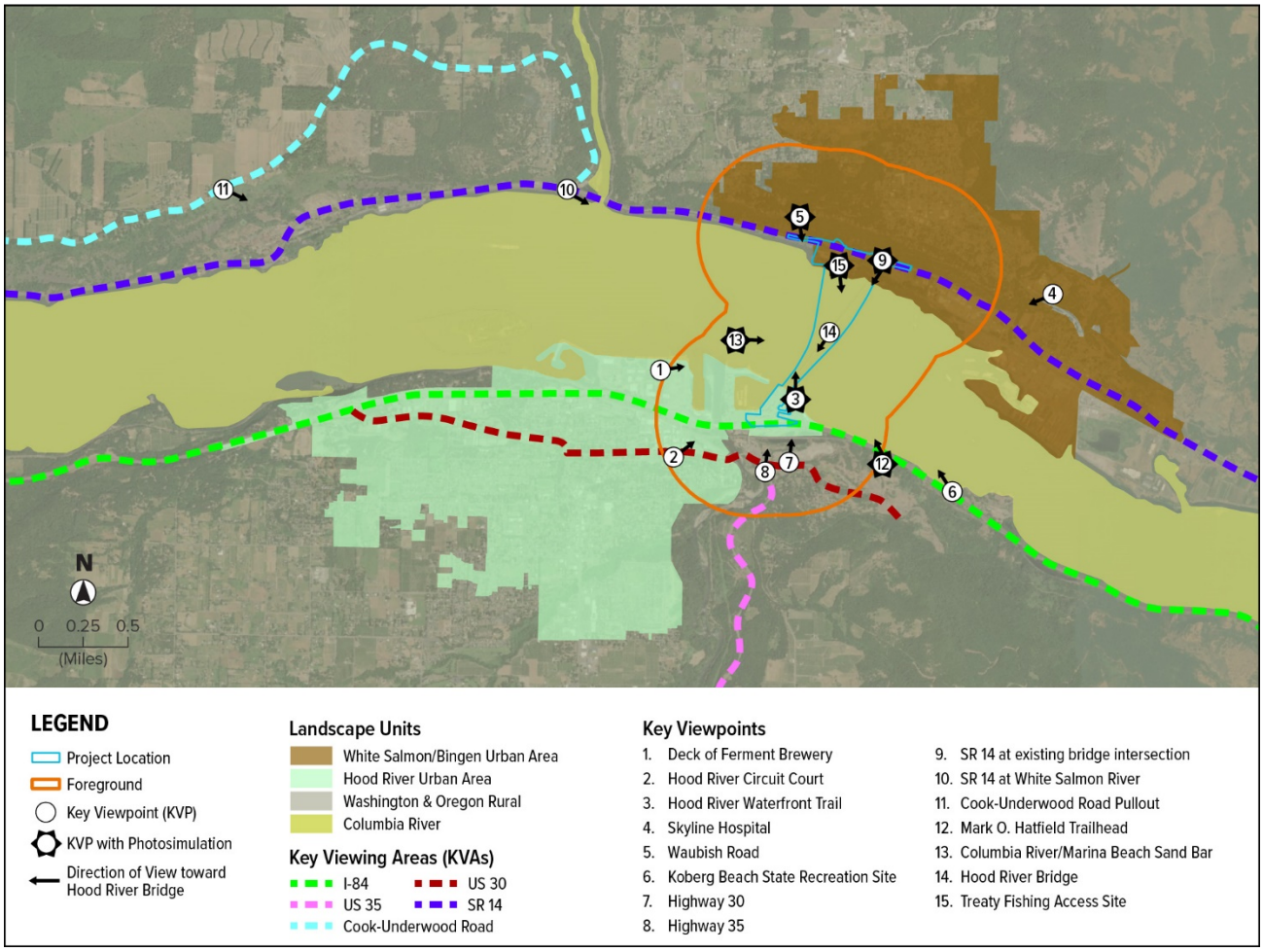
The Project's Visual Impact Assessment Report (Appendix P), completed in compliance with FHWA Guidelines, defined the API for the visual analysis, called the "Area of Visual Effect" (AVE), as an area within 5 miles of the existing bridge. Within the AVE, views of the existing bridge are available at many locations. The AVE is divided into the foreground, middle ground, and background. Changes to the visual environment would be most discernible in the foreground located 0 miles to 0.5 miles from the bridge but would be only somewhat visible in the middle ground located 0.5 mile to 5.0 miles away and would not be discernible in the background. The Visual Impact Assessment Report documented views from eight Key Viewing Areas established in the CRGNSA Management Plan (e.g., I-84, SR 14, Columbia River) and 15 key viewpoints within the AVE including the White Salmon TFAS located on a parcel that borders the existing bridge to the west (Exhibit 3-50) (CRGC 2016).

Within the AVE, the Visual Impact Assessment Report defined 10 geographic areas called "landscape units" sharing similar visual features. The landscape units include urban areas (Hood River and White Salmon), transportation corridors (I-84, OR 30, OR 35, SR 14, and Cook-Underwood Road in Washington), rural landscapes in Washington and Oregon, and the Columbia River. The Visual Impact Assessment Report evaluated the natural, cultural, and Project visual resources in each landscape unit. The landscape units nearest the bridge are the urban areas of Hood River and White Salmon/Bingen characterized by a mix of human-made residential, commercial, civic, institutional, and industrial structures including large forest product and produce storage buildings on the Washington side of the river. Transportation facilities with vehicles, traffic devices, and manmade structures also form part of the immediate visual context of the bridge. The Columbia River with water, rock outcrops, and shoreline vegetation is part of the foreground of the AVE near the existing bridge. Further away from the bridge in the middle and background areas, the rural landscapes of Washington and Oregon dominate with mountain foothills sloped toward the Columbia River with semi-arid vegetation, dispersed residential structures, and agricultural land.

Visual quality is an interaction between the viewer and the environment and depends on what a viewer perceives and their personal preferences and sensitivities. The purpose of the visual impact analysis process is to objectively discern what viewers perceive in the visual environment and how they could be affected by visual changes a project would bring on a short-term and long-term basis. The Visual Impact Assessment Report defined different viewer groups within the AVE. which are categorized as travelers or neighbors. Neighbors are further categorized into residential, recreational, institutional, civic, retail, commercial, industrial, agricultural, and tribal types. Traveler types include pedestrian, bicycling, and motoring. Residential, recreational, and tribal neighbors and pedestrians and bicyclists tend to be most sensitive to visual changes in the environment while work-oriented viewer classes (institutional, civic, retail, commercial, industrial, and agriculture) tend to be focused on their jobs and less sensitive to visual change.

The landscape units and viewer types are important context for assessing changes in visual quality from the Project and viewer sensitivity to these changes.

Exhibit 3-50. Columbia River Gorge National Scenic Area Key Viewing Areas and Project Key Viewpoints



Project Impacts and Benefits

Direct visual impacts resulting from the Project were assessed by multiple criteria: compatibility, viewer sensitivity, and visual quality. Project compatibility includes scale, form, materials, and visual character. Viewer sensitivity depends on a viewer's class (traveler or neighbor) and the likelihood they would notice change in the visual environment. Visual quality of the existing bridge was assessed across three sub-criteria:

- Natural harmony: The viewer's perception of a project's harmony with its natural environment. The natural environment consists of land, water, vegetation, animals, and atmospheric conditions. More specifically, the natural environment in the AVE is made up of sloping forested hills punctuated by snow-capped mountain backdrops, rim-rock bluffs, the waters of the Columbia and Hood rivers, and semi-arid grasslands.
- Cultural order: The viewer's perception of whether a project is orderly or disorderly in the context of its cultural environment. The cultural environment consists of cultural sites, buildings, infrastructure, structures, artifacts, and public art. In the AVE, the cultural environment includes three tribal fishing access sites and one fish processing facility; buildings in the White Salmon, Bingen, and Hood River urban areas; lights; and transportation infrastructure including I-84, OR 30, and OR 35 in Oregon and SR 14 in Washington.
- Coherence of project components: The viewer's perception of whether a project is coherent or incoherent in the context of the project environment. The Project environment consists of pavement and structures, vegetative cover, and ancillary elements such as signage. In the AVE, the existing bridge environment consists of the steel trussed bridge 57 feet above the river with two prominent towers at the centrally-located lift span; the Washington bridge approach and intersection at SR 14 with traffic lights; and a toll booth and more developed urban environment with the buildings of nearby businesses at the Oregon bridge approach.

No Action Alternative

Since there would be no construction and no replacement bridge, there would be no direct changes to visual resources or quality from the continued operation of the bridge in the No Action Alternative. If a catastrophic event such as an earthquake, landslide, or barge or vessel strike occurs, the bridge could be damaged or collapse into the river. Direct impacts to visual resources from a catastrophe could include that the damaged bridge remains in place for months or years, which would negatively impact visual compatibility, viewer sensitivity, and visual quality. If the existing bridge exceeds its operational life and is closed to traffic, there would no longer be light or glare from vehicles crossing the bridge and the bridge itself would not be illuminated and visible at night. Views from the bridge would be eliminated.

Build Alternatives

Both build alternatives (Alternative EC-2 and Alternative EC-3) would largely have the same construction, direct, and indirect impacts on visual resources. During the approximate 6-year construction period, changes to the visual landscape would include: use of construction equipment and signs visible in the AVE; staging areas where equipment and materials may be visible; removal of vegetation concentrated at the northern bridge touchdown to accommodate construction activities; barges, cranes and boats visible in the Columbia River at times; and lighting to illuminate work areas. Staging areas on both sides of the river and construction of the bridge approaches would occur in urban areas where viewers are accustomed to building construction and road maintenance activities. In-water construction activities for bridge piers would include barges and cranes and boats bringing workers to the construction area. Similar equipment would be used to deconstruct the existing bridge. Stationary viewers with long-term views of the area such as residents and recreationists could experience moderate and temporary impacts from construction activities during construction. Columbia River treaty tribes' fishers, residents, and campers at the White Salmon TFAS, could be expected to have higher sensitivity to changes in the visual environment due to the site's close proximity to bridge construction activities including lights illuminating construction areas on land or over the water, construction equipment and materials, and the partially-completed bridge.

Long-term (direct) visual impacts from the build alternatives were evaluated on compatibility, viewer sensitivity, and visual quality.

The visual compatibility assessment looked at project scale, form, materials, and visual character and noted:

- Project Scale: Both build alternatives would result in a bridge similar in length to the existing bridge, but slightly wider to accommodate two lanes of traffic and a shared use path that would create new views for recreationalists. The increased bridge height would be more visible to many viewers; however, in the visual context of the Columbia River Gorge, the scale of the surrounding mountains and expansive river would reduce the overall impact of the taller bridge. Because many viewers would see the bridge from higher elevations, the increased height of the bridge would have a negligible impact on their view. Recreational boaters, users of the TFASs, and other river traffic who would view the bridge from below would encounter a taller bridge with fewer in-water piers as compared with the existing bridge, opening larger viewing windows up and down the river and to surrounding landscapes.
- Project Form: Alternative EC-2 and Alternative EC-3 would have an alignment like that of the existing bridge. At the main span, the build alternative's vertical profile (height) would be higher than the existing bridge to meet navigational requirements but would have eight fewer in-water piers creating larger viewing windows between piers. Because there would be no substantial vertical elements above the bridge deck, views of the Project environment behind the bridge from the viewer's perspective would be unobstructed (Exhibit 3-51). The replacement bridge would have a curved arch appearance over the river, mimicking the adjacent natural ridgelines promoting visual harmony with the environment.
- Project Materials: Design character and ornamental elements would be consistent with the Columbia River Bridge Replacement guidelines in the CRGNSA Management Plan. Material and color selection would be finalized during the Project's design phase and are expected to be consistent with the existing visual character of the natural and cultural setting and applicable plans and permits. Sample architectural landscape concepts for the Project (Exhibit 3-52, Exhibit 3-53, and Exhibit 3-54) show how the bridge's design could be compatible with the scenic, cultural, natural, and recreational setting of the Columbia River Gorge. All design concepts would include railing, lighting, and benches. Other concepts may be developed through the aesthetics advisory committee as the Project advances through final design and permitting phases; however, for the EIS the following architectural landscape concepts are defined as:

- Historic: The historic concept reflects elements from the existing Hood River Bridge including green steel railings adjacent to travel lanes and the shared use path, decorative vehicle lighting, recessed walkway lighting in the shared use path, and backless benches.
- Columbia River Gorge: The Columbia River Gorge design concept embodies similar design to other bridges and roadways along I-84, SR 14, and other National Scenic Area facilities including cobra head style vehicle lighting, recessed walkway lighting within the wall separating the shared use path from the vehicle lanes, and benches.
- Contemporary: The contemporary concept includes steel railings, curved vehicle lighting, ground-level lighting on the shared use path, and two-level benches.

- Project Visual Character: Overall, the replacement bridge would be compatible with the existing natural, cultural, and Project environment in terms of scale, form, and materials and would not substantially alter views of the landscape.

Exhibit 3-51. Looking East from Columbia River/Marine Beach Sandbar (Key Viewpoint #13) Photo Simulation

Existing view

Proposed view

Exhibit 3-52. Historic Architectural Landscape Concept

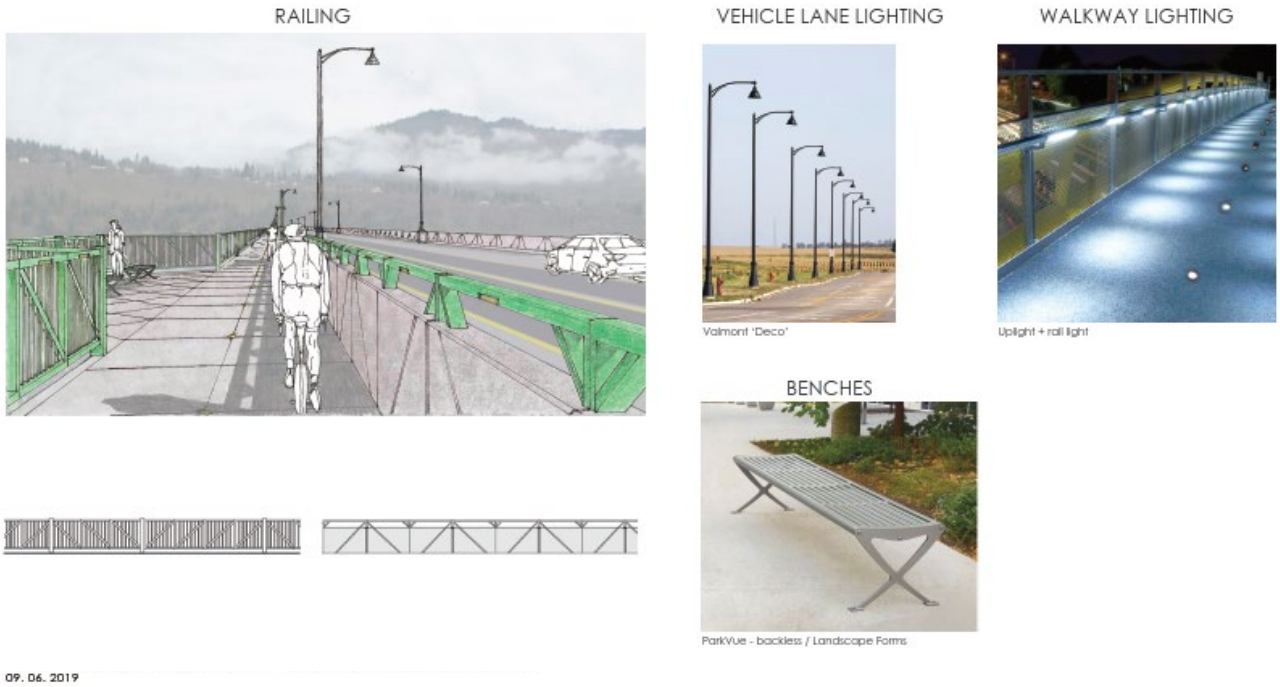


Exhibit 3-53. Columbia River Gorge Architectural Landscape Concept

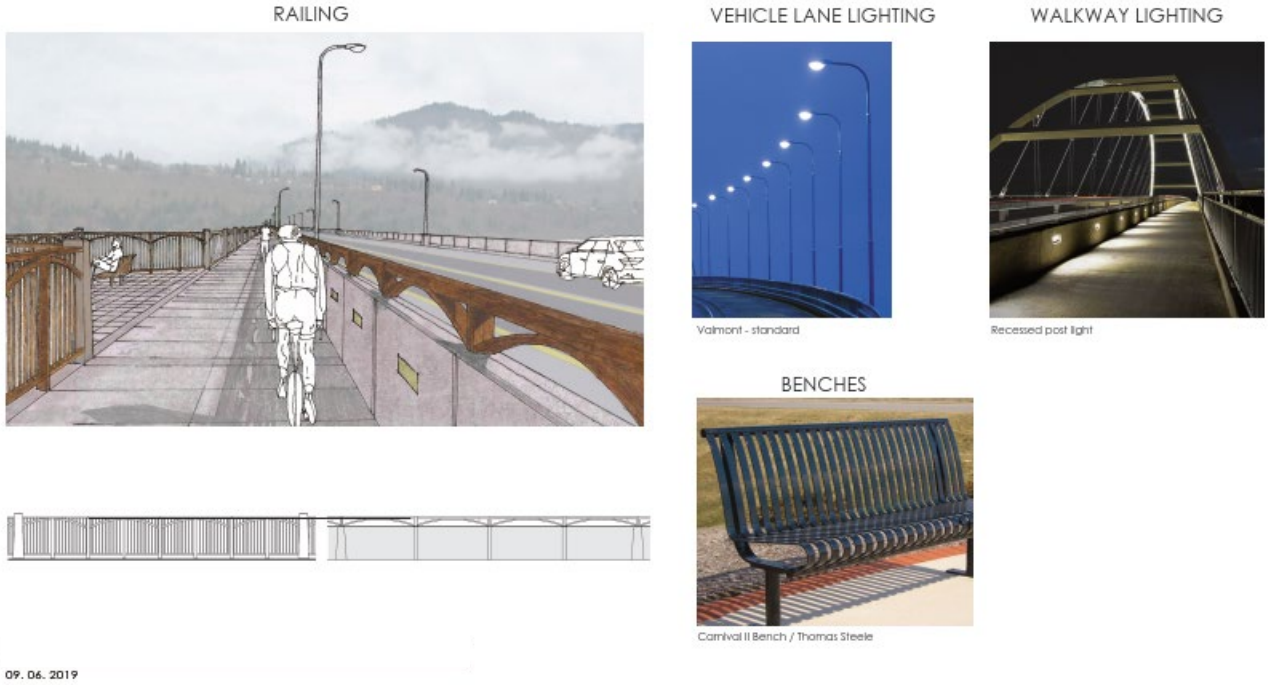
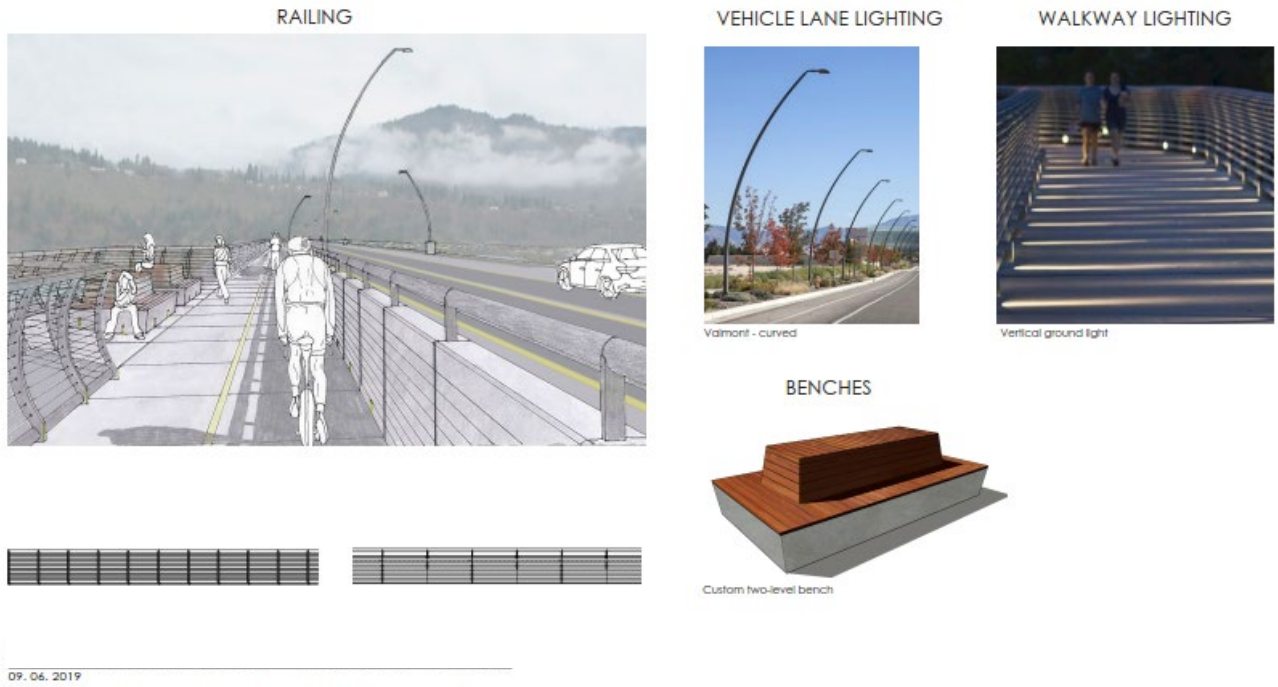


Exhibit 3-54. Contemporary Architectural Landscape Concept



Viewer sensitivity to the Project over the long-term would be expected to be low for the build alternatives. The Project would replace an existing bridge with one of similar scale and approximate alignment (Exhibit 3-55). The public has voiced support for the Project as incorporated into planning documents for CRGNSA, Klickitat County, and Hood River County, and the build alternatives would create new views and recreational opportunities for bicyclists and pedestrians. Viewer groups at the White Salmon TFAS include commercial, subsistence, or ceremonial fishers and temporary residents. White Salmon TFAS viewers may be sensitive to changes in the visual environment resulting from the construction of a new bridge. The green color of the steel bridge components and the proposed natural or earth-toned colors and open structural design would help the bridge blend visually with surrounding Gorge-landscape, as visually unobtrusive as practicable and harmonious with the structures and land uses in the urban areas.

Exhibit 3-55. Looking Southeast from Waubish Road (Key Viewpoint #5) Photo Simulation

Existing view

Proposed view

Using the framework of key viewpoints and the three dimensions of visual quality (natural harmony, cultural order, and coherence of Project components). The build alternatives would generally have the same visual quality impacts since the design of the replacement bridge would be of similar scale with only the alignment and number of in-water piers being the primary difference across alternatives. The overall impacts to visual quality would be neutral for the Project, which would utilize approximately the same corridor to replace an existing two-lane bridge with a new, two-lane bridge with a bicycle and pedestrian shared use path. Specific improvements to visual quality resulting from the build alternatives include aesthetic and architectural treatments on the bridge including ornamental railing for pedestrians, a shallower bridge deck and fewer piers with less obstructed views above and below the bridge, and new viewpoints for pedestrians and bicyclists on the bridge.

Expected visual quality impacts and benefits from the Project common to the 14 key viewpoints would include:

- Natural harmony: The primary change to the natural environment from the build alternatives would be vegetation removal for the north touchdown visible from a handful of key viewpoints including the removal of a mature Oregon white oak in Alternative EC-3. Mitigation plantings would result in a neutral to beneficial impact within a few years. For viewers already accustomed to a bridge, the build alternatives would have fewer in-water piers and no substantial vertical elements above the deck creating broader viewing windows and offering better views of the river, forested slopes, and distant mountains (Exhibit 3-56). Placement of existing utilities underground that are now aboveground would enhance views of the natural environment from the Washington side of the river.

Exhibit 3-56. Looking Northwest from Hood River Waterfront Trail (Key Viewpoint #3) Photo Simulation

Existing view

Proposed view

- Cultural Order: The existing bridge has been a visual component of the AVE for generations, but its replacement has been supported by the community for many years. Other cultural landmarks including buildings and infrastructure in the AVE seen from the key views would not be adversely affected since the slimmer bridge design with fewer vertical elements and larger viewing windows would maintain or improve views. Later phases of the Project would convene an aesthetics advisory committee to develop a shore-to-shore design concept reflecting the community's cultural order preferences. The bridge's slimmer design with larger viewing windows and integration of cultural preferences in design would result in an overall neutral visual quality change. The bridge is not expected to alter the existing pattern of work, society, or community at the White Salmon TFAS. Horizontal bridge elements would be somewhat higher with a slimmer profile than the existing bridge and there would be fewer vertical piers, which would allow for more open views of the surrounding landscape from the White Salmon TFAS, which are an important component of the cultural order at this site. Views of Mount Hood, valued by White Salmon TFAS users, would be preserved under the build alternatives (Exhibit 3-57).
- Project Coherence: The shore-to-shore design concept would promote visual consistency. The Project's scale and form would be compatible with the visual character of the AVE and the Columbia River Bridge Replacement guidelines including the concrete piers that would be consistent with other bridges and roads in the Hood River and White Salmon/Bingen urban areas. Final aesthetic design including color, railing design, and light fixture design, site and pedestrian furnishings would be directed by the aesthetics committee. Project coherence would be high resulting in a neutral change to visual quality.

A potential indirect impact from the build alternatives would be increased pedestrian and bicycle use of the replacement bridge over time, which would allow more recreationalists and those who commute by these modes to have views from the bridge toward the Columbia River Gorge.

Exhibit 3-57. Looking South from the White Salmon TFAS (Key Viewpoint #15) Photo Simulation

Existing view

Proposed view

Summary

Exhibit 3-58 summarizes the construction-related, direct, and indirect impacts and benefits related to visual resources.

Exhibit 3-58. Summary of Impacts to Visual Resources

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	• None	• Construction signs, brightly colored and reflective safety equipment, fencing and barricades • Terrain grading at north and south touchdown areas • Construction vehicles and heavy equipment • Boats, barges, and cranes for in/over water activities • Flashing lights and illumination of work areas	
Visual Compatibility	• No change	• Project scale, form, materials, and character would be compatible with visual character of AVE	
Viewer Sensitivity	• No change	• Change in viewer sensitivity looking toward the bridge would be low because an existing two-lane bridge would be replaced by a new two-lane bridge of similar scale	
Visual Quality	• No change	• Overall: Visual quality impacts would be neutral • Natural harmony: New views would be created from the replacement bridge for pedestrians and bicyclists; Alternative EC-2 and Alternative EC-3 would remove vegetation and fill at north approach including a mature tree in Alternative EC-3 • Cultural order: Community supports a replacement bridge and a slimmer bridge design would maintain and improve views of cultural landmarks • Project coherence: Shore-to-shore design concept would promote visual consistency; Project form and scale, including concrete piers, would be consistent with bridges and roads in the area and the Columbia River Bridge Replacement guidelines	
Indirect Impacts	• Removal of vehicle light and reflective glare once existing bridge is inoperable.	• Increased pedestrian and bicycle use of replacement bridge, allowing growth in recreational sight-seeing opportunities • Increased vehicular traffic	

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to visual resources:

- Minimize Project-related light and glare to the maximum extent feasible, given safety considerations, by operating lights at the lowest wattage practicable.
- Focus lights on the work area only and direct lights away from night skies and nearby sensitive locations such as residences, the White Salmon TFAS, medical facilities, and parks.
- Use shields on lights to prevent ambient spill-over light, when practicable.

- Restore staging areas to preconstruction conditions once construction is complete to minimize the impact on visual quality and character at these sites. Restoration of the staging areas would meet the following performance standards:
  - All disturbed terrain would be restored.
  - Replacement plantings would be installed in areas where vegetation was removed. All replacement plantings would be native and indigenous to the area. No invasive plant species would be used under any conditions.
- Minimize the removal of trees and shrubs and pruning needed to accommodate construction activities. For vegetation removed in Washington, follow WSDOT's Roadside Manual guidance for vegetation replanting (WSDOT 2017).
- Contour grading so that it looks consistent with natural terrain to the degree possible.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to visual resources:

- Convene a broadly representative aesthetics committee to support the subsequent phase of land-use permitting. The aesthetics committee would recommend a cohesive aesthetic theme for the non-structural components of the bridge, including but not limited to such things as railings, light poles, site furniture, and signage. The committee could also make a recommendation on concrete colors, textures, shapes, and treatments that would be consistent with the visual quality goals for Columbia River Bridge Replacement described in the CRGNSA Management Plan.
- Use low-sheen and non-reflective surface materials to reduce potential for glare.
- Use lighting that has minimum impact to the surrounding environment.
  - Downcast, cut-off type fixtures would be used to shield and direct light only towards objects requiring illumination.
  - Install lights at the lowest appropriate height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky.
  - Light fixtures would have non-glare finishes that would not cause reflective daytime glare.

Additional detail on visual resources is provided in the Visual Impact Assessment Report (Appendix P).

3.20. Noise and Vibration

Existing Conditions

Ambient noise monitoring near the existing bridge on the Oregon side of the Columbia River.

Noise levels are influenced by loudness of the source, number of sources, distance from the source, and whether existing topography or structures dampen the noise. Traffic from the bridge, SR 14 and I-84 are the dominant noise sources in the API with noise from aircraft and trains also present. Existing noise levels at 25 modeled sites range from 47 decibels to 65 decibels along current roadways. The White Salmon TFAS is located immediately west of the existing bridge. Receptor site R15 is an existing picnic area within the TFAS and receptor site R16 is the camping and residential area within the TFAS; the project-specific noise study modeled existing noise levels at 52 decibels at these receptor sites. The highest noise levels are at the Heritage Plaza Park and Ride facility on the Washington side of the Columbia River and at Hood River WaterPlay on the Oregon side. WSDOT and ODOT establish Noise Abatement Criteria (NAC) for different land use categories including recreational, commercial, and residential. The Project-specific noise model shows that, except for the Hood River WaterPlay modeled at 65 decibels, noise levels at all land uses within the API range from 51 decibels to 64 decibels, which is below ODOT and WSDOT NAC.

Project Impacts and Benefits

No Action Alternative

Construction noise would not result from the No Action Alternative, since it does not include construction activities. Direct impacts include an increase in noise of 0 decibels to 3 decibels at receptor sites as a result of increased traffic. Following closure of the existing bridge in 2045 when it reaches its operational lifespan, traffic noise on the bridge would cease.

Build Alternatives

Both build alternatives would generate temporary noise during the 6-year construction period from activities such as clearing, grading, removing old roadways, paving, and construction of the bridge, and roadway connections. The highest noise levels would come from the impact and vibratory pile installation and removal, removal of the existing bridge, and earthwork phase. Noise generated by the engines of construction equipment would be the most prevalent type. Construction noise levels would range from 69 decibels to 106 decibels at 50 feet away. Noise impacts would be reduced or eliminated by working only during specified hours and using equipment meeting U.S. EPA standards with mufflers. The build alternatives are close to noise sensitive land uses including the White Salmon TFAS that would be located approximately 500 feet west of bridge construction. Other noise sensitive land uses in proximity to the bridge include Bridge RV Park and Campground on the Washington side of the River and the Hood River Waterfront Trail, Hood River WaterPlay, and Best Western Hood River Inn on the Oregon side. These land uses would experience construction noise.

Roadway traffic noise levels under the build alternatives would not change much over time despite projected increases in future traffic volumes. Changes in future noise levels over existing conditions would range from an increase of 3 decibels to a decrease of 1 decibel depending on the existing land use and its location (Exhibit 3-59). Decreases in noise at certain land uses in the build alternatives would be due to the distance from the alternative alignment and a quieter driving surface as compared with the existing steel grate deck. Increases would primarily be due to an increase in future traffic levels and speeds expected under each alternative and are not considered substantial under any of the bridge build alternatives in year 2045. The TFAS would also experience a slight increase in noise ranging from 1 decibel to 3 decibels over the long-term, an increase that would be barely be perceptible to most listeners including the commercial, subsistence, or ceremonial fishers and residents and campers at the site.

No indirect noise impacts are expected from the No Action Alternative or either of the build alternatives.

Exhibit 3-60 summarizes noise impacts by alternative.

Exhibit 3-59. Modeled Locations and Predicted Build Impacts (2045) for the Build Alternatives

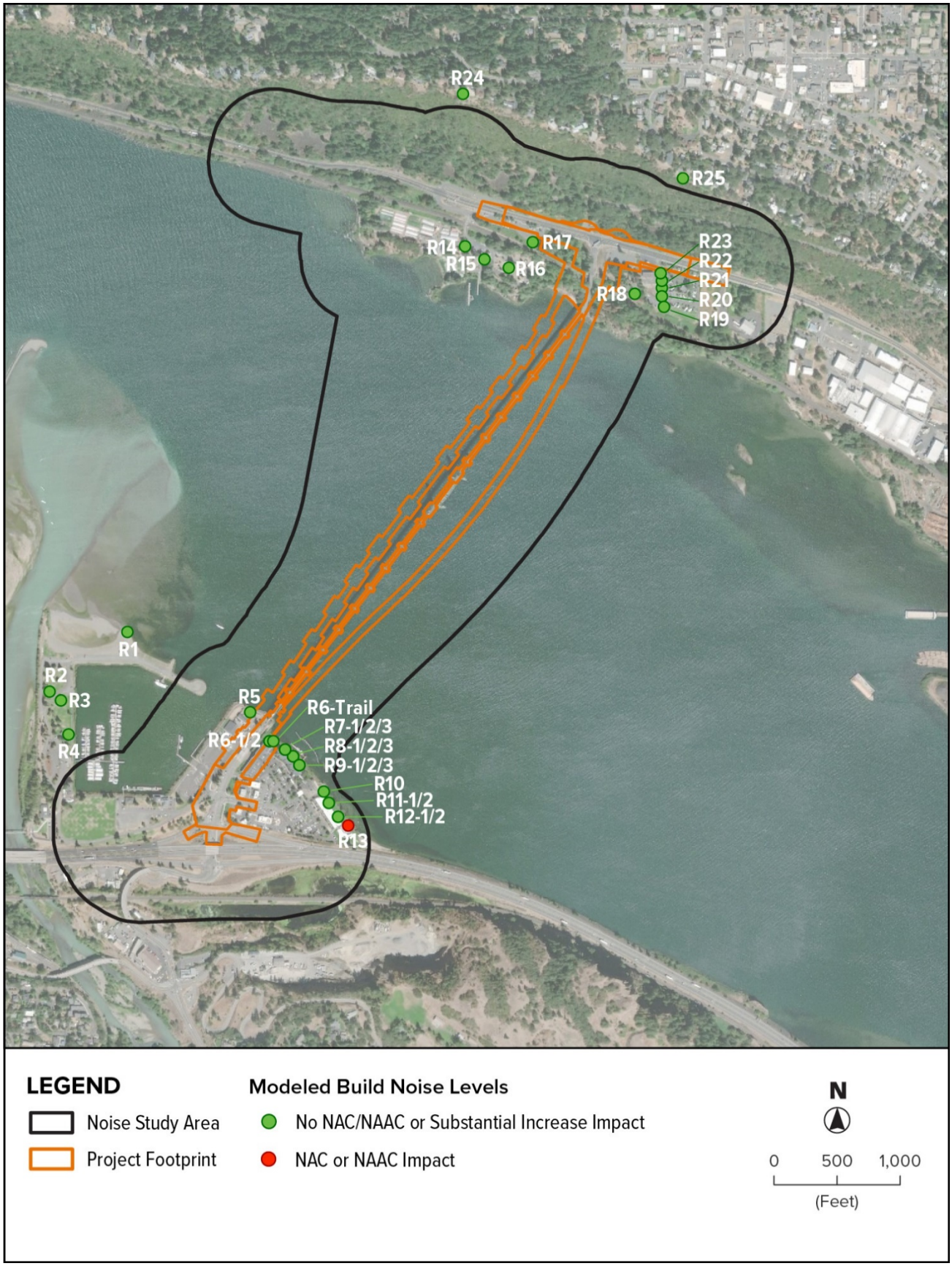


Exhibit 3-60. Summary of Impacts to Noise Levels

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	• None	• Temporary increase in noise at areas near construction	
Locations Exceeding NAC	• Hood River WaterPlay: modeled for 65 decibels in 2045 (due to I-84 traffic)		
Indirect Impacts	• None		

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to noise levels:

- The contractor would comply with all state and local sound control and noise level rules, regulations, and ordinances that would apply to any work performed pursuant to the contract.
- All equipment would comply with pertinent equipment noise standards of the U.S. EPA.
- All equipment used would have sound control devices no less effective than those provided on the original equipment. No equipment would have unmuffled exhaust.
- No construction would be performed within 1,000 feet of an occupied dwelling unit on Sundays, legal holidays, or between the hours of 10:00 pm and 6:00 am on other days without the approval of the Port construction Project Manager.
- No vibratory or impact hammers, hoe ramming, or blasting operations would be performed within 3,000 feet of any occupied dwelling unit, including camping areas at the White Salmon TFAS or Bridge RV Park, on Sundays, legal holidays, and between the hours of 8:00 p.m. and 8:00 a.m., Monday through Saturday without the approval of the Project Manager.
- The noise from rock crushing or screening operations within 3,000 feet of any occupied dwelling would be mitigated by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the Project Manager.

Should specific noise complaints occur during the construction of the Project, one or more of the following noise abatement measures would be required, as directed by the Project Manager:

- Locate stationary construction equipment as far from the nearby noise-sensitive properties as practical.
- Shut off idling equipment.
- Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
- Notify nearby residences, CRITFC, and Columbia River treaty tribes whenever extremely noisy work would be occurring.
- Install temporary or portable acoustic barriers around stationary construction noise sources.
- Consider operating electric-powered equipment using line voltage power or solar power instead of on-site generators.

Long-Term Impacts

One site, the pool at Hood River WaterPlay, represented by Site R13 would be impacted by traffic noise by both build alternatives. The impacted site is located approximately 1,000 feet from the existing bridge and approximately 130 feet from vehicles traveling on I-84 and would be located at or near the same distance from these roadways with the build alternatives. Possible mitigation measures for this receptor include:

- Traffic management: traffic control devices could be used to reduce the speed of the traffic; however, the minor benefit of 1 decibel per 5 mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures, such as time or use restrictions for certain vehicles, do not meet the transportation objectives of the facility.
- Alteration of horizontal and/or vertical alignments: any alteration of the build alternatives' alignment would displace residences, require additional right-of-way and not be cost effective/reasonable.

» Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

» Noise barriers: noise barriers include noise walls, berms, and buildings that are not sensitive to noise. A noise barrier's effectiveness is determined by its height and length and by project site topography. To be effective, the barrier must block the line-of-sight between the noise source and the receptor. It must be long enough (at least eight times as long as the distance from the home or receptor to the barrier) to prevent sounds from passing around the ends, have no openings (i.e., driveway connections), and be dense enough so that noise would not be transmitted through it. Intervening rows of buildings that are not noise sensitive could also be used as barriers (FHWA 1973).

Evaluation of Noise Barriers

As shown in Exhibit 3-61, one noise barrier, "Noise Barrier 1," was evaluated for the two build alternatives to reduce traffic noise levels at Hood River WaterPlay, which would be the one site exceeding ODOT Noise Abatement Approach Criteria . I-84 is the primary source of noise at Hood River Waterplay. Noise Barrier 1 was evaluated along the edge of the pavement north of the westbound I-84 off-ramp to Button Bridge Road. While the barrier would meet ODOT's noise reduction design goal of at least 7 decibels, the evaluation determined that the barrier would exceed ODOT's cost allowance and is, therefore, not recommended for placement. After considering I-84 as the primary source of noise, the mitigation options presented above, and the distance from I-84 to the API, no feasible and reasonable options are available to mitigate noise. No measures are required to avoid, minimize, or mitigate long-term noise impacts.

Exhibit 3-61. Location of Evaluated Noise Barrier

Additional detail on noise levels is provided in the Noise Technical Report (Appendix J).

3.21. Hazardous Materials

Existing Conditions

The API is in a geologic setting characterized by a stratigraphy of basalt and volcanic rock layers topped with alluvial and erosional soil deposits. Soils on the Washington side are silt loams and on the Oregon side are alluvial outwash from Hood River with fill placed over base soils. Groundwater in shallow wells is 22 feet to 42 feet below the surface on the Washington side and 5 feet to 15 feet on the Oregon side.

Records research revealed six sites of low-level risk for containing hazardous materials located within the API. These sites included the NW Pipeline meter station formerly holding mercury-containing equipment, and several sites contaminated with petroleum products including two gas stations, the Mt. Hood Railroad Company, the Mobil Oil Bulk Plant, and the Carson Oil Company site (Exhibit 3-62).

Known hazardous materials in the API:

- Mercury
- Petroleum
- Gasoline
- Diesel
- Heavy oils
- Solvents Herbicides/pesticides
- Asbestos
- Lead based paint
- Mineral insulating oil

Project Impacts and Benefits

No Action Alternative

There would be no construction or direct impacts to hazardous materials associated with the No Action Alternative from ongoing bridge operation because this alternative would not include construction activities. If a catastrophic event occurred such as an earthquake, landslide, or barge or vessel strike, the bridge could be damaged or collapse into the river. Direct impacts from a catastrophe could include release of hazardous materials such as lead-based paint chips from the bridge, asbestos and hydraulic fluids entering the water from bridge infrastructure, as well as the potential that all or part of the bridge superstructure could fall into the Columbia River. Indirect impacts from the No Action Alternative include an ongoing risk that hazardous materials transported across the existing bridge could spill and enter the Columbia River through the steel grate bridge deck or spills along detour routes may occur during bridge closure.

Build Alternatives

In both build alternatives, construction activities over water and near the former city docks and BNSF Railway line could encounter hazardous materials, soil, and groundwater that would need to be properly removed. Additionally, if the pole mounted transformers along SR 14 containing mineral insulating oil are not handled correctly, PCBs could be released into the ground or water. During removal of the existing bridge, lead paint and asbestos present in the existing bridge and associated facilities would need to be managed. There would be a low risk that construction activities for the roundabout in Alternative EC-2 could encounter mercury-contaminated soils that remain after cleanup activities in 1991 and 2007 at the Northwest Pipeline meter station. In addition to encountering hazardous materials, there would be the potential for accidental spills of hazardous materials during construction. Relatively small quantities of fuels (including diesel, gasoline, and propane) for various pieces of small equipment would likely be stored at a construction staging area. Concrete would also be poured to connect bridge segments. There would be the potential for accidental spills of these materials with a risk of polluting the waterway or ground.

Direct impacts from the build alternatives would be limited to the potential for release of hazardous materials during bridge maintenance or from bridge accidents that could contaminate stormwater facilities.

There would be no indirect impacts to contaminated or hazardous material sites from any of the bridge replacement alternatives.

Exhibit 3-63 summarizes the impacts from and benefits of removal of hazardous materials by alternative.

Exhibit 3-62. Sites of Environmental Concern to the Project

Legend

API

N

0 1,000 2,000

(Feet)

Potential Sites of Concern

1. Northwest Pipeline ST White Salmon/Hood River
2. Town Pump Gas Station
3. Heidis Gas and Deli – Panelog
4. Mt. Hood Railroad Company
5. Mobil Oil Bulk Plant
6. Carson Oil Company

Exhibit 3-63. Summary of Impacts to Hazardous Materials and Benefits of Removal

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Potential Hazardous Materials Risks During Construction	• None	• Sediments along submerged lands of the Columbia River • Spill-contaminated materials within BNSF Railway right-of-way • Asbestos and/or lead from existing bridge and tollbooth removal • Removal of hazardous materials encountered during construction • Potential for hazardous material spills to water or ground	
		• Mercury at the Northwest Pipeline meter station	• No additional known hazardous materials encountered
Direct Impacts	• Spills would continue to discharge directly to the Columbia River	• Spills would no longer discharge directly to the Columbia River • Spills could migrate off the bridge into stormwater water quality facilities	
Indirect Impacts	• Spills could occur on alternative routes after closure of the existing bridge	• None	

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to hazardous materials:

- Characterize soil, sediment, and groundwater conditions within and adjacent to the alignment prior to construction and remediate if necessary. This includes the characterization of soil, sediment, and groundwater at pier locations within the Columbia River because of historic industrial uses along the Columbia River.
- Arrange with utilities to remove and relocate transformers as necessary along the alignment.
- Arrange with Northwest Pipeline LLC to relocate the natural gas metering station (Alternative EC-2 only).
- Conduct pre-removal surveys for asbestos, PCBs, and lead for the existing bridge and all other structures to be removed. If necessary, proceed with removal and disposal in accordance with regulations prior to removal of the existing bridge. Prepare pollution prevention plans and hazardous materials containment plans in accordance with WSDOT Standard Specification Section 1-07.15(1) “Spill Prevention, Control and Countermeasures Plan,” and ODOT Standard Specification Section 00290.29(g) “Spills and Releases” and Section 00290.30 “Pollution Control.”
- Wash-water from concrete delivery trucks, pumping equipment, and tools will also be similarly (impervious basins) contained. Treated equipment entering state waters (including barges, boats, cranes, etc.) would be maintained to prevent any visible sheen from petroleum products from appearing on the water's surface. No oil, fuel, or chemicals would be discharged into the Columbia River. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc. would be checked regularly for drips or leaks; they would be maintained to prevent spills. Concentrated waste or spilled chemicals would be removed from the site and disposed of at a facility approved by Ecology, Oregon DEQ, or the appropriate county health department.
- Spills into the Columbia River, or onto land, with a potential to enter the water would be reported immediately to relevant agencies including U.S. EPA, USCG, Oregon DEQ, and Ecology. Emergency spill control equipment would be on-site at all times. If a spill occurs, containment and clean-up efforts would begin immediately and be completed as soon as possible, taking precedence over normal work. Paint and solvent spills should be considered as oil spills and thus prevented from entering the Columbia River.
- Conduct site assessments as necessary to evaluate soil, sediment, and groundwater conditions near the hazardous materials. Evaluate soil conditions near construction as grading and drilling activities occur. Remove and dispose of hazardous materials, and remediate contaminated soil, sediment, and groundwater in accordance with applicable regulations.

- Evaluate soil conditions along the railroad grade as construction grading occurs. If contaminated soil is suspected, assess soil conditions and remediate as necessary in accordance with applicable regulations.
- If soil and groundwater contamination that has not previously been assessed is encountered during drilling, clearing, and grading activities in the Project footprint, these impacts would be mitigated by assessment and remediation following WSDOT Standard Specification Section 1-07.5(3) "State Department of Ecology" and ODOT Standard Specification Section 00290.29(f) "Unexpected Contamination."

Long-Term Impacts

No measures are required to avoid, minimize, or mitigate long-term impacts to hazardous materials.

Additional detail on hazardous materials impacts is provided in the Hazardous Materials Technical Report (Appendix G).

3.22. Irreversible and Irretrievable Commitment of Resources

Implementation of the proposed action would involve a commitment of natural, physical, human and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time that the land is used for the transportation facility. However, if a greater need arises for use of the land, or if the transportation facility is no longer needed, then the land can be converted to another use. At present, there is no reason to believe that it would ever be necessary or desirable to convert land used for this transportation Project to another use.

Construction of a replacement bridge would require one-time use of labor and construction materials.

Considerable amounts of fossil fuels, labor, and roadway construction materials such as cement, aggregate, and bituminous material would be expended during construction of the Project. Additionally, large amounts of labor and natural resources would be used in the making of construction materials. These materials are generally not retrievable. However, they are not currently in short supply and their use would not have an adverse impact upon continued availability of these resources. Any construction of the replacement bridge and deconstruction of the existing Hood River Bridge would also require a substantial one-time expenditure of local, state and/or federal funds, which would not be retrievable. The commitment of these resources is based on the concept that residents, businesses, and economies in the local area, region, and states would benefit from the improved quality of the transportation system. These benefits would consist of improved safety, multimodal accessibility, travel time, and navigation, which would be expected to outweigh the commitment of these resources. In addition to the costs of construction and right-of-way acquisition, there would be costs for bridge and roadway maintenance.

Both build alternatives would commit the same types and amounts of irreversible and irretrievable resources.

3.23. Relationship between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

No Action Alternative

The No Action Alternative offers none of the gains or losses described above. However, the No Action Alternative would not meet the Project's purpose and need (Section 1.2, Purpose and Need). The No Action Alternative would avoid short-term impacts but would have long-term adverse impacts from seismic instability, reduced travel reliability, increased maintenance needs, navigational hazards for marine freight vessels, and eventual closure of the existing bridge. Bridge closure would have associated safety impacts; degraded emergency service response times, diminished transit, vehicle, and freight travel times and reliability; reduced cross-river connectivity; and a diminished regional economy.

Construction of the build alternatives would reduce ongoing maintenance needs of the existing bridge.

Build alternatives

The build alternatives would have similar temporary, short-term impacts during construction. Short-term impacts and use of resources resulting from any build alternative could include the following:

- Noise, dust, light, and glare produced by construction equipment and activities
- Traffic delays and detours for automobiles, freight trucks, buses, emergency response vehicles, bicyclists, and pedestrians
- Slight changes to commercial and tribal fishers' navigation during construction to avoid temporary, barge-based equipment in the river
- Use of materials, labor, and energy to construct improvements
- Changes in access to properties during construction
- Reduced visibility, dust creation, soil erosion, respiratory hazards, mobilized contaminants, changes in aesthetics of the surrounding area, establishment of invasive plants, increased sediment in stormwater runoff because of ground clearing construction activities
- Creation of short-term jobs to construct the Project and related spending at local businesses

Project implementation would result in the short-term impacts and use of resources as described above, while providing long-term gains including reduced congestion and improved safety, travel reliability, cross-river connectivity, emergency service response times, transit travel times, truck freight movement efficiency, economic benefits, seismic resiliency, and improved horizontal clearance for marine freight vessels to maneuver under the bridge.