

# Chapter 3

## Affected Environment, Impacts, and Mitigation Measures

### Introduction

This chapter discusses how the Updated Preferred Alternative would affect the natural and built environment in the project area. The following sections evaluate the proposed changes in project design and construction compared to what was described in the Final EIS. This chapter does not include an analysis or discussion of impacts that were already covered in the Final EIS, but it focuses on those elements that have changed and identifies where impacts differ. The changes are summarized at the beginning of each section.

The disciplines that could be affected by the proposed changes are transportation; economics; noise and vibration; cultural, historic, and archaeological resources; land use, shorelines, and parks and recreation; public services and utilities; social resources and environmental justice; visual quality; fish, wildlife, and vegetation; and water resources. The remaining resources (air quality, contaminated materials, energy, and geology and soils) were described in the Final EIS, but they are not addressed in this chapter because there is no potential for changed effects.

Technical supplements have been prepared for some of the disciplines; these documents can be found as appendices to this SEIS.

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## 3.1 Transportation

### Affected Environment

The study area for transportation includes the Alaskan Way corridor between Broad Street and S. King Street. Several other north-south corridors, including SR 99, and 1<sup>st</sup> Avenue South were also included in the study area for the SEIS. The transportation network within this study area consists primarily of arterial roadways. Section 3.1 of the Final EIS provides additional information on the affected transportation facilities.

Although the Alaskan Way Viaduct Replacement Project changed the transportation network south of Spring Street beginning in 2011, the baseline year for measuring construction-related impacts in the Central Seawall area is 2010 for both the EIS and the SEIS. As a result, the baseline analysis does not reflect the changed conditions, such as the rerouting of traffic from under the viaduct and the elimination of parking spaces. Using 2010 conditions as a baseline ensures that impacts are described in relation to the original Alaskan Way environment rather than to the current condition, in which roadway capacity is limited and congestion has increased. This approach avoids understating the effects of the Elliott Bay Seawall Project. Additional explanation for use of the 2010 baseline year is provided in the Technical Supplement to the Transportation Discipline Report (Appendix A).

The City also performed an analysis to compare traffic volumes on Alaskan Way in 2010 with current (2013) traffic volumes, which are affected by Alaskan Way Viaduct construction. In the North Seawall project area, where no construction is taking place, traffic volumes on Alaskan Way increased by approximately 6 percent between 2010 and 2013. In the Central Seawall project area, which is affected by Alaskan Way Viaduct construction, traffic on Alaskan Way dropped by 27 percent<sup>1</sup>. The decrease in traffic on Alaskan Way is offset by a corresponding increase in traffic on parallel north-south routes in the project area, such as 1<sup>st</sup> Avenue South. This existing level of diversion is likely to continue in the southern part of the project area as construction of the seawall project begins.

### Changes in Construction and Operational Impacts

The potential impacts to the transportation network associated with the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to the transportation network include the following:

#### Transportation Key Points

- Because summer traffic volumes were used in the EIS analysis, traffic impacts are not expected to be greater than those already described in the EIS during summer construction.
- Moving the ferry-queuing area to the south of Colman Dock would improve traffic on Alaskan Way north of Yesler Way, but it may increase congestion on 1<sup>st</sup> Avenue South, S. Jackson Street, and southbound on the temporary road.

<sup>1</sup> The 2013 count includes only the temporary road beneath the Alaskan Way Viaduct, not the ferry access lanes to the west of the Alaskan Way Viaduct.

- Closing most businesses on Piers 54 through 57 for a 9-month period, currently anticipated to occur during the off-peak season from October 2014 through June 2015
- Eliminating the summer construction shutdowns
- Revising ferry queuing, beginning as soon as summer 2014 and lasting through the end of construction

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-1. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect the transportation network.

**Table 3-1. Summary of Updates Affecting Transportation**

Updates to the Preferred Alternative Affecting Transportation	New or Increased Significant Impacts?
<b>Construction</b>	
Closing most businesses on Piers 54 through 57 for an anticipated 9-month period	No – The business closure may reduce traffic in the immediate area, but it would not result in a significant change in operation.
Eliminating the summer construction shutdowns	No – Traffic modeling for the Final EIS used summer traffic volumes; therefore, continuing construction through the summer would not result in greater impacts than those already described.
Revising ferry queuing, beginning as soon as summer 2014 and lasting through the end of construction	No – The intersection of Alaskan Way and S. Jackson Street would remain congested and would drop from level of service E to F; however, the proposed ferry queuing would improve traffic operations on Alaskan Way north of Yesler Way.

### Changes in Construction Impacts

The Final EIS divided the traffic analysis for the Central Seawall project into two phases. Phase I covered the timeframe from fall 2013 to spring 2015, and the area from Virginia Street to Madison Street. Phase II covered the remaining time and area of Central Seawall construction. These phases are also used for the SEIS analysis.

During Phase I, the transportation network would be largely as described in the Final EIS, except that the temporary road would narrow from four to three lanes south of Lenora Street (rather than at Virginia Street), and access to Colman Dock would change, as described below. During Phase II (defined as fall 2015 to spring 2016), the major changes would be the revised Colman Dock access and the potential restoration of Alaskan Way as a three-lane roadway with angled parking north of Pike Street, rather than a four-lane roadway as described in the Final EIS. None of these changes are expected to increase the potential effects to traffic operations from those described in the Final EIS.

Because the traffic modeling done for the Final EIS used summer traffic volumes, which are higher than winter volumes, continuing construction through the summer months would not affect the results of the traffic analysis for Phase I or Phase II. Closure of businesses on Piers 54 through 57 to improve construction access and efficiency would likely reduce traffic somewhat in the immediate area during the closure period, but not to a significant degree. The closure would also reduce the demand for parking, which would benefit businesses that remain open during this period.

The most substantive proposed change to traffic during construction is the rerouting of ferry access to Colman Dock. As described in Chapter 2, the Final EIS evaluated two lanes of ferry queuing north of Colman Dock between Madison Street and Yesler Way, with access for northbound traffic via a U-turn at Madison Street. In the Updated Preferred Alternative, the U-turn is planned to be eliminated in summer 2014, and up to five lanes of dedicated queuing could be provided south of Colman Dock between Yesler Way and S. Jackson Street. Access to the queue would be from westbound S. Jackson Street or from southbound on the Alaskan Way temporary road. The proposed arrangement would reduce the potential for spillover of the ferry queue and would improve traffic operations on Alaskan Way north of Yesler Way by eliminating the U-turn. Southbound traffic volumes would increase on the temporary road, as ferry-bound traffic from the north would use the southbound lane instead of moving into a dedicated ferry-queuing lane. This would result in moderate congestion. There is likely to be some increase in traffic volumes on 1<sup>st</sup> Avenue South, especially at the S. Jackson Street intersection, due to the change in access patterns. However, traffic modeling indicates that intersection levels of service along 1<sup>st</sup> Avenue South would not change, although some turning movements could experience more delay. The intersection of Alaskan Way and S. Jackson Street would remain congested and would drop from level of service E to F. The EIS showed a drop in level of service from A to E at this intersection; the drop from E to F is a slight worsening of impacts.

The Final EIS identified a reduction in parking spaces along the waterfront as a result of project construction. With the Updated Preferred Alternative, the overall amount of parking available during construction would be similar, but the shift in the ferry-queuing location would allow more parking to be retained in the central commercial area north of Colman Dock.

### **Changes in Operational Impacts**

Operational impacts to the transportation network are not expected to change from those described in Section 5.1 of the Final EIS.

## **Avoidance, Minimization, and Mitigation Measures**

Other than elimination of the summer shutdown, all mitigation measures identified in the Final EIS would apply to the Updated Preferred Alternative. The only additional mitigation identified is the potential use of a flagger at the Bell Street Pier Cruise Terminal to assist with access by provisioning trucks during the months when cruise ships are active. As described in the Final EIS, the City continues to develop and implement parking mitigation measures, including highly visible maps and signage along the waterfront to direct people to parking areas and striping of parking spaces in portions of the Alaskan Way right-of-way not being used for construction. Continued implementation of WSDOT's parking mitigation program for the Alaskan Way Viaduct, although not designed to address seawall project impacts, would provide the benefit of low-rate, short-term parking spaces for waterfront visitors, promoted through marketing and online tools.

## 3.2 Economics

### Affected Environment

The study area for local economic impacts is focused between S. Jackson Street and Broad Street, and between 1<sup>st</sup> Avenue and Elliott Bay. Indirect effects to the regional economy were evaluated in the EIS and were based on a study area that includes Seattle and the surrounding central Puget Sound region (King, Snohomish, Pierce, and Kitsap counties). Regional effects were not reevaluated within this SEIS, because they are not expected to differ significantly from the previous analysis. Section 3.2 of the Final EIS provides additional information.

Businesses within the project area include food services, commercial recreation businesses, retail, and offices. The regional economy is similarly diverse, with an emphasis on industry sectors including services and tourism, high-tech, retail trade, government, and education.

### Changes in Construction and Operational Impacts

The potential economic impacts associated with the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to the local economy include the following:

- Closing most businesses on Piers 54 through 57 for a 9-month period, currently anticipated to occur during the off-peak season from October 2014 through June 2015
- Eliminating the summer construction shutdowns
- Revising ferry queuing, beginning as soon as summer 2014 and lasting through the end of construction

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-2. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect the economy.

### Economics Key Points

- The proposed business closure could result in lost revenues of approximately \$11.1 to \$18.6 million. The City would compensate property owners for the period of lost access.
- As many as 245 employees could be temporarily laid off during the proposed business closure.
- Once businesses reopen, access would be available to Zone 3 for the peak tourist season.
- The change in ferry queuing is not expected to adversely affect businesses in Pioneer Square during project construction.

**Table 3-2. Summary of Updates Affecting Economics**

Updates to the Preferred Alternative Affecting Economics	New or Increased Significant Impacts?
<b>Construction</b>	
Closing most businesses on Piers 54 through 57 for an anticipated 9-month period	No – Revenue losses within the project area would increase compared to the evaluation provided in the Final EIS, but they would be offset by the compensation provided by the City for lost access during the business closure.
Eliminating the summer construction shutdowns	Potential New Impact – Although access would be provided to businesses in the project area during construction, the impacts of construction, such as noise, disruption, and reduced parking, would continue throughout the summer in some areas.
Revising ferry queuing, beginning as soon as summer 2014 and lasting through the end of construction	No – While traffic may increase slightly in Pioneer Square as a result of revised ferry queuing, adverse effects to businesses are not anticipated.

**Changes in Construction Impacts**

As described in Section 4.2 of the Final EIS, project construction will result in substantial temporary economic effects at the local and regional level. Both adverse and beneficial effects are anticipated, as described in the Final EIS, and would include:

- Reduction in local business revenues during construction
- Decreased parking supply and parking revenue during construction
- Increase in regional employment and spending within the local economy from nearby construction activities and procurement of construction materials
- Generation of state and local sales taxes from the purchase of local goods and construction materials

The nature of these impacts is not expected to change substantially from the Updated Preferred Alternative. However, with the proposed business closure and elimination of the summer construction shutdown, the economic effects of the Updated Preferred Alternative would be greater than those described in the Final EIS. In particular, there would be a direct loss of jobs and revenue resulting from the 9-month closure of retail and restaurant businesses on Piers 54 through 57.

Results of the economic analysis performed for this SEIS are summarized below. Additional detail is provided in the Technical Supplement to the Economics Discipline Report, in Appendix B.

### *Impacts on Local Businesses*

One of the most substantial changes in the Updated Preferred Alternative is the proposed closure of businesses on Piers 54 through 57. The closure is expected to last for 9 months, currently planned to extend from October 2014 through June 2015; the businesses affected primarily consist of food and dining establishments and retail shops. These businesses draw customers to the waterfront, especially during the peak summer tourist season, and collectively they are estimated to generate between \$26 and \$43 million in annual revenue.<sup>2</sup>

Under the Updated Preferred Alternative, the restaurant and retail businesses located on Piers 54 through 57 would not be open during the 9-month business closure period. During this time, the businesses would not earn revenue, would experience a reduction in operating costs (e.g., labor, inventory, utilities), and are expected to reduce staff levels. The estimated impacts can be summarized as follows:

- The 9-month closure of businesses is estimated to result in lost gross revenues of between approximately \$11.1 and \$18.6 million. This estimate is based on the assumption, discussed in Section 4.2 of the Final EIS, that approximately 56 percent of annual revenues for waterfront businesses are generated during the months from October through June. These losses would be offset to some degree by a corresponding reduction in operating costs. The City would reimburse property owners for the loss of access to their piers during the closure period.
- The business closures could result in the temporary layoff of up to 245 employees, based on standard estimating methods for the size and types of businesses that would be affected by the closure (see Appendix B). These employees would primarily be in service roles; it is assumed that some key employees would remain on staff during the closure. Most affected workers are expected to be able to find similar jobs in the local area during the closure period. Hiring would occur before businesses reopen in summer 2015.

Once the businesses reopen, access would be restored to Piers 54 through 57 for the peak tourist season. A restored roadway with parking spaces and sidewalk would be available for pedestrian use, and construction activities would occur outside of this area.

The economic analysis in the Final EIS assumed that all retail businesses within the area directly affected by construction would experience some reduction in business during the construction period. However, if construction activities continued through the summers, the impacts to

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<sup>2</sup> This estimate is based on information gathered from a business survey conducted in 2010 for the EIS as part of the Elliott Bay Seawall Project outreach efforts and on standard estimating methods developed by the Institute of Transportation Engineers that are based on the square footage of various business types.

local businesses may increase incrementally above the level of effect described in the Final EIS. The effects of this incremental increase may be largely absorbed by transfers to other regional businesses, but local businesses would still experience adverse effects. To reduce the potential impacts from work during the summer seasons, the City would phase construction activities, to the greatest extent feasible, to ensure that access to businesses and parking was provided during the summer.

### *Impacts on Sales Tax Revenue*

The proposed business closure and the resulting loss of sales may result in additional adverse effects on sales tax revenue compared to the impact described in Section 4.2 of the Final EIS. No sales taxes would be generated by the affected retail and restaurant businesses during the closure. Based on the estimated revenue losses, it is expected that sales tax losses due to the business closure would range from \$1.4 to \$2.3 million. Additional reduction in sales tax revenue beyond that estimated in the Final EIS could occur if continued construction during summer seasons resulted in reduced patronage of the waterfront businesses. While these estimated revenue losses are considerably greater than the estimated \$500,000 sales tax loss for the same time period in the Final EIS, this loss in sales tax would still be more than offset by the sales tax gained through regional spending for project construction.

### *Potential Impacts on Businesses in Pioneer Square*

As described in Chapter 2, changes are proposed to the ferry queuing plan evaluated in the EIS. An analysis was done to evaluate whether the changes in queuing locations might lead to increased traffic congestion that could affect Pioneer Square businesses. As discussed in Section 3.1 of this SEIS, traffic modeling indicates that the revised ferry queuing may slightly increase congestion within Pioneer Square by increasing delay at the intersection of 1<sup>st</sup> Avenue South and S. Jackson Street. Operations along 1<sup>st</sup> Avenue South may also be affected by varying levels of pedestrian activity at the intersections; however, these changes in traffic operations would be minor, with no changes expected in overall levels of service at any of the intersections along 1<sup>st</sup> Avenue South. Therefore, the change in ferry queuing is not expected to adversely affect businesses in Pioneer Square during project construction.

### **Changes in Operational Impacts**

Operational impacts to the local and regional economy are not expected to change from those described in Section 5.2 of the Final EIS. The project still has the potential to result in a minor beneficial effect on the local and regional economy.

## **Avoidance, Minimization, and Mitigation Measures**

Mitigation for economic impacts will generally remain as described in Sections 4.2 and 5.2 of the Final EIS. To mitigate for the closure of most businesses on Piers 54 through 57, the City would compensate property owners for the period of lost access. In addition, the City will work to minimize the effects of summer construction on project area businesses to the greatest extent feasible through outreach and coordination with the business owners, and through careful timing and sequencing of disruptive activities.

As described in the Final EIS, the City continues to develop and implement parking mitigation measures, including highly visible maps and signage along the waterfront to direct people to parking areas and striping of parking spaces in portions of the Alaskan Way right-of-way not being used for construction. Continued implementation of WSDOT's parking mitigation program for the Alaskan Way Viaduct, although not designed to address seawall project impacts, would provide the benefit of low-rate, short-term parking spaces for waterfront visitors, promoted through marketing and online tools.

## 3.3 Noise and Vibration

### Affected Environment

The upland study area for the noise and vibration analysis is generally within 1,000 feet of the project area. For in-water noise, the study area extends up to 7 miles. Section 3.3 of the Final EIS provides more information regarding the affected environment and the regulations and guidelines applicable to construction-related noise and vibration.

#### *Noise*

The predominant source of noise in the project area is traffic on the Alaskan Way Viaduct and Alaskan Way. Ambient daytime noise levels at outdoor monitoring locations within the project area range between 60 A-weighted decibels (dBA) and 80 dBA. Underwater noise levels are dominated by container shipping, ferry, and other boat traffic.

#### *Vibration*

Vibration within the project area is generated by the Alaskan Way Viaduct; however, existing vibration levels are below the threshold that is typically perceptible to humans.

### Changes in Construction and Operational Impacts

The potential impacts on noise and vibration from the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential noise and vibration effects include:

- Eliminating the summer construction shutdowns
- Providing up to continuous dewatering and treatment for all excavation areas behind containment wall

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-3. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to increase impacts from noise and vibration.

### Noise and Vibration Key Points

- Without the summer shutdown period, construction noise would continue during the summer months and could affect nearby businesses and residences, as well as visitors.
- Pumps used for water treatment could generate sound levels of 90 dBA or more at 30 feet, which would be perceptible at all times during construction. Mitigation would be used to reduce sound levels to within the project's noise variance limits.

**Table 3-3. Summary of Updates Affecting Noise and Vibration**

Updates to the Preferred Alternative Affecting Noise and Vibration	New or Increased Significant Impacts?
<b>Construction</b>	
Eliminating the summer construction shutdowns	No – Construction-related noise during the summer season would be similar to the noise generated at other times during construction, as outlined in the Final EIS; the most intense source of noise (i.e., pile driving) would primarily occur outside of the summer months.
Providing up to continuous dewatering and treatment for all excavation areas behind containment wall	No – Noise from the water treatment processes could be loud and continuous, and unattenuated noise levels would be similar to those generated by heavy construction equipment. However, mitigation measures would be used as needed to ensure that noise levels were in compliance with the project noisevariance.

### Changes in Construction Impacts

Similar to the Preferred Alternative, the Updated Preferred Alternative would result in short-term, moderate adverse effects on the noise environment; however, details regarding the timing of effects and the sources and locations of noise would change based on the proposed revisions to construction schedule and technique.

#### *Noise*

Without the summer construction shutdown, construction activities would generate noise throughout the summer. Elimination of the summer construction shutdown would expose a greater number of people to increased noise levels, due to the higher volumes of people that typically visit the waterfront in the summer. Construction activities during these summer months may be phased to avoid working directly in front of businesses or other sensitive noise receptors, but the noise would be audible throughout the Central Seawall project area.

Construction-related noise could occur during both daytime and nighttime hours, as multiple shifts may be needed each day to meet the construction schedule. During the summer, the increased noise levels would be intermittently intrusive to businesses and residences with outdoor seating and to those that rely on open windows to regulate indoor temperatures. In particular, people living along Alaskan Way may experience sleep disruption if their windows are open at night during the summer months. The pedestrian environment would also be affected by heavy equipment noise, which could contribute to “input overload.” Pedestrians may walk through the area faster or choose a different route altogether in response to the noise generated within the project area. Noise levels during the summer season would be similar to those described in the EIS for other months.

One source of noise not evaluated in the Final EIS is from pumps used in the water treatment process. As described in Chapter 2, these pumps may be located on a barge. To evaluate the greatest potential impact, the noise analysis assumes that water treatment would be located on a barge at Piers 62/63. This area has sufficient space to support the water treatment process and also enables the City to evaluate the potential effects to the most sensitive noise receivers within the project area. Several pumps would likely run simultaneously 24 hours per day, 7 days per week for the duration of construction. As described in the Technical Supplement to the Noise and Vibration Discipline Report (Appendix C), these effects would be significant if not mitigated.

Dewatering pumps can generate sound levels of 90 dBA or more at 30 feet, which could increase if many pumps were running simultaneously. This noise level is similar to the noise produced by typical heavy equipment, but it would be perceived as a steady hum or whine and would likely be perceptible at all times during construction (day and night). Depending on the placement of the pumps, unmitigated noise could be clearly audible inside residences across Alaskan Way, at the adjacent Seattle Aquarium, and at nearby recreational spaces such as Piers 62/63. Noise from these pumps would be more perceptible at night when background noises are reduced.

Various measures could be used to reduce these noise levels. For example, if sound-attenuated pumps were feasible for use, they could reduce the noise levels to approximately 65 and 70 dBA at 30 feet. Other measures include placing the pumps as far away as possible from sensitive receivers and shielding them by using enclosures and/or placing them behind the treatment tanks. Regardless of the measures used, noise levels would comply with applicable noise regulations.

### *Vibration*

Temporary construction-related impacts from vibration are not expected to change as a result of the Updated Preferred Alternative. For more information on these effects, please see Section 4.3 of the Final EIS.

### **Changes in Operational Impacts**

Operational impacts from noise and vibration are not expected to change from those described in Section 5.3 of the Final EIS. The Alaskan Way Viaduct would continue to be the primary source of noise in the project area until it is closed to traffic in 2016, and noise associated with its operation would be comparable to existing conditions. Although routine maintenance and repair of the new seawall could result in temporary noise and vibration, these effects are expected to be negligible.

## **Avoidance, Minimization, and Mitigation Measures**

The City will comply with the Seattle Noise Ordinance, which includes obtaining noise variances as necessary. Mitigation measures specified within the noise variances will be implemented to reduce construction noise.

To mitigate for potential adverse effects from noise generated by the water treatment barge, the water treatment system would be designed, through building and other equipment specifications (e.g., sound-attenuated pumps, silencers, mufflers, and engineered sound enclosures), to reduce noise levels to fully comply with the thresholds outlined under all federal, state, or local noise regulations, including the Seattle Noise Ordinance and the project noise variances.

### 3.4 Cultural, Historic, and Archaeological Resources

#### Affected Environment

The study area for cultural, historic, and archaeological resources is referred to as the Area of Potential Effects (APE). The northern and southern boundaries of the APE are at Broad Street and S. Main Street, respectively. The eastern boundary extends up to two blocks from the existing seawall to incorporate historic properties that may be affected by ground disturbance, noise, vibrations, and other project elements. The western boundary extends into Elliott Bay and is based on the waterward limit of the proposed ecosystem restoration, water-access elements of the project, or the end of piers. The maximum vertical depth of the APE is based on the extent of ground-disturbing activities required for project construction, extending up to 75 feet below ground surface.

The number of historic properties that are eligible for or listed in the National Register of Historic Places (NRHP), or are locally recognized historic properties, has been updated since the Final EIS. A total of 26 historic buildings or structures are located within the APE; 19 were listed in the Final EIS. This number has been updated to include additional resources located within the Pioneer Square Historic District that were inadvertently omitted from the Final EIS. Table 3-4 reflects the historic properties within the APE.

The number of archaeological sites eligible for listing in the NRHP has also been updated. Additional studies led by Washington State Ferries and the Federal Transit Administration following publication of the Final EIS provided evidence that two of the three underwater archaeological sites identified in the EIS near Colman Dock (sites 45KI1012 and 45KI1013) were not eligible for the NRHP (Johnson *et al.*, 2013). USACE and the Washington State Department of Archaeology and Historic Preservation (DAHP) have concurred with the revised list of historic properties and determinations of eligibility.

Additional information regarding the cultural setting and historic resources within the APE is provided in Section 3.4 of the Final EIS.

#### Cultural, Historic, and Archaeological Resources Key Points

- Two potentially affected archaeological sites identified in the Final EIS have been determined not to be eligible for the NRHP. This leaves only two adversely affected historic properties (the existing seawall and the Washington Street Boat Landing).
- In consultation with USACE, DAHP, and the Advisory Council on Historic Preservation, the City has signed a Memorandum of Agreement that identifies means for avoiding, minimizing, and mitigating adverse effects to the affected properties.

**Table 3-4. Historic Properties within the Area of Potential Effects**

ID	Address	Current Name (Historic Name)	Historic Designation
H1	Alaskan Way	Elliott Bay Seawall	Eligible NRHP
H2	Alaskan Way/Battery Street	Alaskan Way Viaduct and Battery Street Tunnel	Eligible NRHP
H3	S. Main Street to Bell Street	Burlington Northern Railroad Tunnel (Great Northern Railway Tunnel)	Eligible NRHP

**Table 3-4. Historic Properties within the Area of Potential Effects**

ID	Address	Current Name (Historic Name)	Historic Designation
H4	Foot of S. Washington Street	Washington Street Boat Landing Pergola	NRHP, PSPD
H5	1 Yesler Way	One Yesler Building (Bedford Hotel)	PSHD, PSPD
H6	619 Western Avenue	Western Building	PSHD, PSPD
H7	61 Columbia Street	Polson Building	PSHD, PSPD
H11	925 Alaskan Way	Fire Station No. 5	Eligible NRHP and SL
H12	911 Western Avenue	Maritime Building	Eligible NRHP
H13	1001 Alaskan Way	Pier 54 (Northern Pacific Railroad 3/Galbraith Dock)	Eligible NRHP and SL
H14	1101 Alaskan Way	Pier 55 (Northern Pacific Railroad 4/Arlington Dock)	Eligible NRHP and SL
H15	1201 Alaskan Way	Pier 56 (Frank Waterhouse House)	Eligible NRHP and SL
H16	1203-1207 Western Avenue	(Olympic Warehouse)	NRHP; SL
H17	51 University Street	(Pacific Net and Twine Building)	Eligible NRHP and SL
H18	1301 Alaskan Way	Pier 57 (John P. Agen’s/Milwaukee Dock)	Eligible NRHP and SL
H23	1483 Alaskan Way	Pier 59/Seattle Aquarium (Ainsworth & Dunn Pike St. Wharf)	SL
H26	1507 Western Avenue	Fix Building	Eligible NRHP and SL
H27	Pike Place	Main Arcade Pike Place Market	PPMHD
H34	2800 Elliott Avenue	Old Spaghetti Factory (Ainsworth & Dunn)	Eligible NRHP and SL
<i>H35</i>	<i>77 Yesler Way</i>	<i>Pioneer Square Hotel (Yesler Hotel)</i>	<i>PSHD</i>
<i>H36</i>	<i>114 Alaskan Way S.</i>	<i>Prudential Building</i>	<i>PSHD</i>
<i>H37</i>	<i>68 S. Washington Street</i>	<i>Washington Park Building (Lowman &amp; Hanford)</i>	<i>PSHD</i>
<i>H38</i>	<i>77 S. Washington Street</i>	<i>Compass Center (Pacific Coast Company)</i>	<i>PSHD</i>
<i>H39</i>	<i>81 S. Washington Street</i>	<i>St. Charles Hotel</i>	<i>PSHD</i>
<i>H41</i>	<i>212 Alaskan Way S.</i>	<i>OK Hotel</i>	<i>PSHD</i>
<i>H42</i>	<i>76 S. Main Street</i>	<i>Boston Hotel</i>	<i>PSHD</i>

Notes: NRHP = National Register of Historic Places; PPMHD = Pike Place Market Historic District; PSHD = Pioneer Square Historic District; PSPD = Pioneer Square Preservation District (local); SL = Seattle Landmark  
Italicized font indicates properties added to the list of historic properties after the Final EIS was issued.

## Changes in Construction and Operational Impacts

The potential effects to cultural, historic, and archaeological resources from the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to historic resources within the APE include:

- Closing most businesses on Piers 54 through 57 for a 9-month period, currently anticipated to occur during the off-peak season from October 2014 through June 2015

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-5. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect cultural, historic, and archaeological resources.

**Table 3-5. Summary of Updates Affecting Cultural, Historic, and Archaeological Resources**

Updates to the Preferred Alternative Affecting Cultural, Historic, and Archaeological Resources	New or Increased Significant Impacts?
<b>Construction</b>	
Closing most businesses on Piers 54 through 57 for an anticipated 9-month period	No – The City would work with property owners to ensure that the historic buildings and structures are maintained in good condition throughout the closure.

## Changes in Construction Impacts

As described in Section 4.4 of the Final EIS, two types of effects on historic properties in the built environment may occur during construction: physical effects and effects due to noise, dust, mud, traffic congestion, construction traffic, loss of parking, and limited access to buildings. The proposed updates to the Preferred Alternative would not change the project’s physical effects on historic properties, and they would not change the nature of the indirect effects, though the timing of effects would change. Public access to most portions of the historic piers would be reduced during the business closure period.

The business closure period is currently planned to last from October 2014 through June 2015. After the closure, access would be available to the historic piers. The City would work to restore the roadway and sidewalk for vehicle and pedestrian access before the busy summer season, and parking would be provided in the vicinity of these piers.

Through consultation with DAHP and USACE, the City determined that project construction would result in an adverse effect to two historic properties – the Elliott Bay Seawall and the Washington Street Boat Landing pergola. These adverse effect determinations would not change as a result of the updates to the Preferred Alternative.

## **Changes in Operational Impacts**

Operational impacts on cultural, historic, and archaeological resources are not expected to change from those described in Section 5.4 of the Final EIS. The project would have no adverse operational effects on the remaining NRHP-eligible archaeological site. The Elliott Bay Seawall would be affected by the project, as its existing function would be replaced by operation of the new seawall structure.

## **Avoidance, Minimization, and Mitigation Measures**

Following publication of the Final EIS, a Memorandum of Agreement (MOA) has been developed by USACE, in consultation with DAHP, the City of Seattle, interested tribes, and other consulting parties, to mitigate for the adverse effects to the Elliott Bay Seawall and the Washington Street Boat Landing. Some of the primary mitigation measures in the signed MOA include:

- Tribal and public outreach and education related to waterfront history
- Archival documentation of the seawall with a narrative history and photographs
- Development of an archaeological monitoring plan and an inadvertent discovery plan
- Development of a vibration monitoring plan that includes a procedure to minimize and repair potential damage to historic properties
- Refinement of the Zone 1 beach design, as described in Chapter 2, to minimize adverse effects to the historic setting of the Washington Street Boat Landing pergola
- Restoration and replacement of the Washington Street Boat Landing pergola

## 3.5 Land Use, Shorelines, and Parks and Recreation

### Affected Environment

As described in Section 3.5 of the Final EIS, the study area for land use, shorelines, and parks and recreation is generally located between S. Washington Street and Broad Street, and between 1<sup>st</sup> Avenue and Elliott Bay. Many urban zones, including industrial, commercial, and mixed use, exist within the study area and provide for a variety of land uses. Among the office, commercial, hotel, retail, government, and residential uses, there are many formally designated parks and recreational areas, as well as informal shoreline public access areas.

The shoreline within the study area has been designated as Urban Harborfront in the City's Shoreline Master Program. The Urban Harborfront designation encourages economically viable, water-dependent uses to meet the needs of waterborne commerce, facilitates the revitalization of the downtown Seattle waterfront, provides opportunities for public access and recreational enjoyment of the shoreline, preserves and enhances elements of historic and cultural significance, and preserves views of Elliott Bay and landforms beyond.

### Changes in Construction and Operational Impacts

The land use, shorelines, and parks and recreation impacts associated with the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to land use, shorelines, and parks and recreation include the following.

- Closing most businesses on Piers 54 through 57 for a 9-month period, currently anticipated to occur during the off-peak season from October 2014 through June 2015
- Eliminating the summer construction shutdowns
- Modifying habitat improvements to avoid conflicts with navigation and adjacent structures

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-6. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect land use, shorelines, and parks and recreation.

### Land Use, Shoreline, and Parks and Recreation Key Points

- Land use and shoreline access within the central waterfront would be temporarily affected during the proposed business closure.
- More people would be affected by construction-related impacts, such as noise, vibration, and dust, because construction would continue during the peak summer tourism season.
- To mitigate the impact on Argosy Cruises when public access in Zone 3 is limited, tours would leave from different locations.

**Table 3-6. Summary of Updates Affecting Land Use, Shorelines, and Parks and Recreation**

Updates to the Preferred Alternative Affecting Land Use, Shorelines, and Parks and Recreation	New or Increased Significant Impacts?
<b>Construction</b>	
Closing most businesses on Piers 54 through 57 for an anticipated 9-month period	No – The business closure is planned to occur during off-peak months. Park access would be maintained during the closure period, though access points could change.
Eliminating the summer construction shutdowns	No – Construction through the summer may affect regular access points to parks and recreational facilities, but it would be phased to avoid (to the extent feasible) working directly in front of shoreline public access points and parks and recreational facilities during the busy summer months. Additionally, the City would work to restore the roadway and sidewalk for parking and pedestrian access to the greatest extent possible before the summer season.
<b>Operation</b>	
Modifying habitat improvements to avoid conflicts with navigation and adjacent structures	No – This change would result in a slight improvement from the EIS design because conflicts to existing use of these shoreline moorage areas would be reduced or avoided.

### Changes in Construction Impacts

Seawall construction will temporarily affect land use, shorelines, and parks and recreation through short-term changes in parking supply and modifications in access to businesses, residences, parks and recreational facilities, and shorelines, as well as increased noise, vibration, and dust from adjacent construction activities. This disruption may reduce the number of visitors to shoreline public access areas and to parks and recreational facilities along the waterfront during construction. In the Final EIS, the summer construction shutdown was expected to reduce impacts during the period when higher numbers of people typically visit the waterfront. The proposed changes to the construction schedule, including the potential need to work through the summer construction shutdowns, would increase the effects to land use, shorelines, and parks and recreation compared to those described in the Final EIS.

#### *Land Use and Shorelines*

The closure of most businesses on Piers 54 through 57 for an anticipated period of 9 months would temporarily affect land use, as these businesses form the primary retail and service zone within the project area. Because patronage of these retail shops and services is expected to resume after construction is completed in Zone 3, no permanent effects on land use are expected, either on the piers themselves or on other uses in the surrounding area.

Elimination of the summer shutdown period would result in impacts to land uses along Alaskan Way, including temporary access disruption, noise and vibration, and dust. Although these impacts would be of the same type as those described in the Final EIS, more people would be affected because of the greater use of the area during this time period.

As described in the EIS, temporary construction easements (TCEs) will be required to provide space for construction activities and equipment. These TCEs will be located waterward of the existing seawall. As a result of design refinements and additional construction planning, the total square footage of the TCEs has increased by approximately 50 percent from the estimate provided in the Final EIS, but no adverse effects from temporary use of the space are anticipated because right-of-way agreements would be executed with the landowners before construction begins on the affected parcels.

### *Parks and Recreation*

The waterfront's shoreline public access points, parks, and recreational facilities are most heavily used during the summer months; therefore, if the summer construction shutdowns were eliminated, the potential effects to these areas would be greater than those discussed in the Final EIS.

Throughout construction and during the summer months, the sidewalk on the west side of Alaskan Way would remain in place except within the active construction zone. Temporary structures would provide access through the active construction zone; however, these structures would modify regular access to the shoreline, park, and recreational facilities, affecting the ease of activities such as walking and viewing. The noise, vibration, and dust that occur during active construction may also affect regular use of the waterfront. The increased disruption during summer would be somewhat offset by the fact that the construction would be phased to avoid working directly in front of park and recreational areas, to the extent feasible.

In addition to shops and restaurants, Piers 54 through 57 provide shoreline public access points, which would be restricted throughout the business closure period; however, shoreline public access will still be provided throughout the larger project area, as construction will be concentrated in Zone 3 during this time. The public will retain the ability to access and enjoy the shoreline at other locations along the waterfront.

Argosy Cruises, located between Piers 55 and 56 in Zone 3, would be affected by limited access during construction. The regularly scheduled boat services and cruises that depart from the waterfront would continue, but they would be relocated elsewhere along the Elliott Bay waterfront or to South Lake Union, where Argosy also currently operates. Access to the remaining parks and recreational facilities in the Central Seawall project area would remain the same as discussed in the Final EIS.

## **Changes in Operational Impacts**

Temporary effects on land use, shorelines, and parks and recreation during project construction would not affect long-term land use decisions, access to the shoreline, or use of park and recreational facilities in the project area; however, several modifications made during the final design process may result in slight changes to operational (permanent) impacts. None of these impacts are expected to be adverse or significant.

To ensure that adjacent land uses and shoreline access along the seawall are not affected, some of the habitat improvements described in the Final EIS would be modified. The expanded habitat bench north of Pier 54 would be removed because it would be located on privately owned property. In addition, to minimize potential impacts to existing moorage, the expanded habitat bench north of Pier 69 would be removed, and the waterward extent of the habitat bench north of Pier 56 would be reduced. Collectively, these modifications would avoid the potential adverse impacts on land use and shorelines that might have occurred from the design in the Final EIS. By avoiding conflict with navigation, this change would also be consistent with the Urban Harborfront shoreline designation, which encourages water-dependent uses to meet the needs of waterborne commerce.

## **Avoidance, Minimization, and Mitigation Measures**

### **Construction Mitigation**

To mitigate the potential impacts of working through the summer, construction would be timed, to the extent feasible, to avoid working in front of shoreline public access points or parks during the summer months when use of these areas is at its annual peak.

During the business closure at Piers 54 through 57, shoreline public access points would be available at other locations along the seawall. To mitigate the impact on Argosy Cruises when public access in Zone 3 is limited, tours would leave from a different location. The City would provide relocation assistance in accordance with existing policies.

### **Operational Mitigation**

Changes in operational effects would not result in new or increased significant impacts; therefore, no additional mitigation measures for land use, shorelines, and parks and recreation are recommended beyond those outlined in the Final EIS.

### 3.6 Public Services and Utilities

#### Affected Environment

##### Public Services

Public services within the project area include fire suppression and emergency medical services, law enforcement services, disaster preparedness, and solid waste disposal and recycling. Section 3.6 of the Final EIS contains additional information on public services in the project area.

##### Utilities

Alaskan Way accommodates many public and private utilities, including electricity, water, stormwater drainage, wastewater management, natural gas, steam, and telecommunications. These systems service adjacent properties and function as part of larger city-wide and regional utility systems. Please see Section 3.6 of the Final EIS for additional information.

#### Public Services and Utilities Key Points

- During summer construction, emergency response times could be slower than estimated in the Final EIS because of the additional people and traffic in the area.

#### Changes in Construction and Operational Impacts

The impacts on public services and utilities from the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to public services and utilities include:

- Eliminating the summer construction shutdowns
- Reducing the number of temporary access structures to Piers 54 through 57 during the business closure period

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-7. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect public services and utilities.

**Table 3-7. Summary of Updates Affecting Public Services and Utilities**

Updates to the Preferred Alternative Affecting Public Services and Utilities	New or Increased Significant Impacts?
<b>Construction</b>	
Eliminating the summer construction shutdowns	No – Restricted mobility and access disruptions affecting public services and utilities would continue through the summer months, but they would be consistent with those anticipated during the regular construction season.

**Table 3-7. Summary of Updates Affecting Public Services and Utilities**

Updates to the Preferred Alternative Affecting Public Services and Utilities	New or Increased Significant Impacts?
Reducing the number of temporary access structures to Piers 54 through 57 during the business closure period.	No – Although access would be reduced, temporary access structures would still be provided during construction in front of these piers and would still meet fire and emergency access standards. Access needs would be lower due to business closures.

## Changes in Construction Impacts

### *Public Services*

As described in Section 4.7 of the Final EIS, seawall construction will result in restricted mobility and access disruptions in the corridor. These conditions will temporarily affect public services by increasing emergency response times by up to 17 seconds and reducing access for service providers within the project area. Demand for public services, such as police or emergency medical services, may also increase with the presence of an active construction zone; however, this should be a relatively minor effect.

Under the original construction schedule, regular (i.e., faster) response times would resume during the summer construction shutdown. The proposed elimination of the summer shutdown would result in continued potential for delay during the summer months. Therefore, response times could be increased by up to 17 seconds for the entire duration of Central Seawall construction.

Reducing the number of temporary access structures to Piers 54 through 57 during the business closure period may complicate the ability to provide fire and police services. However, because an emergency response plan will be in place and there would be fewer businesses open during the closure period, the risk of fire or other emergencies may be lower. Thus, the net effect of the changes on emergency services is not expected to be significant. Effects on the remaining public services, including solid waste collection, disposal, and recycling, public schools, and postal services could continue through the summer months, but they would not change significantly from the analysis in the Final EIS.

### *Utilities*

Temporary construction-related impacts to utilities are not expected to change as a result of the Updated Preferred Alternative. For more information on these effects, please see Section 4.7 of the Final EIS.

### **Changes in Operational Impacts**

Operational impacts on public services and utilities are not expected to change from those described in Section 5.7 of the Final EIS. Generally, public services would not be affected by the project, while many utility facilities would be physically improved and/or more reliable because of upgrades made in conjunction with the seawall project.

### **Avoidance, Minimization, and Mitigation Measures**

Mitigation for public services and utilities will remain as described in Sections 4.7 and 5.7 of the Final EIS. The City will continue to coordinate with service and utility providers to minimize delays in response times and outages in service during construction. No additional mitigation is proposed.

## 3.7 Social Resources and Environmental Justice

### Affected Environment

The study area for social resources and environmental justice is consistent with the study area defined in the Final EIS – between S. Washington Street and Broad Street, and between 1<sup>st</sup> Avenue and Elliott Bay. The demographics and social resources of the area are described in Section 3.7 of the Final EIS, including identification of neighborhoods, housing and community facilities, religious and cultural institutions, social and employment services, and government installations. The affected environment also includes groups that are federally protected by Executive Order 12898 on environmental justice, including minorities, low-income households, transit-dependent populations, individuals over 65 years old, persons with disabilities, Limited English Proficiency populations, and Native Americans.

### Changes in Construction and Operational Impacts

The social resources and environmental justice impacts associated with the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to social resources and environmental justice include:

- Closing most businesses on Piers 54 through 57 for a 9-month period, currently anticipated to occur during the off-peak season from October 2014 through June 2015
- Eliminating the summer construction shutdowns

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-8. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect social resources and environmental justice.

### Social Resources and Environmental Justice Key Points

- Construction-related impacts on residents living near the work zone and local community resources would continue during the summer due to the lack of the summer construction shutdown.
- Employees laid off as a result of the business closures may experience temporary hardship after the layoff, but they are generally expected to be able to find other work.
- Changes to the project are not expected to result in disproportionately high and adverse effects on environmental justice populations.

**Table 3-8. Summary of Updates Affecting Social Resources and Environmental Justice**

Updates to the Preferred Alternative Affecting Social Resources and Environmental Justice	New or Increased Significant Impacts?
<b>Construction</b>	
Closing most businesses on Piers 54 through 57 for an anticipated 9-month period	No – Although minimum-wage and other lower-income workers at the affected businesses would need to seek new employment, the supply of jobs in the regional economy is expected to be sufficient to absorb the short-term job loss.

**Table 3-8. Summary of Updates Affecting Social Resources and Environmental Justice**

Updates to the Preferred Alternative Affecting Social Resources and Environmental Justice	New or Increased Significant Impacts?
Eliminating the summer construction shutdowns	No – Construction would continue through the summer and may affect social resources and residents within the project area, but it would be consistent with the impacts anticipated during the other months of construction.

## Changes in Construction Impacts

### *Neighborhood Cohesion*

The types of construction impacts on social resources within or adjacent to the project area would be similar to those described in Section 4.8 of the Final EIS. Construction traffic, noise, dust, light, and glare would affect residents living within or near the work zone, especially the elderly, people with disabilities, or people dependent on transit. The homeless population would also be affected by these impacts and by the removal of informal places of shelter. Additional impacts, such as access restrictions or changes in transit routes, would affect local community resources and facilities.

Congestion, travel delays, increased response time for emergency services, changes in transit services, and decreased parking could, as described in the Final EIS, have adverse effects on minority and low-income populations.

In the EIS, these impacts were expected to be reduced to some degree by the summer construction shutdown. However, with the proposed elimination of the summer construction shutdowns, the effects to community cohesion would be somewhat greater than those described in the Final EIS. The effects described above would continue through the summer months in active construction areas. Once mitigation measures are implemented, however, these changes are not expected to significantly affect neighborhood cohesion.

### *Employment and Housing*

The temporary closure of retail and restaurant businesses on Piers 54 through 57 could result in the loss of as many as 245 service-sector jobs for the anticipated 9-month closure period. The business closure may result in temporary economic hardship for those individuals. However, service-sector jobs are relatively abundant in the region, and it is expected that most employees laid off would be able to find similar work within the region. Although the businesses may not immediately staff up to preclosure levels, they would likely rehire a similar number of employees prior to reopening and would eventually regain a full staff; therefore, no permanent employment impacts are anticipated.

### *Environmental Justice*

Barge use during construction may affect tribal fishing, as gear may need to be relocated, and fishing from the piers or in Elliott Bay could be disrupted. However, these impacts would be mitigated by the implementation of an operations protocol that addresses the ingress and egress of barges during construction, associated communication between the City and affected tribes, and reimbursement for lost fishing time and damaged gear. In addition, the City has committed to prohibiting the use of delivery barges for the project during August and September to minimize potential impacts during the peak fishing period.

The overall impacts on environmental justice populations are not expected to change from those described in Section 4.8 of the Final EIS and are not expected to be “disproportionately high and adverse.”

### **Changes in Operational Impacts**

Operational impacts on social resources and environmental justice populations are not expected to change from those described in Section 5.8 of the Final EIS. Social resources would not be affected by the project.

### **Avoidance, Minimization, and Mitigation Measures**

Mitigation for social resources and environmental justice will remain as described in Sections 4.8 and 5.8 of the Final EIS. Outreach efforts will continue through construction and will inform social service agencies, neighborhood groups, and representatives of religious, cultural, and governmental institutions of ongoing construction activities and potential disruptions. Through existing government-to-government consultation, the City will coordinate with the affected tribes to reduce potential impacts on tribal fishing from construction activities within the project area. In addition to the existing mitigation measures, the City would prohibit the use of delivery barges for the project during August and September to minimize effects on the peak fishing season.

### 3.8 Visual Quality

#### Affected Environment

The visual quality assessment in the Final EIS considered 19 visual resources, some of which are of regional importance and others of more local interest. Regional visual resources include the Olympic Mountains, Elliott Bay, and the Seattle skyline. The remaining visual resources are located within the project area and include the piers, Bell Harbor Marina, Waterfront Park, Colman Dock Ferry Terminal, and the Washington Street Boat Landing pergola, as well as the existing Elliott Bay Seawall, its railing, and the exposed riprap stone revetment along its base. These resources are further described in Section 3.9 of the Final EIS.

#### Changes in Construction and Operational Impacts

The visual quality impacts associated with the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to visual quality include:

- Eliminating the summer construction shutdowns
- Modifying habitat improvements to avoid conflicts with navigation and adjacent structures
- Incorporating aesthetic design elements into the Zone 1 habitat beach

Relevant updates to the Preferred Alternative and impacts are summarized in Table 3-9. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect visual quality.

#### Visual Quality Key Points

- Without the summer shutdown, more viewers would experience visual impacts from construction equipment and an active work zone due to the higher level of activity along the waterfront in the peak season.
- Aesthetic design elements would be incorporated into the design of the Zone 1 beach.

**Table 3-9. Summary of Updates Affecting Visual Quality**

Updates to the Preferred Alternative Affecting Visual Quality	New or Increased Significant Impacts?
<b>Construction</b>	
Eliminating the summer construction shutdowns	No – Although construction would continue through the summer, the effects to visual quality would be consistent with the impacts anticipated during the remaining months of construction.
<b>Operation</b>	
Modifying habitat improvements to avoid conflicts with navigation and adjacent structures	No – The habitat improvements will not be prominent visual features because they will be installed within the intertidal and subtidal zones; therefore, modification of the overall habitat design would not have a significant impact on visual quality.

**Table 3-9. Summary of Updates Affecting Visual Quality**

Updates to the Preferred Alternative Affecting Visual Quality	New or Increased Significant Impacts?
Incorporating aesthetic design elements into the Zone 1 habitat beach	No – Aesthetic elements would be coordinated with the natural features of the beach and the surrounding area.

### Changes in Construction Impacts

As described in Section 4.9 of the Final EIS, seawall construction will temporarily affect visual quality within the study area due to the presence of construction equipment and an active work zone. Construction would also require the removal and temporary relocation of Alaskan Way, and the removal and replacement of existing sidewalks, railings, street trees, furnishings, signs and architectural features, and the seawall face. A construction fence would be constructed around the perimeter of the work zone and may add visual interest within the project area.

While the types of temporary impacts on visual quality would remain unchanged by the Updated Preferred Alternative, the duration and timing of construction would be modified. As noted in Chapter 2, the summer shutdown would be eliminated; as a result, the visual quality and character of the project area could be affected continuously during Central Seawall construction. This would mean that visual impacts would be experienced for a longer period of time, and by more viewers due to the higher level of activity along the waterfront in the peak season. However, the proposed schedule changes would not significantly change the effects to visual quality compared to the analysis in the Final EIS.

### Changes in Operational Impacts

Operational impacts on visual quality would remain mostly unchanged from the discussion provided in Section 5.9 of the Final EIS. Views toward the regional visual resources, the Olympic Mountains, Elliott Bay, and the Seattle skyline will be preserved. Within the study area, the project improvements will reinforce the existing visual character.

The Final EIS noted that the visual experience from adjacent piers and watercraft could be improved by the habitat features, which would be installed between piers and at the southern end of the project area, south of Colman Dock. The areas where habitat features are proposed to change would be located in the intertidal and subtidal zones and would typically be out of view; therefore, the proposed slight modifications to their design are not expected to result in significant differences in visual quality from the Preferred Alternative.

The City may also incorporate aesthetic design elements into the natural features of the Zone 1 beach. Although the design elements are still in the conceptual phase, they would be compatible with the area's natural function as habitat. These design elements are not expected to change the form of the beach or change views of Elliott Bay, the Olympic Mountains, or the Washington Street Boat Landing pergola.

Overall, although the proposed changes in project design would result in slightly different impacts on visual quality from those described in the Final EIS, these changes are not expected to result in significant impacts.

### **Avoidance, Minimization, and Mitigation Measures**

Mitigation for visual quality will remain as described in Sections 4.9 and 5.9 of the Final EIS. The City will install screening around the work zone to mitigate for adverse effects on visual resources during construction. After construction, the City will install riparian vegetation and replace street trees to mitigate for these effects to visual quality within the project area. No additional mitigation is proposed.

## 3.9 Fish, Wildlife, and Vegetation

### Affected Environment

The study area evaluated for fish, wildlife, and vegetation has not changed from the Final EIS and is located between S. Washington Street and Broad Street. Western Avenue delineates the eastern border; the western border generally extends into Elliott Bay to approximately the 50-foot bathymetric contour, which varies along the seawall. Impacts on local biological resources can extend in-water for up to 7 miles during certain construction activities (i.e., pile driving), so the study area is increased accordingly in these instances.

The affected environment described in Section 3.10 of the Final EIS has not changed; however, nearshore habitat within the project area has recently been proposed for designation as critical habitat for yelloweye rockfish, canary rockfish, and Bocaccio. These fish are 3 of the 17 endangered, threatened, and candidate species within the project area.

The physical and biological features that are essential to the conservation of juvenile canary rockfish and Bocaccio occur within the nearshore ecosystem in Elliott Bay and are comprised of substrates with sand, rock, and/or cobble that also support kelp. The proposed critical habitat designation also includes deepwater portions of Elliott Bay, but the deep water habitat is located outside of the project area.

### Changes in Construction and Operational Impacts

The impacts on fish, wildlife, and vegetation from the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to fish, wildlife, and vegetation include:

- Cutting the temporary containment wall instead of extracting it at the end of construction in some areas
- Modifying habitat improvements to avoid conflicts with navigation and adjacent structures
- Enhancing geotechnical reinforcement at the Zone 1 beach
- Providing up to continuous dewatering and treatment for all excavation areas behind containment wall

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-10. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect fish, wildlife, and vegetation.

### Fish, Wildlife, and Vegetation Key Points

- Cutting the containment wall in some areas would reduce the expected noise and vibration effects on marine mammals, fish, and birds compared to extracting it by vibratory methods.
- Seals and other pinnipeds are not expected to experience any substantial effects from noise generated by pumps on the water treatment barge, and marine mammals at the Seattle Aquarium would likely become accustomed to the sound.
- Minor and temporary effects to Puget Sound rockfish proposed nearshore critical habitat would occur when riprap is removed from along the seawall.

**Table 3-10. Summary of Updates Affecting Fish, Wildlife, and Vegetation**

Updates to the Preferred Alternative Affecting Fish, Wildlife, and Vegetation	New or Increased Significant Impacts?
<b>Construction</b>	
Cutting the temporary containment wall instead of extracting it at the end of construction in some areas	No – This change would slightly reduce underwater noise by eliminating the vibratory removal of the sheet pile.
Modifying habitat improvements to avoid conflicts with navigation and adjacent structures	No – Reducing the overall extent of the habitat features would reduce disturbance slightly while still enhancing the nearshore ecosystem, as previously evaluated.
Enhancing geotechnical reinforcement at the Zone 1 beach	No – Although the installation of the additional geotechnical reinforcement (sheet pile) would slightly increase turbidity and underwater noise, the increase would be offset by the potential reduction in total length of containment wall.
Providing up to continuous dewatering and treatment for all excavation areas behind containment wall	No – Even if unattenuated, noise from the water treatment process would be at similar levels as noise generated by typical heavy construction equipment. It is expected that nearby captive marine mammals would adjust to this noise within a few days, and other wildlife would not be substantially affected.
<b>Operation</b>	
Modifying habitat improvements to avoid conflicts with navigation and adjacent structures	No – Although some habitat features would be reduced, the overall extent of the habitat features is still expected to be highly beneficial to the surrounding nearshore environment.
Cutting the temporary containment wall instead of extracting it at the end of construction in sections of Zones 3 and 4	No – This change would reduce the potential for kelp and other macroalgae attachment on the vertical face of the habitat bench in some areas, but this potential was already expected to be low. The remaining portion of containment wall would provide greater stability to the habitat bench.

**Changes in Construction Impacts**

As described in Section 4.10 of the Final EIS, noise, vibration, and sediment movement caused by construction activities could alter the behavior of fish and wildlife, including marine mammals, near the construction area. To reduce potential impacts from construction, best management practices (BMPs) would be implemented, and all in-water work would occur during the approved in-water work window during the fall and winter months when the densities of protected salmonids and other aquatic species would be at their lowest and when marine plants would be seasonally dormant.

*Underwater Noise and Vibration*

The proposed geotechnical reinforcement of the Zone 1 beach requires in-water installation of sheet pile and would increase the overall extent of the noise and vibration generated during work in this area. However,

as described in Chapter 2, a turbidity curtain may be used in lieu of a containment wall in some places along the seawall alignment. The potential reduction in sheet pile installation would be equivalent to or greater than the amount of sheet pile that would be used for geotechnical reinforcement. Consequently, the underwater noise and vibration from installing sheet pile is expected to remain essentially the same as anticipated for the Preferred Alternative.

Under the Updated Preferred Alternative, the containment wall would be cut at the top elevation of the habitat bench in sections of Zones 3 and 4 and would remain as support for the habitat bench. Cutting the containment wall rather than extracting it by vibratory methods would reduce the estimated use of vibratory equipment by approximately 10 days, lowering the expected noise effects on marine mammals, fish, and birds. The underwater cutting equipment would generate much lower levels of noise (up to 120 decibels [dB] compared to a peak level of 182 dB for vibratory pile driving), and it would be considered a continuous noise source as opposed to an impulsive noise source. Cutting the containment wall would therefore result in fewer temporary effects on fish and wildlife compared to removal.

One source of noise not evaluated in the Final EIS is the pumps associated with the water treatment processes. The Fish, Wildlife, and Vegetation analysis assumed that a water treatment barge would be located at Piers 62/63, which allowed the City to evaluate the greatest potential impact; as noted in Chapter 2, water treatment could occur on land instead. Assuming that treatment would take place on a barge in this location also enabled the City to evaluate the potential effects to the captive marine mammals at the Seattle Aquarium, which would not have the opportunity to relocate in response to the increase in noise.

Multiple pumps would likely run simultaneously 24 hours per day, 7 days per week for the duration of construction. If sound from the pumps is not attenuated, they could generate in-air sound levels of 90 dBA or more at 30 feet, which is similar to the sound levels generated by typical heavy equipment. While 90 dBA is the behavioral threshold for harbor seals, it is 10 dBA less than the threshold for other pinnipeds. Because noise drops exponentially with distance from the source, seals and other pinnipeds are not expected to experience any substantial effects. Marine mammals in the exterior exhibit at the nearby Seattle Aquarium could experience temporary disturbance during the first few days of the system's operation, but then they are likely to become accustomed to the sound.

Various measures could be used to reduce potential impacts to marine mammals in Elliott Bay and at the Seattle Aquarium. For example, if sound-attenuated pumps were feasible for use, they could reduce the sound levels to approximately 65 and 70 dBA at 30 feet—a level within the range of ambient sound levels on the waterfront. Other potential measures include enclosing the pumps and/or locating them as far as possible from the marine mammal exhibits at the aquarium.

### *Aquatic Habitat Disturbance and Water Quality*

Use of a turbidity curtain in lieu of a temporary containment wall in some locations would result in slight changes in short-term effects on aquatic habitat and water quality. The overall extent of turbidity generated during installation of the containment wall would be reduced by eliminating some of the in-water installation of sheet pile; however, this reduction would be offset by the additional sheet pile that would be installed in-water beneath the Zone 1 beach. In locations where turbidity curtains were used alone in lieu of sheet pile containment, the potential would exist for more debris to escape into the water column during demolition of the existing wall due to the absence of a solid barrier.

The reduced footprint of the Zone 1 beach and revised design of the remaining expanded habitat benches would slightly reduce the potential for disturbance of contaminants during construction. The smaller footprint would also slightly reduce the potential for temporary displacement of marine species.

The proposed designation of critical habitat for yelloweye rockfish, canary rockfish, and Bocaccio within the nearshore area means that there would be minor and temporary effects to Puget Sound rockfish proposed nearshore critical habitat when riprap is removed to allow for installation of the containment wall. Removing riprap from the nearshore could result in reduced kelp cover during construction; however, kelp colonizes quickly during each growing season and is expected to colonize once construction is completed. Changes in Operational Impacts

Operational impacts to fish, wildlife, and vegetation would be very similar to those described in Section 5.10 of the Final EIS. The changes are relatively minor and would result from a net reduction of up to 20 percent in the total area of the habitat improvements and from use of the sheet pile as structural support for the habitat benches, which would reduce the potential for kelp and other macroalgae to attach to the waterward face of the bench. Despite these changes, the habitat features are still expected to be highly beneficial to the surrounding nearshore environment and to meet the habitat enhancement goals of the project.

### **Avoidance, Minimization, and Mitigation Measures**

In addition to the mitigation provided in Section 5.10 of the Final EIS, the following measures could be implemented to avoid and minimize potential adverse effects to fish, wildlife, and vegetation from project construction.

- Use sound attenuation, such as sound-attenuated pumps or enclosures, to reduce noise generated as part of the water treatment system.
- Provide assistance to the Seattle Aquarium, as necessary, for additional veterinary care for animals disturbed by construction noise.

## 3.10 Water Resources

### Affected Environment

The study area for the water resources analysis is Elliott Bay, with a focus on water quality within the project limits and in close proximity to the seawall. Water quality in Elliott Bay is generally good and meets Washington State standards; however, baseline water quality in the bay is affected by localized and more distant sources of pollutants, which have caused some areas to be listed as waters of concern by Ecology. Section 3.11 of the Final EIS contains additional information on the physical and regulatory environment of Elliott Bay.

### Changes in Construction and Operational Impacts

The impacts on water resources from the Updated Preferred Alternative were evaluated and compared to those described in Chapters 4 and 5 of the Final EIS. The design and construction changes that are analyzed for potential effects to water resources include:

- Reducing the extent of the seawall setback in Zone 1
- Cutting the temporary containment wall instead of extracting it at the end of construction in some areas
- Modifying habitat improvements to avoid conflicts with navigation and adjacent structures
- Enhancing geotechnical reinforcement at the Zone 1 beach
- Extending the southern terminus of the project area to S. Main Street

Relevant updates to the Preferred Alternative and the resulting impacts are summarized in Table 3-11. The remaining changes to design and construction, which were described in greater detail in Chapter 2, are not expected to affect water resources.

#### Water Resources Key Points

- The proposed changes would not significantly change the overall extent of sediment resuspension and turbidity associated with construction.
- The water treatment system will meet Ecology standards to ensure that water quality in Elliott Bay is not affected by construction-related discharges.

**Table 3-11. Summary of Updates Affecting Water Resources**

Updates to the Preferred Alternative Affecting Water Resources	New or Increased Significant Impacts?
<b>Construction</b>	
Reducing the extent of the seawall setback in Zone 1	No – BMPs will be used to comply with water quality standards.
Cutting the temporary containment wall instead of extracting it at the end of construction in sections of Zones 3 and 4	No – Cutting the containment wall would generate similar or reduced levels of turbidity as vibratory removal.

**Table 3-11. Summary of Updates Affecting Water Resources**

Updates to the Preferred Alternative Affecting Water Resources	New or Increased Significant Impacts?
Modifying habitat improvements to avoid conflicts with navigation and adjacent structures	No – This change would reduce overall turbidity generated by construction.
Enhancing geotechnical reinforcement at the Zone 1 beach	No – Although the installation of the additional geotechnical reinforcement (sheet pile) would slightly increase sediment resuspension and turbidity, the increase would be offset by the potential reduction in total length of containment wall.
Extending the southern terminus of the project area to S. Main Street	No – The amount of soil disturbed during construction would increase, but it would be contained using appropriate BMPs and measures from the approved plans that protect water quality.

### Changes in Construction Impacts

As described in Section 5.11 of the Final EIS, the project’s overall construction effects on water quality could include increased turbidity and pH, increased pollutants and sediments entering stormwater runoff, and increased risk of solid waste and pollutant spills. BMPs will be implemented to reduce the potential for these effects. Additionally, a Stormwater Pollution Prevention Plan (SWPPP) and a Construction Stormwater and Erosion Control Plan will be prepared to ensure that measures are in place to protect water quality, prevent erosion and sedimentation, and manage activities and potential pollutant sources.

#### *Sediment Resuspension and Turbidity*

Where feasible, a temporary sheet pile containment wall will be installed along the seawall to protect water quality in Elliott Bay during construction. Installation and removal of the wall will result in short-term, localized turbidity plumes within the water column. Under the Updated Preferred Alternative, the temporary containment wall may not be installed in some areas due to constructability issues, and a turbidity curtain would be used for containment of construction activities. In these areas, the effects of turbidity from some sheet pile installation would be eliminated; however, the addition of installing sheet pile as geotechnical reinforcement at the Zone 1 beach would generate similar levels of turbidity. The project would still be required to meet all applicable water quality standards and in-water work permit conditions, and BMPs would be installed to ensure compliance.

The extent of in-water work in Zone 1 is less than originally planned, as the 15-foot setback would be eliminated and the area would be demolished down to provide a foundation for the habitat beach materials. A turbidity curtain may be used instead of a containment wall

during these activities. The turbidity curtain would ensure that water quality standards outside of the active work area are maintained.

Some turbidity and disturbance of marine sediments would also occur during placement of the habitat features. Because the overall extent of habitat improvements has been reduced in an effort to avoid conflicts with adjacent land uses and navigation, there would be slightly less turbidity as a result of this construction activity.

Collectively, these proposed changes to the Preferred Alternative would not significantly change the overall extent of sediment resuspension and turbidity associated with construction.

### *Stormwater Runoff*

To improve connectivity with the adjacent roadway, road and utility work would extend approximately 300 feet farther south than the existing southern terminus of the project. Expanding the project area would slightly increase the total amount of exposed soil, which could contribute to turbidity; however, the use of BMPs and compliance with erosion control plans would minimize this potential.

### **Changes in Operational Impacts**

Operational impacts on water resources are not expected to change from those described in Section 5.11 of the Final EIS. Stormwater runoff will be treated before discharge and will result in a beneficial effect on water quality by reducing pollutant loadings to the aquatic environment. The placement of habitat features will likely reduce the extent of resuspension of contaminants into the water column.

### **Avoidance, Minimization, and Mitigation Measures**

Mitigation for impacts to water resources will remain as described in Sections 4.11 and 5.11 of the Final EIS. No additional mitigation is proposed. As mentioned above, the City will implement BMPs and appropriate plans during construction to avoid, minimize, and mitigate potential effects to water quality during construction. Adverse effects to water quality from operation are not anticipated.

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