



## 4 Environmental Consequences

The potential environmental effects resulting from implementation of Alternative 1: No Action (No Action), Alternative 2: Proposed Action (Proposed Action) or Alternative 3: Hybrid Terminal Option (Hybrid Terminal Option) at SEA are presented in this chapter in accordance with FAA Order 1050.1F. The analysis presented in this chapter includes considerations of direct and indirect impacts and their significance, as well as possible conflicts with the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls for the GSA. This chapter also presents a discussion of mitigation required, as well as minimization measures the Port would implement to reduce potential impacts.

### 4.1 Analysis Years

For the assessment of potential operational impacts, the Action Alternatives (Proposed Action and Hybrid Terminal Option) were compared to the No Action for 2032 conditions. The year 2032 was selected as the evaluation period for this EA because it represents the year when most, if not all, of the elements of the Proposed Action would be substantially complete and operational if construction begins in late 2025. FAA Order 1050.1F also suggests conducting analysis of noise impacts for an out-year to understand the potential impacts associated with growth in activity after implementation. For this EA, the FAA has selected 2037 as the out-year, which is used for the evaluation of the out-year impacts for Air Quality, Climate, Noise, and Surface Transportation. Finally, the interim years of 2025 through 2032 were assessed for potential construction related impacts.

**Table 4-1** lists the aircraft operations and passengers assumed under each alternative for 2032 and 2037. These aircraft operations and passenger levels were used for the assessment of environmental impacts that are driven by the numbers of future aircraft operations and passengers (such as air quality, climate, energy supply, noise, solid waste, and surface transportation). For more information on forecasted aircraft operations and passengers see **Appendix A**.<sup>43</sup>

**TABLE 4-1: FORECASTED AIRCRAFT OPERATIONS AND PASSENGERS BY ALTERNATIVE**

Alternative	Aircraft Operations (2032)	Passengers (2032)	Aircraft Operations (2037)	Passengers (2037)
1: No Action	466,900	57,171,652	474,874	59,483,817
2: Proposed Action	475,655	58,294,388	509,892	64,093,412
3: Hybrid Terminal Option	475,655	58,294,388	509,892	64,093,412

Source: Forecast Update and Constrained Operating Growth Scenario Analysis, Port of Seattle, 2023.

### 4.2 Environmental Resources Not Affected

As discussed in Chapter 3, Farmlands and Wild and Scenic Rivers are not present within the GSA and therefore would not be impacted by any of the alternatives. These two categories will not be discussed further.

<sup>43</sup> 56 MAP was identified as the benchmark for what the Airport could serve at an optimal level of service within existing airspace, airfield, and cost constraints, however higher forecasted passenger levels were used to evaluate impacts from operations, given the projected growth under constrained operating conditions. See further explanation in Appendix A.



### 4.3 Environmental Impacts and Mitigation

The following sections describe the potential environmental impacts and mitigation (if warranted) for each of the environmental resource categories where potential impacts may occur. **Table 4-2** provides a summary of the potential environmental impacts, significance determination, and mitigation commitments (if warranted) by resource category.



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Air Quality	Emissions of criteria pollutants would occur in 2032 and 2037 due to aircraft activity, GSE usage, stationary sources, and motor vehicles.	Includes both construction emissions and operational emissions. In 2032 and 2037 criteria pollutants would increase compared to the No Action. However, those increases are not considered significant.	Construction related emissions would be slightly higher than the Proposed Action. Operational emissions would be the same as the Proposed Action.	None
Biological Resources	No new impacts.	No construction effects to federally-listed threatened or endangered species or their habitat. Indirect effects may occur but would likely not be adverse impacts to Chinook salmon, Steelhead, Bull trout, Bocaccio rockfish, Yelloweye rockfish, Killer whale and their critical habitat due to operational stormwater runoff and industrial wastewater discharges generated. Approximately 56.4 acres of potential habitat for non-listed species and migratory birds would be impacted. However, these impacts are not considered significant.	Same as Proposed Action.	Stormwater-related impacts would be mitigated with post-construction stormwater quantity and quality controls in accordance with applicable regulatory requirements. Any activity during nesting season requires the construction area to be checked for active nests prior to construction. If nests are identified, a buffer would be established until the birds vacate the nest.



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Climate	Emissions of GHGs would occur in 2032 and 2037 due to aircraft activity, GSE usage, stationary sources, and motor vehicles.	Includes both construction and operational GHG emissions. In 2032 and 2037 GHG emissions would increase compared to the No Action due to additional aircraft activity, GSE usage, stationary sources, and motor vehicles.	Construction related emissions would be slightly higher than the Proposed Action. Operational emissions would be the same as the Proposed Action.	None
Coastal Resources	No new impacts.	Relocation of FAA-owned equipment and associated infrastructure projects would not affect the coastal resources. If any NTPs trigger the need for individual Section 404 / 401 permits, then SEA will be responsible to submit a Consistency Certification form as part of the permit process.	Same as Proposed Action.	None
Department of Transportation Act Section 4(f)	No new impacts.	Would not result in a use (permanent, temporary, or constructive) of a Section 4(f) resource.	Same as Proposed Action.	None



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Hazardous Materials, Solid Waste, and Pollution Prevention	No new impacts to / from hazardous materials. Solid waste would continue to be generated from the terminal, flights, and passengers. There is landfill capacity in the region to accommodate the waste.	<p>Would impact contaminated areas and includes demolition of buildings that have hazardous materials. The Port would handle all hazardous materials consistent with applicable laws and regulations. As a result, no significant impacts are anticipated.</p> <p>Additional solid waste would be generated from the construction and operation of the NTPs when compared to the No Action. No significant impacts related to solid waste are anticipated because there is landfill capacity in the region to accommodate the additional waste.</p>	Same as Proposed Action.	<p>Material will be tested prior to disposal. Hazardous materials will be disposed of according, but not limited, to the following regulations and / or construction protocols during construction:</p> <ul style="list-style-type: none"> <li>• USEPA's RCRA</li> <li>• Washington's Dangerous Waste Regulations</li> <li>• WSDE's MTCA cleanup levels</li> <li>• The Port's Environmental Agent Work Plan</li> <li>• Sea-Tac Airport Construction Safety Manual</li> <li>• Sea-Tac Airport Construction General Requirements</li> </ul>



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Historical, Architectural, Archaeological, and Cultural Resources	No new impacts.	The FAA has determined that there would be No Adverse Effect to any eligible historical, architectural, archaeological, or cultural resources. Therefore, no significant impacts would occur.	Same as Proposed Action.	Inadvertent Discoveries Plan for all NTP sites. An archaeological monitor on-site during ground disturbing activities for C03, S10, T02, L03, L05, L07, and the southern half of C02.
Land Use	No new impacts.	Would be consistent with all Airport and local jurisdiction planning documents and would not significantly alter the general land use patterns in the area. Therefore, no significant land use impacts would result.	Same as Proposed Action.	None
Natural Resources and Energy Supply	Energy (electricity, natural gas, and fuel), as well as other natural resources for maintaining facilities would continue to be consumed. SEA would have inadequate jet fuel storage volume required to meet minimum storage levels per the Fuel Consortium's standards / policies.	Would increase demand for energy due to the increase in aircraft activity, passengers, employees, and facilities as compared to the No Action. Natural resources for construction (asphalt, water, etc.) would also increase. However, these increases in demand are not considered significant impacts because the energy sources and materials are not in short supply in the region.	Same as Proposed Action.	None



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Noise and Noise-Compatible Land Use	Aircraft noise would continue to occur due to the aircraft activity at SEA.	In 2032 and 2037, the 65 DNL noise contour for the Proposed Action would be larger than the 2032 and 2037 No Action, respectively, and more people and noise sensitive facilities would be exposed to 65 DNL noise levels. However, no areas of 1.5 DNL increase would occur over a noise sensitive area within the 65 DNL when compared to the No Action in 2032 or 2037. Therefore, no significant noise impacts would occur. The noise contours for each alternative are smaller in 2037 than 2032 due to the increase in the Boeing 737-7/8/9 MAX aircraft which are quieter than the aircraft they are replacing.	Same as Proposed Action.	None



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Socioeconomic, Environmental Justice, and Children’s Environmental Health and Safety Risks	<p><u>Socioeconomic</u> Would not support the long-term economic growth of the region as much as the Proposed Action and would limit the economic benefits to businesses on or near SEA, and for the entire Puget Sound region.</p> <p><u>Environmental Justice</u> Environmental justice populations would be exposed to air emissions, noise, and roadways that do not meet mobility standards.</p> <p><u>Children’s Health</u> No impacts to children’s health and safety risks would result.</p>	<p><u>Socioeconomic</u> Two business (Doug Fox Lot and PACCAR Aviation) and one intersection (24th Avenue South from S. 150th Street) would be closed. No adverse impacts to economic resources are expected.</p> <p><u>Environmental Justice</u> Environmental justice populations would be exposed to increased air emissions, noise, socioeconomic impacts, and roadways that do not meet mobility standards as a result of the Proposed Action. However, none of the impacts were found to be significant with mitigation and none are considered disproportionate and adverse.</p> <p><u>Children’s Health</u> No impacts to children’s health and safety risks would result.</p>	Same as the Proposed Action.	None





**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Surface Transportation	In 2032 / 2037, 10 roadway intersections would fail to meet mobility standards. These degradations would be due to background growth in traffic and / or travel pattern changes unrelated to the Proposed Action.	In 2032 / 2037, 26 roadway intersections would be impacted (all of which could be mitigated). With implementation of mitigation, these are not considered significant impacts.	Same as the Proposed Action.	Mitigation includes bringing the impacted traffic intersections in line with the mobility standards and may include installation of traffic signals, intersection approach modifications, and the addition of turn lanes. Proportionate share payments of improvement costs equal to percentage of total intersection trips generated by NTPs to jurisdictions.
Visual Effects	No new impacts.	Would result in new sources of light emissions and visual elements; however, the changes would not result in significant impacts.	Same as Proposed Action.	None



**TABLE 4-2: SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS (CONTINUED)**

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Water Resources	No new impacts.	<p>Would permanently impact jurisdictional wetlands and wetland buffers. Temporary construction impacts to wetlands and wetland buffers would also occur. The Proposed Action would permanently impact streams, potentially jurisdictional ditches, and stream buffers. Temporary construction impacts to streams and stream buffers would also occur.</p> <p>Stormwater runoff would increase due to the increase in impervious surface from the Proposed Action.</p> <p>Given the regulatory and permitting opportunities to address these impacts, no significant water resource impacts are anticipated. No impacts to floodplains are anticipated.</p>	Same as Proposed Action.	<p>Wetland, stream, and buffer impacts would be mitigated in accordance with applicable federal and state requirements and guidelines.</p> <p>Stormwater-related impacts would be mitigated with post-construction stormwater quantity and quality controls in accordance with applicable regulatory requirements.</p>



### 4.3.1 Air Quality

This section presents the results of the air quality analysis for the Proposed Action and alternatives. The preliminary construction phasing schedule, the assumptions of on-road surface transportation and non-road construction vehicles, the emission factors, and details on the air quality analysis are provided in **Appendix C**.

#### 4.3.1.1 Significant Impact Threshold

As described in FAA Order 1050.1F, a project is considered to have a significant air quality impact if “[t]he action would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the USEPA under the CAA, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.” As discussed in Chapter 3, SEA is located within an attainment area for all pollutants, which means that the region meets all NAAQS.

An emissions inventory is a summary in tons per year of the total pollutants generated by an alternative. Pollutant concentrations in the NAAQS are measured in micrograms per cubic meter or parts per million / billion and describe concentrations of the pollutants in the air. An emissions inventory is not directly comparable to the NAAQS.

#### 4.3.1.2 Criteria Pollutants

The air quality analysis included criteria air pollutants CO, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and ozone precursor pollutants NO<sub>x</sub> and VOCs.

#### 4.3.1.3 Construction Emissions Inventories

Construction activities can result in temporary air quality emissions. On-road construction vehicle emissions were estimated using USEPA MOVES4. For non-road construction equipment Airport Construction Emissions Inventory Tool (ACEIT) was used to identify equipment and USEPA’s MOVES4 was used to estimate emissions.

##### Alternative 1: No Action

The No Action Alternative is not anticipated to result in project-related construction emissions.

##### Alternative 2: Proposed Action

**Table 4-3** provides the construction emissions inventory for the Proposed Action. Peak construction emissions are expected to occur in 2028 for NO<sub>x</sub> (40 short tons) and 2029 for CO (239 short tons).

**TABLE 4-3: CONSTRUCTION EMISSIONS INVENTORY - PROPOSED ACTION (IN SHORT TONS)**

Year	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2025	17	1	8	0	8	1
2026	124	3	24	0	8	2
2027	204	4	36	0	9	2
2028	214	5	40	0	9	2
2029	239	5	36	0	9	2
2030	181	3	24	0	8	2
2031	143	2	18	0	8	1
2032	40	1	9	0	8	1

Source: Port of Seattle and L&B, 2024.



Alternative 3: Hybrid Terminal Option

**Table 4-4** provides the construction emissions inventory for the Hybrid Terminal Option. Peak construction emissions are expected to occur in 2028 for NO<sub>x</sub> (47 short tons) and 2029 for CO (242 short tons) and would be equal to or slightly greater than the Proposed Action due to changes to the phasing schedule and the additional elements that must be constructed such as the proposed connection to Concourse D.

**TABLE 4-4: CONSTRUCTION EMISSIONS INVENTORY - HYBRID TERMINAL OPTION (IN SHORT TONS)**

Year	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2025	17	1	8	0	8	1
2026	124	3	24	0	8	2
2027	201	5	39	0	9	2
2028	211	5	47	0	10	3
2029	242	5	44	0	9	3
2030	188	4	37	0	9	2
2031	149	3	31	0	9	2
2032	42	1	15	0	8	1

Note: Minor differences from the Proposed Action may not be evident due to rounding and the number of significant digits displayed.

Source: Port of Seattle and L&B, 2024.

**4.3.1.4 Operational Emissions Inventories (2032 and 2037)**

Aircraft, GSE and stationary source emissions were evaluated using the FAA's AEDT Version 3f. Emissions from motor vehicles were evaluated using USEPA's MOVES4.

Alternative 1: No Action

**Table 4-5** and **Table 4-6** provide the results of the operational emissions inventories for the Future (2032) and (2037) No Action Alternative. For all pollutants, aircraft operations are the highest source of emissions. For most pollutants, motor vehicles represent the second highest source of emissions. For aircraft, the decrease in CO and increase in NO<sub>x</sub> is due to phasing-out of the Boeing 737-700/800/900 aircraft and the phasing-in of the 737-7/8/9 MAX aircraft from 2032 to 2037. There is an anticipated decrease in emissions for motor vehicles between 2032 and 2037 due to expected improvements in motor vehicle emissions.



**TABLE 4-5: EMISSIONS INVENTORY - FUTURE (2032) NO ACTION ALTERNATIVE (IN SHORT TONS)**

Emission Source	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Aircraft</b>	<b>2,152</b>	<b>249</b>	<b>2,761</b>	<b>236</b>	<b>27</b>	<b>27</b>
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,042	233	2,631	222	14	14
APUs	109	16	73	11	13	13
Aircraft Run-Ups	1	0	57	2	0	0
<b>GSE</b>	<b>190</b>	<b>6</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>1</b>
Tenant-Owned GSE	187	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
<b>Stationary Sources</b>	<b>16</b>	<b>11</b>	<b>27</b>	<b>37</b>	<b>1</b>	<b>1</b>
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	11	37	0	0
Fuel Farm Tanks	0	10	0	0	0	0
<b>Motor Vehicles</b>	<b>2,089</b>	<b>18</b>	<b>122</b>	<b>2</b>	<b>4</b>	<b>3</b>
Parking Facilities	35	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,054	17	119	2	4	3
<b>Total</b>	<b>4,447</b>	<b>283</b>	<b>2,923</b>	<b>275</b>	<b>32</b>	<b>32</b>

Note: Totals may not sum due to rounding.  
 Source: Port of Seattle and L&B, 2024.

**TABLE 4-6: EMISSIONS INVENTORY - FUTURE (2037) NO ACTION ALTERNATIVE (IN SHORT TONS)**

Emission Source	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Aircraft</b>	<b>2,089</b>	<b>238</b>	<b>2,975</b>	<b>242</b>	<b>29</b>	<b>29</b>
LTO (includes Start-Up, Approach, Climb, and Taxiing)	1,972	222	2,842	227	13	13
APUs	117	16	77	12	15	15
Aircraft Run-Ups	1	0	56	2	0	0
<b>GSE</b>	<b>194</b>	<b>6</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>1</b>
Tenant-Owned GSE	191	6	9	0	0	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
<b>Stationary Sources</b>	<b>16</b>	<b>11</b>	<b>27</b>	<b>37</b>	<b>1</b>	<b>1</b>
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	11	37	0	0
Fuel Farm Tanks	0	10	0	0	0	0
<b>Motor Vehicles</b>	<b>1,682</b>	<b>14</b>	<b>72</b>	<b>2</b>	<b>2</b>	<b>2</b>
Parking Facilities	27	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,655	13	71	2	2	2
<b>Total</b>	<b>3,982</b>	<b>268</b>	<b>3,088</b>	<b>281</b>	<b>32</b>	<b>32</b>

Note: Totals may not sum due to rounding.  
 Source: Port of Seattle and L&B, 2024.

Alternative 2: Proposed Action

Table 4-7 and Table 4-8 provides the operational emissions inventory for the Future (2032) and (2037) Proposed Action. For all pollutants, aircraft operations are the highest source of emissions. For most



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pollutants, motor vehicles represent the second highest source of emissions. For aircraft, the increase in emissions is due to the increase in operations and taxi times and phasing-out of the Boeing 737-700/800/900 aircraft and the phasing-in of the 737-7/8/9 MAX aircraft. There is an anticipated decrease in emissions for motor vehicles, between 2032 and 2037, due to expected improvements in motor vehicle emissions.

**TABLE 4-7: EMISSIONS INVENTORY - FUTURE (2032) PROPOSED ACTION (IN SHORT TONS)**

Emission Source	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Aircraft</b>	<b>2,166</b>	<b>251</b>	<b>2,807</b>	<b>239</b>	<b>28</b>	<b>28</b>
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,054	235	2,675	225	14	14
APUs	111	16	74	11	13	13
Aircraft Run-Ups	1	0	58	2	0	0
<b>GSE</b>	<b>194</b>	<b>6</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>1</b>
Tenant-Owned GSE	191	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
<b>Stationary Sources</b>	<b>23</b>	<b>15</b>	<b>39</b>	<b>54</b>	<b>1</b>	<b>1</b>
Natural Gas Boilers and Heaters	19	1	23	0	0	0
Diesel Generators	4	0	16	54	0	0
Fuel Farm Tanks	0	13	0	0	0	0
<b>Motor Vehicles</b>	<b>2,135</b>	<b>18</b>	<b>124</b>	<b>2</b>	<b>4</b>	<b>3</b>
Parking Facilities	39	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,096	17	121	2	4	3
<b>Total</b>	<b>4,517</b>	<b>290</b>	<b>2,984</b>	<b>295</b>	<b>33</b>	<b>33</b>

Note: Totals may not sum due to rounding.  
Source: Port of Seattle and L&B, 2024.

**TABLE 4-8: EMISSIONS INVENTORY - FUTURE (2037) PROPOSED ACTION (IN SHORT TONS)**

Emission Source	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Aircraft</b>	<b>2,231</b>	<b>252</b>	<b>3,184</b>	<b>259</b>	<b>31</b>	<b>31</b>
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,104	235	3,041	243	14	14
APUs	126	17	82	13	16	16
Aircraft Run-Ups	1	0	60	2	0	0
<b>GSE</b>	<b>208</b>	<b>6</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>1</b>
Tenant-Owned GSE	204	6	10	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	5	0	0	0
<b>Stationary Sources</b>	<b>23</b>	<b>15</b>	<b>39</b>	<b>54</b>	<b>1</b>	<b>1</b>
Natural Gas Boilers and Heaters	19	1	23	0	0	0
Diesel Generators	4	0	16	54	0	0
Fuel Farm Tanks	0	13	0	0	0	0
<b>Motor Vehicles</b>	<b>1,784</b>	<b>14</b>	<b>76</b>	<b>2</b>	<b>2</b>	<b>2</b>
Parking Facilities	32	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,752	14	74	2	2	2
<b>Total</b>	<b>4,245</b>	<b>288</b>	<b>3,314</b>	<b>315</b>	<b>35</b>	<b>34</b>

Note: Totals may not sum due to rounding.  
Source: Port of Seattle and L&B, 2024.



The results of the comparison between the Future (2032 and 2037) Proposed Action and the Future (2032 and 2037) No Action Alternative are shown in **Table 4-9**. Emissions of all pollutants are expected to be greater with the Future (2032 and 2037) Proposed Action than the Future (2032 and 2037) No Action due to the increased aircraft operations, taxi times, and motor vehicles.

Of the project pollutant increases, the largest increase would be to CO and NO<sub>x</sub>. Based on coordination with the PSCAA, the potential increase in criteria pollutant emissions, as shown in the emissions inventory for the Proposed Action compared to the No Action Alternative, would not be expected to create any new violation of the NAAQS.<sup>44</sup>

**TABLE 4-9: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE 2032 AND 2037 (IN SHORT TONS)**

Emission Source	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2032 No Action Alternative	4,447	283	2,923	275	32	32
2032 Proposed Action (Construction & Operational)	4,557	291	2,993	295	41	34
2032 Proposed Action (Construction)	40	1	9	0	8	1
2032 Proposed Action (Operational)	4,517	290	2,984	295	33	33
<b>2032 Increase in Emissions</b>	<b>110</b>	<b>8</b>	<b>70</b>	<b>20</b>	<b>9</b>	<b>2</b>
2037 No Action Alternative	3,982	268	3,088	281	32	32
2037 Proposed Action (Operational Only)	4,245	288	3,314	315	35	34
<b>2037 Increase in Emissions</b>	<b>263</b>	<b>20</b>	<b>225</b>	<b>34</b>	<b>3</b>	<b>2</b>

Note: Totals may not sum due to rounding.

Source: Port of Seattle and L&B, 2024.

Alternative 3: Hybrid Terminal Option

The Hybrid Terminal Option would have the same operational emissions as the Proposed Action because the number of future aircraft operations and operational assumptions would be the same. The only difference would be related to construction emissions. As discussed under the Proposed Action, the potential increase in criteria pollutant emissions, as shown in the emissions inventory for the Hybrid Terminal Option as compared to the No Action Alternative, is not expected to create any new violation of the NAAQS. The results of the comparison between the Future (2032 and 2037) Hybrid Option and the Future (2032 and 2037) No Action Alternative are shown in **Table 4-10**.

**TABLE 4-10: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, HYBRID OPTION COMPARED TO THE NO ACTION ALTERNATIVE 2032 AND 2037 (IN SHORT TONS)**

Emission Source	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2032 No Action Alternative	4,447	283	2,923	275	32	32
2032 Hybrid Terminal Option	4,559	291	2,999	295	41	34
2032 Hybrid Terminal Option (Construction)	42	1	15	0	8	1
2032 Hybrid Terminal Option (Operational)	4,517	290	2,984	295	33	33
<b>2032 Increase in Emissions</b>	<b>112</b>	<b>8</b>	<b>76</b>	<b>20</b>	<b>9</b>	<b>2</b>
2037 No Action Alternative	3,982	268	3,088	281	32	32
2037 Hybrid Terminal Option (Operational Only)	4,245	288	3,314	315	35	34
<b>2037 Increase in Emissions</b>	<b>263</b>	<b>20</b>	<b>225</b>	<b>34</b>	<b>3</b>	<b>2</b>

Note: Totals may not sum due to rounding.

Source: Port of Seattle and L&B, 2024.

<sup>44</sup> Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023.



## Mitigation and Minimization Measures

### *Mitigation*

Because no significant impacts related to air quality were identified, no mitigation would be necessary.

### *Minimization Measures*

Minimization measures and best management practices (BMPs) would be used to minimize air quality impacts during construction. The Port would adhere to FAA AC 150/5370-10H, *Standard Specifications for Construction of Airports*.

## **4.3.2 Biological Resources**

This section presents the analysis of potential impacts to biological resources for the Proposed Action and alternatives. More information regarding the species identified and analysis of impacts can be found in **Appendix D**.

### **4.3.2.1 Significant Impact Threshold**

Significant impacts to biological resources include actions where the USFWS or the NMFS determine that the action would likely:

- Jeopardize the continued existence of a federally-listed threatened or endangered species or
- Result in the destruction or adverse modification of federally designated critical habitat.

The FAA has not established a significance threshold for non-listed species, but they have identified factors to consider when evaluating potential environmental impacts to biological resources. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. These factors to consider when evaluating impacts to biological resources include:

- Long-term or permanent loss of unlisted plant or wildlife species;
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels required for population maintenance.

Trees and vegetation in the GSA are not federally regulated resources. Special status wildlife and plant species are discussed in **Appendix D**.

### **4.3.2.2 Fish and Wildlife**

#### Alternative 1: No Action

The No Action Alternative does not include any changes to the biological environment. However, the No Action Alternative would have treated stormwater runoff so it may affect not likely to adversely affect ESA-listed species or their habitat.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

A Biological Evaluation (BE) was prepared to evaluate the Proposed Action's potential effects on ESA-listed species and critical habitats that potentially occur in the ESA Study Area.





The FAA determined the Action Alternatives would not result in direct effects on ESA-listed species or critical habitat. Indirect effects could result from delayed consequences associated with operational treated stormwater runoff and industrial wastewater discharges generated by the Action Alternatives but would likely not adversely affect ESA-listed species. **Table 4-11** summarizes the species evaluated in the BE and effects determinations for each species and critical habitat.

**TABLE 4-11: EFFECTS DETERMINATIONS FOR ESA-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT**

Species / Habitat	Effects Determination
Bocaccio rockfish ( <i>Sebastes paucispinus</i> , Puget Sound / Georgia Basin DPS) and critical habitat	May affect, not likely to adversely affect
Bull trout ( <i>Salvelinus confluentus</i> , Coastal-Puget Sound DPS) and critical habitat	May affect, not likely to adversely affect
Central America / Western North Pacific Humpback Whale ( <i>Megaptera novaeangliae</i> )	No effect
Chinook salmon ( <i>Oncorhynchus tshawytscha</i> , Puget Sound ESU) and critical habitat	May affect, not likely to adversely affect
Killer whale ( <i>Orcinus orca</i> , Southern Resident DPS) and critical habitat	May affect, not likely to adversely affect
Marbled murrelet ( <i>Brachyramphus marmoratus</i> )	No effect
Monarch butterfly ( <i>Danaus Plexippus</i> )	Not likely to jeopardize the continued existence
North American wolverine ( <i>Gulo gulo luscus</i> )	No effect
Northwestern pond turtle ( <i>Actinemys marmorata</i> )	No effect
Southern green sturgeon ( <i>Acipenser medirostris</i> )	No effect
Southern Pacific eulachon ( <i>Thaleichthys pacificus</i> )	No effect
Steelhead ( <i>O. mykiss</i> , Puget Sound ESU)	May affect, not likely to adversely affect
Steelhead critical habitat	No effect
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	No effect
Yelloweye rockfish ( <i>S. ruberrimus</i> , Puget Sound / Georgia Basin DPS) and critical habitat	May affect, not likely to adversely affect

DPS = Distinct population segment; ESU = Evolutionarily significant unit

Source: US Department of Transportation, Federal Aviation Administration, Northwest Mountain Region – Seattle Airports District Office, 2024. Seattle-Tacoma International Airport Sustainable Airport Master Plan Near-Term Projects: Final Biological Evaluation. Prepared, by Kandice Krull, Environmental Protection Specialist.

The Action Alternatives were also evaluated for potential effects on essential fish habitat (EFH). It was determined that the Action Alternatives may affect, but are not likely to adversely affect, EFH for groundfish, coastal pelagic, and Pacific salmon species in Puget Sound and EFH for Pacific salmon species in the Duwamish River and tributaries that drain to Puget Sound from the Airport. Any effect to EFH would result from delayed consequences associated with operational treated stormwater runoff and industrial wastewater discharges that are generated by the Action Alternatives. FAA sent the request to the NMFS to initiate informal Section 7 and EFH consultation on September 24, 2024. See **Appendix D** for the BE and consultation with the NMFS.



Non-listed species may be impacted by the proposed removal of vegetation and trees that may provide habitat. Approximately 56.4 acres of land that currently has trees, shrubs, and maintained grassy areas would be cleared for the construction of the offsite cargo (C02 and C03), north GT holding lot (L05), employee parking structure (L07), CRDC (S10), and west side maintenance campus (S07). Some common non-listed species may be displaced due to loss of habitat; however, it is likely that these animals would relocate to surrounding areas near North Sea-Tac Park, Tub Lake, and the Miller Creek stream buffer providing similar habitat. For this reason, the impacts to non-listed fish and wildlife species would not be significant.

### Mitigation and Minimization Measures

#### *Mitigation*

See Section 4.3.14.3, Surface Waters for mitigation measures related to operational treated stormwater runoff and industrial wastewater discharges that will be put in place to mitigate impacts to ESA-listed species.

#### *Minimization Measures*

To minimize impacts, the Port would implement BMPs, such as silt fencing, during construction to protect against sediment and soils entering nearby streams and creeks. The Port would also implement strategies outlined in their April 2024 Land Stewardship Plan.<sup>45</sup> Port-owned properties outside of the Airport Activity Area (AAA) will comply with any appropriate city standards.

### **4.3.2.3 Migratory Birds**

#### Alternative 1: No Action

The No Action Alternative would not cause new impacts to migratory birds. The Port would continue its policies and protocols for minimizing wildlife hazards, including bird strikes, in accordance with FAA and United States Department of Agriculture guidelines.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives include removal of vegetation and trees that may provide nesting locations for migratory birds. However, the areas around these two sites provide similar vegetation and trees for migratory birds to utilize. Given the availability of alternate sites and the ability to meet the MBTA requirements, the Action Alternatives would not result in a significant impact to migratory birds protected by the MBTA. No impacts to bald eagles or golden eagles regulated under the BGPA are anticipated, because no nests or roosting sites have been documented within the GSA.

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<sup>45</sup> <https://www.airportprojects.net/sampenvironmentalreview/tree-replacement-standards/>. These standards established voluntary goals to protect and restore healthy trees, forest, and other habitat, and connect and expand existing habitat areas, among other goals.

## Mitigation and Minimization Measures

### *Mitigation*

No direct impacts to MBTA species are anticipated and as a result, no mitigation specific to MBTA-listed species is necessary. To comply with the MBTA, a pre-construction nest survey will be conducted by a qualified biologist 7-10 days before the start of construction and follow King County development standards for migratory birds.<sup>46</sup> Airport personnel will be notified of the breeding season and advised not to disturb nests during future maintenance activities. If nests are found, BMPs will be used to develop measures to prevent disturbing nests, such as instituting a 100-foot buffer around the nests and / or timing restrictions.

### *Minimization Measures*

The Port would draw upon the USFWS' Nationwide Standard Conservation Measures,<sup>47</sup> as well as other measures designed to protect birds and their resources.

## **4.3.3 Climate**

This section provides the estimate of GHG emissions attributable to construction and operational emissions due to the Proposed Action and alternatives. **Appendix C** contains detailed information on the GHG emissions inventories, long-term effects related to an increase in GHG emissions, level of preparedness, and climate adaptation.

### **4.3.3.1 Significant Impact Threshold**

The FAA has not established a significance threshold for Climate. There are currently no accepted methods of determining significance applicable to aviation projects. There is a considerable amount of ongoing scientific research to improve understanding of global climate change and FAA guidance will evolve as the science matures or if new federal requirements are established.

### **4.3.3.2 Construction GHG Emissions Inventories**

The GHG construction emissions inventories were prepared using the same data, assumptions, and models as developed for the air quality criteria pollutant construction emissions inventories.

#### Alternative 1: No Action

No project-related construction activity or emissions would occur in the No Action Alternative.

#### Alternative 2: Proposed Action

**Table 4-12** provides the construction GHG emissions inventory for the Proposed Action. As the table shows, peak construction GHG emissions are expected to occur in 2028, which is the year with the most anticipated construction activity and would produce 44,111 MT of CO<sub>2</sub>e that year.

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<sup>46</sup> KCC 21A.24.382, June 4, 2024, contains standards for migratory birds and time periods when certain construction activities can occur for bird species. (included in Appendix D).

<sup>47</sup> <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>, accessed January 2024.



**TABLE 4-12: CONSTRUCTION GHG EMISSIONS INVENTORY - PROPOSED ACTION (CO<sub>2</sub>E MT PER YEAR)**

Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
2025	6,055	2	16	6,073
2026	25,761	14	79	25,854
2027	40,154	22	114	40,290
2028	43,967	23	121	44,111
2029	41,593	25	105	41,722
2030	29,633	19	73	29,725
2031	22,899	15	58	22,972
2032	8,458	5	20	8,482

Note: Totals may not sum due to rounding.  
Source: Port of Seattle and L&B, 2024.

Alternative 3 - Hybrid Terminal Option

**Table 4-13** provides the construction GHG emissions inventory for the Hybrid Terminal Option. Peak construction GHG emissions are expected to occur in 2029 and produce 48,347 MT of CO<sub>2</sub>e. In 2025 and 2026, there is no difference in GHG construction emissions between the Action Alternatives. From 2027 through 2032, the Hybrid Terminal Option results in greater GHG emissions than the Proposed Action due to the change in construction phasing and the additional elements that must be constructed such as the connection to Concourse D.

**TABLE 4-13: CONSTRUCTION GHG EMISSIONS INVENTORY - HYBRID TERMINAL OPTION (CO<sub>2</sub>E MT PER YEAR)**

Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
2025	6,055	2	16	6,073
2026	25,761	14	79	25,854
2027	41,730	22	111	41,862
2028	48,048	24	118	48,191
2029	48,211	26	109	48,347
2030	39,235	21	81	39,337
2031	32,633	17	65	32,715
2032	12,362	5	22	12,390

Note: Totals may not sum due to rounding.  
Source: Port of Seattle and L&B, 2024.

**4.3.3.3 Operational GHG Emissions Inventories (2032 and 2037)**

The data and assumptions developed for the air quality criteria pollutant emissions inventory were used to prepare the GHG emissions inventory. The GHG emission inventories utilized fuel dispensed to model operations (including start-up, approach, climb, and taxiing), APUs, and aircraft run-up emissions. Emissions factors from MOVES4, USEPA GHG Emission Factors Hub, and Port electricity providers were used to develop the operational GHG emissions inventory. The operational emissions inventories address GHG emissions associated with aircraft operations, GSE, stationary sources, and motor vehicle traffic for 2032 and 2037. For the future Proposed Action and Hybrid Terminal Option alternatives, the operating condition reflects completion of the project.



Alternative 1: No Action

**Table 4-14** and **Table 4-15** provide the estimated annual rate (MT per year) of operational GHG emissions for the Future (2032) and (2037) No Action Alternative.

**TABLE 4-14: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2032) NO ACTION ALTERNATIVE (CO<sub>2</sub>E MT PER YEAR)**

Emissions Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
<b>Scope 1</b>				
Port-Owned Airfield Vehicles / Equipment	4,324	5	0	4,330
Natural Gas Boilers and Heaters	17,627	11	10	17,648
Diesel Generators	327	0	1	328
Fuel Farm Tanks <sup>1</sup>	0	0	0	0
<i>Total - Scope 1</i>	<i>22,278</i>	<i>17</i>	<i>11</i>	<i>22,306</i>
<b>Scope 2</b>				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
<i>Total – Scope 2</i>	<i>2,463</i>	<i>0</i>	<i>0</i>	<i>2,463</i>
<b>Scope 3</b>				
Aircraft (fuel dispensed)	6,631,793	0	63,977	6,695,771
Tenant-Owned GSE	32,691	47	0	32,737
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	496	0	12	509
Roadways	408,362	222	4,339	412,923
Parking Facilities	6,786	6	66	6,858
<i>Total - Scope 3</i>	<i>7,080,457</i>	<i>276</i>	<i>68,394</i>	<i>7,149,127</i>
<b>Total</b>	<b>7,105,199</b>	<b>293</b>	<b>68,405</b>	<b>7,173,897</b>
			<b>CO<sub>2</sub>e Total</b>	<b>7,173,897</b>

<sup>1</sup> CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.

Source: Port of Seattle, L&B, 2024. GWP from USEPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, March 2018, [https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors\\_mar\\_2018\\_0.pdf](https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf)



**TABLE 4-15: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2037) NO ACTION ALTERNATIVE (CO<sub>2</sub>E MT PER YEAR)**

Emissions Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
<b>Scope 1</b>				
Port-Owned Airfield Vehicles / Equipment	4,398	6	0	4,404
Natural Gas Boilers and Heaters	17,627	11	10	17,648
Diesel Generators	327	0	1	328
Fuel Farm Tanks <sup>1</sup>	0	0	0	0
<i>Total - Scope 1</i>	<i>22,352</i>	<i>17</i>	<i>11</i>	<i>22,380</i>
<b>Scope 2</b>				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
<i>Total - Scope 2</i>	<i>2,463</i>	<i>0</i>	<i>0</i>	<i>2,463</i>
<b>Scope 3</b>				
Aircraft (fuel dispensed)	6,745,055	0	65,070	6,810,125
Tenant-Owned GSE	33,300	48	0	33,347
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	480	0	12	492
Roadways	412,215	211	4,394	416,820
Parking Facilities	6,669	6	67	6,742
<i>Total - Scope 3</i>	<i>7,198,049</i>	<i>265</i>	<i>69,543</i>	<i>7,267,857</i>
<b>Total</b>	<b>7,222,864</b>	<b>283</b>	<b>69,554</b>	<b>7,292,700</b>
			<b>CO<sub>2</sub>eTotal</b>	<b>7,292,700</b>

<sup>1</sup> CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.

Source: Port of Seattle, L&B, 2024. GWP from USEPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, March 2018, [https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors\\_mar\\_2018\\_0.pdf](https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf)



Alternative 2: Proposed Action

**Table 4-16** and **Table 4-17** provide the operational emissions inventory for the Future (2032) and (2037) Proposed Action.

**TABLE 4-16: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2032)  
 PROPOSED ACTION (CO<sub>2</sub>E MT PER YEAR)**

Emissions Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
<b>Scope 1</b>				
Port-Owned Airfield Vehicles / Equipment	4,405	6	0	4,411
Natural Gas Boilers and Heaters	24,866	16	14	24,896
Diesel Generators	550	1	1	552
Fuel Farm Tanks <sup>1</sup>	0	0	0	0
<i>Total - Scope 1</i>	29,821	22	15	29,859
<b>Scope 2</b>				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
<i>Total - Scope 2</i>	3,386	48	0	3,434
<b>Scope 3</b>				
Aircraft (fuel dispensed)	6,756,148	0	65,177	6,821,325
Tenant-Owned GSE	33,291	48	0	33,338
Tenant Electricity Consumption	462	6		468
Airside Deliveries	505	0	12	518
Roadways	416,812	227	4,422	421,461
Parking Facilities	7,634	7	74	7,714
<i>Total - Scope 3</i>	7,214,852	287	69,685	7,284,825
<b>Total</b>	<b>7,248,060</b>	<b>357</b>	<b>69,700</b>	<b>7,318,118</b>
			<b>CO<sub>2</sub>eTotal</b>	<b>7,318,118</b>

<sup>1</sup> CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.

Source: Port of Seattle, L&B, 2024. GWP from USEPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, March 2018, [https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors\\_mar\\_2018\\_0.pdf](https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf)



**TABLE 4-17: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2037)  
PROPOSED ACTION (CO<sub>2</sub>E MT PER YEAR)**

Emissions Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
<b>Scope 1</b>				
Port-Owned Airfield Vehicles / Equipment	4,722	6	0	4,728
Natural Gas Boilers and Heaters	24,866	16	14	24,896
Diesel Generators	550	1	1	552
Fuel Farm Tanks <sup>1</sup>	0	0	0	0
<i>Total - Scope 1</i>	<i>30,138</i>	<i>23</i>	<i>15</i>	<i>30,176</i>
<b>Scope 2</b>				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
<i>Total – Scope 2</i>	<i>3,386</i>	<i>48</i>	<i>0</i>	<i>3,434</i>
<b>Scope 3</b>				
Aircraft (fuel dispensed)	7,242,447	0	69,868	7,312,315
Tenant-Owned GSE	35,700	51	0	35,751
Tenant Electricity Consumption	462	6	0	468
Airside Deliveries	515	0	13	529
Roadways	436,738	223	4,644	441,606
Parking Facilities	7,904	7	79	7,990
<i>Total - Scope 3</i>	<i>7,723,767</i>	<i>287</i>	<i>74,605</i>	<i>7,798,659</i>
<b>Total</b>	<b>7,757,291</b>	<b>358</b>	<b>74,620</b>	<b>7,832,269</b>
			<b>CO<sub>2</sub>eTotal</b>	<b>7,832,269</b>

<sup>1</sup> CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, are by-products of fuel combustion. Per the FAA’s *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value

Source: Port of Seattle, L&B, 2024. GWP from USEPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, March 2018, [https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors\\_mar\\_2018\\_0.pdf](https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf).

**Alternative 3: Hybrid Terminal Option**

The Future (2032) and (2037) Hybrid Terminal Option would have different construction GHG emissions but the same operational GHG emissions as the Future (2032) and (2037) Proposed Action because number of future aircraft operations would be the same.

**Table 4-18** provides a comparison of the operational GHG emissions between the No Action and Proposed Action for 2032 and 2037 conditions. **Table 4-19** provides a comparison of the operational GHG emissions between the No Action and Hybrid Terminal Option for 2032 and 2037 conditions.





**TABLE 4-18: SUMMARY OF GHG ANNUAL EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE (CO<sub>2</sub>E MT PER YEAR)**

Scenario	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
2032 No Action Alternative	7,105,199	293	68,405	7,173,897
2032 Proposed Action (Construction & Operational)	7,256,518	362	69,720	7,326,600
2032 Proposed Action (Construction)	8,458	5	20	8,482
2032 Proposed Action (Operational)	7,248,060	357	69,700	7,318,118
<b>2032 Increase in Emissions</b>	<b>151,319</b>	<b>69</b>	<b>1,316</b>	<b>152,703</b>
2037 No Action Alternative	7,222,864	283	69,554	7,292,700
2037 Proposed Action (Operational Only)	7,757,291	358	74,620	7,832,269
<b>2037 Increase in Emissions</b>	<b>534,427</b>	<b>75</b>	<b>5,066</b>	<b>539,569</b>

Note: Totals may not sum due to rounding.  
 Source: Port of Seattle and L&B, 2024.

**TABLE 4-19: SUMMARY OF GHG ANNUAL EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE (CO<sub>2</sub>E MT PER YEAR)**

Scenario	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
2032 No Action Alternative	7,105,199	293	68,405	7,173,897
2032 Hybrid Terminal Option (Construction & Operational)	7,260,422	363	69,723	7,330,507
2032 Hybrid Terminal Option (Construction)	12,362	5	22	12,390
2032 Hybrid Terminal Option (Operational)	7,248,060	357	69,700	7,318,118
<b>2032 Increase in Emissions</b>	<b>155,223</b>	<b>70</b>	<b>1,318</b>	<b>156,611</b>
2037 No Action Alternative	7,222,864	283	69,554	7,292,700
2037 Hybrid Terminal Option (Operational Only)	7,757,291	358	74,620	7,832,269
<b>2037 Increase in Emissions</b>	<b>534,427</b>	<b>75</b>	<b>5,066</b>	<b>539,569</b>

Note: Totals may not sum due to rounding.  
 Source: Port of Seattle and L&B, 2024.

The Proposed Action and the Hybrid Terminal Option would increase GHG emissions as compared to the No Action Alternative. The Proposed Action would increase Scope 1, 2 and 3 GHG emissions by 152,703 (2.1 percent) CO<sub>2</sub>e MT over the No Action Alternative in 2032 and by 539,569 (7.4 percent) CO<sub>2</sub>e MT in 2037. The Hybrid Terminal Option would increase Scope 1, 2 and 3 GHG emissions by 156,611 (2.2 percent) MT over the No Action Alternative in 2032 and by 539,569 MT (7.4 percent) in 2037. The majority of the GHG emissions increase comes from Scope 3 which includes GHG emissions that are not under the direct control of the Port (such as aircraft-related emissions). The analysis did not include the use of SAF or the increase in electric GSE due to limitations in the model. Both of these, as well as other improvements, will help to reduce future GHG emissions.

For context and intensity, State of Washington’s GHG emissions were estimated at 102.1 million MT<sup>48</sup> of CO<sub>2</sub>e in 2019. Of this, 40.3 million MT were attributed to transportation overall with 6.3 million MT attributed to aviation. U.S. based GHG emissions were estimated at 6,341.2 million MT CO<sub>2</sub>e in 2022.<sup>49</sup>

<sup>48</sup> Department of Ecology State of Washington, Washington State Greenhouse Gas Emissions Inventory: 1990-2019. December 2022, Publication 22-02-054.

<sup>49</sup> USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022, 2024. Available online: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>, accessed March 1, 2024.



According to King County,<sup>50</sup> climate change could result in:

- Increased temperatures resulting in more illnesses, hospitalizations, and deaths. In addition, the rise in temperatures results in an increase in wildfire threat which causes poor air quality.
- Decreased snowfall and heavy rain events resulting in extreme river conditions and an increase in landslides. Low snowpack results in less water for people, agriculture, and fish.
- Increased sea levels resulting in more frequent coastal flooding and an increase in acidity in the ocean causing increased costs to shellfish growers.

Overall, climate change could impact the environment by increasing stress for salmon, increasing impacts on forests from disease and fire, changing habitat important to local species, and increasing harmful algal blooms in lakes and the Puget Sound. Impacts to the economy could result from greater risks to homes, businesses, and infrastructure from increased coastal and river flooding and marine based economies could suffer as fish and shellfish diminish. The region could experience health impacts from changes in illnesses carried by ticks and mosquitos, increased risks for people with asthma and heart illness due to more pollution, and greater risk of injury and property damage from more extreme weather events.

Implementation of GHG-reduction efforts, independent of the Proposed Action, by the Port, local and state agencies, and local stakeholders (including airline operators) will help reduce GHG emissions from aircraft sources. The FAA published the United States Aviation Climate Action Plan in 2021, which describes a whole-of-government approach to achieve new-zero emissions by 2050. The Plan outlines ways to decrease emissions that includes new technology (aircraft and engines), SAF, and improving how aircraft operate throughout the National Airspace System.

The risks associated with climate change would be present regardless of the implementation of the Action Alternatives and would not be exacerbated. Therefore, the anticipated increase in GHG emissions due to the Action Alternatives in the context of the Airport's sustainability efforts and climate goals is not anticipated to result in an adverse impact on climate.

### Mitigation and Minimization Measures

#### *Mitigation*

Because the Action Alternatives are not anticipated to result in adverse impacts on climate, no mitigation is necessary.

#### *Minimization Measures*

Minimization measures and BMPs would be used to minimize GHG emissions during construction. The Port has undertaken a wide range of activities designed to reduce GHG emissions and prepare for the effects of climate change, independent of the Proposed Action. Furthermore, the Port is playing a key role in efforts to facilitate the adoption and local production of SAF with airline partners. The Port has set the goal to power every flight fueled at SEA with at least ten percent blend of SAF by 2028.

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<sup>50</sup> <https://kingcounty.gov/en/legacy/services/environment/climate/our-changing-climate/impacts#:~:text=Heavy%20rain%20events%20are%20getting,are%20harmful%20to%20marine%20species>, accessed May 2024.

#### 4.3.4 Coastal Resources

The CZMA requires that “each federal agency activity within or outside the coastal zone that affects any land or water use, or natural resource of the coastal zone shall be carried out in a manner which is consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs.”<sup>51</sup> The specific type of federal action determines the appropriate process. Activities undertaken by or for a federal agency follows the process outlined in 15 CFR Part 930 Subpart C. Activities that require a federal license or permit follows the process outline in 15 CFR Part 930 Subpart D. Federal assistance to state or local government agencies for activities that have reasonably foreseeable effects on the resources or uses of the coastal zone may be subject to a federal consistency review.

For federal authorizations listed in the Washington CZMP, a federal agency cannot issue a permit or approval unless WSDE agrees that the project is consistent with Washington’s enforceable policies. The FAA is responsible for determining if its project or activity has any reasonably foreseeable direct or indirect effects on Washington’s CZMP. The Port is responsible to review projects that will require a federal license or permit for compliance with the CZMP’s enforceable policies and prepare a federal Consistency Certification during the permit process.

##### 4.3.4.1 Significant Impact Threshold

The FAA has not established a significance threshold for coastal resources, but they have identified factors to consider when evaluating potential environmental impacts on coastal resources. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider include situations in which the proposed action or alternative(s) would have the potential to:

- Be inconsistent with the relevant state CZM plan(s);
- Cause an unacceptable risk to human safety or property; or
- Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.

##### 4.3.4.2 Coastal Zone Impacts

###### Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to coastal resources.

###### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

There are currently no listed federal assistance activities in Washington State’s CZMP. Four of the airfield projects (A01, A02, A04, and A06) would require the FAA to relocate FAA-owned equipment (including navigational and visual aids) and associated infrastructure. These relocations may require modifications to existing FAA airspace procedures. The extent of these relocations and modifications would be determined during the design of the airfield projects. Relocations of equipment would occur on the airfield. The FAA has determined that the proposed FAA activities would be undertaken in a manner as to not affect the coastal resources or uses of Washington State coastal zone. The FAA has therefore determined that a Negative Determination is appropriate for the FAA activities. The Negative Determination was submitted to the WSDE Federal Consistency Coordinator on July 2, 2024 (see **Appendix E, Coastal Resources**). WSDE did not have any questions or concerns with the Negative Determination.

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<sup>51</sup> 15 CFR Part 930, *Federal Consistency with Approved Coastal Management Programs*.



If any NTPs trigger the need for individual Section 404 / 401 permits, then SEA will be responsible to submit a Consistency Certification form as part of the permit process.

Mitigation and Minimization Measures

*Mitigation*

Because there would be no significant coastal zone impacts under any of the alternatives considered, no mitigation would be necessary.

*Minimization Measures*

No minimization measures have been identified.

**4.3.5 U.S. Department of Transportation Act, Section 4(f)**

This section presents the results of the analysis of potential impacts to Section 4(f) resources as a result of the Proposed Action and alternatives. Resources that are protected by Section 4(f) inside the GSA include 15 publicly-owned parks or recreation areas.

**4.3.5.1 Significant Impact Threshold**

**Table 4-20** presents the definitions of an impact to, or “use of” a Section 4(f) resource.

**TABLE 4-20: SECTION 4(F) IMPACT**

Impact Type	Definition
Physical Use	Actual physical taking of a Section 4(f) property, through purchase of land or permanent easement, physical occupation of all or a portion of the property, or alteration of structures or facilities located on the property.
Temporary Use	Temporary use of a Section 4(f) resource that is adverse.
Constructive Use	Direct or indirect impacts that substantially impair the activities, features and / or attributes of a Section 4(f) resource. This means that the value of the Section 4(f) resource, in terms of its prior significance and enjoyment, is substantially reduced or lost as a result of the project.

According to the FAA, a significant impact would occur when the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a “constructive use.”

**4.3.5.2 USDOT Section 4(f) Impacts**

Alternative 1: No Action

The No Action Alternative is not anticipated to result in impacts to USDOT Section 4(f) resources.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Neither Action Alternative would physically impact any Section 4(f) properties within the GSA. As a result, there would be no physical use of a Section 4(f) property. See Section 4.3.12, for additional information on the trails related surface transportation impacts and mitigation. The assessment of potential constructive use impacts focused on changes in noise exposure and concluded that none of the Section 4(f) resources would experience a substantial impairment due to increases in noise from operations or construction. See Section 4.3.10, for additional information on noise impacts. Therefore, the Action Alternatives would not result in significant impacts to Section 4(f) properties.

## Mitigation and Minimization Measures

### *Mitigation*

Because there would be no physical or constructive use impacts under any of the alternatives considered, no mitigation would be necessary.

### *Minimization Measures*

No minimization measures have been identified.

## **4.3.6 Hazardous Materials, Solid Waste, and Pollution Prevention**

This section presents the analysis of potential exposure to hazardous materials, impacts to solid waste management and disposal, and applicable pollution prevention measures that could occur due to the Proposed Action and alternatives. Additional information, including information on pollution prevention and recycling, can be found in **Appendix F**.

### **4.3.6.1 Significant Impact Threshold**

The FAA has not established a significance threshold for hazardous materials or solid waste; however, there are several factors to consider during the analysis. If these factors exist, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors that may be relevant include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and / or solid waste management;
- Involve a contaminated site where impacts cannot be mitigated below significant levels;
- Produce an appreciably different quantity or type of hazardous waste that cannot be disposed of or mitigated adequately;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal or would exceed local landfill or hazardous waste disposal site capacity; or
- Adversely affect human health and the environment.

### **4.3.6.2 Hazardous Materials**

#### Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to / from hazardous materials.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would utilize construction equipment containing hazardous substances such as oil, fuel, solvents, batteries, or other similar products. All hazardous materials used during construction would be handled, stored, and disposed of in accordance with federal, state, and local requirements.

Eleven documented incidents of hazardous materials contamination are located within the limits of disturbance of one or more elements of the Action Alternatives. The sites are listed in **Table 4-21** and depicted on **Exhibit 4-1**.

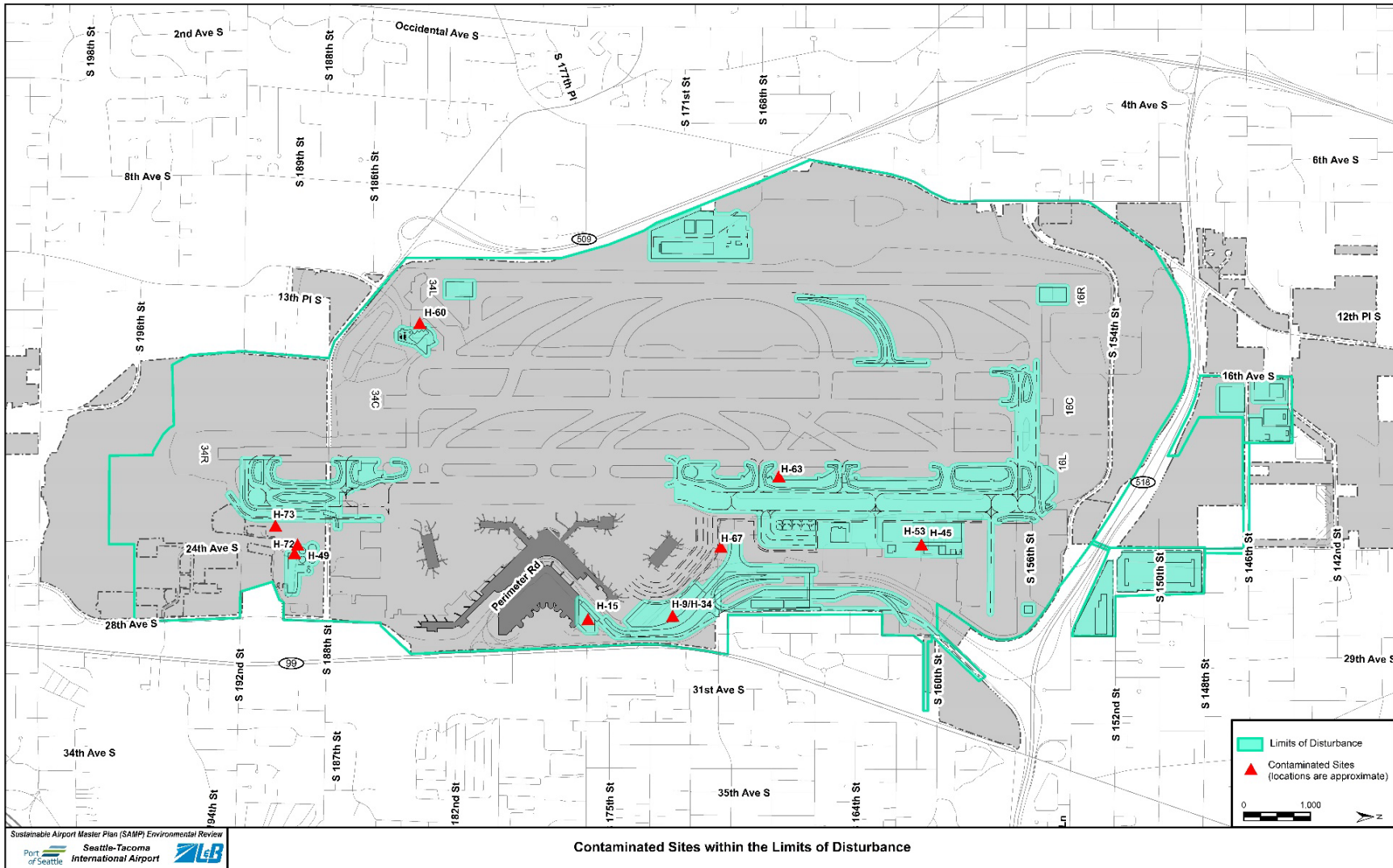


**TABLE 4-21: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION  
WITHIN THE LIMITS OF DISTURBANCE**

Map ID	Name	Cleanup Site ID	Address	Site Status	Project that Would Impact the Site:
H-9	Continental Olympic United Fuel Farm	1917	Air Cargo Rd, Seattle, Washington, 98158	Completed under Participation Agreement Conditions	A09: Hardstand (Central)
H-15	Hertz Avis National Fuel Facility QTA	9588	Sea-Tac International Airport	Cleanup Started	L04: Northeast GT Center
H-34	Sea-Tac United Fuel Farm	1918	Sea-Tac International Airport	See H-9	A09: Hardstand (Central)
H-45	Sea-Tac United Tank Removal	7191	2230 S. 161 <sup>st</sup> St, Seattle, Washington, 98158 (Building 161A – TBR)	Cleanup Started	A08: Hardstand (North) S04: Fuel Rack Relocation
H-49	Swissport Fueling	12270	2350 S. 190 <sup>th</sup> St, Seattle, Washington, 98188	Cleanup Started	S01: Fuel Farm Expansion
H-53	United Airlines Sea Tac International Airport	7040	2230 S. 161 <sup>st</sup> St, Seattle, Washington, 98158 (Building 161A – TBR)	Closed under VCP	A08: Hardstand (North) S04: Fuel Rack Relocation
H-60	AFFF Testing and Training Location	N/A	Southern portion of Airfield, between Runway 34L and Runway 34C	N/A	S02: Primary ARFF
H-63	Aircraft Engine Fire / AFFF Release	N/A	Central Airfield on Taxiway B	N/A	A04: Taxiway B 500-foot Separation
H-67	ARFF Station AFFF Storage and Testing / Training	N/A	ARFF Station	N/A	T01: North Gates
H-72	AFFF Accidental Release	N/A	Airport Fuel Farm	N/A	S01: Fuel Farm Expansion
H-73	AFFF Storage for Fuel Farm	N/A	Airport Fuel Farm	N/A	S01: Fuel Farm Expansion

Source: Washington Department of Ecology, *What's In My Neighborhood Tool*, accessed February 2023. (<https://apps.ecology.wa.gov/neighborhood/>). WSDE data was supplemented with current, Port of Seattle data where applicable.

**EXHIBIT 4-1: CONTAMINATED SITES WITHIN THE LIMITS OF DISTURBANCE**





SEATTLE-TACOMA INTERNATIONAL AIRPORT  
ENVIRONMENTAL ASSESSMENT  
FOR THE SUSTAINABLE AIRPORT MASTER PLAN NEAR-TERM PROJECTS

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All work within an area of contamination would be conducted in accordance with the Port's Construction General Requirements for handling contaminated soil.<sup>52</sup> These general requirements include utilizing an approved Contaminated Soils Management Plan identifying disposal facilities and BMPs such as: soil and construction stockpile controls (such as covering and maintaining stockpiles to prevent erosion), construction site controls (such as sweeping and cleaning pavements outside the work area to remove debris), and personal protective equipment requirements for worker safety and protection.

All material excavated from within the project area would be tested prior to disposal. Any material found to be contaminated would either be removed and disposed of in accordance with federal, state, and local requirements, encapsulated on-site to minimize any human health or environmental exposure risk, or remediated below established cleanup levels. As is standard for Port construction projects,<sup>53</sup> all excavations would be monitored by a trained environmental professional for evidence of unanticipated contaminated soils under SEA's Environmental Agent Work Plan. None of the hazardous materials known to potentially be encountered are uncommon and the Port would comply with applicable rules and regulations to handle and dispose of the materials safely.

If any unanticipated hazardous materials, waste, or contaminated soils are encountered during construction the discovery would immediately be brought to the attention of the Port's Project Manager for determination of appropriate action. The contractor would be prohibited from disturbing such hazardous materials or contaminated soils until directed by the Project Manager. Soils determined to be contaminated and requiring removal would be hauled and disposed of as contaminated materials, in accordance with federal, state, and local requirements, including, but not limited to:

- Management of Hazardous Waste (49 U.S.C. § 260-280)
- Transportation of Hazardous Waste (49 U.S.C. § 171-199)
- The Model Toxics Control Act (Revised Code of Washington [RCW] 70.105D.010)
- Dangerous Waste Regulations (Washington Administrative Code [WAC] 173-303)

Given that the Port would construct and operate the new facilities in accordance with these and other requirements, no significant impacts to, or from, hazardous materials are anticipated as a result of the Action Alternatives.

### *Buildings to be Demolished*

The Action Alternatives include the demolition of 12 existing buildings: Building 160D, Gourmet Flight Kitchen; Building 161A, United Airlines Maintenance; Building 161E Cargo 4E; Building 161G, Port Maintenance Building; Building 166B United Airlines Maintenance / Cargo 4S; Building 167A / 167B, Cargo 6 Swissport; Building 170A, ARFF; Building 170B Doug Fox Payment Building; Building 170C Doug Fox Office; Building 170 D Guard Shack, Building 170W, Port Westside Field Offices, and Building 188WB, PACCAR Building. Given the age of these structures (except for Buildings 170B and 170C which were built in 2014 and Building 170D which was built in 2006), each has the potential to contain regulated building materials including, but not limited to, asbestos-containing materials (commonly found in floor and ceiling tiles and insulation), lead paint, and mercury (commonly found in fluorescent light tubes and thermostats). Previous surveys of four of the buildings confirmed varying amounts of regulated building materials in three out of the four buildings (167A, 170A, and 170W). No regulated building materials were found in Building 161A. In addition, because most of these structures

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<sup>52</sup> Port of Seattle Master Specification Section 02 61 13 – Handling Contaminated Soils.

<sup>53</sup> Port of Seattle Master Specification Section 02 61 13 – Handling Contaminated Soils.



have been used for maintenance or storage of equipment, each has the potential for underground fuel lines, utility lines, or areas of subsurface contamination.

Port construction requirements require development of a pollution prevention plan that includes an inventory / inspection of known hazardous materials in the buildings and on the site, a hazardous material cleanup and disposal plan, and a site-specific plan outlining administrative, operational, and structural BMPs that would be implemented to minimize risks and respond to any incidents should they occur.<sup>54</sup> A Contractor's Safety Plan is also required by the Port to document site-specific emergency procedures, and may include respiratory protection requirements, personal protective equipment requirements, and other safety requirements.<sup>55</sup> These requirements would avoid or minimize risks of exposure or offsite pollutant transport. Given this framework, no significant impacts related to building demolition are anticipated as part of the Action Alternatives.

#### *Per- and Polyfluoroalkyl Substances (PFAS)*

Five sites where PFAS is either stored or has been deployed for an incident would be impacted by the Action Alternatives. These include H-60 (testing / training location), H-63 (engine fire on Taxiway B), H-67 (ARFF Station), H-72 (Fuel Farm release), and H-73 (Fuel Farm storage). Construction occurring on or near these sites would follow Port specifications for handling contaminated soil noted above. As regulations for PFAS are in development at the state and federal level, the Port would ensure work is conducted in accordance with all applicable PFAS regulations in place at the time of construction.

#### Mitigation and Minimization Measures

##### *Mitigation*

Established regulations and construction protocols would mitigate risks, exposure, or pollutant transport should unknown areas of contamination be encountered during construction. These include, but are not limited to:

- WSDE's MTCA cleanup levels listed in the MTCA Method A Tables 720-1, Table 740-1, and Table 745-1 (Washington Administrative Code [WAC] 173-340-900)
- The Port's Environmental Agent Work Plan
- Sea-Tac Airport Construction Safety Manual
- Sea-Tac Airport Construction General Requirements

To document that construction actions have not impacted groundwater quality within or downgradient of the work area, the Port will monitor contaminant levels in groundwater during and following completion of construction. Given these construction protocols and BMPs, no significant impacts to / from hazardous materials would occur as a result of implementing the Action Alternatives.

##### *Minimization Measures*

No minimization measures or additional BMPs beyond those already included above are anticipated to be implemented.

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<sup>54</sup> Sea-Tac Airport Construction General Requirements, Section 01 57 23 – Pollution Prevention Planning and Execution.

<sup>55</sup> Sea-Tac Airport Construction General Requirements, Section 01 35 29T – Tenant Safety Management, Appendix A.



### 4.3.6.3 Solid Waste and Recycling

#### Alternative 1: No Action

Because the number of passengers would increase under the No Action Alternative, waste generation would also increase. Despite the increase in solid waste and recycling materials, the quantity and type of waste would not be appreciably different, and it would not exceed local landfill capacity. King County’s Solid Waste Division has identified that there is adequate capacity in the Cedar Hills Regional Landfill to continue accepting waste beyond 2028. In November 2022 the County identified a preferred alternative for landfill development. This development is estimated to increase Cedar Hills Regional Landfill life until early 2038.<sup>56</sup>

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Construction activities associated with the Action Alternatives would generate additional solid waste, such as construction debris (e.g. asphalt, concrete, and wood), building materials (e.g. steel, wood, glass, and plastic products), and other materials commonly associated with facility construction. The selected contractor would be responsible for managing and disposing of construction generated waste in accordance with a Waste Management Plan and Waste Management Final Report. The Port’s existing Waste Diversion and Recycling Program would also continue, and the selected contractor would be expected to meet the goal of diverting at least 90 percent of construction debris from the landfill.

Once the proposed improvements have been completed, the additional terminal, gates, and passengers utilizing these facilities would result in an increase of solid waste being generated at the Airport. Waste generation forecasts, presented in **Table 4-22**, for the Action Alternatives were based on passenger projections, historic data on waste generated per passenger, past analysis of modeling related to increases in square footage of food service concessionaires, and modeling related to increases in square footage of remote facilities. Given the Port’s continued recycling programs, the needs for additional waste disposal are considered conservative.

**TABLE 4-22: SOLID WASTE PROJECTIONS (IN TONS) FOR THE ACTION ALTERNATIVES IN 2032 AND 2037**

Facility	No Action	Action Alternatives	Difference
2032 Terminal	10,067	12,807	2,740
2032 Airfield	3,018	3,335	317
2037 Terminal	10,519	14,091	3,572
2037 Airfield	3,140	3,667	527

Source: Data provided by Port, 2023. Based on Seattle-Tacoma International Airport Solid Waste Growth Forecast and Capacity Analysis 2020–2034, 2020.

The additional waste would not be significantly more than the No Action. As discussed under No Action, there is sufficient landfill capacity to accommodate the additional solid waste. Because neither alternative would result in appreciably different quantity of waste; different method of collection or disposal; exceedance of disposal capacity; or changes in waste diversion and recycling, no significant impacts related to solid waste would be expected.

<sup>56</sup> <https://kingcounty.gov/en/dept/dnrp/waste-services/garbage-recycling-compost/solid-waste-facilities/cedar-hills-development>, accessed May 2024.



## Mitigation and Minimization Measures

### *Mitigation*

Because no significant impacts to solid waste were identified, no mitigation is necessary.

### *Minimization Measures*

No minimization measures beyond those already included above have been identified.

## **4.3.7 Historical, Architectural, Archaeological, and Cultural Resources**

This section presents the results of the NHPA Section 106 process, which assesses the effects an “undertaking” would have on historical, architectural, archaeological, and cultural resources. The FAA conducted the required consultation with the Washington SHPO through the Washington State DAHP and federally-recognized Native American Tribes under the NHPA. More information on the consultation and the analysis can be found in **Appendix G**.

### **4.3.7.1 Significant Impact Threshold**

In making a Section 106 effect determination, the FAA considers several different types of impacts to historic properties, including direct and indirect effects from both construction and operation activities.

The FAA has not established a significance threshold for historical, architectural, archaeological, and cultural resources. However, the FAA does consider the context and intensity of adverse effects. NHPA regulations state that an adverse effect finding is not necessarily significant under NEPA. Resolution of adverse effects may be sufficient to avoid a significant impact.

### **4.3.7.2 Historical, Architectural, Archaeological, and Cultural Resources Impacts**

#### Alternative 1: No Action

The No Action Alternative is not anticipated to result in impacts to any properties that are listed on or eligible for the NRHP.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

There are no NRHP-eligible properties located within the APE. Therefore, the FAA determined that a finding of No Adverse Effect was appropriate. The FAA and the Port agreed to include an Inadvertent Discoveries Plan, which would be prepared for all projects, and to have an archaeological monitor on-site during ground disturbing activities for projects in C03, S10, T02, L03, L05, L07, and the southern half of C02 as part of the No Adverse Effect finding given the potential to locate resources in these areas. FAA submitted a finding of No Adverse Effect to DAHP on August 3, 2021. DAHP concurred with the finding of No Adverse Effect on August 30, 2021. The FAA also initiated government-to-government consultation with Native American Tribes on July 28, 2021. The FAA updated the APE to include potential visual impacts for the proposed cargo facilities (C02 and C03) and DAHP concurred with the updated APE on November 16, 2023. FAA submitted an updated finding of No Adverse Effect to DAHP on July 11, 2024 and DAHP concurred with the updated finding on July 12, 2024.

## Mitigation and Minimization Measures

### *Mitigation*

A Monitoring and Inadvertent Discovery Plan will be prepared to identify the steps that would be taken if archaeological materials are inadvertently encountered during construction. An archaeological monitor will be on-site as explained above.

### *Minimization Measures*

No minimization measures have been identified.

## **4.3.8 Land Use**

This section describes the analysis of potential land use impacts associated with the Proposed Action and alternatives. Additional information related to local land use plans and the analysis of those plans can be found in **Appendix H**.

### **4.3.8.1 Significant Impact Threshold**

The FAA has not established a significance threshold for land use. The determination that significant impacts exist in the Land Use impact category is normally dependent on the significance of other impacts. FAA Order 1050.1F states “the compatibility of land uses in the vicinity of an airport may also need to be assessed to ensure those uses do not adversely affect safe aircraft operations.” Section 1506.2(d) of the CEQ Regulations requires that NEPA documents discuss any inconsistency with approved state and / or local plan(s) and law(s) (whether or not federally-sanctioned).<sup>57</sup>

### **4.3.8.2 Land Use Impacts**

#### Alternative 1: No Action Alternative

The No Action Alternative is not anticipated to result in impacts to existing and future planned land uses and would be consistent with local land use plans.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would occur entirely on Port-owned property and would be consistent with the conditionally approved ALP. Each of the local land use plans for jurisdictions adjacent to or in the vicinity of SEA have recognized the Airport operations, including in some cases specifically addressing the potential for additional development of Airport property or property in the vicinity of SEA for Airport related operations. The State Growth Management Act, RCW 36.70.547, further protects airport development and operations from inconsistent or incompatible land uses being developed adjacent to the airport. **Table 4-23** presents the local plans and how the Action Alternatives are consistent with each plan.

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<sup>57</sup> Public Law (P.L.) 91-190, 42 United States Code (U.S.C.) 4321, et. seq., National Environmental Policy Act, 1969, Section 102(2)(c). CEQ amended its regulations implementing NEPA effective April 20, 2022.



**TABLE 4-23: CONSISTENCY WITH LOCAL PLANS**

Plan	Consistency with Plan
Port and City of SeaTac ILA (2018)	All elements would be considered allowable land uses per the ILA and are therefore consistent with this agreement.
City of SeaTac Comprehensive Plan (updated in 2021)	All project elements would occur in the City of SeaTac, within the areas governed by this plan. All project elements would be consistent with this plan, as the City’s zoning code mirrors the ILA allowable land uses within the Airport areas.
Des Moines Comprehensive Plan (2015, amended in 2020)	None of the project elements, nor significant direct or indirect impacts of the Action Alternatives, would occur within the City of Des Moines. Therefore, the Action Alternatives would be consistent with the Des Moines Comprehensive Plan.
The Burien Plan (updated in 2022)	None of the project elements, nor significant direct or indirect impacts of the Action Alternatives, would occur within the City of Burien. Therefore, the Action Alternatives would be consistent with the Burien Plan.
Tukwila Comprehensive Plan (2015)	None of the project elements, nor significant direct or indirect impacts of the Action Alternatives would occur within the City of Tukwila. Therefore, the Action Alternatives would be consistent with the Tukwila Comprehensive Plan.
Puget Sound Regional Council - Vision 2050 (adopted in 2020)	The VISION 2050 calls for cities and counties to continue preserving industrial lands and limit the encroachment of incompatible land uses around airports, particularly in the critical approach and departure paths. Because the Action Alternatives would be compatible with Airport operations and would not encroach upon the critical approach and departure paths, they would be considered compatible with this goal. The Action Alternatives would also support growth at SEA, and therefore be consistent with the PSRC’s goals to leverage the region’s position as an international gateway and optimize commercial aviation activities.

**Mitigation and Minimization Measures**

*Mitigation*

Because no inconsistencies with local plans were identified, no mitigation would be necessary.

*Minimization Measures*

No minimization measures have been identified.



### 4.3.9 Natural Resources and Energy Supply

This section describes the analysis of potential impacts to natural resources and energy supply associated with the Proposed Action and alternatives.

#### 4.3.9.1 Significant Impact Threshold

The FAA has not established a significance threshold for natural resources and energy supply. However, the FAA considers the potential of the project to cause demand that exceeds available or future supplies of natural resources or energy supply when evaluating the context and intensity of potential impacts. For most actions, changes in energy demands or other natural resource consumption will not result in significant impacts. If an EA identifies problems such as demand exceeding supply, additional analysis may be required. Otherwise, impacts are not considered significant.

#### 4.3.9.2 Energy Supply

##### Alternative 1: No Action

##### *Electricity and Natural Gas*

Demand for electricity and natural gas at SEA would continue to increase under the No Action due to the increase in total number of passengers utilizing SEA. **Table 4-24** provides the anticipated electricity demand and **Table 4-25** provides the anticipated natural gas demand under the No Action.

**TABLE 4-24: PROJECTED ANNUAL ELECTRICAL DEMAND FROM THE NO ACTION ALTERNATIVE (2032 AND 2037)**

Alternative	Additional Annual Electrical Use (MWH)
No Action (2032 and 2037)	152,804

Notes: Estimates are based on the additional square footages of the projects included in the No Action Alternative.

MWH = megawatt-hours

**TABLE 4-25: PROJECTED ANNUAL NATURAL GAS DEMAND FROM THE NO ACTION ALTERNATIVE (2032 AND 2037)**

Alternative	Additional Annual Natural Gas Use (therms)
No Action (2032 and 2037)	3,769,066

Notes: Estimates are based on the additional square footages of the projects included in the No Action Alternative.

1 therm = a unit of heat equivalent to 100,000 British Thermal Units

##### *Fuel Consumption*

Fuel demand is expected to increase under the No Action due to the projected increase in aircraft operations. The anticipated fuel demand is provided in **Table 4-26**. Because the No Action does not include any new fuel storage capacity, the increase in demand would require SEA to evaluate options to meet future minimum fuel storage requirements. Although Jet A fuel is not in short supply, the BP Olympic Pipeline is near capacity, and during summer peak operations at SEA there are often challenges having enough jet fuel in storage tanks to meet desired storage levels. This could become even more critical if a disruption in the BP Olympic Pipeline serving SEA occurred.



**TABLE 4-26: PROJECTED ANNUAL FUEL DEMAND FROM THE NO ACTION ALTERNATIVE (2032 AND 2037) IN GALLONS**

Fuel Type	2032 No Action	2037 No Action
Jet A	692,985,758	704,820,987
Diesel	560,280	569,849
Gasoline	609,743	620,157

Notes: Projections are based on the ratio of usage per operation, based on 2022 actual data.  
 Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The new facilities proposed as part of the Action Alternatives would result in an increase in demand for energy, but that increase can be met by available supply. The following summarizes the findings for each energy source.

*Electricity and Natural Gas*

While implementing the Action Alternatives would increase the demand for electricity (**Table 4-27**), the additional energy demand would not exceed the available energy supplies in the Seattle-Tacoma area. During the development of the NTPs, the Port would utilize the Sustainable Evaluation Framework, which identifies opportunities to reduce energy and waste for each project.

BPA provides 90 percent of the electric power using PSE transmission infrastructure within the Airport fence line. BPA has more than 15,000 circuit miles of transmission lines, 260 substations and an extensive network of related transmission facilities, telecommunications, and IT infrastructure across six states, which allows for the sale of surplus power across the West.<sup>58</sup>

**TABLE 4-27: COMPARISON OF PROJECTED ANNUAL ELECTRICAL DEMAND FROM THE ACTION ALTERNATIVES (2032 AND 2037)**

Alternative	Additional Annual Electrical Use (MWH)
No Action (2032 and 2037)	152,804
Action Alternatives (2032 and 2037)	209,223
Increase	56,419

MWH = megawatt-hours

Sources: SAMP Technical Memo No. 9, Table 4-3; Landrum & Brown analysis, 2023.

While implementing the Action Alternatives would increase the demand for natural gas (**Table 4-28**), the additional demand would not exceed the available energy supplies, which are not in short supply in the Seattle-Tacoma area. As of 2022, Canada, where SEA natural gas typically comes from, is estimated to have 1,368 trillion cubic feet of natural gas resources, an amount equal to over 200 years of current annual demand.<sup>59</sup> RNG is used (planned to continue into the future until at least 2030) for approximately 60 percent usage of natural gas in the boilers and all the natural gas supply at the CNG fueling station.<sup>60</sup>

<sup>58</sup> Bonneville Power Administration 2018–2023 Strategic Plan.

<sup>59</sup> Natural Gas Facts, Canadian Gas Association, <https://www.cga.ca/natural-gas-statistics/natural-gas-facts/>, accessed January 15, 2024.

<sup>60</sup> This Port of Seattle contract commenced in October of 2020 and is for a term of 10 years.





**TABLE 4-28: COMPARISON OF PROJECTED ANNUAL NATURAL GAS DEMAND FROM THE ACTION ALTERNATIVES (2032 AND 2037)**

Alternative	Additional Natural Gas Use (therms)
No Action (2032 and 2037)	3,769,066
Action Alternatives (2032 and 2037)	5,133,321
Increase	1,364,255

1 therm = a unit of heat equivalent to 100,000 British Thermal Units

Sources: SAMP Technical Memo No. 9, Table 4-4; Landrum & Brown analysis, 2023.

*Fuel Consumption - Jet A / Diesel / Gas*

**Table 4-29** shows the projected Jet A, diesel, and gasoline fuel consumption for the Action Alternatives in 2032 and 2037. Action Alternatives would address the storage concerns described above and improve resiliency for emergencies as well as day-to-day operations by increasing the storage capacity of SEA’s fuel farm. The proposed Fuel Farm Expansion (Project S01) would also provide storage and blending infrastructure to support the Port’s SAF goal to power every flight fueled at SEA with at least a ten percent blend of SAF. The increased use of SAF would reduce the demand for Jet A fuel. Anticipated increases in diesel and gasoline usage because of construction and operation of the Action Alternatives would not result in a significant impact because diesel and gasoline are not in short supply in the region.

**TABLE 4-29: PROJECTED FUEL CONSUMPTION FROM THE ACTION ALTERNATIVES (2032 AND 2037) IN GALLONS**

Fuel Type	No Action	Action Alternatives	Increase
2032 Jet A	692,985,758	705,980,168	12,994,410
2032 Diesel	560,280	570,786	10,506
2032 Gasoline	609,743	621,177	11,434
2037 Jet A	704,820,987	756,795,661	51,974,674
2037 Diesel	569,849	611,870	42,022
2037 Gasoline	620,157	665,888	45,731

Notes: Projections are based on the ratio of usage per operation, based on 2022 actual data.

Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Mitigation and Minimization Measures

*Mitigation*

Because no significant impacts related to energy supply were identified, no mitigation is necessary.

*Minimization Measures*

Minimization measures (efficiencies or upgrades in mechanical systems, upgrades in lighting, and alternative fuel sources) and BMPs would be used to minimize energy use during and after construction of the Proposed Action or the Hybrid Terminal Option.



### 4.3.9.3 Natural Resources

#### Alternative 1: No Action

##### *Water*

Because the total number of passengers utilizing SEA is expected to continue to increase even under the No Action scenario, there would be additional demand on water supply associated with this alternative (see **Table 4-30**). There is ample supply of water to handle this increase in demand.

##### *Other Natural Resources*

The No Action Alternative is not anticipated to result in impacts to other natural resources.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

##### *Water*

The Action Alternatives would result in an increase in demand for water. **Table 4-30** shows estimated future water usage based on the projected number of future passengers, and the average gallons used per passenger.

**TABLE 4-30: PROJECTED WATER USAGE IN GALLONS (2032 AND 2037)**

Alternative	Water Consumption (gallons)
2032 No Action	307,011,771
2032 Action Alternatives	313,040,864
2037 No Action	319,428,097
2037 Action Alternatives	344,181,622

Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Because there is ample supply of water to handle this increase in demand, no significant impact related to water usage would occur.

##### *Other Natural Resources*

The construction of the Action Alternatives would require the use of other natural resources such as sand, gravel, concrete, asphalt, and water, in addition to construction materials such as steel, wood, and glass. Metal wiring and plastic insulation would be used for new lighting. These construction materials are not in short supply in the Seattle-Tacoma area and construction of the Action Alternatives is unlikely to exceed the available supply of these materials. Therefore, no significant impact related to other natural resource usage would occur.

#### Mitigation and Minimization Measures

##### *Mitigation*

Because no significant impacts related to natural resources were identified, no mitigation is necessary.

##### *Minimization Measures*

Minimization measures (use of recyclable materials, minimize and recycle construction waste) and BMPs related to water usage and use of other natural resources would be used to minimize impacts during construction.



### 4.3.10 Noise and Noise-Compatible Land Use

This section presents the results of aircraft and construction noise analyses for the Proposed Action and alternatives. The impact of aircraft-related noise levels upon the surrounding area is presented as the number and type of noise sensitive land uses located within the noise contours for each alternative for both 2032 and 2037 conditions. Noise contours for the levels of DNL 65, 70, and 75 dB were calculated and represent average-annual day conditions. Construction noise considers the distance of any noise sensitive land uses from construction sites.

There are minor differences in the taxiway layout and location of where aircraft would park for passenger loading / unloading among the different alternatives. However, the primary factor that resulted in changes in noise exposure was the number of aircraft operations, the fleet mix, and the day-night split assumed for the average-annual day in each alternative condition. **Table 4-31** presents the average-annual day operations for each of the alternatives assessed in this section. **Appendix J** contains the protocol for the noise analysis and detailed information about the noise analysis including modeling inputs. **Appendix A** contains additional information on the forecast and operational assumptions.

**TABLE 4-31: ANNUAL-AVERAGE DAY OPERATIONS**

Alternative	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total Operations
2032 No Action	531.98	108.88	542.11	92.21	1,279.18
2032 Action Alternatives	544.56	108.31	550.04	100.25	1,303.16
2037 No Action	552.22	99.62	548.85	100.34	1,300.96
2037 Action Alternatives	587.38	112.49	588.93	108.16	1,396.96

Notes: Totals may not sum due to rounding.

Daytime = 7:00am – 9:59pm, Nighttime = 10:00pm – 6:59am.

Source: Aviation Forecast Update, prepared by Port of Seattle / Leigh-Fisher, 2023, Sustainable Airport Master Plan – Near-Term Projects, Constrained Operating Growth Scenarios, Seattle-Tacoma International Airport, Landrum & Brown, July 2023.

#### 4.3.10.1 Significant Impact Threshold

According to FAA Order 1050.1F, a noise impact is significant if the alternative would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No Action for the same timeframe.

#### 4.3.10.2 Aircraft Noise Modeling Results – 2032 Conditions

##### Alternative 1: No Action

The 65+ DNL of the Future (2032) No Action noise exposure contour encompasses approximately 10.10 square miles within the cities of Burien, Des Moines, and SeaTac, and unincorporated King County. The 65+ DNL contour extends approximately 3.7 miles to the north and 3.3 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 9,518 housing units, of which 4,534 are sound insulated, with an estimated population of 21,975 people within the 65+DNL. There would be 12 schools (two have been sound insulated), 22 places of worship, five nursing homes, and two libraries within the 65+ DNL noise contour.



Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The 65+ DNL of the Future (2032) Action Alternatives noise exposure contour encompasses approximately 10.25 square miles, which is 0.15 square miles larger than the Future (2032) No Action noise exposure contour. The 65+ DNL contour extends approximately 3.7 miles to the north and 3.3 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 9,855 housing units, of which 4,694 are sound insulated, with an estimated population of 22,799 people within the 65+DNL. There would be 12 public schools (two have been sound insulated), 22 places of worship, five nursing homes, and two libraries within the 65+ DNL noise contour, which is the same as the Future (2032) No Action Alternative.

**Exhibit 4-2** shows the comparison of the Future (2032) No Action noise exposure contours and the Future (2032) Action Alternatives noise exposure contours. The comparison shows the small increase in the contour to the north and the south compared to the Future (2032) No Action. This directly corresponds to the predicted increase in operations between the two alternatives. The Future (2032) Action Alternatives would not increase noise by 1.5 DNL or more for a noise sensitive area at or above the 65 DNL (the range of increase was between 0.0 DNL and 0.6 DNL) or that would be exposed at or above the 65 DNL level due to a 1.5 dB or greater increase, (range of increase was between 0.03 – 0.16 DNL within the 63.5 – 65 DNL) when compared to the Future (2032) No Action. Therefore, no significant noise impact would occur as a result of implementing the Future (2032) Action Alternatives.

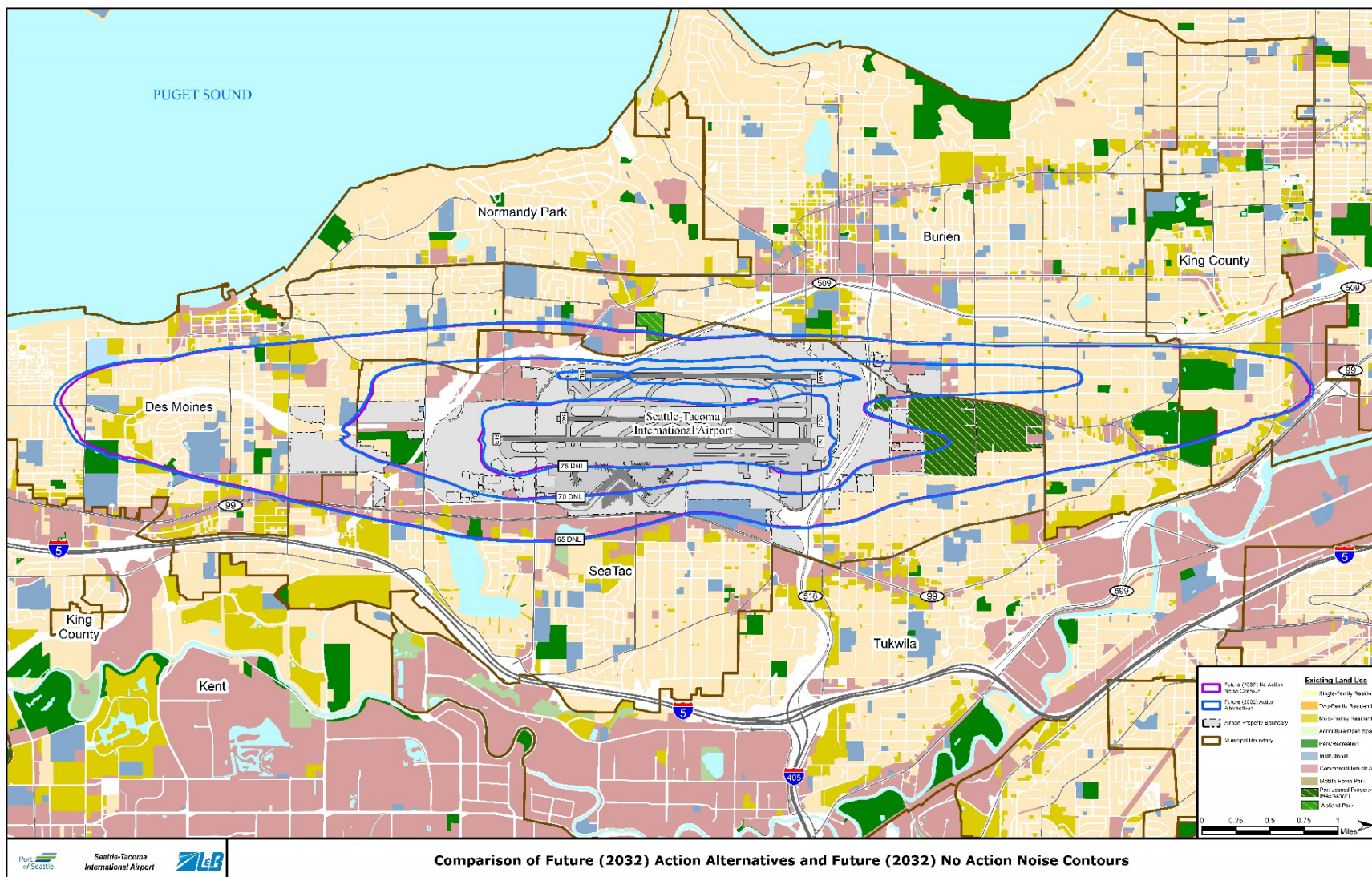
**Table 4-32** summarizes the comparison of housing units and estimated population for 2032 in the alternatives. The Future (2032) Action Alternatives would increase the total number of housing units by 337 and population by 824 within the 65+ DNL as compared to the Future (2032) No Action. The increase in residences and population is attributed to the predicted increase in the size of the Future (2032) Action Alternatives noise exposure contour as compared to the Future (2032) No Action noise exposure contour.

**TABLE 4-32: NOISE SENSITIVE FACILITIES COMPARISON (2032)**

Mitigation Status / Land Use	No Action DNL 65+ dB	Action Alternatives DNL 65+ dB	Difference
<b>Sound Insulation Completed</b>			
Single-Family	4,146	4,258	+112
Multi-Family	388	436	+48
Mobile Home	0	0	0
<i>Subtotal</i>	<i>4,534</i>	<i>4,694</i>	<i>+160</i>
<b>Not Sound Insulated</b>			
Single-Family	1,046	1,089	+43
Multi-Family	3,782	3,895	+113
Mobile Home	156	177	+21
<i>Subtotal</i>	<i>4,984</i>	<i>5,161</i>	<i>+177</i>
<b>Total Housing Units</b>	<b>9,518</b>	<b>9,855</b>	<b>+337</b>
<b>Total Estimated Population</b>	<b>21,975</b>	<b>22,799</b>	<b>+824</b>

Source: Landrum & Brown analysis, 2024. See also Appendix J.

**EXHIBIT 4-2: COMPARISON OF FUTURE (2032) ACTION ALTERNATIVES AND FUTURE (2032) NO ACTION NOISE CONTOURS**



Sources: AEDT Version 3f; Landrum & Brown analysis, 2024

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### **4.3.10.3 Aircraft Noise Modeling Results – 2037 Conditions**

#### Alternative 1: No Action

The 65+ DNL of the Future (2037) No Action noise exposure contour encompasses 9.16 square miles within the cities of Burien, Des Moines, and SeaTac, and unincorporated King County. This area is smaller than the 65+ DNL of the Future (2032) No Action due to the increase in the number of Boeing 737-7/8/9 MAX aircraft forecasted to be operating in the fleet. The MAX aircraft have a substantially smaller noise footprint than the aircraft they are replacing (Boeing 737-700/800/900 aircraft).

The 65+ DNL contour extends approximately 3.6 miles to the north and 3.0 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 7,166 housing units, of which 3,871 are sound insulated, with an estimated population of 16,297 people within the 65+DNL. There would be 10 schools (two have been sound insulated), 21 places of worship, four nursing homes, and two libraries within the 65+ DNL noise contour.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The 65+ DNL of the Future (2037) Action Alternatives noise exposure contour encompasses 9.82 square miles, which is 0.66 square miles larger than the Future (2037) No Action noise exposure contour. This area is smaller than the 65+ DNL of the Future (2032) Action Alternatives due to the increase in the number of Boeing 737-7/8/9 MAX aircraft forecasted to be operating in the fleet. The 65+ DNL contour extends approximately 3.7 miles to the north and 3.2 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 9,017 housing units, of which 4,325 are sound insulated, with an estimated population of 20,736 people within the 65+DNL. There would be 11 public schools (two have been sound insulated), 21 places of worship, four nursing homes, and two libraries within the 65+ DNL noise contour, which is one more school than the Future (2037) No Action, the Community Chapel Christian School.

**Exhibit 4-3** shows the comparison of the Future (2037) No Action Alternative noise exposure contours and the Future (2037) Action Alternatives noise exposure contours. The comparison shows the increase in the contour to the north and the south compared to the Future (2037) No Action. This primarily corresponds to the increase in operations.

The Future (2037) Action Alternatives would not increase noise by 1.5 DNL or more for a noise sensitive area at or above the 65 DNL (the range of increase was between 0.0 DNL and 0.6 DNL) or that would be exposed at or above the 65 DNL level due to a 1.5 dB or greater increase (range of increase was between 0.26 – 0.46 DNL within the 63.5 – 65 DNL), when compared to the Future (2037) No Action. Therefore, no significant noise impact would occur as a result of implementing the Future (2037) Action Alternatives.

**Table 4-33** summarizes the comparison of housing units and estimated population for 2037. The Future (2037) Action Alternatives would increase the total number of housing units by 1,851 and population by 4,439 within the 65+ DNL as compared to the Future (2037) No Action. The increase in residences and population is attributed to the increase in the size of the Future (2037) Action Alternatives noise exposure contour as compared to the Future (2037) No Action noise exposure contour.



**TABLE 4-33: NOISE SENSITIVE FACILITIES COMPARISON (2032 AND 2037)**

Mitigation Status / Land Use	2032 No Action DNL 65+ dB	2032 Action Alternatives DNL 65+ dB	Difference	2037 No Action DNL 65+ dB	2037 Action Alternatives DNL 65+ dB	Difference
<b>Sound Insulation Completed</b>						
Single-Family	4,146	4,258	+112	3,546	3,959	+413
Multi-Family	388	436	+48	325	366	+41
Mobile Home	0	0	0	0	0	0
<i>Subtotal</i>	<i>4,534</i>	<i>4,694</i>	<i>+160</i>	<i>3,871</i>	<i>4,325</i>	<i>+454</i>
<b>Not Sound Insulated</b>						
Single-Family	1,046	1,089	+43	837	989	+152
Multi-Family	3,782	3,895	+113	2,356	3,572	+1,216
Mobile Home	156	177	+21	102	131	+29
<i>Subtotal</i>	<i>4,984</i>	<i>5,161</i>	<i>+177</i>	<i>3,295</i>	<i>4,692</i>	<i>+1,397</i>
<b>Total Housing Units</b>	<b>9,518</b>	<b>9,855</b>	<b>+337</b>	<b>7,166</b>	<b>9,017</b>	<b>+1,851</b>
<b>Total Estimated Population</b>	<b>21,975</b>	<b>22,799</b>	<b>+824</b>	<b>16,297</b>	<b>20,736</b>	<b>+4,439</b>

Source: Landrum & Brown analysis, 2024. See also Appendix J.

Mitigation and Minimization Measures

*Mitigation*

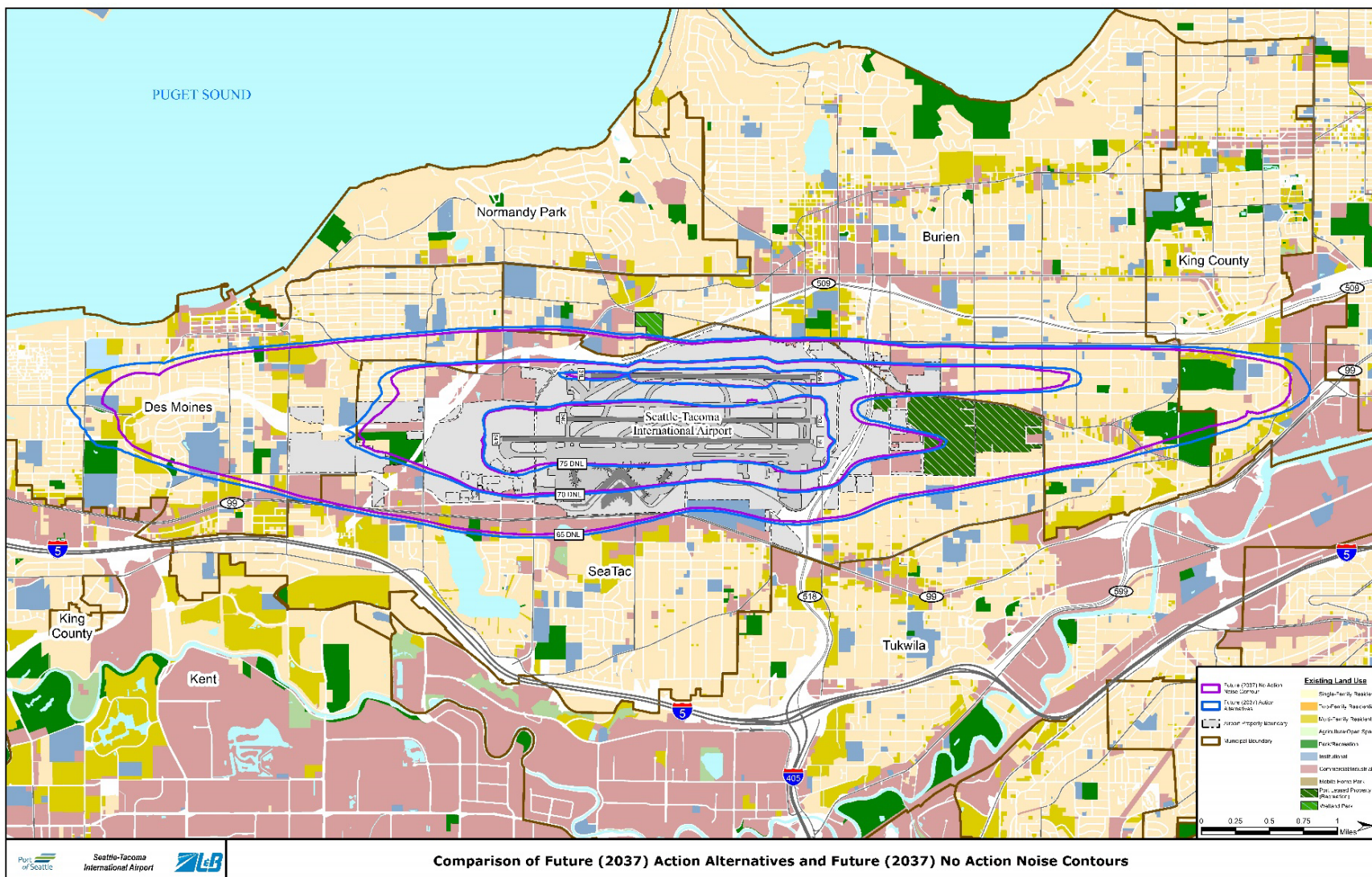
Because no significant impacts related to noise or noise-compatible land use would occur, no mitigation is necessary.

*Minimization Measures*

The Port has initiated a Part 150 Study Update, which is a separate process. This study will evaluate incompatible land uses and their eligibility for inclusion in the Port’s noise remedy program.



**EXHIBIT 4-3: COMPARISON OF FUTURE (2037) ACTION ALTERNATIVES AND FUTURE (2037) NO ACTION NOISE CONTOURS**



Sources: AEDT Version 3f; Landrum & Brown analysis, 2024



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#### **4.3.10.4 Construction Noise**

Based on a screening analysis, a detailed construction noise assessment was completed for NTPs C02 and C03 as the projects are directly adjacent to residential properties (see **Appendix J**). The residential properties are located east of 24<sup>th</sup> Avenue S., west of 30<sup>th</sup> Avenue S., and south of S. 148<sup>th</sup> Street. Construction for C02 would start in 2026 (lasting approximately 18 months) and construction for C03 would start in 2028 (lasting around 16 months). Major construction activities are anticipated to be limited to daylight hours and the Port has construction requirements that help to minimize noise levels near construction sites.

The assessment determined noise from construction may occasionally exceed ambient noise levels and be noticeable to residential properties. For C02, there are 13 residential properties that would experience a noticeable increase (over 3 dB) in construction noise intermittently during construction. The longest continuous duration would be approximately 18 weeks. For C03, there are eight residential properties that would experience a noticeable increase (over 3 dB) in construction noise periodically during construction. The longest duration would be approximately 26 weeks. The short-term increase in noise during construction would be temporary. Construction related noise increases would be minimized through strict adherence to the Port's Construction General Requirements and by meeting State and City of SeaTac requirements. Contractors will also utilize BMPs to reduce noise impacts. In addition, most of the residential properties, adjacent to the C02 and C03 sites that would experience a noticeable temporary noise increase, have received sound insulation through the Port's Sound Insulation Program which reduces the noise that enters the interior of the structure.

#### **4.3.11 Socioeconomics, Environmental Justice, and Children's Health and Safety Risks**

This section presents the results of the analysis of potential socioeconomic impacts, environmental justice impacts, and children's environmental health and safety risks that would occur as a result of the Proposed Action and alternatives. This section summarizes information and analysis included in **Appendix L** as well as **Appendix C**, **Appendix H**, and **Appendix J**.

##### **4.3.11.1 Socioeconomic Impacts**

###### Significant Impact Threshold

The FAA has not established a significance threshold for socioeconomic impacts. However, the FAA has identified several factors to consider, including the degree to which the action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities (see Section 4.3.12 Surface Transportation); or
- Produce a substantial change in the community tax base.



### Alternative 1: No Action

#### *Induced Economic Growth / Substantial Loss in Community Tax Base*

The No Action would experience economic growth due to the increase in forecasted passengers, although a smaller increase than the other alternatives. Additional passengers would mean an increase in Airport revenue, concessions and retail related revenue, and visitor related revenue to the region from lodging, food / beverage, entertainment, or shopping. While the economic impact of the No Action has not been quantified, it is likely that it would result in less gross tax revenue than the other alternatives, but it would likely not produce a substantial change in the community tax base.

#### *Division of Established Communities*

The No Action Alternative would not result in the division of communities.

#### *Relocation of Residences / Relocation of Businesses*

The No Action Alternative would not require the relocation of residences or businesses.

### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

#### *Induced Economic Growth / Substantial Loss in Community Tax Base*

The Action Alternatives would support long-term economic growth for the Puget Sound region and the area near SEA by providing facilities necessary to accommodate future passenger and cargo growth. The proposed Second Terminal would directly create new airline support jobs (such as ticket counter agents, gate attendants, etc.), new restaurant and retail jobs (for the new food and shopping establishments), and new jobs associated with operation and maintenance of the new facilities. Temporary growth in economic activity for local businesses would occur from the creation of construction jobs and supporting businesses. Additional indirect growth in economic activity may occur from passengers using nearby hotels, restaurants, etc. The overall effect to the economic environment of the GSA would be beneficial and no adverse impacts to economic resources are expected.

#### *Division of Communities*

The construction and implementation of the Action Alternatives would occur on existing Port-owned property. There would be no land acquisition. Although new facilities north of SR 518, such as the proposed cargo warehousing (C02 and C03), would be located on the periphery of existing residential communities, they would not displace any residents or key amenities of those communities. As part of the proposed cargo warehousing, access to 24<sup>th</sup> Avenue S. from S. 150<sup>th</sup> Street would likely be eliminated. While final design of the proposed cargo warehousing would be needed to determine if the access would be eliminated, the analysis in this EA assumed the access was eliminated to disclose the potential impacts. Drivers wanting to access 24<sup>th</sup> Avenue S. from S. 150<sup>th</sup> Street would have to utilize S. 152<sup>nd</sup> Street or S. 148<sup>th</sup> Street. This would add a maximum of 0.75 miles to the trip compared to the current access. While this would result in slightly longer drives for approximately 60 homes located along the western portion of S. 150<sup>th</sup> Street, there would be reasonable alternative routes, and this would not be considered a significant division of this community. Therefore, the Action Alternatives would not result in significant impacts related to division of communities.

#### *Relocation of Residences / Relocation of Businesses*

Neither alternative would result in the relocation of residences. The Doug Fox Lot and PACCAR Aviation would be directly impacted by the Action Alternatives. Each of these is described below:

Doug Fox Lot: The Doug Fox Lot, which is a parking business that leases Port-owned property, would be closed due to the proposed construction of the Second Terminal and parking garage. The Port would either not renew the lease (set to expire in June 2026) or would exercise termination rights within the lease. There are numerous other parking options near SEA for passengers to use, including the proposed parking garage. The approximately 25 Doug Fox Lot employees would likely find replacement employment with Port offered employment assistance. While this would result in the loss of revenue for the operator of the Doug Fox Lot, this is not considered a significant economic impact and the loss of parking would largely be replaced by the new parking structure (T02).

PACCAR Aviation: PACCAR Aviation, located off Starling Drive, has approximately 14 employees at this location to support the company's corporate aviation functions. This facility would close due to the proposed construction of the ARFF. The Port would either not renew the lease or would exercise termination rights within the lease. It is anticipated that the business and employees would relocate to another airport in the region. While this would result in the termination of the lease for PACCAR at this site, this is not considered a significant economic impact due to the scale of the operation and the ability of the employees to be relocated.

#### Mitigation and Minimization Measures

##### *Mitigation*

No significant impacts to socioeconomic resources would occur as a result of implementing the Action Alternatives. Therefore, no mitigation for socioeconomic impacts would be necessary.

##### *Minimization Measures*

No minimization measures have been identified.

#### **4.3.11.2 Environmental Justice**

##### Significant Impact Threshold

The FAA has not established a significance threshold for environmental justice impacts. However, the FAA has identified factors to consider when evaluating potential environmental justice impacts. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. The factors to consider include, but are not limited to, whether the Proposed Action or alternative would have the potential to lead to a disproportionate and adverse impact to an environmental justice population due to:

- Significant impacts in other environmental impact categories; or
- Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines is unique to the environmental justice population and significant to that population.

Some adverse impacts may not be significant impacts in another environmental impact category, yet they may be a significant impact when examined in the context of their effects on environmental justice populations. As a result, the FAA must undertake a case-by-case analysis of an action's unique facts. The FAA does this to determine if impacts not otherwise rising to a level of significance for another resource category represent disproportionate and adverse effects, and / or a significant impact for environmental justice purposes. The evaluation of environmental justice impacts also considered any benefits of the alternative to environmental justice populations as well as mitigation measures.



### Alternative 1: No Action

The No Action Alternative would not include the development proposed under the Action Alternatives. Under the No Action Alternative, existing operations at SEA would continue. Environmental justice populations would be exposed to air emissions, noise, and roadways that do not meet mobility standards due to the increase in SEA activity.

### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

All resource categories were evaluated for potential disproportionate and adverse impacts to environmental justice populations. The Action Alternatives would result in an increase in air and GHG emissions, population located in 65+ DNL noise contour, business relocations, and surface transportation impacts as compared to No Action. Each of these potential changes and how they relate to environmental justice populations is described below.

#### *Air Quality*

As discussed in Section 4.3.1, the Action Alternatives would result in a net increase in air emissions when compared to the No Action in both 2032 and 2037. However, PSCAA indicated that, based on the increased emissions of the Action Alternatives relative to the No Action Alternative as well as ambient pollutant levels measured in the region as part of the regional network, PSCAA does not anticipate exceedances of the NAAQS as a result of the Action Alternatives.<sup>61</sup> The Action Alternatives are not expected to cause an exceedance of USEPA's health-based standards and are therefore not expected to cause adverse health effects to environmental justice populations.

#### *Biological*

As discussed in Section 4.3.2, the Action Alternatives could impact but are not likely to adversely impact fish species which Native American Tribes fish. The Action Alternatives would contribute only a small proportion of the overall pollutant loading discharged into the waterways. While the pollutants would still constitute a potential incremental adverse water quality impact over the life of the new facilities, that incremental increase is not likely to adversely impact ESA species. As a result, the Native American Tribes are not anticipated to experience disproportionate and adverse impacts from the Action Alternatives.

#### *Climate*

As discussed in Section 4.3.3, the Action Alternatives would result in a net increase in GHG emissions when compared to the No Action in both 2032 and 2037. Climate change affects King County in several ways including increased temperatures, precipitation changes, ecological effects, human health effects, and sea-level rise. In the case of GHGs and climate change, climate is driven by global cumulative changes of GHG concentrations in the atmosphere. The changes in emissions from one individual project are too small to calculate resulting changes in temperature, sea-level, precipitation, and other significant cumulative climate effects. However, estimation of emissions is still useful to the public and decision makers so that they can understand the project's GHG emissions. Although the Action Alternatives result in an increase in GHG emissions, the increase is not expected to prevent actions by King County to mitigate climate change. Climate change is a global phenomenon and as a result, environmental justice populations in the GSA would not experience disproportionate and adverse impacts from the Action Alternatives.

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<sup>61</sup> Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023.



*Noise*

As discussed in Section 4.3.10, the Action Alternatives would result in an increase in the 65+ DNL noise contour in 2032 and 2037. The Future (2032) Action Alternatives noise contour is larger than the Future 2032 No Action by 0.15 square miles due primarily to the 24 additional average-annual day operations. Within the area of increased noise exposure associated with the Future (2032) Action Alternatives there would be 337 additional housing units and approximately 824 additional people within the 65+ DNL. The Future (2037) Action Alternatives noise contour is larger than the Future (2037) No Action by 0.66 square miles due primarily to the 93 additional average-annual day operations. Within the area of increased noise exposure associated with the Future (2037) Action Alternatives there would be 1,851 additional housing units and approximately 4,439 additional population within the 65+ DNL.

While there would be increases in noise due to the Action Alternatives, no 1.5 DNL increase areas would occur within the 65 DNL for 2032 or 2037 over noise sensitive areas. The range of increase was between 0.0 DNL and 0.6 DNL. Therefore, no significant noise impact would occur as a result of the Action Alternatives.

As shown, in **Table 4-34**, the overall percentage of minority population residing in the 65+ DNL noise contour is the same (57 percent) in both the No Action and Action Alternatives for both 2032 and 2037. The overall percentage of low-income population residing in the 65+ DNL noise contour is the same in the No Action and Action Alternatives for 2032 (11 percent) and 2037 (12 percent). Therefore, noise impacts would not be disproportionate and adverse on environmental justice populations.

**TABLE 4-34: POPULATION LOCATED WITHIN THE NO ACTION AND ACTION ALTERNATIVES 65+ DNL NOISE CONTOUR IN 2032 AND 2037**

Alternative	Total Population	Minority Population	Percent Minority	Low-Income Population	Low-Income Persons	Percent Low-Income
2032 No Action	31,168	17,896	57%	58,195	6,581	11%
2032 Action Alternatives	31,413	18,030	57%	58,195	6,581	11%
2037 No Action	27,985	15,967	57%	52,087	5,991	12%
2037 Action Alternatives	30,325	17,386	57%	56,650	6,563	12%

Note: Total population and low-income population numbers vary because minority percentage is calculated using census blocks, while low-income is calculated using census block groups. Census block groups encompass a larger area than census blocks.

Source: 2020 U.S. Census Data, 2021 U.S. Census American Community Survey.

*Socioeconomic*

As discussed in Section 4.3.11, as part of the proposed cargo warehousing (C02 and C03), it is likely that access to 24<sup>th</sup> Avenue S. from S. 150<sup>th</sup> Street would be eliminated, and two businesses would be relocated or closed. Drivers wanting to access 24<sup>th</sup> Avenue S. from S. 150<sup>th</sup> Street would have to utilize S. 152<sup>nd</sup> Street or S. 148<sup>th</sup> Street. This would add a maximum of 0.75 miles to the trip compared to the current access. This access point is adjacent to environmental justice populations. While this would result in slightly longer drive times, there would be reasonable alternative routes available. Therefore, the Action Alternatives would not result in disproportionate and adverse effects on environmental justice populations.



The Action Alternatives would result in the closure of the Doug Fox Lot and the relocation of PACCAR Aviation to other offices in the region. Neither business is registered as minority- or women-owned. The Doug Fox Lot has 24 employees and PACCAR Aviation has 14 employees. It is unknown if the PACCAR employees are low-income or minority employees. Of the 24 Doug Fox Lot employees, 21 are minority and considered environmental justice populations. Therefore, the Action Alternatives could adversely impact those employees. The Doug Fox Lot employees would likely find replacement employment at other nearby parking providers and the Port has a program to provide employment assistance. The PACCAR business would likely transfer to another airport in the region to support their general aviation needs. Consequently, the Action Alternatives would not result in disproportionate and adverse impacts to environmental justice populations.

*Surface Transportation*

As discussed in Section 4.3.12, the Action Alternatives would impact a total of 26 intersections. Of the 26 intersections, 18 were mitigated and therefore would not result in a disproportionate and adverse impact to environmental justice communities. The remaining intersections were examined to determine if they are considered ramps / intersections that feed highways of statewide or regional significance. All eight were considered ramps / intersections that feed highways of statewide or regional significance.<sup>62</sup> Ramps / intersections that feed highways of statewide or regional significance would affect environmental justice populations and non-environmental justice populations similarly and no disproportionate and adverse impact would occur to environmental justice populations.

**Table 4-35** provides a summary of the 26 intersections, mitigation status, and if they are considered a ramp / intersection that feeds a highway or statewide or regional significance.

**TABLE 4-35: SUMMARY OF INTERSECTIONS**

ID	Intersection	Impact Mitigated?	Feeds a Highway of Statewide or Regional Significance?	Disproportionate and Adverse Impact?
49	1st Ave S. at SW 160 <sup>th</sup> Street	Yes	N/A	No
98	Des Moines Memorial Drive / S. 168 <sup>th</sup> Street	Yes	N/A	No
89	Pacific Hwy S. at S. 216 <sup>th</sup> Street	Yes	N/A	No
93	Pacific Hwy S. at SR 516	Yes	N/A	No
14	Des Moines Mem. Drive / S. 144 <sup>th</sup> Street	Yes	N/A	No
17	24 <sup>th</sup> Ave. S. / S. 146 <sup>th</sup> Street	Yes	N/A	No
48	8 <sup>th</sup> Ave. S. / S. 156 <sup>th</sup> Street	Yes	N/A	No
54	Host Rd. / SR 518 On-Ramp/S. 160 <sup>th</sup> Street	Yes	N/A	No

<sup>62</sup> WSDOT definition of regional highway – RCW 47.05.025, Highways of regional significance may receive funding under the conditions of RCW 36.120.020(8)(c). The following highways are of regional significance: (1) That portion of state route number 9 that runs from state route number 522 in the south to state route number 531 in the north; (2) That portion of state route number 524 that runs from state route number 5 easterly to state route number 522; (3) That portion of state route number 704 from state route number 5 to state route number 7. [2002 c 56 § 303.]





**TABLE 4-35: SUMMARY OF INTERSECTIONS (CONTINUED)**

ID	Intersection	Impact Mitigated?	Feeds a Highway of Statewide or Regional Significance?	Disproportionate and Adverse Impact?
96	16 <sup>th</sup> Ave. S. / S. 144 <sup>th</sup> Street	Yes	N/A	No
101	8 <sup>th</sup> Ave. S. / Des Moines Memorial Drive S.	Yes	N/A	No
102	S. 152 <sup>nd</sup> Street / Des Moines Memorial Drive S.	Yes	N/A	No
105	32 <sup>nd</sup> Ave. S. / S. 160 <sup>th</sup> Street	Yes	N/A	No
106	Military Rd S. at S. 164 <sup>th</sup> Street at 42 <sup>nd</sup> Ave S.	Yes	N/A	No
107	34 <sup>th</sup> Ave S. at S. 170 <sup>th</sup> Street	Yes	N/A	No
109	Military Rd S. at S. 216 <sup>th</sup> Street	Yes	N/A	No
21	SR 509 SB Ramps / SW 148 <sup>th</sup> Street	No	Yes	No
23	SR 518 EB Ramps / Des Moines Mem. Drive	Yes	N/A	No
24	SR 518 WB Ramps / Des Moines Mem. Drive	Yes	N/A	No
28	SR 518 EB Off-Ramp / S. 154 <sup>th</sup> Street	No	Yes	No
33	SR 518 WB Off-Ramp / S. 154 <sup>th</sup> Street	Yes	N/A	No
37	International Blvd (SR 99) at S. 154 <sup>th</sup> Street	No	Yes	No
42	SR 518 EB Off-Ramp / 51 <sup>st</sup> Ave. S.	No	Yes	No
78	Northbound I-5 Ramps at S. 188 <sup>th</sup> Street	No	Yes	No
83	Military Rd. S. / SB I-5 Ramps / S. 200 <sup>th</sup> Street	No	Yes	No
86	Military Rd. S. / NB I-5 Ramps	No	Yes	No
94	Southbound I-5 Ramps at SR 516	No	Yes	No



**Table 4-36** provides a summary of environmental justice impacts for the Action Alternatives by environmental resource category.

**TABLE 4-36: SUMMARY OF ENVIRONMENTAL JUSTICE IMPACTS**

Environmental Resource Category	Impact?	Does the Impact Cause a Disproportionate and Adverse Effect?	Significant Environmental Justice Impact?
Air Quality	Yes, increase in emissions	No exceedance of the NAAQS.	No
Biological	Yes, indirect impacts to ESA-listed species	Not likely to adversely impact ESA species. As a result, the Native American treaty-reserved fishing rights are not anticipated to be impacted.	No
Climate	Yes, increase in GHG emissions	No, climate change is a global phenomenon.	No
Noise and Noise-Compatible Land Use	Yes, increase in the 65+ DNL noise contours in the Action Alternatives in 2032 and 2037 when compared to the No Action	No, overall percentage of environmental justice populations residing in the 65+ DNL noise contour is the same in the No Action and Action Alternatives for 2032 and 2037.	No
Socioeconomics (Business Relocation)	Yes, closure of businesses employing environmental justice populations	No, Port has a program to provide employment assistance.	No
Surface Transportation	Yes, 26 intersections had LOS impacts	No, impacts were mitigated, or the intersections were ramps / intersections that feed highways of statewide or regional significance which would affect environmental justice populations and non-environmental justice populations similarly.	No

**Environmental Justice Determination**

None of the alternatives would result in significant impacts to environmental justice populations.

**Mitigation and Minimization Measures**

No significant impacts to environmental justice populations would occur as a result of implementing the Action Alternatives. Therefore, no additional mitigation (other than mitigation integrated into the assessment above) is necessary.

**4.3.11.3 Children’s Environmental Health and Safety Risks**

**Significant Impact Threshold**

The FAA has not established a significance threshold for children’s environmental health and safety risks. However, the FAA has identified a factor to consider when evaluating potential impacts: whether the action has the potential to lead to a disproportionate health or safety risk to children. The existence of this factor does not necessarily establish a significant impact; rather, the FAA must evaluate this factor in light of context and intensity to determine if there are significant impacts.

### Alternative 1: No Action

The No Action Alternative is not anticipated to result in impacts related to children's environmental health and safety.

### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would not result in significant changes to health and safety risks including air, food, drinking water, recreational waters, soil, or products children may use or to which they would be exposed. The Action Alternatives could result in non-permanent noise impacts during construction of the proposed cargo development (C02 and C03). No schools are located in areas where impacts are identified; however, children living in these residential areas may experience temporary increases in noise during construction. No significant noise impacts were identified, and there are no separate noise impact standards for children. The Action Alternatives would not increase health and safety risks attributable to products or substances that a child is likely to encounter or ingest, such as air, food, water, recreational waters, soil, or products they may be exposed to; consequently, the Action Alternatives would not result in health and safety risks to children when compared to the No Action Alternative.

### Mitigation and Minimization Measures

#### *Mitigation*

Because no significant impacts to children's environmental health and safety were identified, no mitigation is necessary.

#### *Minimization Measures*

Minimization measures (fencing project areas, removal / disposal of contaminated materials / soils in accordance with federal, state, and local requirements) and BMPs would be used to minimize impacts during construction.

## **4.3.12 Surface Transportation**

This section describes the results of the surface transportation study. More information about the analysis and the results can be found in **Appendix L**.

### **4.3.12.1 Significant Impact Threshold**

The FAA has not established a significance threshold for surface transportation. However, the FAA does consider the degree to which the action would have the potential to disrupt local traffic patterns and substantially reduce the LOS of roads serving an airport and its surrounding communities. FAA Order 1050.1F indicates that this is not a threshold and FAA must evaluate these factors considering context and intensity to determine if there are significant impacts.

### **4.3.12.2 Surface Transportation Impacts**

The surface transportation study evaluated 114 intersections within the STSA for the No Action and 111 intersections for the Action Alternatives to identify roadway intersections that would fail to meet local and agency mobility standards in 2032 and 2037.

### Alternative 1: No Action

By 2032, nine of the roadway intersections analyzed would fail to meet mobility standards under the No Action and 17 of the roadway intersections would fail under the No Action in 2037. These degradations



would be due to background growth in traffic and / or travel pattern changes unrelated to the Action Alternatives.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives analysis assumed the SR 509 Phase 2 extension and transportation and infrastructure projects would be constructed by 2032. The intersections were sorted into one of four categories depending on the results of the analysis:

- Category 1: Intersection has a LOS deficiency because of additional trips added by the Action Alternatives. Four intersections in 2032 and eight intersections in 2037 were Category 1 intersections.
- Category 2: Intersection has a LOS deficiency in No Action, but Action Alternatives' trips would add additional delay. Eleven intersections in 2032 and 18 intersections in 2037 were Category 2 intersections.
- Category 3: Intersection meets the mobility standard in both No Action and Action Alternatives even after additional delay from Action Alternatives trips. Sixty-three intersections in 2032 and 54 intersections in 2037 were Category 3 intersections.
- Category 4: Intersection delay improves or does not change with the Action Alternatives. Thirty-eight intersections in 2032 and 36 intersections in 2037 were Category 4 intersections.

**Table 4-37 and Table 4-38** show the Category 1 and Category 2 intersections for 2032 and 2037.<sup>63</sup> Category 1 intersections were considered significant impacts and require mitigation.

**TABLE 4-37: CATEGORY 1 INTERSECTIONS**

ID - Intersection	Jurisdiction /Agency	Mobility Standard	2032 NA LOS	2032 PA LOS	Change in Delay (sec)	2037 NA LOS	2037 PA LOS	Change in Delay (sec)
14 - Des Moines Mem. Drive/S 144 <sup>th</sup> Street	SeaTac (Burien)	E	E	F	201.3	E	F	222.1
17 - 24 <sup>th</sup> Ave. S/S 146 <sup>th</sup> Street	SeaTac	D	C	E	22.8	D	F	47.3
24 - SR 518 WB Ramps/ Des Moines Mem. Drive	WSDOT	D	C	E	20.7	Cat.2	Cat.2	Cat.2
42 - SR 518 EB Off-Ramp/51 <sup>st</sup> Ave. S.	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	D	E	11.3
48 - 8 <sup>th</sup> Ave. S./S. 156 <sup>th</sup> Street	SeaTac	E	Cat. 3	Cat. 3	Cat. 3	E	F	120.1
83 - Military Rd. S. / SB I-5 Ramps/S. 200 <sup>th</sup> Street	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	D	E	9.9
86 - Military Rd. S./NB I-5 Ramps	WSDOT	D	D	E	16.8	Cat.2	Cat.2	Cat.2
96 - 16 <sup>th</sup> Ave. S/S 144 <sup>th</sup> Street	SeaTac	D	Cat. 3	Cat. 3	Cat. 3	B	E	30.6
98 - Des Moines Memorial Drive/S 168 <sup>th</sup> Street	Burien	C	Cat. 3	Cat. 3	Cat. 3	C	D	9.9

Notes: NA = No Action, PA = Proposed Action, LOS = Level of Service, Delay (seconds).

<sup>63</sup> Based on coordination with WSDOT, Burien, Des Moines, and Tukwila Category 3 intersections are not considered impacts and would not require mitigation. Category 3 impacts in the City of SeaTac will be mitigated according to the ILA between the Port and the City of SeaTac.



**TABLE 4-38: CATEGORY 2 INTERSECTIONS**

ID - Intersection	Jurisdiction / Agency	Mobility Standard	2032 NA LOS	2032 PA LOS	Change in Delay (sec)	2037 NA LOS	2037 PA LOS	Change in Delay (sec)
102 – S. 152 <sup>nd</sup> Street /Des Moines Memorial Drive S.	SeaTac (Burien)	E	Cat. 3	Cat. 3	Cat. 3	D	F	24.0
21 - SR 509 SB Ramps/SW 148 <sup>th</sup> Street	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	E	E	11.8
23 - SR 518 EB Ramps/Des Moines Mem. Drive	WSDOT	D	F	F	344.1	F	F	719.6
24 - SR 518 WB Ramps/Des Moines Mem. Drive	WSDOT	D	Cat. 1	Cat. 1	Cat. 1	E	F	150.8
28 - SR 518 EB Ramps/S. 154 <sup>th</sup> Street	WSDOT	D	F	F	6.8	F	F	21.2
33 - SR 518 WB Off-Ramp (Loop) / S. 154 <sup>th</sup> Street	WSDOT	D	F	F	78.9	F	F	115.0
37 - International Blvd./S. 154 <sup>th</sup> Street	WSDOT	E-Mitigated	F	F	2.2	F	F	4.6
49 - 1st Ave. S/SW 160 <sup>th</sup> Street	Burien	D	E	E	0.4	E	E	1.4
54 - Host Rd./SR 518 On-Ramp / S. 160 <sup>th</sup> Street	SeaTac/Burien	E	Cat. 3	Cat. 3	Cat. 3	F	F	68.3
78 - NB I-5 Ramps/S. 188 <sup>th</sup> Street	WSDOT	D	E	E	1.6	F	F	2.4
86 - Military Rd. S./NB I-5 Ramps	WSDOT	D	Cat. 1	Cat. 1	Cat. 1	E	F	16.6
89 - Pacific Hwy S./S. 216 <sup>th</sup> Street	Des Moines	F (v / c 1.0)	E	E	0.2	E	E	1.6
93 - Pacific Hwy S./SR 516	Des Moines	F (v / c 1.2)	F	F	3.4	F	F	3.8
94 - SB I-5 Ramps/SR 516	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	E	E	6.8
101 - 8 <sup>th</sup> Ave. S./Des Moines Memorial Drive S.	Burien/SeaTac	D / E	F	F	150.7	F	F	227.4
105 - 32 <sup>nd</sup> Ave. S./S. 160 <sup>th</sup> Street	SeaTac	E	F	F	47.2	F	F	72.4
106 - Military Rd. S./S. 164 <sup>th</sup> Street/42 <sup>nd</sup> Ave. S.	SeaTac	E	Cat. 3	Cat. 3	Cat. 3	F	F	5.5
107 - 34 <sup>th</sup> Ave. S./S. 170 <sup>th</sup> Street	SeaTac	E	Cat. 4	Cat. 4	Cat. 4	F	F	0.7
109 - Military Rd. S./S. 216 <sup>th</sup> Street	SeaTac	E	F	F	7.0	F	F	9.8

Notes: NA = No Action, PA = Proposed Action, LOS = Level of Service, Delay (seconds).

Source: SAMP Environmental Review – Future Conditions Traffic Analysis Summary (Concord, 2024); included in Appendix L.



Mitigation and Minimization Measures

*Mitigation*

Mitigation was proposed for Category 1, Category 2, and Category 3<sup>64</sup> intersections according to each jurisdiction’s requirements. Meetings were held with the local jurisdictions to present the results and proposed mitigation. Based on the meetings and coordination with the local jurisdictions, the proposed mitigation for Category 1 intersections is shown in **Table 4-39**. The proposed mitigation for Category 2 intersections is shown in **Table 4-40**.

**TABLE 4-39: PROPOSED MITIGATION FOR CATEGORY 1 INTERSECTIONS**

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
98	Des Moines Memorial Drive at S. 168 <sup>th</sup> Street	City of Burien	Construct new signal, provide dedicated westbound left turn lane, and provide shared WB through and right turn lane. Westside Trail will be maintained or improved and no change in access would occur with the proposed mitigation.	A / B
14	Des Moines Mem. Drive at S. 144 <sup>th</sup> Street	City of SeaTac	Widen east leg to provide a WB left turn lane, widen south leg to provide a northbound right turn lane, and modifications to the traffic signal. Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	D / D
17	24 <sup>th</sup> Ave. S. at S. 146 <sup>th</sup> Street	City of SeaTac	Construct a signal and add leading protected northbound left turn phase.	B / B
48	8 <sup>th</sup> Ave. S. at S. 156 <sup>th</sup> Street	City of SeaTac	Shift southbound lanes west to add dedicated southbound left and right turn lanes, add dedicated northbound left turn lane, and modify signal timing with protected left turns for all approaches. Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	D / E
96	16 <sup>th</sup> Ave. S. at S. 144 <sup>th</sup> Street	City of SeaTac	Construct an eastbound right turn lane.	C / C
102	S. 152 <sup>nd</sup> Street at Des Moines Memorial Drive S.	City of SeaTac	Construct single leg roundabout to consolidate three intersections (100, 101, and 102). Westside Trail will be maintained or improved and no change in access would occur with the proposed mitigation.	A / A

<sup>64</sup> The ILA between the Port and the City of SeaTac requires mitigation for projects outside the AAA, therefore mitigation is proposed for those Category 3 intersections.



**TABLE 4-39: PROPOSED MITIGATION FOR CATEGORY 1 INTERSECTIONS (CONTINUED)**

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
24	SR 518 Westbound Off-ramp at Des Moines Mem. Drive	WSDOT	Construct single lane roundabout where WB approach would be converted to a left turn lane and yield right turn lane. Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	A / A
42	SR 518 Eastbound Off-ramp & 51 <sup>st</sup> Avenue S.	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
83	Military Rd. S. at Southbound I-5 Ramps at S. 200 <sup>th</sup> Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
86	Military Rd. S. at Northbound I-5 Ramps	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A

Note: No Category Type 1 impacts occurred in the City of Des Moines or the City of Tukwila.  
 Source: SAMP Environmental Review – Future Conditions Traffic Analysis Summary (Concord, 2024); included in Appendix L.

**TABLE 4-40: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS**

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
49	1 <sup>st</sup> Ave S. at SW 160 <sup>th</sup> Street	City of Burien	Pay proportionate share of corridor improvement costs equal to the percentage of total intersection trips generated by NTPs in 2037 (1%). Corridor improvement is included as Project #22 on Burien’s TIP.	N/A
89	Pacific Hwy S. at S. 216 <sup>th</sup> Street	City of Des Moines	No Port mitigation is identified. City stated mitigation for intersection #93 covers this intersection as well.	N/A
93	Pacific Hwy S. at SR 516	City of Des Moines	Pay proportionate share for delay added by NTP trips based on the total number of PM peak hour trips added to intersection #93 and the City’s traffic impact fee schedule. <sup>65</sup>	N/A
54	Host Rd. at S. 160 <sup>th</sup> Street / SR 518 Eastbound On-ramp	City of SeaTac	Construct a signal.	A / A
101	8 <sup>th</sup> Ave S. at Des Moines Memorial Drive	City of SeaTac	Construct a roundabout that would consolidate three intersections (100, 101, and 102).	A / A
105	34 <sup>th</sup> Ave S. at S. 160 <sup>th</sup> Street	City of SeaTac	Construct a roundabout.	A / A

<sup>65</sup> The City of Des Moines’ current traffic impact fee amount is \$7,651.41 per PM peak hour trip.



**TABLE 4-40: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS (CONTINUED)**

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
106	Military Rd S. at S. 164 <sup>th</sup> St at 42 <sup>nd</sup> Ave S	City of SeaTac	Pay proportionate share of roundabout construction costs equal to the percentage of total intersection trips generated by NTPs in 2037 (4%). Constructed costs would be based on project costs identified for Project ST 116 in the City of SeaTac's Transportation Master Plan.	N/A
107	34 <sup>th</sup> Ave S. at S. 170 <sup>th</sup> Street	City of SeaTac	Pay proportionate share of corridor improvement costs equal to the percentage of total intersection trips generated by NTPs in 2037 (1%). Constructed costs would be based on project costs identified for Project ST 016 in the City of SeaTac's Six-Year TIP.	N/A
109	Military Rd S. at S. 216 <sup>th</sup> Street	City of SeaTac	Pay proportionate share of channelization improvement costs equal to the percentage of total intersection trips generated by NTPs in 2037 (2%). Constructed costs would be based on project costs identified for Project ST 140 in the City of SeaTac's Six-Year TIP.	N/A
21	SR 509 Southbound Ramps at SW 148 <sup>th</sup> Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
23	SR 518 Eastbound Ramps and Des Moines Memorial Drive	WSDOT	Construct a roundabout. Design of the intersection will accommodate the West Side Trail connection along the east side of Des Moines Memorial Drive S. The Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	A / A
28	SR 518 Eastbound Off-Ramp at S. 154 <sup>th</sup> Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
33	SR 518 Westbound Ramp at S. 154 <sup>th</sup> Street	WSDOT	Construct a signal.	C / C
37	International Blvd at S. 154 <sup>th</sup> Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
78	Northbound I-5 Ramps at S. 188 <sup>th</sup> Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
94	Southbound I-5 Ramps at SR 516	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A

Source: SAMP Environmental Review – Future Conditions Traffic Analysis Summary (Concord, 2024); included in Appendix L.



In addition, mitigation for Category 3 intersections in the City of SeaTac will be provided in accordance with the ILA between the City of SeaTac and the Port.

With the proposed mitigation, none of the impacted intersections would experience a significant impact. As previously mentioned, mitigation was coordinated with the jurisdictions and will be completed by 2032.<sup>66</sup> The Port and the local jurisdictions are in the process of formalizing the mitigation commitments in a MOU with each of the jurisdictions. More detail on each intersection, improvements recommended and coordination with the local jurisdictions can be found in **Appendix L**.

#### *Minimization Measures*

Minimization measures and BMPs would be used to minimize surface transportation impacts during construction of the Action Alternatives. This includes designated truck routes or flaggers directing traffic.

### **4.3.13 Visual Effects**

This section describes the results of the visual effect impact analysis associated with the Proposed Action and alternatives.

#### **4.3.13.1 Significant Impact Threshold**

The FAA has not established a significance threshold for visual effects, but they have identified factors to consider when evaluating the potential impacts related to light emissions and visual character. If these factors exist, the FAA must evaluate these factors considering context and intensity to determine if there are significant impacts. Factors to consider for light emissions and visual resources / visual character, include, but are not limited to:

##### Light Emissions:

The degree to which the action has the potential to:

- Create annoyance or interfere with normal activities from light emissions; or
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.

##### Visual Resources / Visual Character:

The potential that the action would:

- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and / or visual character in the study area; or
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

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<sup>66</sup> Reference to the MOU agreements with each jurisdiction.



### 4.3.13.2 *Light Emissions*

#### Alternative 1: No Action

The No Action Alternative would not create additional lighting sources or modify the activities associated with existing sources; consequently, no changes in light emissions would occur.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

As described in **Appendix H**, the Port's ILA with the City of SeaTac regulates land uses differently based on whether the land is within the AAA, within the AAA but adjacent to public right-of-way, public property owned by another agency, or privately owned property (Edge Properties), or outside the AAA. Each category of land use has its own specific requirements related to lighting and visual screening.

The Action Alternatives would include development that would provide new sources of light emissions from the illumination of the proposed new buildings and parking areas. Most of the projects would be built inside the AAA. Given the extensive lighting that is already present on the airfield, most of the Action Alternatives would not be distinguishable from the ambient light of SEA, and therefore would have no impact on light emissions. However, portions of the Action Alternatives would be on Edge Properties (**Table 4-41**). These include:

- S07 – Westside Maintenance Campus
- S08 – Airline Support (North)
- L01 – NAE Relocation (southbound lanes)
- L02 – Elevated Busway & Stations
- L03 – Second Terminal Roads / Curbside
- L04 – Northeast Ground Transportation Center (NE GTC)
- T02 – Second Terminal and Parking



**TABLE 4-41: EFFECTS FROM LIGHT EMISSIONS – EDGE PROPERTIES**

Project Element	POTENTIAL EFFECTS
S07 – Westside Maintenance Campus	Although there are no residential properties on the east side of SR 509 in the vicinity of this project, there are some homes immediately west of the road, approximately ¼ mile away from the proposed maintenance campus. Because the Westside Maintenance Campus would be in an elevated position on the edge of Port property, there is potential that new lighting sources could be visible from certain vantage points at these residential properties. However, given the distance this new light source would be from these properties, it would not create additional annoyances, or interfere with normal activities.
S08 – Airline Support (North)	Proposed building would be in an active cargo area of the Airport that is currently illuminated by high mast light poles with downward pointing lights. Additional building related light would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances, or interfere with normal activities.
L01 – NAE Relocation (southbound lanes)	Proposed improvements would be located along an existing roadway that is currently illuminated with standard street lighting, with downward pointing lights. Additional roadway lighting would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances, or interfere with normal activities.
L02 – Elevated Busway & Stations	Proposed busway and stations would be located along a corridor that is currently illuminated with standard street lighting and high mast light poles, each with downward pointing lights. Additional busway and station lighting would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances, or interfere with normal activities.
L03 – Second Terminal Roads / Curbside	Proposed Second Terminal roads / curbside would be located along an area that is currently illuminated with standard street lighting and parking lot light fixtures located within the Doug Fox Lot. Because the new roads / curbside would include above-grade lanes and associated lighting on the edge of Port property, it is likely that new lighting sources would be visible from adjacent properties. However, those properties are primarily commercial uses with their own lighting. Therefore, it would not create additional annoyances, or interfere with normal activities.
L04 – Northeast Ground Transportation Center (NE GTC)	Proposed NE GTC would be an extension of the existing Main Parking Garage. Given the existing lighting of the garage, and the location between the Main Terminal and the existing Sound Transit station, additional lighting would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances, interfere with normal activities, or adversely affect the visual character of the area.
T02 – Second Terminal and Parking	Proposed Second Terminal and parking would be in an area that is currently illuminated with standard street lighting and parking lot light fixtures located within the Doug Fox Lot. Because the new terminal and parking garage would include multiple above-grade levels on the edge of Port property, it is likely that new lighting sources would be visible from adjacent properties. However, those properties are primarily commercial uses with their own lighting. Therefore, it would not create additional annoyances, or interfere with normal activities.



The changes in light intensity caused by any of these elements of the Action Alternatives on Edge Properties within and adjacent to the AAA (**Table 4-42**) would not cause significant impacts. Certain elements of the Action Alternatives would be located on Port-owned property that is outside of the AAA. Development in these areas would be subject to measures within the ILA and City of SeaTac Municipal Code. The following project elements would be located outside of the AAA:

- C02 – Offsite Cargo – Phase I
- C03 – Offsite Cargo – Phase II
- L05 – North GT Holding Lot
- L07 – Employee Parking Structure
- S10 – CRDC

**TABLE 4-42: EFFECTS FROM LIGHT EMISSIONS – OUTSIDE THE AAA**

Project Element	Potential Effects
C02 – Offsite Cargo – Phase I and C03 – Offsite Cargo – Phase II	Cargo warehousing elements would be located on a site that is currently undeveloped and therefore has no existing lighting. New lighting sources would be required along the proposed building and parking areas. This area is adjacent to residential properties along 26 <sup>th</sup> Avenue S. and S. 152 <sup>nd</sup> Street, creating the potential for lighting related impacts or annoyance. These impacts are not significant. In addition, the Port is required to implement measures within the ILA to reduce light impacts of the development. Per the ILA, the design of facilities shall comply with requirements for signage and lighting and screening for parking.
L05 – North GT Holding Lot	Proposed north GT holding lot would be located on a site that is currently undeveloped but would be situated between the existing NEPL and several industrial / commercial buildings where other sources of light are present. There are no residential or other light sensitive land uses that would have direct view of this site. Therefore, it would not create additional annoyances or interfere with normal activities.
L07 – Employee Parking Structure	Proposed employee parking structure would be located on a developed site between the existing NEPL, SR 518, and 16 <sup>th</sup> Avenue S. where other sources of light are present. It would also be located directly across the street from an unlighted sports field complex, but this complex is only utilized during daylight hours. There are no residential or other light sensitive land uses that would have direct view of this site. Therefore, it would not create additional annoyances or interfere with normal activities.
S10 – CRDC	Proposed CRDC would be located on a site that is currently undeveloped but would be between the existing NEPL and several industrial / commercial buildings where other sources of light are present. There are no residential or other light sensitive land uses that would have direct view of this site. Therefore, it would not create additional annoyances, or interfere with normal activities.

Although new light sources would result from the construction of the Action Alternatives in these areas outside the AAA, no significant increase in light intensity is expected to occur due to the presence of existing light-emitting sources such as buildings, parking areas, and public roads. The changes in light intensity caused by the Action Alternatives would not cause significant impacts.

**Mitigation and Minimization Measures**

*Mitigation*

Because no significant impacts related to light emissions were identified, no mitigation is necessary.



*Minimization Measures*

Although no significant impacts are anticipated, certain minimization measures would be implemented. Projects constructed on non-edge properties inside the AAA would be designed in accordance with the Port’s most recent Design Guidelines and Standards.<sup>67</sup>

**4.3.13.3 Visual Resources and Visual Character**

Alternative 1: No Action

The No Action Alternative would not introduce new visual elements that would change the visual character of the GSA, contrast with the visual character of the GSA, or block or obstruct views of existing visual resources. The No Action Alternative is not anticipated to result in new visual impacts.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would include new Airport related development that would affect the viewshed by adding new visual features. Most of the Action Alternatives would occur within the AAA. In those locations, the intensity of this existing land use is such that many of the proposed visual elements of the Action Alternatives would be consistent with the visual character and would not significantly alter the visual setting. Some of the elements would be located on Edge Properties (**Table 4-43**), with potential to affect adjacent properties. These projects include:

- S07 – Westside Maintenance Campus
- S08 – Airline Support (North)
- L01 – NAE Relocation (southbound lanes)
- L02 – Elevated Busway & Stations
- L03 – Second Terminal Roads / Curbside
- L04 – Northeast Ground Transportation Center (NE GTC)
- T02 – Second Terminal and Parking

**TABLE 4-43: EFFECTS TO VISUAL RESOURCES – EDGE PROPERTIES**

Project Element	Potential Effects
S07 – Westside Maintenance Campus	There are some residential properties immediately west of SR 509, approximately ¼ mile away from the proposed maintenance campus. Because the Westside Maintenance Campus would be in an elevated position on the edge of Port property, there is potential that proposed facilities would be visible from certain vantage points at these residential properties. However, given the distance from the site, the dense tree cover, and the relatively small size of the development, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
S08 – Airline Support (North)	Proposed building would be in an active cargo area of the Airport and would be consistent with the visual character of this portion of the Airport. This structure would be indistinguishable to off-Airport receptors. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.

<sup>67</sup> Seattle-Tacoma International Airport Design Guidelines and Standards (2024), <https://www.airportprojects.net/sampenvironmentalreview/wp-content/uploads/sites/45/2024/09/SEA-Architecture-Design-Guidelines-Standards-reduced.pdf>



**TABLE 4-43: EFFECTS TO VISUAL RESOURCES – EDGE PROPERTIES (CONTINUED)**

Project Element	Potential Effects
L01 – NAE Relocation (southbound lanes)	Proposed roadway improvements would be located along an existing roadway and would be consistent with the visual character of this portion of the Airport. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L02 – Elevated Busway & Stations	Proposed busway and stations would be located adjacent to the existing elevated Sound Transit tracks, which have a similar visual style and characteristic. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L03 – Second Terminal Roads / Curbside	Proposed roads / curbside would be in an area with multiple roadways, overpasses, and grade separated intersections. Proposed improvements would be consistent with the visual character of this area of the Airport and indistinguishable to off-Airport viewers. Therefore, no significant changes to the area’s visual character, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L04 – Northeast Ground Transportation Center (NE GTC)	Proposed NE GTC would be an extension of the existing Main Parking Garage and would be consistent with the visual character of this portion of the Airport. Given the location of elevated roadways and the Sound Transit lines that obscure views to and from this portion of the Airport, this 5-story building would be indistinguishable to off-Airport viewers. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
T02 – Second Terminal and Parking	<p>Proposed Second Terminal and parking would be located immediately west of Washington Memorial Park cemetery that abuts the east edge of the existing Doug Fox Lot. The existing Doug Fox Lot is a surface lot, and the cemetery is partially screened from the lot by a row of landscaping and intermittent trees. The Action Alternatives would replace this surface lot with a seven-story parking structure, new terminal, and elevated terminal roadways. This would alter the visual and aesthetic character of the cemetery when looking in a south and west direction, although the overall visual character of a cemetery within a heavily developed environment would remain. While this would alter the immediate view from portions of the cemetery, it is not anticipated to be a significant negative effect as there is no connectivity in terms of the use of the cemetery and the existing view of Airport functions, and the change is not one that would result in loss of notable views. The Port would work with the cemetery to provide appropriate screening and visual context to minimize potential impacts to cemetery operations and enjoyment.</p> <p>In addition, the Second Terminal and parking garage would likely be visible from areas east of International Boulevard, particularly as the terrain rises. While these changes would be noticeable, the size, style and design of the structures would be consistent with the other structures visible from these areas east of International Boulevard.</p>



Although the Action Alternatives would result in changes to the visual character of some areas by introducing new visual elements, the impacts from these new elements would be isolated, and limited to views from certain angles or vantage points. No significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur because of any of these elements of the Action Alternatives.

Elements of the Action Alternatives Located Outside of the AAA:

Certain elements of the Action Alternatives would be located on Port-owned property that is outside of the AAA (**Table 4-44**). Development in these areas would be subject to measures within the ILA and City of SeaTac Municipal Code. The following project elements would be located outside of the AAA:

- C02 – Offsite Cargo – Phase I
- C03 – Offsite Cargo – Phase II
- L05 – North GT Holding Lot
- L07 – Employee Parking Structure
- S10 – CRDC

**TABLE 4-44: EFFECTS TO VISUAL RESOURCES – OUTSIDE THE AAA**

Project Element	Potential Effects
C02 – Offsite Cargo – Phase I and C03 – Offsite Cargo – Phase II	Cargo warehousing elements would be located on a site that is currently undeveloped but adjacent to residential properties along 26 <sup>th</sup> Avenue S. and S. 152 <sup>nd</sup> Street. The existing site is mostly wooded, with several intersecting streets (S. 152 <sup>nd</sup> Street and S. 150 <sup>th</sup> Street). The Action Alternatives would alter the visual and aesthetic character of this area by clearing most of the existing trees, being replaced with cargo buildings and parking. These new buildings would be visible from the adjacent residential properties. No significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur. In addition, the Port is required to implement measures within the ILA to reduce visual impacts of the development, including setbacks, signage and lighting restrictions, screening for parking, and landscaping.
L05 – North GT Holding Lot	Proposed north GT holding lot would be located between existing industrial / commercial buildings in an area of limited visibility from sensitive receptors. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L07 – Employee Parking Structure	Proposed employee parking structure would include seven above-ground levels (one level below ground); however, the proposed location west of the existing NEPL would place it in an area over 2,000 feet from the nearest residential property, with intervening topography, vegetation, and buildings that would limit the degree to which the structure would be visible. Therefore, no significant changes to the area’s visual character, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
S10 – CRDC	Proposed CRDC would be between existing industrial / commercial buildings in an area of limited visibility from sensitive receptors. Therefore, no significant changes to the area’s visual character, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.

Although new visual elements would be introduced from the construction of the Action Alternatives in these areas, the changes would not result in significant changes in the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources.



Mitigation and Minimization Measures

*Mitigation*

Because no significant impacts related to visual resources or visual character were identified, no mitigation is necessary.

*Minimization Measures*

Although no significant impacts are anticipated, certain minimization measures will be implemented, where applicable according to the Airport’s Landscape Vision, Design Guidelines, and Standards.<sup>68</sup>

**4.3.14 Water Resources**

This section presents the results of the analysis of potential impacts to water resources, including wetlands, floodplains, surface waters, and groundwater that would occur because of the Proposed Action and alternatives. See **Appendix M** for more information on the inventory and analysis conducted.

**4.3.14.1 Significant Impact Threshold**

Exhibit 4-1 of FAA Order 1050.1F provides FAA’s significance thresholds for water resources. The thresholds are shown in the following table.

Significant Impact Thresholds
<b>Wetlands</b>
Adversely affect a wetland’s function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers
Substantially alter the hydrology needed to sustain the affected wetland system’s values and functions or those of a wetland to which it is connected
Substantially reduce the affected wetland’s ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public)
Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands
Promote development of secondary activities or services that would cause circumstances listed above occur
Be inconsistent with applicable state wetland strategies
<b>Surface Waters</b>
Exceed water quality standards established by federal, state, local, and tribal regulatory agencies
Contaminate public drinking water supply such that public health may be adversely affected
<b>Floodplains</b>
Cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of USDOT Order 5650.2, Floodplain Management and Protection
<b>Groundwater</b>
Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies
Contaminate an aquifer used for public water supply such that public health may be adversely affected

<sup>68</sup> Sea-Tac International Airport Landscape Vision, Design Guidelines, and Standards (2024), <https://www.airportprojects.net/sampenvironmentalreview/2024-sea-landscape-standards/>.



#### **4.3.14.2 Wetlands**

##### Alternative 1: No Action

The No Action Alternative would not adversely affect any wetland functions, alter hydrology, or affect wetland resources, and no new impacts to wetlands would occur.

##### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

###### *Permanent Impacts to Wetlands and Wetland Buffers*

The Action Alternatives would permanently impact up to 0.79 acres of jurisdictional wetlands as a result of construction related activities. Most of the individual projects in the Action Alternatives result in 0.02 acres or less of an impact and are anticipated to qualify under a Nationwide Permit. None of the impacts would exceed any of the significance thresholds established by the FAA based on the following conclusions:

- None of the impacts would adversely affect the quality or quantity of municipal water supplies (including surface waters and sole source and other aquifers) as there are no municipal water supplies derived from the drainages in which this project occurs.
- None of the impacts would substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected.
- None of the impacts would substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public).
- None of the impacts would adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands. In addition to the minor impacts to wetlands, there would be no permanent adverse impacts to fish habitat and the minor and temporary impacts would be mitigated, supporting fish and wildlife habitat over time. There are no economically important resources that are harvested from the wetlands within the GSA.
- None of the impacts would promote development of secondary activities or services that would cause the circumstances listed above to occur. All known activities and secondary activities / services were fully included as part of the evaluation in this assessment.
- None of the impacts would be inconsistent with applicable state wetland strategies. The project impact assessment and mitigation approach are consistent with local, state and federal guidance. The mitigation would be part of a watershed level approach prepared for this basin.



Therefore, no significant wetland impacts would occur with the Action Alternatives. **Table 4-45** and **Exhibits 4-4** through **4-7** identify wetland impacts by project.

**TABLE 4-45: PERMANENT JURISDICTIONAL WETLAND IMPACTS**

Project Name	Wetland Impact (acres)	Wetland Size (acres)	Wetland ID
Employee Parking Structure (L07)	0.02	0.11	Wetland A
Fuel Farm Expansion (S01)	0.21	0.21	Wetland E1
Westside Maintenance Campus (S07)	<0.01	2.60	Wetland 39
Stormwater Pond (Miller Creek detention pond)	0.55*	0.55	Wetland A20
Storm (Utility Line)	0.01	3.12	Wetland 44
Storm (Utility Line)	<0.01	0.21	Wetland A14
Storm (Utility Line)	<0.01	0.55	Wetland A20
Storm (Utility Line)	<0.01	1.12	Wetland R13
Storm (Utility Line)	<0.01	0.06	Wetland R14a
<b>Grand Total Impacted**</b>	<b>0.79</b>		

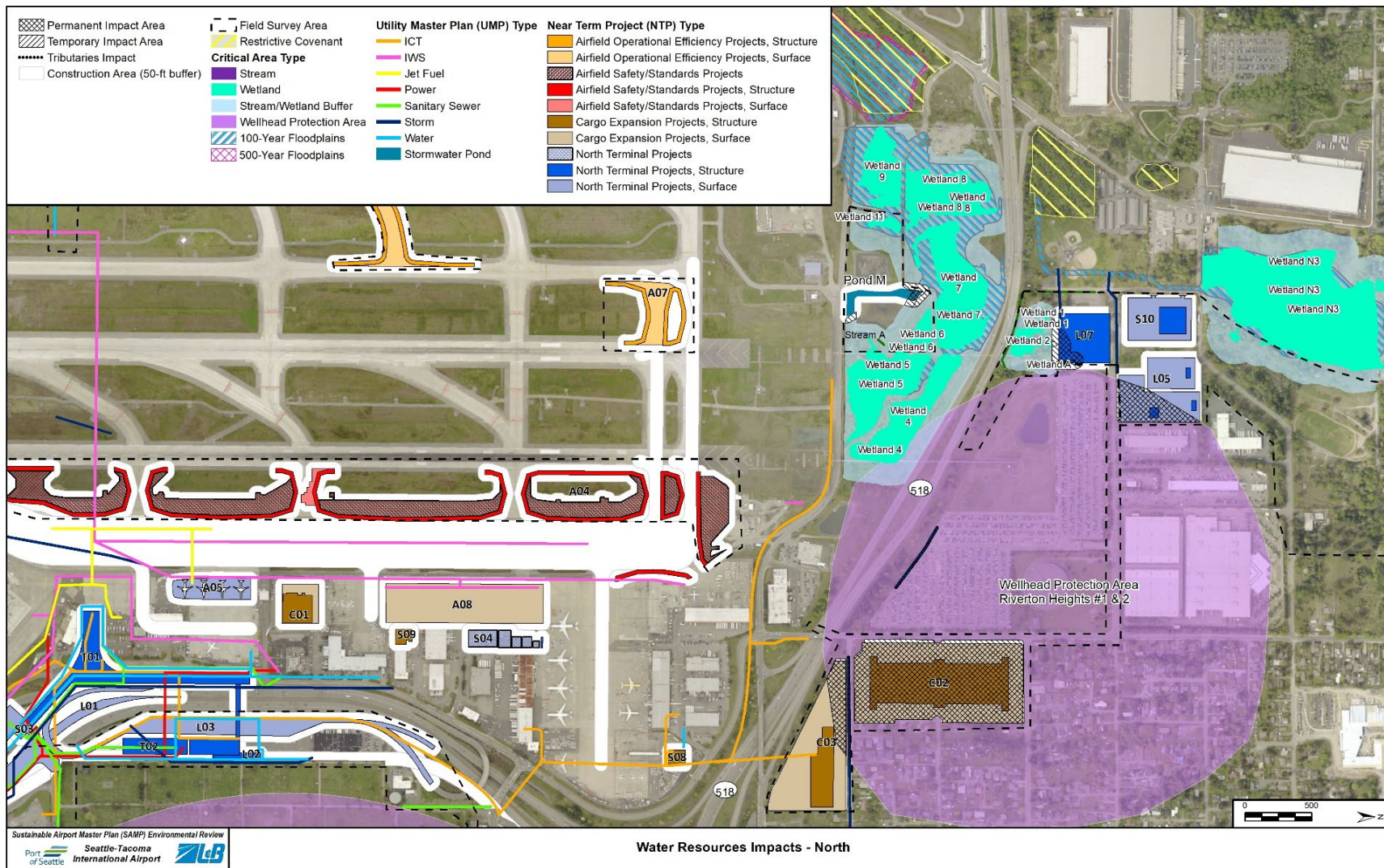
\* Future design may include a vault, reducing or eliminating this impact.

\*\* Impact values in the table are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion). Source: Sustainable Airport Master Plan (SAMP) Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

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**EXHIBIT 4-4: WATER RESOURCES IMPACTS – NORTH**



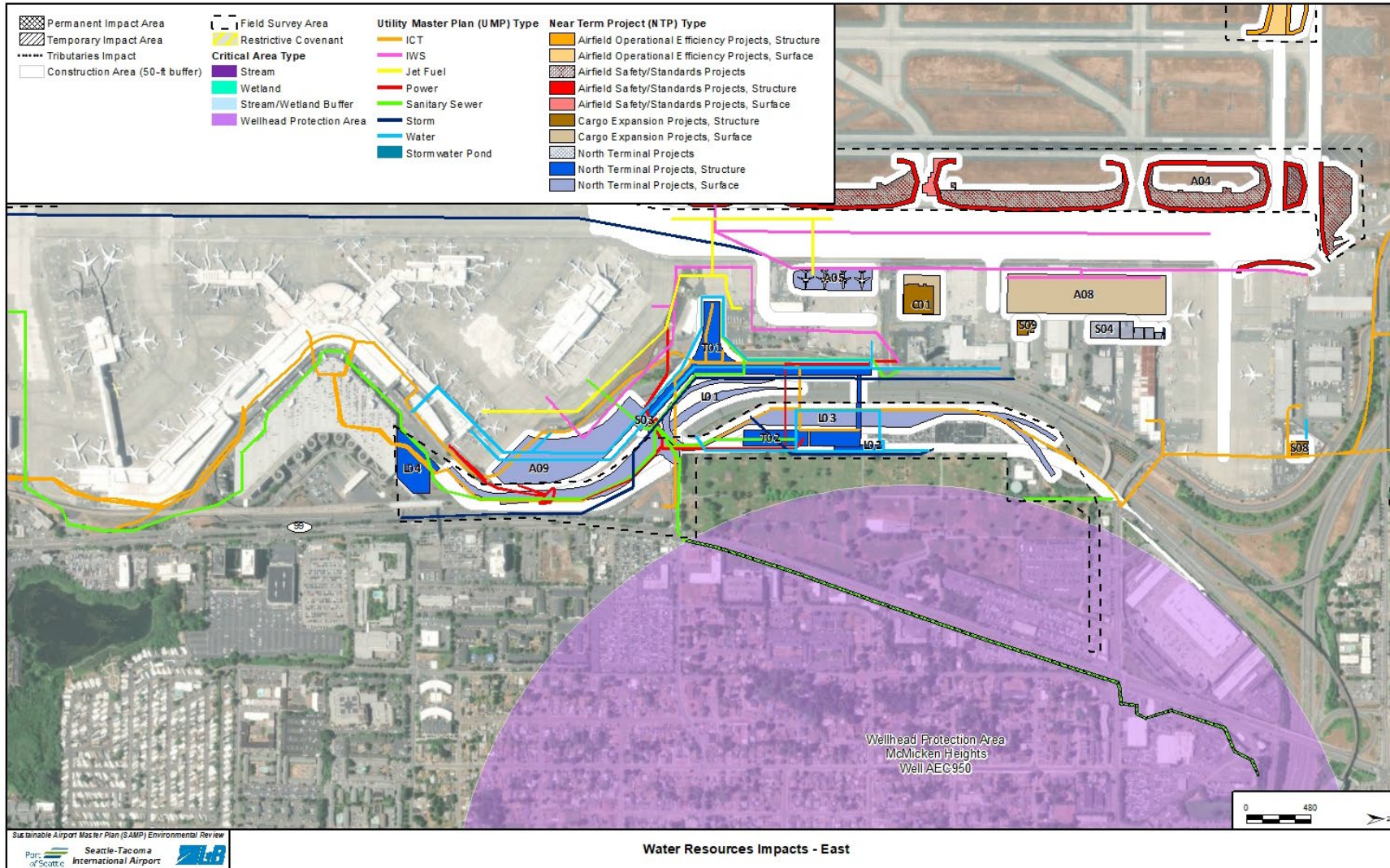
Source: Parametrix, 2024.



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**EXHIBIT 4-5: WATER RESOURCES IMPACTS – EAST**



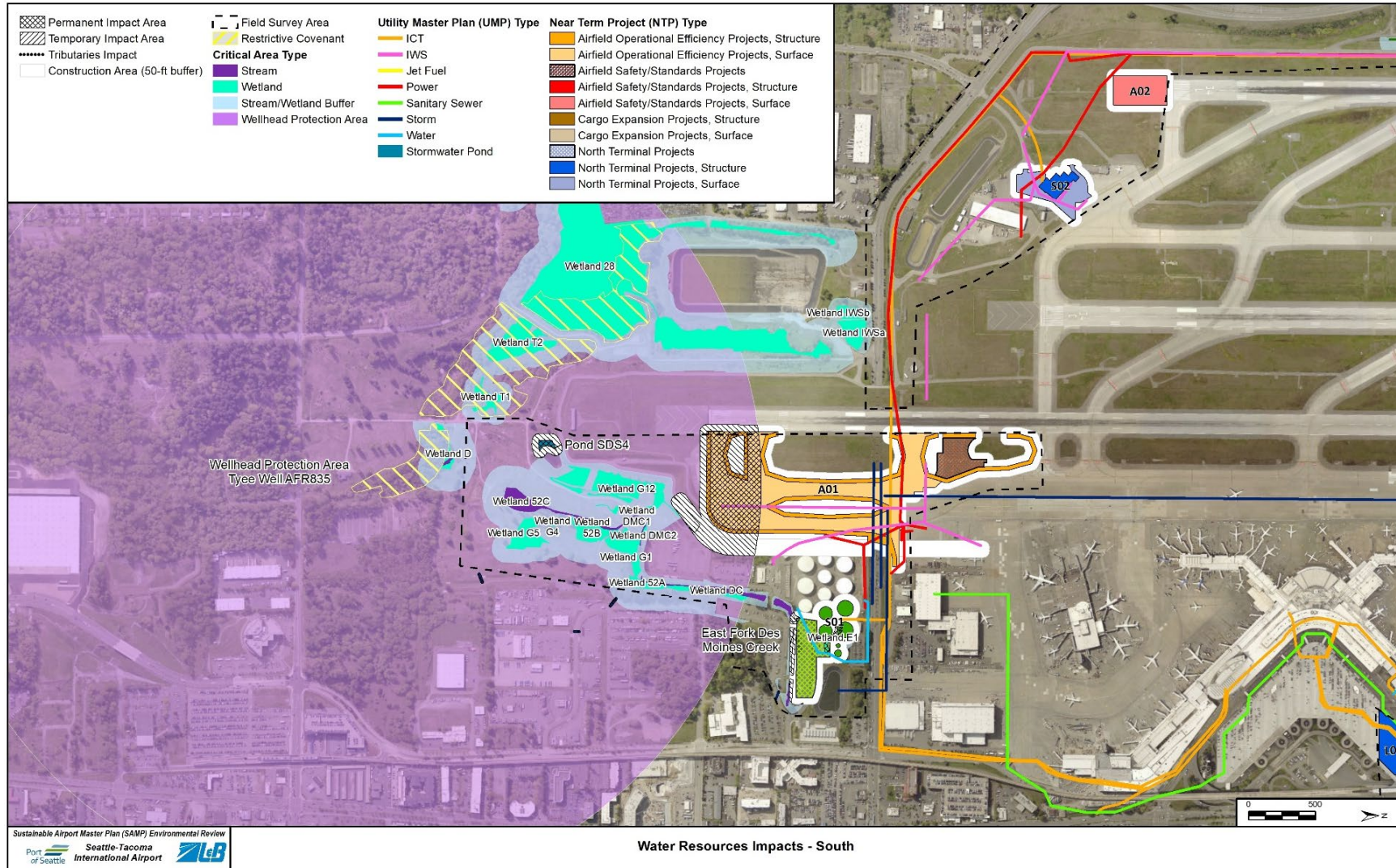
Source: Parametrix, 2024.



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**EXHIBIT 4-6: WATER RESOURCE IMPACTS – SOUTH**



Source: Parametrix, 2024.



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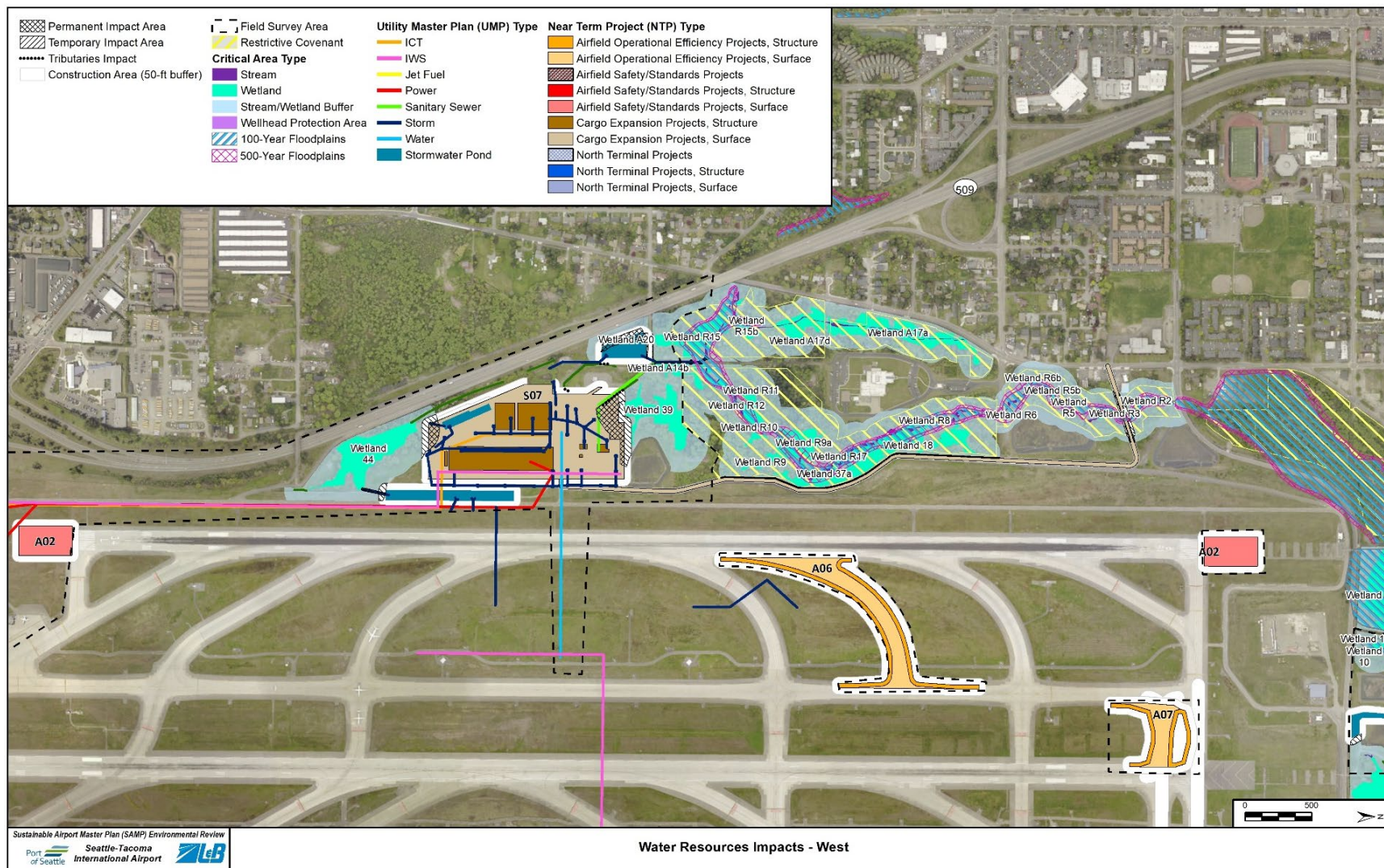
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**EXHIBIT 4-7: WATER RESOURCES IMPACTS – WEST**



Source: Parametrix, 2024.



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The Action Alternatives would also result in total permanent wetland buffer impacts of 2.66 acres (**Table 4-46**). The requirement to provide compensatory mitigation for buffer impacts is guided by local critical area ordinances. The FAA has not established significance thresholds for impacts to wetland buffers. The determination of significance for permanent wetland impacts described above took into consideration the associated wetland buffer impacts as well. Most of the permanent wetland buffer impacts are associated with a wetland that would be impacted, for which no significant impacts were identified. The remaining permanent wetland buffer impacts for wetlands that would not be directly impacted are small and would not be considered significant impacts because they would not cause or contribute to exceedance of any of the wetland significance threshold conditions explained above.

**TABLE 4-46: PERMANENT WETLAND BUFFER IMPACTS**

Project Name	Wetland Buffer Impact (acres)	Wetland ID
Employee Parking Structure (L07)	0.60	Overlapping Wetlands A, 1, 2
Fuel Farm Expansion (S01)	0.01	Wetland DC
Westside Maintenance Campus (S07)	1.70	Wetlands 39, 44, R9, 37a, 18, R3, and R2
Stormwater Pond (Pond F)	<0.01	Wetland 44
Stormwater Pond (SDS4 detention pond)	<0.01	Wetland G12
Stormwater Pond (Pond M)	0.11	Overlapping Wetlands 6, 7
Sanitary Sewer (Utility Line)	0.01	Wetland 39
Storm (Utility Line)	0.23	Wetlands 44, 39, A20, A14a, A14b, Wetland 13, R15, and R15b
<b>Grand Total*</b>	<b>2.66</b>	

\* Impacts values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion). Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

*Temporary Impacts to Wetlands and Wetland Buffers*

The Action Alternatives would result in temporary construction impacts where wetland and wetland buffers would be affected by clearing and ground disturbing work during construction activities. These areas would be revegetated following construction and restored to their pre-construction condition. Temporary construction impacts would total 0.21 acres of wetlands and 3.43 acres of wetland buffers (**Table 4-47**). These impacts are not considered significant because they would not cause any of the significance threshold conditions described above. The temporary impacts to wetlands and buffers would occur during construction activities and would affect small, isolated wetlands with minor to no impacts on the large wetland and stream complexes in the GSA. There would be no change to water conveyance through the larger systems.



**TABLE 4-47: TEMPORARY WETLAND AND WETLAND BUFFER IMPACTS**

Project Name	Wetland Impact (acres)	Wetland ID	Wetland Size (acres)	Wetland Buffer Impact (acres)
Employee Parking Structure (L07)	0.02 / 0.02	Wetland A / Wetland 2	0.11 / 0.81	0.55
Fuel Farm Expansion (S01)	0.07	Wetland DC	0.54	0.35
Taxiway A/B Extension (A01)	0.0	Wetland G12	2.41	0.42
Westside Maintenance Campus (S07)	0.06 / 0.04	Wetland 39 / Wetland 44	2.60/3.10	1.41
Stormwater Pond (SDW2 / Pond F detention pond)	0.0	N/A	0.0	0.11
Stormwater Pond (SDS4 pond)	0.0	N/A	0.0	0.06
Stormwater Pond Buffer (Pond M)	0.0	N/A	0.0	0.53
<b>Grand Total*</b>	<b>0.21</b>	<b>N/A</b>	<b>N/A</b>	<b>3.43</b>

\* Impacts values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion).

N/A = Not Applicable

Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

**Mitigation and Minimization Measures**

*Mitigation*

The temporary impacts to wetlands and buffers described above would be restored in-kind on-site. For permanent impacts to wetlands and associated buffers, the Port would develop a compensatory mitigation plan during the wetlands and Waters of the U.S. permitting phase, after environmental review is complete and in accordance with applicable federal and state requirements and guidelines. These guidelines are listed in the USACE and the USEPA’s *Compensatory Mitigation for Losses of Aquatic Resources*,<sup>69</sup> and the WSDE interagency guidance contained in *Wetland Mitigation in Washington State: Parts 1 and 2*.<sup>70</sup>

The Port has seven sites within its ownership identified as being suitable for compensatory mitigation. Six sites are within the Airport and one site is located along the Green River in Auburn. They encompass over 150 acres and include potential for greater than 40 acres of wetland re-establishment, 11 acres of wetland enhancement, almost eight acres of preservation, and 80 acres of buffer enhancement.

**Table 4-48** provides a summary of the calculated compensatory wetland mitigation requirements for the Action Alternatives, based on preliminary design and the potential unavoidable, permanent impacts to wetlands, temporary impacts to wetlands, and wetland buffer impacts and the required mitigation ratios. It is anticipated that the NTPs will comply with the compensatory mitigation ratios recommended by an interagency review committee composed of the USACE, USEPA, and WSDE.<sup>71</sup> For the purposes of this evaluation, it is conservatively assumed that all buffer impacts would be mitigated by reestablishing

<sup>69</sup> 33 Code of Federal Regulations (CFR) Part 332/ 40 CFR Part 230.

<sup>70</sup> Wetland Mitigation in Washington State Part 1: Agency Policies and Guidance <https://apps.ecology.wa.gov/publications/documents/2106003.pdf> and Part 2: Developing Mitigation Plans <https://apps.ecology.wa.gov/publications/documents/0606011b.pdf> (2006).

<sup>71</sup> Ibid.



buffer in association with the wetland compensatory mitigation at a 1:1 ratio (impact to re-establishment) resulting in 2.66 acres. **Appendix M** has additional information on the interagency recommended compensatory mitigation ratios for wetland impacts.

**TABLE 4-48: COMPENSATORY WETLAND MITIGATION AREA CALCULATIONS (ACRES)**

Project Element	Areas of Impact (ac / Rating)	Re-establishment Area Needed	Rehabilitation Area Needed	Enhancement Area Needed
Wetlands (permanent) <sup>1</sup> Facilities	0.23 / III	0.46	0.92	1.84
Wetlands (permanent) <sup>1</sup> Storm Lines	0.01 / III	0.02	0.04	0.08
Wetlands (permanent) <sup>1</sup> Utility Lines	0.01 / II	0.03	0.06	0.12
Wetlands (permanent) <sup>1</sup> Stormwater Ponds	0.55 / III	1.10	2.75	4.40
	<b>Total Areas*</b>	<b>1.61</b>	<b>3.77</b>	<b>6.44</b>
Wetland (temporary) <sup>2</sup> Facilities	0.21 / III	N/A	N/A	N/A
Wetland (temporary) <sup>2</sup> Storm Lines	0.00	N/A	N/A	N/A
Wetland (temporary) <sup>2</sup> Utility Lines	0.00	N/A	N/A	N/A
Wetland (temporary) <sup>2</sup> Stormwater Ponds	0.00	N/A	N/A	N/A
	<b>Total Areas*</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Wetland Buffer (permanent) <sup>3</sup> Facilities	N/A	2.31	2.31	2.31
Wetland Buffer (permanent) <sup>3</sup> Storm Lines	N/A	0.24	0.24	0.24
Wetland Buffer (permanent) <sup>3</sup> Stormwater Ponds	N/A	0.11	0.11	0.11
	<b>Total Areas*</b>	<b>2.66</b>	<b>2.66</b>	<b>2.66</b>

\* Values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table.

<sup>1</sup> Impacts to permanent wetlands would be permitted through the USACE.

<sup>2</sup> Temporary impacts to wetlands will be restored to their current state after construction.

<sup>3</sup> It is conservatively assumed that all buffer impacts would be mitigated at a 1:1 ratio.

Source: Parametrix analysis, 2024.

Based on these calculations, the mitigation areas identified by the Port have sufficient capacity to provide the needed compensatory mitigation to compensate for the impacts of the Action Alternatives.

**Minimization Measures**

Additional avoidance and minimization measures would be implemented, as practical, during project design. The Port would continue to explore options to reduce permanent wetland impacts and to minimize buffer impacts. Additional strategies would include minimizing vegetation clearing and restoring temporarily affected areas as soon after the initial impact as possible.

The Port would comply with standard specifications, BMPs,<sup>72</sup> and applicable federal and state mitigation requirements during design, construction, and post-construction activities. The Port would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal and state regulations.

<sup>72</sup> BMPs include various methods and devices to control, remove, or reduce pollution, and are listed in the Airport’s Stormwater Pollution Prevention Plan (<https://www.airportprojects.net/sampenvironmentalreview/swppp-2022/>). BMPs include operational practices (e.g. training and spill prevention), structural controls (e.g. stormwater ponds and oil/water separators), and erosion and sediment controls (e.g. silt fence and filter strips).



### 4.3.14.3 Surface Waters

#### Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to surface waters.

#### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

##### *Permanent Impacts to Streams, Stream Buffers, and Jurisdictional Ditches*

The Action Alternatives would permanently impact a total of 0.01 acres of streams and 0.01 acres of potentially jurisdictional ditches as a result of construction related activities (**Table 4-49**). The ditches are considered potentially jurisdictional based on the duration of flow and the fact that they discharge to receiving waters that are under jurisdiction of the USACE. The stream impacts would be associated with a crossing of Miller Creek for an access road for the Westside Maintenance Campus. The Action Alternatives would also result in permanent stream buffer impacts totaling 0.12 acre. These impacts are not considered significant for the following reasons:

- None of the impacts would exceed water quality standards established by federal, state, local, and tribal regulatory agencies. The stream impacts would be minor (0.01 acre of stream impacts) and would occur at the eastern edge of the GSA for an access road crossing. Stream flow would be maintained throughout construction activities, and construction BMPs would limit the potential for water quality impacts. Potentially jurisdictional ditch impacts would also be minor (0.01 acre) and would feed into stormwater management facilities where the runoff would be treated along with existing surface runoff. All construction would be conducted in compliance with permit conditions, the project SWPPP, and other relevant documents.
- None of the impacts would contaminate public drinking water supply such that public health may be adversely affected.

**TABLE 4-49: PERMANENT STREAM AND STREAM BUFFER IMPACTS (ACRES)**

Project Name	Stream / Potentially Jurisdictional Ditch Impact	Stream ID	Stream Buffer Impact
Westside Maintenance Campus (S07)	0.01	Miller Creek	0.07
Storm (Utility Line)	0.01	Tributary 2	0.05
<b>Grand Total*</b>	<b>0.02</b>		<b>0.12</b>

\* Impacts values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion).

Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

**Exhibits 4-4 through 4-7** show the location of the impacted stream, stream buffer, and jurisdictional ditches.

##### *Temporary Impacts to Streams, Stream Buffers, and Jurisdictional Ditches*

Temporary stream impacts include 0.07 acres to the East Fork Des Moines Creek resulting from construction activities associated with the Fuel Farm Expansion Project (S01). Additionally, construction of the access road for the Westside Maintenance Campus (S07) would temporarily impact 0.01 acres of Miller Creek. The Action Alternatives would also result in temporary stream buffer impacts totaling 0.20 acres. These impacts are not considered significant because they would not result in any of the conditions considered significant (see significance factors above) and would only occur during certain



construction related activities. These areas would be returned to their pre-construction condition after construction activities have been completed. **Table 4-50** identifies temporary stream and stream buffer impacts by project.

**TABLE 4-50: TEMPORARY STREAM AND STREAM BUFFER IMPACTS**

Project Name	Stream Impact (acre)	Stream Buffer Impact (acre)
Fuel Farm Expansion (S01)	0.07	0.00
Westside Maintenance Campus (S07)	0.01	0.20
<b>Grand Total*</b>	<b>0.08</b>	<b>0.20</b>

\* Impacts values in the table are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the Westside Maintenance Campus may be permitted separately from the fuel farm expansion).

Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

*Potential Impacts on Stormwater Quantity and Quality*

The Action Alternatives would add new impervious areas, as well as the replacement of existing impervious surfaces. Major impervious area changes include the reconfiguration of taxiways to meet safety and operational requirements, expansion of aircraft hardstand areas on the apron, expansion of the fuel farm, Westside Maintenance Campus, and the construction of new cargo and parking facilities on undeveloped sites north of SR 518. The addition of impervious surfaces would be partially offset by the demolition of select impervious surfaces along the taxiways and other hard surfaces.

The change in impervious surfaces between pre- and post-development conditions was analyzed in detail for each project footprint and within each drainage subbasin. The total impervious area within SEA’s SDS and IWS drainage subbasins would increase by approximately 37 acres. An additional increase in impervious area of approximately 38 acres would be required for development within the City of SeaTac’s Municipal Separate Stormwater System, including new developments north of SR 518. Overall, total impervious area at SEA would increase by approximately 75 acres.

Stormwater Drainage System: A detailed analysis was performed to evaluate the impacts of the Action Alternatives on stormwater runoff rates and assess the future demand for SDS conveyance infrastructure and stormwater control (i.e., detention and treatment) capacities. As part of this analysis, the change in impervious area within each existing subbasin was compared to available stormwater detention and treatment capacity within that subbasin, to determine the need for new or expanded stormwater controls.

This analysis accounted for the remaining capacities of existing stormwater conveyance and controls (some of which had excess capacity to address a portion of the planned development), identified deficiencies in comparison to future demand, and made recommendations for improvements to address those deficiencies. Specific recommendations were identified for each drainage basin and watershed in which development is planned, in accordance with applicable stormwater development standards (**Appendix M**).



Industrial Wastewater System: Based on the conditions for the current NPDES and Industrial Waste Department (IWD) permits, wastewater runoff rates associated with the Action Alternatives were identified, and the future demand for IWS conveyance infrastructure, storage capacity, snow storage areas, and Industrial Wastewater Treatment Plant (IWTP) infrastructure was assessed. Potential improvements to address surface water impacts and comply with applicable regulatory requirements include construction of additional detention for de-icing runoff and infrastructure upgrades in the IWTP to improve treatment at higher flow rates (**Appendix M**). The Airport's NPDES and IWD permits were renewed on 9/1/2021 and 7/2/2021, respectively. There were no changes to the NPDES permit; the renewed IWD permit has two tiers of reduced effluent limits, effective 10/1/22 and 03/31/26.

City of SeaTac Municipal Separate Stormwater System: Impervious area changes within the new development areas north of SR 518 would include the implementation of new stormwater controls. With these controls, the resulting impacts are not considered significant. The resulting stormwater runoff would be treated consistent with applicable City of SeaTac stormwater management standards and Port protocols as explained below, and all new stormwater management features would be compliant with relevant permitting requirements.

With the planned measures previously described in place, the Proposed Action would not result in significant impacts to surface waters, nor would it result in an exceedance of water quality standards or contamination of public drinking water supply.

#### Mitigation and Minimization Measures

##### *Mitigation*

To mitigate potential impacts associated with runoff from construction activities, the Port would implement erosion and sediment control measures in accordance with applicable regulatory requirements and the Port's own construction SWPPP.<sup>73</sup> The Proposed Action would include appropriate measures in accordance with applicable NPDES permit requirements for discharges from construction activities. Outside of the Port's NPDES permit boundary, projects that would result in the disturbance of one or more acres and discharge stormwater to surface waters would be required to apply for coverage under the WSDE Construction Stormwater General Permit, and to implement erosion and sediment control measures and other measures as needed to comply with that permit and applicable regulatory requirements.

The Port has a Programmatic Construction SWPPP that defines requirements of SEA's construction SWMP. All projects within the permit boundary must meet the Port's Erosion and Sediment Control Plan Specification requirements, while projects meeting certain disturbance thresholds within the permit area would be required to develop project-specific construction SWPPPs and monitoring plans.

To mitigate the potential impacts to stormwater runoff quantity and quality associated with expanded impervious surfaces and grading activities, the Port would implement post-construction stormwater quantity and quality controls in accordance with applicable regulatory requirements (**Table 4-51**). Low impact development techniques and infiltration features would also be considered for implementation where feasible. Source controls would be implemented where necessary to comply with permit limits and water quality standards.

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<sup>73</sup> Port of Seattle Master Specification Section 01 57 13 - Temporary Erosion and Sediment Control Planning and Execution, Section 01 57 23 – Pollution Prevention, Planning and Execution, and Section 01 59 00 – Construction Water Management System. These specifications would not apply to properties north of SR518. Properties north of SR518 would follow City of SeaTac code.





**TABLE 4-51: PLANNED STORMWATER CONTROLS BY AREA**

Drainage Basin / Area Served <sup>1</sup>	Stormwater Controls to be Added / Modified <sup>2</sup>
SDW1b	<ul style="list-style-type: none"> <li>• Expand detention volume by 4.4 acre-feet.</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration.</li> <li>• Provide source controls where required, including oil / water separator.</li> </ul>
SDW2	<ul style="list-style-type: none"> <li>• Relocate existing detention pond or convert to an underground vault to avoid proposed development. Provide a total storage capacity of 14.3 acre-feet (existing storage plus additional 2.4 acre-feet of storage).</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration to offset storage requirements.</li> <li>• Provide source controls where required, including oil / water separator.</li> </ul>
SDE4 & SDE4X	<ul style="list-style-type: none"> <li>• Expand detention volume by up to 2.0 acre-feet.</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration.</li> <li>• Provide source controls where required, including oil / water separators.</li> <li>• Install canisters for water quality treatment.</li> </ul>
SDN2/3/4	<ul style="list-style-type: none"> <li>• Expand detention volume by up to 4.7 acre-feet.</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration at SR 518 pond to offset storage requirements.</li> <li>• Provide source controls where required.</li> </ul>
SDS4	<ul style="list-style-type: none"> <li>• Expand detention volume by 0.1 acre-feet to address development within subbasin only (assuming no diversion from SDS3 / 5).</li> <li>• Expand bioretention swale footprint by 90 square feet or provide equivalent detention and treatment alternative.</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration to offset storage requirements.</li> <li>• Provide source controls where required.</li> </ul>
SDD05B	<ul style="list-style-type: none"> <li>• Expand detention volume by 2.3 acre-feet.</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration to offset storage requirements.</li> <li>• Provide source controls where required.</li> </ul>
SDD06A	<ul style="list-style-type: none"> <li>• Expand detention volume by 6.4 acre-feet.</li> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration to offset storage requirements.</li> <li>• Provide source controls where required.</li> </ul>
New Development North of SR 518	<ul style="list-style-type: none"> <li>• Integrate on-site low impact development techniques as feasible.</li> <li>• Pursue opportunities for shallow / deep infiltration to offset storage requirements.</li> <li>• Provide source controls where required.</li> <li>• Implement local detention facilities and water quality treatment as follows:             <ul style="list-style-type: none"> <li>• Offsite Cargo Phase 1 C02 and Offsite Cargo Phase 2 C03 – 14.1 acre-feet</li> <li>• North GT Holding Lot (L05),<sup>3</sup> Employee Parking (L07), and CRDC (S10)<sup>4</sup> – 7.7 acre-feet</li> </ul> </li> </ul>

1. “SDXX” nomenclature refers to drainage basin IDs within the SDS. The third character in each drainage basin ID (N / E / S / W) indicates the side of the Airport where the drainage basin is located (north / east / south / west).



2. Stormwater control needs summarized above account for available capacity remaining within existing facilities. Drainage areas that experience an increase in impervious area but are not shown in this table were found to have sufficient capacity available within existing stormwater controls.

Source: Utility Master Plan (UMP): Sewer and Surface Water, HNTB (December 2022).

Given the regulatory framework within which the Port would construct and operate the various elements of the Proposed Action and the associated mitigation requirements, there would be no significant impacts to surface waters.

**Minimization Measures**

The Port would comply with standard specifications, BMPs, and applicable federal and state requirements during design, construction, and post-construction activities. The Port would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal and state regulations.

The avoidance and minimization of impacts to surface waters was and will continue to be a guiding principle for the preliminary project design. Additional avoidance and minimization measures would be implemented, as practical, during project design. The Port is exploring options to reduce or eliminate stream impacts associated with the Fuel Farm Expansion Project, the Westside Maintenance Campus, and associated utilities.

The Port has undertaken several initiatives to reduce stormwater runoff and improve the quality of discharges from Airport lands. Such initiatives include enacting low impact development guidelines for new and redevelopment projects in the tributary to the SDS; integrating Airfield Green Stormwater Infrastructure guidance and Infiltration Feasibility Assessment into a programmatic guide for application on-Airport lands; attaining a Salmon-Safe Certification for stormwater infrastructure; implementing measures to manage aircraft deicer runoff; and integrating findings for stormwater infrastructure from the Climate Vulnerability Assessment into its utility planning.

**4.3.14.4 Floodplains**

Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to floodplains.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Freeboard Value Approach was used to establish the FFRMS floodplain. The FFRMS Floodplain Determination Worksheet was completed for five NTPs located near a floodplain (A02, L05, L07, S07, and S10). A portion of the access road improvements included as part of NTP S07 would occur in a floodplain. However, the existing road is higher than the FFRMS floodplain and the improvements would not directly impact any floodplains or adversely affect any beneficial floodplain values.

**Table 4-52** summarizes the results of the determination.

**TABLE 4-52: FFRMS FLOODPLAIN DETERMINATIONS**

Project Description	Lowest Project Elevation (feet)	FFRMS Flood Elevation (feet)	Determination
A02 – Runway 16 Blast Pad	396	280	Not in a FFRMS Floodplain
L05 – North GT Holding Lot	321	280	Not in a FFRMS Floodplain
L07 – Employee Parking Garage	297	280	Not in a FFRMS Floodplain
S07 – Westside Maint. Campus	255	226	Not in a FFRMS Floodplain
S10 – CRDC	308	280	Not in a FFRMS Floodplain

## Mitigation and Minimization Measures

### *Mitigation*

Because there would be no impacts to floodplains under any of the alternatives being considered, no mitigation is necessary.

### *Minimization Measures*

Stormwater management facilities would be implemented for planned development, in accordance with regulatory requirements, to avoid indirect water quantity, flow, and quality impacts to floodplains (see Section 4.3.14.3, Surface Waters for further information).

## **4.3.14.5 Groundwater**

### Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to groundwater aquifers or WHPA and would not cause any exceedances of groundwater quality standards or contaminate any aquifers used for public water supply.

### Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Groundwater resources include WHPA. WHPA were established to prevent contamination of the water source by establishing management zones around public wells based on the time it would take for a contaminant to travel through the aquifer to the pumping well. Impact calculations to WHPA are based on ground disturbance within the ten-year contaminant travel zone, where potential contaminants could be released. Based on guidelines established as part of the Wellhead Protection Program,<sup>74</sup> any high-risk operations or facilities (such as pesticide application areas, injection wells, or landfills/disposal areas) located within the wellhead protection area must be identified, and steps taken to reduce contaminant loading.

The Proposed Action would result in permanent impacts to 43.6 acres within the WHPA for Riverton Heights #1 and Riverton Heights #2, along with temporary construction impacts of 2.34 acres. These impacts would be associated primarily with the proposed offsite cargo buildings (C02 and C03), the north GT holding lot (L05), and utility line connections. Note that these two wells are adjacent to each other, and the protection areas almost completely overlap. The impact calculation considers each wellhead protection area separately; thus, the impact is essentially counted twice.

The Taxiway A/B Extension (A01), a stormwater detention pond, and utility line connections would permanently affect 6.25 acres of the wellhead protection area for Tyee Well AFR835. There would be temporary construction impacts to this wellhead protection area totaling 5.21 acres. Operations at this wellhead were voluntarily suspended due to samples exceeding the Washington Department of Health State Action Levels for PFAS.

Additionally, there would be a permanent impact of 2.24 acres to the wellhead protection area associated with the McMicken Heights well east of the Airport. This permanent impact would be due to a utility line connection.

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<sup>74</sup> WAC 246-290-130 (<https://app.leg.wa.gov/wac/default.aspx?cite=246-290-130>) and WAC 246-290-135 (<https://app.leg.wa.gov/wac/default.aspx?cite=246-290-135>), accessed March 6, 2024.



Construction and operation of the Proposed Action would abide by all applicable regulations related to spill prevention and control regulations to prevent spills from causing significant adverse impacts to groundwater. These regulations also specify required cleanup/mitigation actions should a spill occur. To document that construction actions have not impacted groundwater quality within or downgradient of the work area, the Port will monitor groundwater during and following completion of construction. Therefore, no significant impacts to groundwater are anticipated.

Because the Proposed Action would not cause impacts to groundwater that would exceed applicable groundwater quality standards, and because the Proposed Action would not contaminate an aquifer used for public water supply, no significant impacts are anticipated. Implementation of stormwater management best practices and facilities (described below under Mitigation and Minimization Measures) would reduce the likelihood that wells or WHPA would be adversely impacted during the construction or operation of the Proposed Action.

### Mitigation and Minimization Measures

#### *Mitigation*

Given the regulatory framework within which the Port would construct and operate the various elements of the Proposed Action, no significant impacts related to groundwater resources would occur.

#### *Minimization Measures*

Potential impacts to groundwater resources would be mitigated through the planned implementation of post-construction stormwater quantity and quality controls, source controls, operational and construction BMPs, and other measures to comply with the Port's NPDES permit, King County's IWD Permit, Construction General Permit, SPCC regulations, and other environmental programs.<sup>75</sup> The Port would also monitor PFAS levels in groundwater downgradient of the work area semiannually for potential impacts to the WHPAs. Specific measures to protect WHPAs will be integrated into project design, as appropriate.

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<sup>75</sup> These are discussed in more detail in Appendix G.