

Chapter 4 Comparison of the Alternatives

While Chapter 3 explains the potential effects of the proposed SR 520 Pontoon Construction Project on built and natural resources, this chapter highlights the primary differences between the build alternatives and compares the effects of each by resource.

What are the primary differences between the build alternatives?

Following are the primary differences between the build alternatives as they relate to the effects on the built and natural environments:

- **Wetlands:** The Aberdeen Log Yard Alternative (Preferred Alternative) would eliminate approximately 1.04 acres of palustrine wetland area and 0.06 acre of estuarine wetland. The Anderson & Middleton Alternative would eliminate approximately 4.8 acres of palustrine wetlands. For the Aberdeen Log Yard property, there is only one small wetland (0.50 acre) that could be affected by dewatering, whereas for the Anderson & Middleton Alternative, dewatering could affect the hydrology of over 30 acres of protected wetlands adjacent to the property.
- **Shoreline:** Because the launch channel at the Aberdeen Log Yard site is farther from the navigation channel than at the Anderson & Middleton site, excavating and building the launch channel would require disturbing approximately 3 acres of area within the rocky intertidal shore, mudflat, and subtidal habitat areas. Constructing the launch channel at the Anderson & Middleton site would require disturbing approximately 0.38 acre of area within the rocky intertidal shore, mudflat, and subtidal habitat. At either site, the launch channel gate might be accessed by a trestle (built into what is now land), which when fully operational, would become a new overwater structure within the site's modified shoreline.
- **Cultural Resources:** Field investigations revealed that an archaeological site on the Anderson & Middleton site is NHRP-eligible, which includes a precontact fish trap complex; casting basin construction would disturb this site. No NHRP-eligible archaeological sites were found on the Aberdeen Log Yard site.

How would the alternatives differ in their effects on the environment?

Analyzing and comparing the project alternatives is considered the “heart” of the NEPA process because knowing and comparing the alternatives’ potential effects are essential in making an informed decision. Chapter 3 presents the potential effects of the build alternatives on the various resources studied in this EIS, and Exhibit 4-1 compares the build alternatives’ effects on each resource. For most resources, the potential effects of the build alternatives would be similar, with only minor variations to distinguish the two alternatives. The use of the CTC facility is an option that is separate from both build alternatives and is not included in Exhibit 4-1 because the effects associated with using this option would apply to either build alternative. As a result, CTC-related project effects are not a point of comparison between the alternatives.

For the proposed SR 520 Pontoon Construction Project, WSDOT considers that the No Build Alternative would be effectively continued existing conditions in the study areas (refer to Chapter 2 for a full description of the No Build Alternative). As a result, the effects of each alternative presented in Exhibit 4-1 are inherently measured against the No Build Alternative because the effects analysis necessarily considers potential effects of the alternatives compared to existing conditions.

EXHIBIT 4-1

Build Alternative Comparison Table

Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Ecosystems			
Aberdeen Log Yard Alternative (Preferred Alternative)	<p>Construction would eliminate 1.04 acres of palustrine wetlands and up to 0.06 acre of estuarine wetlands.</p> <p>The launch channel would excavate 3 acres within the shoreline, including mudflats and subtidal habitat.</p> <p>There would be some effects on fish and wildlife associated with facility construction and operation.</p> <p>Pile-driving during construction would produce the most noise.</p>	<p>Shoreline armoring would be avoided except within launch channel.</p> <p>The project would restore degraded habitat at the Grass Creek mitigation site as mitigation for project effects. Mitigation would meet all federal, state, and local requirements.</p> <p>Mitigation for pile-driving noise could include using a vibratory hammer rather than an impact hammer to drive piles or limiting the pile-driving activity time. Pile-driving effects on fish could be mitigated using bubble curtains, which could reduce the level of waterborne noise from pile-driving by placing a wall of bubbles between the pile and fish.</p>	<p>The proposed project would eliminate 1.1 acres of wetland and 3 acres of shoreline (mudflats and subtidal habitat).</p>
Anderson & Middleton Alternative	<p>Facility construction would eliminate 4.8 acres of palustrine wetlands. The launch channel would require approximately 0.38 acre of excavation within shoreline.</p> <p>Facility construction and operation would result in some effects on fish and wildlife.</p> <p>Pile-driving during construction would produce the most noise.</p> <p>Dewatering could affect wetlands adjacent to the property.</p>	<p>Locating casting basin and ancillary facilities in central portion of site would avoid 6.5 acres of palustrine and estuarine wetland on the western portion of site.</p> <p>The project would restore degraded habitat at the Grass Creek mitigation site for project effects. Mitigation would meet all federal, tribal, state, and local requirements.</p> <p>Mitigating pile-driving noise could include vibratory hammer rather than driving piles using an impact hammer or limiting the pile-driving activity time. Pile-driving effects on fish could be mitigated using bubble curtains, which could reduce the level of waterborne noise from pile-driving.</p> <p>Dewatering effects could be limited by installing cutoff walls.</p>	<p>The proposed project would eliminate approximately 4.8 acres of wetlands and 0.38 acre of nearshore intertidal zone.</p>

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Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Geology and Soils			
Aberdeen Log Yard Alternative (Preferred Alternative)	<p>Casting basin construction would excavate up to 475,000 cubic yards.</p> <p>Launch channel construction would excavate up to 63,000 cubic yards (onshore) and up to 87,000 cubic yards (offshore).</p> <p>Up to 439,000 cubic yards of material would be imported.</p> <p>Certain construction activities, such as soil stockpiling, could cause the ground to settle several inches.</p>	<p>During casting basin facility construction, WSDOT would implement best management practices, such as requiring silt fences downslope of all exposed soils, to avoid and minimize effects on geology and soils.</p> <p>Stockpile materials would be at sufficient distances from buried utilities, site boundaries, and casting basin to prevent settlement damage.</p> <p>Sensitive structures would be underpinned and groundwater reinfiltreated or reinjected locally near susceptible facilities so that compressible soils are not dewatered.</p>	None.
Anderson & Middleton Alternative	<p>Casting basin construction would excavate up to 423,000 cubic yards.</p> <p>Launch channel construction would excavate up to 44,000 cubic yards (onshore) and up to 7,000 cubic yards (offshore).</p> <p>Up to 436,000 cubic yards of material would be imported.</p> <p>Certain construction activities, such as soil stockpiling, could cause the ground to settle several inches.</p>	Best management practices would be the same as for the Preferred Alternative.	None.
Hazardous Materials			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	<p>Dewatering water could contain contaminants unsuitable for discharge but would be treated before being discharged.</p> <p>Areas of localized upland soil contamination might be encountered. Contaminated sediments could be released into the water during launch channel dredging.</p>	Best management practices would be used to avoid or minimize the effects of hazardous materials. Dewatering water would be treated prior to discharge. Contaminated materials would be managed and disposed of in accordance with applicable regulations.	None; there could be a net benefit because encountered contaminated material would be removed.

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Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Water Resources			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	<p>Casting basin excavation and grading could affect water quality. Erosion of soil stockpiles could affect site stormwater runoff.</p> <p>Pontoon construction would produce two types of water—process water and stormwater—which would affect water quality.</p> <p>Dewatering for facility construction and operation could affect groundwater levels.</p>	<p>Implementing the required best management practices, such as temporary erosion and sediment control, stormwater pollution prevention and spill prevention control, and countermeasure plans, would be used to avoid or minimize effects.</p> <p>Stormwater and process water would be treated prior to discharge.</p>	None; there would be a net benefit because stormwater and process water would be treated before discharge, which does not currently occur.
Air Quality			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	These alternatives would meet regional conformity requirements and, therefore, would not substantially affect air quality.	Best management practices, such as reducing vehicle and equipment idling and using newer construction equipment with add-on emission controls, would be implemented to reduce project-related emissions.	None.
Energy and Climate Change			
Aberdeen Log Yard Alternative (Preferred Alternative)	<p>The energy consumed during facility construction would be approximately 679,000 MBtus. The energy consumed during facility operations would be approximately 1,500,000 MBtus.</p> <p>Greenhouse gas emissions during construction would be approximately 50,000 MT CO₂e. Greenhouse gas emissions during facility operation would be approximately 162,000 MT CO₂e.</p>	Best management practices that encourage efficient energy use and reduce emissions, such as reducing vehicle and equipment idling and using newer construction equipment with add-on emission controls, would be used to reduce project greenhouse gas emissions.	Mitigation would reduce energy consumed and greenhouse gases emitted but would not eliminate these effects.
Anderson & Middleton Alternative	<p>The energy consumed during construction would be approximately 754,000 MBtus. The energy consumed during operation would be approximately 1,500,000 MBtus.</p> <p>Greenhouse gas emissions during construction would be approximately 56,000 MT CO₂e. Greenhouse gas emissions for this alternative during operation would be approximately 162,000 MT CO₂e.</p>	Mitigation would be the same as for the Preferred Alternative.	Unavoidable adverse effects would be the same as with the Preferred Alternative.

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Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Cultural Resources			
Aberdeen Log Yard Alternative (Preferred Alternative)	WSDOT does not expect that the project would adversely affect cultural resources.	WSDOT would implement an unanticipated discovery plan that would be followed if potential archaeological resources are encountered during construction.	None.
Anderson & Middleton Alternative	The potential for effects would include disturbing an archaeological site that is NRHP-eligible and includes a precontact fish trap complex.	<p>WSDOT would develop and implement an archaeological treatment plan to mitigate effects on the known archaeological resource on this site. Mitigation might include, but is not limited to, data recovery (scientific excavation and analysis) of the archaeological sites and archaeological monitoring during construction to ensure that no (previously unknown) cultural resources are affected.</p> <p>WSDOT would implement an unanticipated discovery plan that would be followed if potential archaeological resources are encountered during construction.</p> <p>Mitigation for the identified precontact fish trap complex would require working closely with interested Indian tribes and might require preservation in place.</p>	Constructing the casting basin would disturb and adversely affect the portion of an archaeological site that is NHRP-eligible.
Economics			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	<p>Up to 150 workers would be needed for casting basin facility construction. Up to 350 workers would be needed for casting basin facility operation. Economic benefits would be expected because of the new jobs and the likely increase in spending and tax revenue during casting facility construction and operation.</p> <p>Noise and traffic congestion experienced during project construction and operation could result in some negative economic effects, such as a slight decrease in sales for some businesses along the haul routes that depend on unimpeded access.</p>	Noise and traffic reduction best management practices would be used that could reduce or eliminate the economic effects of noise or traffic congestion.	A net benefit of increased employment and income in the short term would be expected.

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Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Navigable Waterways			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	The level of vessel traffic within Grays Harbor is light enough that any use of navigation channels and of Grays Harbor pilots during this project would have only a minor effect, if any.	WSDOT would coordinate with the U.S. Coast Guard and potentially affected ports to avoid conflicts with arriving or departing vessels. WSDOT would provide appropriate lighting on moored pontoons, as required by the U.S. Coast Guard, to limit effects of recreational vessel movement outside the navigation channel.	None.
Noise			
Aberdeen Log Yard Alternative (Preferred Alternative)	<p>Noise levels during casting basin facility construction are predicted to range from 67 to 72 dBA, representing an increase of as much as 5 dBA over existing levels.</p> <p>Noise levels during pontoon-building operations are predicted to range from 40 to 59 dBA, representing an increase of as much as 1 to 5 dBA over existing levels.</p> <p>Noise during operation would not exceed WAC maximum noise levels.</p>	<p>Best management practices for noise abatement could include limiting activities that produce the highest noise levels (such as jackhammering and pile-driving) to between 7 a.m. and 7 p.m. or requiring all engine-powered equipment to have mufflers installed according to the manufacturer's specifications.</p> <p>The project would comply with the applicable WAC noise limits and local jurisdiction noise regulations.</p> <p>Mitigating pile-driving noise could include using a vibratory hammer rather than driving piles with an impact hammer, or limiting the pile-driving activity time. Other methods of reducing pile-driving noise could include coating the piles, using pile pads, or using piston mufflers.</p>	With mitigation, daytime casting basin facility construction noise would still be noticeable. With noise abatement measures, pontoon-building noise levels would be within WAC limits.
Anderson & Middleton Alternative	<p>Noise levels during casting basin facility construction are predicted to range from 57 to 66 dBA, representing an increase of as much as 24 dBA over existing levels.</p> <p>Noise levels during pontoon construction will likely range from 40 to 64 dBA, representing an increase of as much as 22 dBA over existing levels.</p> <p>Noise during project operation would exceed the WAC noise regulation limits at four residential locations.</p>	<p>Best management practices would be the same as those proposed for the Preferred Alternative. The project would comply with the applicable WAC noise limits and local jurisdiction noise regulations, where applicable. A berm or sound wall could be constructed to reduce operational noise levels to below the ordinance limits.</p> <p>Mitigating pile-driving noise would be the same as for the Preferred Alternative.</p>	With mitigation, daytime casting basin facility construction noise would still be noticeable. With noise abatement measures, including a berm or sound wall, noise levels during pontoon construction would be within WAC limits.

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Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Public Services and Utilities			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	<p>No substantial effects on public services and utilities would be expected. There could be an increase in demand for police and emergency medical services typical of an industrial work site.</p> <p>The haul route is longer for the Anderson & Middleton Alternative, which could provide a greater opportunity for accidents compared with the Preferred Alternative.</p>	<p>Coordination with public service and utility providers on a continuous basis would ensure that any potential project effects are understood in advance, planned for, and kept to a minimum.</p> <p>Coordination with local public safety agencies, such as the fire department or police, would keep them aware of the project schedule, activities, and haul route locations.</p>	None.
Land Use			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	<p>The property would be developed into a higher-density industrial use; however, developing a casting basin facility would be compatible with the general plan provisions of the local jurisdiction's comprehensive plan and zoning regulations.</p> <p>State-owned (WDNR) aquatic lands would be used to construct and operate the launch channel and for pontoon moorage in Grays Harbor.</p>	No mitigation would be necessary. WSDOT would obtain a lease to use the state-owned lands.	None.
Social Elements			
Aberdeen Log Yard Alternative (Preferred Alternative)	<p>Some residences north of the project would experience noise levels exceeding the WAC maximum allowable level during project construction and operation.</p> <p>The project would not exceed transportation LOS or air quality standards. However, residents, transit riders, pedestrians, and bicyclists near the haul routes could be inconvenienced by noise, dust, and traffic from increased truck traffic. Pedestrians and bicyclists could experience delays at crosswalks due to increased traffic congestion.</p> <p>Some activities, such as launch channel construction, could temporarily displace tribal fishers from certain in-water Grays Harbor fishing locations.</p> <p>There would be no adverse effects that would cause disproportionately high and adverse effects on minority and/or low-income populations.</p>	<p>The project would comply with the applicable WAC noise limits and local jurisdiction noise regulations.</p> <p>WSDOT would use the project Web site and newsletters to inform the public of upcoming activities and to provide contact numbers where residents can voice concerns about the project. WSDOT could provide project materials in other languages, as needed, such as Spanish; provide notice to the public about increased congestion in their neighborhood caused by project construction and operation activities; and request project employees and truck drivers traveling to and from the site yield for pedestrians at unsignalized intersections.</p> <p>WSDOT would work closely with tribes to coordinate timing of pontoon floatouts and other nearshore activities to minimize or avoid conflicts with tribal fishing.</p>	None.

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Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Anderson & Middleton Alternative	<p>Operation and construction effects would be similar to those for the Preferred Alternative, except noise levels are expected to disturb sensitive receptors.</p> <p>There would be no adverse effects that would cause disproportionately high and adverse effects on minority and/or low-income populations.</p>	<p>Mitigation would be the same as for the Preferred Alternative.</p> <p>The project would comply with the applicable WAC noise limits and local jurisdiction noise regulations, where applicable.</p> <p>A berm or sound wall could be constructed to reduce operational noise levels to below the ordinance limits.</p>	None.
Transportation			
Aberdeen Log Yard Alternative (Preferred Alternative)	<p>During construction, LOS at intersections along haul routes would remain at LOS D or better except for the unsignalized intersection of West Heron Street and South Garfield Street.</p> <p>During operation, LOS at intersections along the haul routes would remain at LOS D or better except for the unsignalized intersection of West Heron Street at South Garfield Street</p>	Potential transportation minimization measures would include best management practices to reduce effects, such as restriping to improve channelization at certain intersections, or using barge or rail to transport materials to and from the site.	None. Traffic conditions could improve in the long-term, depending on mitigation measures used.
Anderson & Middleton Alternative	During project construction and operation, LOS at intersections along the haul routes would remain at LOS D or better.	Mitigation would be the same as for the Preferred Alternative.	None. There would be the potential for improved traffic conditions in the long-term, depending on mitigation measures used.
Visual Quality			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	<p>Construction and operation effects would be similar at both sites but on different landscape units. Both sites are currently located in industrial areas. Surrounding landscape units would see the project, but the project would not alter the character of its industrial surroundings.</p> <p>Pontoon moorage could produce long-term effects on visual quality. The pontoons would be visible above water; at night, they would be prominently illuminated.</p>	Best management practices, such as shielding temporary construction site lighting or designing facilities to blend with surroundings, would be used to avoid or minimize negative effects.	None. Casting basin facility construction and operation would be consistent with the existing visual context of the surrounding area, which is industrial in character.

EXHIBIT 4-1
Build Alternatives Comparison Table

Alternative	Summary of Potential Effects	Potential Avoidance, Minimization, and Compensatory Mitigation	Unavoidable Adverse Effects
Section 4(f)			
Aberdeen Log Yard (Preferred) and Anderson & Middleton Alternatives	There would be no use of Section 4(f) resources.	No mitigation measures are necessary.	None.
dBA decibel on the A-weighted scale LOS level of service MBtu million British thermal unit Mt CO ₂ e metric tons of carbon dioxide equivalent WAC Washington Administrative Code WSDOT Washington State Department of Transportation WDNR Washington Department of Natural Resources			