4 Impacts and Mitigation Measures

4.1 Introduction

The potential adverse environmental impacts 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. The analysis includes consideration of reasonably foreseeable 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.

Potential impacts are described for the SEPA elements of the environment (WAC 197-11-444) that may be affected by the Action Alternatives. The descriptions of impacts incorporate by reference Chapter 4, Environmental Consequences, of the NEPA EA.

The SAMP NTP NEPA EA identified significant impact thresholds for each resource category based on FAA regulations and guidance. These thresholds are provided for reference in this SEPA EIS. Although SEPA does not specify or mandate significance thresholds (WAC 197-11-794), the NEPA significance thresholds are provided for context, followed by a discussion of impact considerations for the SEPA analysis for each element of the environment. These considerations take into account the factors described in WAC 197-11-330(3) for determining an impact's significance.

As described in Section 2.4, the No Action Alternative is used as a baseline for evaluating the effects of the Action Alternatives in future years. Although the NTPs would not be built under the No Action Alternative, travel demand would continue to grow, and operations at SEA are expected to change to accommodate that growth. Section 2.4 identifies other projects that the Port anticipates implementing by 2032 independent of the NTPs. If the NTPs are not built, it is possible that additional projects beyond those noted in Section 2.4 could be implemented at SEA to accommodate increased operations triggered by continuing demand. However, the details regarding any such projects and their impacts are not yet known and are not reasonably foreseeable. The No Action sections in Chapter 4 for each element of the environment include those impacts that the Port can reasonably anticipate from changes to operations to respond to growing demand without the NTPs.

In general, where the Proposed Action and the Hybrid Terminal Option would have different impacts, the analysis differentiates between their impacts and refers specifically to Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option. Where there are no meaningful or measurable differences in impact between Alternatives 2 and 3, the analysis may use the term "Action Alternatives" to discuss the impacts of both the Proposed Action and the Hybrid Terminal Option.

4.2 Analysis Years

For the assessment of potential operational impacts, the Action Alternatives (Proposed Action and Hybrid Terminal Option) were compared to the No Action Alternative for 2032 conditions. The year 2032 was selected as the evaluation period because it represents the year when most, if not all, of the elements of the Proposed Action could be substantially complete and operational. FAA Order 1050.1F[1] also suggests conducting analysis of noise impacts for an out-year to understand the potential impacts

[1] The NEPA EA was completed under FAA Order 1050.1F, which has since been replaced by FAA Order 1050.1G. This provision was not changed.

associated with growth in activity after implementation. For this EIS, 2037 was selected as the out-year, which is used for the evaluation of the out-year impacts for Air Quality, Greenhouse Gas Emissions and Climate, Noise, and Surface Transportation. Finally, the interim years of 2025 through 2032 were assessed for potential construction-related impacts.

Table 4.2-1 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, greenhouse gases and climate, energy supply, noise, solid waste, and surface transportation). For more information on forecasted aircraft operations and passengers, see Appendix A.[2]

TABLE 4.2-1: 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

Note: Table 4.2-1 was Table 4-1 of the NEPA Final EA.

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

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. **Appendix P, Minimization and Mitigation Measures,** is a consolidated list of the proposed minimization and mitigation measures for the Action Alternatives.

4.3.1 Air Quality

This section presents the results of the updated air quality analysis of the potential reasonably foreseeable direct and indirect impacts from 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 Impact Considerations

NEPA – 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

[2] 56 million annual passengers (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.

parts per million / billion and describe concentrations of the pollutants in the air. An emissions inventory is not directly comparable to the NAAQS.

SEPA – Impact Considerations

SEA is subject to state and local air quality regulations that WSDE and the PSCAA, respectively, enforce. The State of Washington and the PSCAA have adopted the USEPA's NAAQS; therefore, this EIS considered the same significance threshold (exceedance of the NAAQS) for air quality as the FAA's Final NEPA EA.

For the SEPA EIS, significance was determined by comparing the total of the modeled Proposed Action-related emissions plus the background concentrations to the NAAQS. If this total is below the applicable primary or secondary NAAQS, it indicates compliance with the air quality standard for that pollutant and no probable significant impact.

For the human health risk assessment (HHRA) conducted for the SEPA EIS, non-cancer health risks were considered significant if the hazard index for a receptor in a given location over a given exposure period exceeded a value of 1. Cancer health risks were considered significant if the cumulative cancer risk (based on pollutant concentrations and exposure duration in a given location) was greater than 1E-05, or 0.00001. More information on how these thresholds were established can be found in the Air Quality and Human Health Risk Assessment Technical Report, which is part of Appendix C**.**

4.3.1.2 Criteria Pollutants

The air quality analysis included criteria air pollutants CO, NO_2, PM_{10}, $PM_{2.5}$, SO_2 and ozone precursor pollutants NO_x and VOCs.

Methods

Criteria pollutant inventories were calculated from aircraft operations at and beyond the airport and emissions from potential changes to motor vehicle traffic on the surrounding road network. The sources and activities for which emissions were estimated included aircraft engine exhaust, ground support equipment (GSE) exhaust, auxiliary power units (APUs), stationary equipment, and on- and off-airport vehicle exhaust. The sources, updated methods and models used to analyze impacts are described in Section 3.3.1 and detailed in the technical reports provided in Appendix C**.** As noted in Section 3.3.1, AEDT version 3f and MOVES version 4 were used for the NEPA analysis and are reflected in the results shown below. Updated results using AEDT Version 3g and MOVES model version 5 are included in the Air Quality and Human Health Risk Assessment Technical Report in Appendix C**.**

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.

The construction analysis identified and quantified construction-related emissions sources emissions for each year of construction, which was analyzed over eight years between 2025 and 2032 in the Final EA. While the actual construction dates are currently unknown, these years were retained in this analysis because they provide a conservative assessment of potential impacts. Exhaust emissions from construction equipment tend to decrease in future years because of equipment turnover and improvements in engine technology; therefore, by retaining the original assessment years, emissions would not be unintentionally reduced by adjusting the analysis to different years.

Alternative 1: No Action

The No Action Alternative is not anticipated to result in project-related construction emissions. While the Port periodically initiates construction projects intended to address operational and efficiency needs, no other construction projects intended to accommodate increased operations in response to continuing growth in passenger demand are anticipated under the No Action Alternative.

Alternative 2: Proposed Action

Table 4.3.1-1 provides the construction emissions inventory for the Proposed Action. Peak construction emissions are expected to occur in 2028 for NO_x (40 short tons) and 2029 for CO (239 short tons).

TABLE 4.3.1-1: CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (IN SHORT TONS)

Year	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
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

Note: Table 4.3.1-1 was Table 4-3 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4.

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

Alternative 3: Hybrid Terminal Option

Table 4.3.1-2 provides the construction emissions inventory for the Hybrid Terminal Option. Peak construction emissions are expected to occur in 2028 for NO_x (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 4.3.1-2: CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (IN SHORT TONS)

Year	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
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

Notes: Table 4.3.1-2 was Table 4-4 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. 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.

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 4.3.1-3 and **Table 4.3.1-4** 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_x 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 4.3.1-3: EMISSIONS INVENTORY – FUTURE (2032) NO ACTION ALTERNATIVE (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,152**	**249**	**2,761**	**236**	**27**	**27**
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
GSE	**190**	**6**	**14**	**0**	**1**	**1**
Tenant-Owned GSE	187	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**16**	**11**	**27**	**37**	**1**	**1**
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
Motor Vehicles	**2,089**	**18**	**122**	**2**	**4**	**3**
Parking Facilities	35	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,054	17	119	2	4	3
Total	***4,447***	***283***	***2,923***	***275***	***32***	***32***

Notes: Table 4.3.1-3 was Table 4-5 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

TABLE 4.3.1-4: EMISSIONS INVENTORY – FUTURE (2037) NO ACTION ALTERNATIVE (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,089**	**238**	**2,975**	**242**	**29**	**29**
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
GSE	**194**	**6**	**13**	**0**	**1**	**1**
Tenant-Owned GSE	191	6	9	0	0	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**16**	**11**	**27**	**37**	**1**	**1**
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
Motor Vehicles	**1,682**	**14**	**72**	**2**	**2**	**2**
Parking Facilities	27	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,655	13	71	2	2	2
Total	***3,982***	***268***	***3,088***	***281***	***32***	***32***

Notes: Table 4.3.1-4 was Table 4-6 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

Alternative 2: Proposed Action

Table 4.3.1-5 and **Table 4.3.1-6** 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 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 4.3.1-5: EMISSIONS INVENTORY – FUTURE (2032) PROPOSED ACTION (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,166**	**251**	**2,807**	**239**	**28**	**28**
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
GSE	**194**	**6**	**14**	**0**	**1**	**1**
Tenant-Owned GSE	191	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**23**	**15**	**39**	**54**	**1**	**1**
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
Motor Vehicles	**2,135**	**18**	**124**	**2**	**4**	**3**
Parking Facilities	39	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,096	17	121	2	4	3
Total	***4,517***	***290***	***2,984***	***295***	***33***	***33***

Notes: Table 4.3.1-5 was Table 4-7 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

TABLE 4.3.1-6: EMISSIONS INVENTORY – FUTURE (2037) PROPOSED ACTION (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,231**	**252**	**3,184**	**259**	**31**	**31**
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
GSE	**208**	**6**	**14**	**0**	**1**	**1**
Tenant-Owned GSE	204	6	10	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	5	0	0	0
Stationary Sources	**23**	**15**	**39**	**54**	**1**	**1**
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
Motor Vehicles	**1,784**	**14**	**76**	**2**	**2**	**2**
Parking Facilities	32	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,752	14	74	2	2	2
Total	***4,245***	***288***	***3,314***	***315***	***35***	***34***

Notes: Table 4.3.1-6 was Table 4-8 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. 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 4.3.1-7**. 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_x. 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 exceed the NAAQS.[3]

TABLE 4.3.1-7: 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_x	SO_x	PM_{10}	$PM_{2.5}$
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*
2032 Increase in Emissions	***110***	***8***	***70***	***20***	***9***	***2***
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
2037 Increase in Emissions	***263***	***20***	***225***	***34***	***3***	***2***

Notes: Table 4.3.1-7 was Table 4-9 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. 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 exceed 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 4.3.1-8**.

[3] Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023.

TABLE 4.3.1-8: 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_x	SO_x	PM_{10}	$PM_{2.5}$
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*
2032 Increase in Emissions	***112***	***8***	***76***	***20***	***9***	***2***
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
2037 Increase in Emissions	***263***	***20***	***225***	***34***	***3***	***2***

Notes: Table 4.3.1-8 was Table 4-10 of the NEPA Final EA. Results shown are based on AEDT Version 3f and MOVES Version 4. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

Operational Criteria Pollutant Concentrations (2032 and 2037)

Methods

Air dispersion modeling was used to estimate ambient criteria pollutant concentrations for the Proposed Action in 2032 and 2037 for comparison to applicable concentration thresholds. As described in Section 3.3.1, air dispersion modeling simulates how pollutants disperse in the atmosphere to estimate downwind ground-level concentrations The air dispersion analysis was performed following FAA, USEPA, and WSDE modeling guidelines (FAA 2024b; FAA 2026; USEPA 2026d; WSDE 2015). The predicted incremental difference in concentrations between the Proposed Action and No Action scenarios for each modeled year represents the Proposed Action-related contribution to ambient concentrations. Because the No Action Alternative would not require construction, Proposed Action-related incremental concentrations from construction would be equivalent to the modeled concentrations of the construction needed the implement the Proposed Action minus zero, effectively equaling the full Proposed Action modeled construction concentrations.

2032 Proposed Action Compared to 2032 No Action Alternative

Table 4.3.1-9 summarizes the 2032 Proposed Action incremental increases in peak concentrations relative to the 2032 No Action Alternative. The incremental concentration increases, which isolate the environmental impact that would occur from implementation of the Proposed Action, were added to the respective background concentration of each pollutant for each applicable averaging period. The total concentrations (increment plus background) were then compared to the NAAQS to determine if an impact could occur. As shown in the table, the incremental change in pollutant concentrations resulting from operational activities under the Proposed Action would not exceed the NAAQS. The geographic extent of the ground-level pollutant concentrations is provided in the Air Quality and Human Health Risk Assessment Technical Report in Appendix C**.**

TABLE 4.3.1-9: OPERATIONAL CONCENTRATIONS – 2032 PROPOSED ACTION COMPARED TO 2032 NO ACTION ALTERNATIVE

Pollutant	Averaging Period	Incremental Peak (µg/m3)	Background (µg/m3)	Total (µg/m3)	NAAQS (µg/m3)	Exceed NAAQS?
CO	1 hour	218	1,087	1,305	40,000	No
	8 hour	83	916	999	10,000	No
Pb	Rolling 3-month average	0.000022	0.022	0.022	0.15	No
NO_2	1 hour	21	79	100	188	No
	Annual	5	18	23	100	No
$PM_{2.5}$	24 hour	1	11	12	35	No
	Annual	0.3	4.6	4.9	9.0	No
PM_{10}	24 hour	3	34	37	150	No
SO_2	1 hour	118	8	126	197	No
	Annual	17	1	18	26	No

Source: CDM Smith 2026

Notes: Totals may not add exactly because of rounding. NO_2 concentrations include special processing to account for the plume rise from aircraft exhaust.

2037 Proposed Action Compared to 2037 No Action Alternative

Table 4.3.1-10 presents the incremental increases in pollutant concentrations for the Proposed Action compared to the No Action Alternative. These increases, combined with background levels, were compared against the NAAQS, showing no exceedances. Details on the spatial distribution of ground-level pollutant concentrations are found in the Air Quality and Human Health Risk Assessment Technical Report in Appendix C.

TABLE 4.3.1-10: OPERATIONAL CONCENTRATIONS – 2037 PROPOSED ACTION COMPARED TO 2037 NO ACTION ALTERNATIVE

Pollutant	Averaging Period	Incremental Peak (µg/m3)	Background (µg/m3)	Total (µg/m3)	NAAQS (µg/m3)	Exceed NAAQS?
CO	1 hour	341	1,087	1,428	40,000	No
	8 hour	88	916	1,005	10,000	No
Pb	Rolling 3-month average	0.000025	0.022	0.022	0.15	No
NO_2	1 hour	22	79	101	188	No
	Annual	6	18	24	100	No
$PM_{2.5}$	24 hour	2	11	13	35	No
	Annual	0.5	4.6	5.0	9.0	No
PM_{10}	24 hour	4	34	38	150	No
SO_2	1 hour	120	8	127	197	No
	Annual	17	1	18	26	No

Source: CDM Smith 2026

Notes: Totals may not add exactly because of rounding. NO_2 concentrations include special processing the account for the plume rise from aircraft exhaust.

Conclusions

Overall, the Proposed Action scenario exhibits small increases in certain pollutant concentrations compared to the No Action scenario. Notably, NO_2 concentrations, which include adjustments for plume rise from aircraft exhaust, show slight concentration increases in areas immediately adjacent to aircraft ground operations. However, these increased concentrations remain below the NAAQS.

Further comparison of the scenarios highlights that particulate matter ($PM_{2.5}$ and PM_{10}) and VOCs either remain relatively stable or experience minimal increases. These changes are primarily attributable to incremental growth in aircraft activity. The differences observed between scenarios are minor, indicating that implementation of the Proposed Action would not substantially alter the air quality in the area.

Additionally, the data suggests that the highest modeled pollutant concentrations are localized near operational hotspots, such as taxiways and idling zones, but decrease with distance from the airport boundaries. Sensitive receptors, such as schools and residential areas, are expected to experience only marginal changes in pollution levels.

In conclusion, the comparative evaluation of air pollutant concentrations under both the Proposed Action and No Action scenarios for 2032 and 2037 confirms that the anticipated changes resulting from the Proposed Action are minor and localized. While slight increases in certain pollutants, particularly NO_2, are projected in areas immediately adjacent to aircraft ground operations, these concentrations remain below the NAAQS. Other pollutants, such as particulate matter ($PM_{2.5}$ and PM_{10}) and VOCs, are expected to remain stable or show only minimal increases due to incremental growth in aircraft activity.

As discussed in Section 3.3.1, the Port has been coordinating with the PSCAA about the potential emission increases and their relationship to the NAAQS. The NEPA Final EA stated that PSCAA does not believe that the emission increases could cause a violation of the NAAQS. While there are some slight differences in the emissions inventory between this SEPA analysis and the NEPA EA, largely attributable to the change from AEDT 3f to AEDT 3g, the change in emissions between the 2032 and 2037 Proposed Action and No Action Alternatives is on par with the Final EA. Furthermore, the dispersion modeling indicates that no localized exceedances of the NAAQS would be expected to occur during construction or after implementing the Proposed Action. Therefore, no significant impacts are expected to occur.

Finally, Appendix C, Air Quality and Greenhouse Gas Emissions**,** considers recent efforts to explore the potential health effects from emissions of ultrafine particles (UFPs) and ultra-ultrafine particles (UUFPs). UFP and UUFP emissions are generated by the combustion of jet fuel during aircraft operations, including arrival, descent, landing, taxi-in, taxi-out, takeoff, climb-out, and departure ascent. UFPs and UUFPs are subsets of the broader classification of $PM_{2.5}$. EPA has established regulatory standards for $PM_{2.5}$ that are designed to be protective of public health and welfare from exposure to $PM_{2.5}$.

The current state of the evidence does not support independent causal UFP health effects. While the pool of research has expanded significantly in recent years, few broad-scale multi-city epidemiological studies are available, and fewer still attempt to isolate the effects of UFPs from the effects of $PM_{2.5}$ or for other co-pollutant effects. Of those that do, evidence remains inconsistent or inconclusive for distinct and independent UFP health effects relative to those already addressed by existing $PM_{2.5}$ standards. Thus, the limited pool of epidemiological findings does not to any extent establish causal health effects from exposure to aviation UFPs or UUFPs that can be discerned as separate and distinct from effects experienced from exposure to $PM_{2.5}$ more broadly, from regulated aviation co-pollutants such as oxides

of nitrogen, or from other co-pollutants ubiquitous to the urban background. On that basis, EPA has declined to address these pollutants in recent rulemakings to date.[4]

The principal research needs to further the state of the science are broad, multi-year epidemiological studies that characterize the independent influence of UFP and UUFP exposure on health outcomes. Until those foundational broad-scale epidemiological studies are completed, site- or project-specific research cannot independently resolve gaps or draw evidence towards causal or non-causal associations, and should not be interpreted as a substitute for, or progress toward, such conclusions.

4.3.1.3 Toxic Air Pollutants

The Port conducted a HHRA to assess the potential impacts to human health in surrounding communities associated with TAP emissions from SEA aircraft ground operations (i.e., taxiing and idling) and construction associated with the Action Alternatives. TAPs evaluated in the HHRA are chemicals that exist in the environment at concentrations that might be of potential health concern to humans, as identified based on a comparison to conservative health-based screening levels. TAPs of concern were identified for further evaluation in a quantitative risk assessment.

The HHRA focused on human health cancer risks and acute and chronic hazards associated with airborne releases of TAPs during SEA's incremental changes in operation after completion of the SAMP NTPs. The HHRA methodologies used were consistent with USEPA risk assessment guidance (USEPA 2009).

The TAPs evaluated for the HHRA were based on pollutants identified by the FAA and USEPA guidance as found in jet aircraft exhaust, WSDE priority TAPs, inorganics/metals found in Jet A fuel, or lead in aviation gasoline. Additionally, the identified TAPs also have acceptable source impact levels (ASILs), *de minimis* emissions, and/or small quantity emission rates (SQERs) published by WSDE. The analysis also considered the findings of PSCAA's December 2023 Tacoma and Seattle Air Toxics Trends Technical Report, which documents the results of monitoring for approximately 20 TAPs and associated potential cancer risks.

From an initial list of 26 TAPs, three were identified as TAPs of concern based on screening levels used in the ASILs, which are set based on cancer and non-cancer health risks. The three TAPs of concern include 1,3-butadiene, diesel particulate matter, and formaldehyde. Risks from the other TAPs evaluated are likely to be small enough that they are not of concern. More information on the identification and screening of TAPs is provided in the Air Quality and Human Health Risk Assessment Technical Report in Appendix C. The results of the analysis are summarized in Section 4.3.1.

Methods

For the TAPs of concern studied in the SEPA analysis (1,3-butadiene, diesel particulate matter, and formaldehyde), exposure concentrations and exposure parameters were estimated to determine cancer risks and non-cancer hazards. Inhalation exposures were evaluated in accordance with USEPA's *Risk Assessment Guidance for Superfund (RAGS), Part F: Inhalation Risk Assessment* (USEPA 1994; USEPA 2009). Exposure parameters were based on USEPA default guidelines, professional judgment, or estimates from exposure studies in the literature (USEPA 2011). A toxicity assessment was then

[4] Under CAA section 231, EPA has exclusive authority to issue aircraft emission standards. Because EPA has the exclusive power to regulate these emissions, CAA section 233 prohibits local governments, including the Port of Seattle, the Puget Sound Clean Air Agency, and the Washington Department of Ecology from imposing any standard for mitigation in consideration of these emissions.

conducted to identify the types of adverse health effects that may be caused by a particular chemical. This included evaluation of what adverse health effects the chemical may cause and how the occurrence of these effects depends upon dose, route, and duration of exposure. The toxicity assessment included two parts: one that characterized and quantified the non-cancer effects of the TAPs of concern, the other to address the cancer effects of the chemical. More information on the analytical methods can be found in found in the Air Quality and Human Health Risk Assessment Technical Report in Appendix C.

Results

The overall conclusions of the HHRA are:

Acute Hazards: Incremental acute non-cancer health hazards for all receptors are well below the hazard index threshold of 1, indicating that short-term exposures to TAPs of concern would not result in adverse health effects.

Chronic Hazards: Maximum incremental chronic non-cancer health hazards for all receptors are also well below 1, indicating that long-term exposures to TAPs of concern would not result in adverse non-cancer health effects.

Cancer Risks: Incremental cancer risks for all receptors are below the 1E-05 cancer risk threshold, which indicates that lifetime exposures to TAPs of concern would not result in unacceptable cancer risks.

Risk Overestimation: Due to the combination of uncertainties in exposure and toxicity estimates and conservative modeling approaches, the calculated hazards/risks presented in the HHRA are likely to overestimate actual risks.

MEI Determination: The maximum individual exposure (MEI) is based on a receptor breathing air at one modeled grid location for their entire exposure period, which is unlikely for long-term (multi-year) exposure scenarios.

The use of conservative modeling protocols and the compounding effect of combining exposure and toxicity uncertainty estimates likely result in an overestimation of the human health risk, which tends to overstate the potential impact. The calculated maximum incremental risks are considered conservative because they assume worst-case scenarios, such as high exposure concentrations (e.g., annual average concentrations), prolonged exposure durations (i.e., residents are assumed to be exposed for 24 hours a day for 350 days a year for 26 years), and direct proximity to the source of risk (e.g., the receptor is assumed to be breathing the air at one modeled grid location for the entire exposure period). Additionally, when deriving toxicity criteria, uncertainty factors are incorporated to account for limitations in the data, such as the uncertainty in extrapolating data obtained from a study with less-than-lifetime exposure or extrapolating from a low-effect level rather than from a no-effect level. These default factors were used to ensure a protective exposure level for the general human population, resulting in a "health-protective" approach designed so that calculated hazards and risks are not underestimated, even if the assumption is not necessarily realistic.

Based on the above analysis, there are no significant impacts from emissions attributable to the Action Alternatives.

4.3.1.4 Minimization and Mitigation Measures

Minimization

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*.

Mitigation

No mitigation is proposed.

4.3.2 Plants and Animals

This section presents the analysis of potential adverse impacts to biological resources for the Proposed Action and alternatives. Section 4.3.2 of the NEPA EA is incorporated by reference. More information regarding the species identified and analysis of impacts can be found in Appendix D.

4.3.2.1 Impact Considerations

NEPA – 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.
- 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.

SEPA – Impact Considerations

The Port adopts by reference the NEPA EA impact analysis on federally threatened and endangered species. The SEPA EIS considered adverse impacts to state-protected species, common plant and wildlife species, and their habitats within the GSA and ESA Study Areas.

4.3.2.2 Methods

A field reconnaissance survey of affected habitats within the GSA was conducted in October of 2019, as well as a review of previous studies, species databases, and wildlife surveys in 2019, 2021, 2023, and 2024.

The GSA was used in the SEPA EIS to assess the impacts from construction and operation of the NTPs to state-listed and common fish, wildlife and vegetation and their habitat. The ESA study area used to evaluate impacts on federally listed threatened and endangered species and state-protected species and their habitats is much larger than the GSA and included Puget Sound estuarine habitats and freshwater habitats associated with Miller, Des Moines, Walker, and Gilliam Creeks.

The SEPA analysis of fish, wildlife and vegetation included a review of the following environmental documents and references:

- Final Seattle-Tacoma International Airport Comprehensive Development Plan SEPA Environmental Review and NEPA Environmental Assessment.[5]
- WDFW Priority Habitat Mapping for information on known locations of priority habitats and species in Washington.[6]
- Washington State Department of Natural Resources (WDNR) Natural Heritage Program 2026 database of publicly available locations of rare species and rare and high-quality ecosystems.[7]

4.3.2.3 Fish and Wildlife Impacts

Alternative 1: No Action

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

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

ESA-Listed Species

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 4.3.2-1** summarizes the species evaluated in the BE and effects determinations for each species and critical habitat.

[5] Port of Seattle, 2007, Final Seattle-Tacoma International Airport Comprehensive Development Plan, POS SEPA No. 07-09, Environmental Review NEPA Environmental Assessment. Prepared by CH2MHill.

[6] WDFW, n.d., PHS on the Web. Available for review at: https://geodataservices.wdfw.wa.gov/hp/phs/. Accessed September 23, 2021.

[7] WDNR, n.d., WNHP Data Explorer. Available for review at: https://dnr.wa.gov/natural-heritage-program/wnhp-data-explorer. Accessed January 29, 2026.

TABLE 4.3.2-1: EFFECTS DETERMINATIONS FOR ESA-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Species / Habitat	Effects Determination
Bocaccio rockfish (*Sebastes paucispinus*, Puget Sound / Georgia Basin distinct population segment [DPS]) and critical habitat	May affect, not likely to adversely affect*
Bull trout (*Salvelinus confluentus*, Coastal-Puget Sound DPS) and critical habitat	May affect, not likely to adversely affect
Central America / Western North Pacific Humpback Whale (*Megaptera novaeangliae*)	No effect
Chinook salmon (*Oncorhynchus tshawytscha*, Puget Sound evolutionarily significant unit [ESU]) and critical habitat	May affect, not likely to adversely affect*
Killer whale (*Orcinus orca*, Southern Resident DPS) and critical habitat	May affect, not likely to adversely affect*
Marbled murrelet (*Brachyramphus marmoratus*)	No effect
Monarch butterfly (*Danaus Plexippus*)	No effect
North American wolverine (*Gulo gulo luscus*)	No effect
Northwestern pond turtle (*Actinemys marmorata*)	No effect
Southern green sturgeon (*Acipenser medirostris*)	No effect
Southern Pacific eulachon (*Thaleichthys pacificus*)	No effect
Steelhead (*O. mykiss*, Puget Sound ESU)	May affect, not likely to adversely affect*
Steelhead critical habitat	No effect
Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)	No effect
Yellow-billed cuckoo (*Coccyzus americanus*)	No effect
Yelloweye rockfish (*S. ruberrimus*, Puget Sound / Georgia Basin DPS) and critical habitat	May affect, not likely to adversely affect*

* In its July 28, 2025, Biological Opinion, NMFS concluded that the effects for these species were "Likely to adversely affect (LAA)." In addition, NMFS concluded the Action Alternatives would also LAA the Sunflower Sea Star (proposed for listing 88 FR 16212).

Note: Table 4.3.2-1 was Table 4-11 in the NEPA Final EA.
Source: US Department of Transportation, Federal Aviation Administration, Northwest Mountain Region – Seattle Airports District Office, 2025. 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 a request to the NMFS to initiate informal Section 7 and EFH consultation on October 2, 2024, and again on June 30, 2025. NMFS responded by issuing a Biological Opinion on July 28, 2025.

FAA sent a request to the USFWS on October 2, 2024, to initiate informal Section 7 consultation and again on June 30, 2025. See Appendix D for the BE and consultation with the NMFS and USFWS.

State-Listed Species

The common loon feeds on fish. Indirect effects to its foraging habitat could result from delayed consequences associated with treated stormwater runoff and industrial wastewater discharges generated by the Action Alternatives, which would ultimately reach habitat in Puget Sound that is used by loons. Implementation of stormwater treatment BMPs would minimize the potential for these impacts.

Common Animal Species

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 off-site 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 potential adverse impacts to non-listed fish and wildlife species would not be significant. Urban-adapted wildlife species that currently occupy the NTP sites would likely relocate during construction and, after construction is complete, could return to areas with new or replaced landscape vegetation.

Based on the analysis described above and the minimization and mitigation measures described below, impacts to fish and wildlife would not be significant.

Minimization and Mitigation Measures

Minimization

To minimize impacts from the Action Alternatives, 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 its April 2024 Land Stewardship Plan.[8] Port-owned properties outside of the AAA would comply with any appropriate city standards. The Port would continue its management practices as part of its Salmon Safe certification, including low-impact development techniques to avoid or reduce stormwater runoff and conservation of potable water through rainwater capture and reuse, high-efficiency fixtures, and recycling of water. The Salmon Safe standards also support ongoing programs in habitat protection and restoration, invasive weed and debris removal, and ecological projects such as Bee Pollinator Habitat, the Queen Bee Breeding Program, and the Community Planting Project.

Mitigation

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

[8] 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.

The Port committed to the following measure as part of the FAA's FONSI/ROD:

- Implementing strategies outlined in their April 2024 Land Stewardship Plan.
- Minimizing take associated with water quality degradation in Puget Sound from stormwater and wastewater discharges as described in the proposed action.
- Ensuring the project does not exceed the design specifications and creates no more than 51 acres of pollutant generating impervious surface (PGIS), unless otherwise coordinated with FAA, NMFS West Coast Region, and USFWS. The Port will be responsible for tracking development of the Proposed Action and amount of PGIS and notify the FAA if the Proposed Action will exceed 51 net acres of PGIS (for those projects that the FAA has authority over) prior to construction of the excess PGIS. The FAA will be responsible for coordinating with NMFS and/or USFWS if the PGIS exceeds 51 net acres.
- Providing the FAA with an as-built report including the total acres of PGIS within 30 days following project completion. The FAA will be responsible for coordinating the report with NMFS and USFWS. The FAA shall provide an as-built report including the total area of PGIS to NMFS within 90 days following project completion. This report should be sent to projectreports.wcr@noaa.gov including "Attn: WCRO2025-01881" within the subject line.
- Carrying out the operation and maintenance plans described in the Seattle-Tacoma International Airport Stormwater Pollution Prevention Plan (Port of Seattle 2022 or most recent) to ensure that facilities or systems that are used to manage stormwater and wastewater at SEA are properly operated and maintained. The Port shall maintain records of inspection and maintenance to document compliance with the standards provided in the Seattle-Tacoma International Airport Stormwater Pollution Prevention Plan (Port of Seattle 2022 or most recent). Records do not need to be provided to NMFS unless requested.
- The Port will submit reports to the FAA and the USFWS each biennium, or as agreed to and documented, for the record. Each report shall document the most recently implemented NTPs (and SDS or IWS improvements) and shall include a quantification of associated new and replaced PGIS. Reports shall be submitted to the Washington Fish and Wildlife Office in Lacey, Washington (WashingtonFWO@fws.gov) and copied to the Assistant Field Supervisor or assigned lead consultation biologist by December 31 of each year that activities are completed.

4.3.2.4 Migratory Birds and Migration Routes Impacts

Alternative 1: No Action

The No Action Alternative would not cause new impacts to migratory birds or migration routes. 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[9].

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 the GSA provide similar vegetation and trees for migratory

[9] FAA Advisory Circular 150/5200-38, Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard, and Management Plans Memorandum of Agreement Between the FAA, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft–Wildlife Strikes (2003).

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.

Construction of the Westside Maintenance Campus would include an access road that crosses over Miller Creek and would result in 0.01 acre of permanent stream impact and 0.07 acre of permanent stream buffer impact. The Port would design the access road and culvert replacement to maintain conveyance and storage capacity of the existing floodplain. The culvert replacement would be designed to improve fish passage. Temporary and permanent impacts would be further minimized or mitigated through the federal and state permitting processes.

Based on the analysis described above and the minimization and mitigation measures described below, impacts to migratory birds would not be significant.

Minimization and Mitigation Measures

Minimization

To minimize impacts from the Action Alternatives, the Port would draw upon the USFWS's Nationwide Standard Conservation Measures,[10] designed to protect birds and their habitats.

The Port will continue to implement industrial Salmon-Safe[11] standards per its 2022 recertification to define management practices for industrial sites, large-scale development, and other related land uses to protect Puget Sound water quality and salmon habitat as described above.

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 preconstruction 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.[12] Airport personnel would be notified of the breeding season and advised not to disturb nests during future maintenance activities. If nests are found, BMPs would be used to develop measures to prevent disturbing nests, such as instituting a 100-foot buffer around the nests and / or timing restrictions.

The Port committed to the following measures as part of the FAA's FONSI/ROD:

- Having a qualified biologist conduct a pre-construction nest survey 7-10 days before the start of construction and adhering to King County development standards for migratory birds. If nests are found, the USFWS's Nationwide Standard Conservation Measures will be used to develop BMPs.
- Adhering to the applicable FAA Advisory Circulars, including, but not limited to, FAA AC 150/5370-10, Standard Specifications for Construction of Airports and FAA AC 150/5200-33, Hazardous Wildlife Attractants on or Near Airports.

[10] USFWS, n.d., Nationwide Standard Conservation Measures. Available for review at: https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf, accessed January 2024.

[11] Salmon-Safe is an independent 501(c)3 nonprofit organization that conducts third-party assessment and certification for land and water management in urban areas.

[12] 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).

4.3.2.5 Plant Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to the biological environment related to construction and operation of the NTPs. Further, the Port does not anticipate making any changes to plants or plant habitat in response to continuing increases in operations under the No Action Alternative.

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

Approximately 56.4 acres of land that is currently vegetated with 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 Westside Maintenance Campus (S07).

Based on the analysis described above and the minimization and mitigation measures described below, impacts to plants would not be significant.

Minimization and Mitigation Measures

Minimization

To minimize impacts from the Action Alternatives, the Port would implement conservation and protection measures to reduce the impacts of the NTPs on existing vegetation communities. These measures would also serve to preserve wildlife cover and shelter habitat. The Port may salvage healthy native shrub and groundcover plant materials within areas requiring clearing for transplanting at restoration sites.

The NTPs would be implemented using the guidance of the Port's Land Stewardship Plan, described in Section 3.3, which integrates consideration of forest health and habitat connectivity into capital project development. The Land Stewardship Plan includes formal requirements to replace trees that are cleared within the AAA for operational safety and development needs at SEA at a 4-to-1 functional ratio. For NTPs outside the AAA, City of SeaTac requirements would apply. Additional measures could include planting landscaping around and within project sites or including islands of landscaping within parking lots, where appropriate.

Mitigation

No mitigation is proposed.

4.3.3 Greenhouse Gas Emissions and Climate

This section provides an estimate of GHG emissions attributable to construction and operation of the Proposed Action and alternatives and the impacts resulting from those emissions. Section 4.3.3.5 evaluates the potential for future climate change to adversely affect the NTPs. Appendix C contains detailed information on the GHG emissions inventories prepared for the analysis.

The SEPA EIS builds from information and analysis in the NEPA Draft EA. The Draft EA was prepared in accordance with then-current federal requirements for evaluation of climate change under EO 13990 and CEQ draft GHG guidance from January 2023. After the publication of the Draft EA, EO 13990 was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq.,* as amended, in response to Executive Order 14154. As a result of these changes, all references to climate and the level of preparedness with respect to the impacts of climate change were removed from the NEPA Final EA.

4.3.3.1 Impact Considerations

NEPA – Significant Impact Threshold

The FAA has not established a significance threshold for GHG. There are currently no accepted methods of determining significance applicable to aviation projects.

SEPA – Impact Considerations

This SEPA EIS considers impacts from GHG emissions attributable to the Action Alternatives consistent with the Port's adopted policy for the assessment of GHG emissions and climate change, as articulated in the Port's 2011 SEPA resolution.[13] Part Four in Appendix A (SEPA and Climate Change) of the resolution states:

> With respect to greenhouse gas emissions from a project and to the possible effects of climate change on a proposal, there is no uniform standard for determining "significance." Any decision by the Port of whether there is adverse environmental impact will be made on a case-by-case basis. In making the threshold determination, the Port as a lead agency may consider:
>
> 1. Whether the proposal will significantly contribute, either directly, indirectly or cumulatively to greenhouse gas concentrations in the atmosphere.
> 2. The extent to which greenhouse gas emissions of the project have been mitigated as part of project design, or through other identified actions.
> 3. The economic and technical feasibility of mitigation options available.
> 4. The aggregate Port greenhouse gas emission inventory and the relation of the project's emissions to the overall balance and trend of the inventory.
> 5. The effects of climate change on the project, including the vulnerability of the project to the specific impacts of climate change within a reasonable timeframe.
> 6. Whether the proposal will conflict with applicable laws and regulations adopted for the purpose of reducing greenhouse gas emissions.
> 7. Guidance and policies adopted by other local governments, and state and federal agencies, including, but not limited to, the Washington State Department of Ecology, and the White House Council on Environmental Quality related to the consideration of climate change and greenhouse gas emission under SEPA and the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq.
>
> Additional mitigation measures may be required to the extent attributable to the identified adverse impacts of the proposal.

[13] Port of Seattle Commission Resolution 3650: A RESOLUTION of the Port Commission of the Port of Seattle (Port), King County, Washington, revising and adopting the Port's policies and procedures under the State Environmental Policy Act (SEPA) and its implementing rules, Chapter 43.21 C RCW and Chapter 197-11 WAC, repealing all prior resolutions pertaining to the same subject matter and adopting climate change policies under SEPA.

4.3.3.2 Methods

GHG Emissions

FAA guidance notes that if a project might increase criteria pollutants and / or fuel use, it could increase GHG emissions, warranting a GHG emissions inventory. The GHG emissions inventories for the Action Alternatives were conducted in accordance with FAA guidelines[14] and are described in more detail in Appendix C. The approach was developed in coordination with the FAA and the PSCAA. This approach to calculating GHG emission inventories is appropriate for SEPA purposes.

The GHG construction and operation emissions inventories were prepared using the same data, assumptions, and models that were developed for the air quality criteria pollutant construction and operation emissions inventories (discussed in Section 4.3.1). The construction emissions inventory was compiled using a detailed construction phasing schedule, assumptions of on-road and non-road construction vehicles, and the emission factors for the Action Alternatives. Further information concerning these assumptions is found in Appendix C**.**

GHG operational emissions inventories are categorized into three groups: Scope 1, 2, and 3 emissions, as previously described in Section 3.3.3. The emissions sources for each scope category were modeled for the criteria pollutants.

Climate

The Airport Climate Risk Operational Screening (ACROS) tool was used to identify high climate change risks at the Airport under future conditions. The ACROS tool provides a relative risk estimate for airport assets and operations for 2030 and 2060. The tool uses regional climate forecasts and a formula to compute an estimated level of risk for assets and operations at the Airport in the future. These risks are then ranked from high to low to provide an estimate of the relative risk posed for each asset and operation.

4.3.3.3 Greenhouse Gas and Climate Impacts

For context, as previously noted in Section 3.3.3, the state of Washington's GHG emissions were estimated at 96.1 million metric tons[15] (MT) of CO_2e in 2021. Of this, 38.2 million MT (40%) were attributed to transportation overall. Emissions from aviation are a subset of transportation emissions. Aviation in Washington was estimated to contribute 5.6 million MT of GHG emissions (6% of overall statewide GHG emissions). U.S.-based GHG emissions were estimated at 6,341.2 million MT CO_2e in 2022, of which aviation emissions were 3% of the US total.[16]

[14] FAA Order 1050.1F, Environmental Impacts: Policies and Procedures (including the Desk Reference); FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions; FAA, 2015, *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

[15] WSDE, 2022, Washington State Greenhouse Gas Emissions Inventory: 1990–2019. Publication 22-02-054.

[16] USEPA, 2024, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022. Available for review at: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. And https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-aircraft

According to King County,[17] 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 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 mosquitoes, 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.

Construction GHG Emissions Inventories

Alternative 1: No Action

No NTP-related construction activity or emissions would occur in the No Action Alternative. While the Port periodically initiates construction projects intended to address operational and efficiency needs, no other construction projects intended to accommodate increased operations in response to continuing growth in passenger demand are anticipated under the No Action Alternative.

Alternative 2: Proposed Action

Table 4.3.3-1 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. Construction activities would produce 44,111 MT CO_2e that year.

TABLE 4.3.3-1: CONSTRUCTION GHG EMISSIONS INVENTORY – PROPOSED ACTION (MT CO_2E PER YEAR)

Year	CO_2	CH_4	N_2O	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

Notes: Table 4.3.3-1 was Table 4-12 of the NEPA Final EA. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

[17] King County, n.d., Our changing climate. Available for review at: https://kingcounty.gov/en/dept/executive/governance-leadership/climate-office/focus-areas/climate-preparedness/our-changing-climate, accessed May 2024.

Alternative 3 - Hybrid Terminal Option

Table 4.3.3-2 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_2e. In 2025 and 2026, there is no difference in GHG construction emissions between the Action Alternatives. From 2027 through 2032, the Hybrid Terminal Option would result 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 4.3.3-2: CONSTRUCTION GHG EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (MT CO_2E PER YEAR)

Year	CO_2	CH_4	N_2O	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

Notes: Table 4.3.3-2 was Table 4-13 of the NEPA Final EA. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

Operational GHG Emissions Inventories (2032 and 2037)

The operational GHG emissions inventories utilized jet 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 for buildings and on-road vehicles. 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 NTPs.

Alternative 1: No Action

Table 4.3.3-3 and **Table 4.3.3-4** provide the estimated annual rate (MT per year) of operational GHG emissions for the Future (2032) and (2037) No Action Alternative.

TABLE 4.3.3-3: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2032) NO ACTION ALTERNATIVE (MT CO_2E PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
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[1]	0	0	0	0
Total - Scope 1	*22,278*	*17*	*11*	*22,306*
Scope 2				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
Total – Scope 2	*2,463*	*0*	*0*	*2,463*
Scope 3				
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
Total - Scope 3	*7,080,457*	*276*	*68,394*	*7,149,127*
Total	***7,105,199***	***293***	***68,405***	***7,173,897***
			CO_2e Total	**7,173,897**

[1] CO_2, CH_4, and N_2O, 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.
Notes: Table 4.3.3-3 was Table 4-14 of the NEPA Final EA. Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

TABLE 4.3.3-4: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2037) NO ACTION ALTERNATIVE (MT CO_2E PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
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[1]	0	0	0	0
Total - Scope 1	*22,352*	*17*	*11*	*22,380*
Scope 2				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
Total – Scope 2	*2,463*	*0*	*0*	*2,463*
Scope 3				
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
Total - Scope 3	*7,198,049*	*265*	*69,543*	*7,267,857*
Total	***7,222,864***	***283***	***69,554***	***7,292,700***
			CO_2eTotal	**7,292,700**

[1] CO_2, CH_4, and N_2O, 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.
Notes: Table 4.3.3-4 was Table 4-15 of the NEPA Final EA. Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

Alternative 2: Proposed Action

Table 4.3.3-5 and **Table 4.3.3-6** provide the operational emissions inventory for the Future (2032) and (2037) Proposed Action.

TABLE 4.3.3-5: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2032) PROPOSED ACTION (MT CO_2E PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
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[1]	0	0	0	0
Total - Scope 1	29,821	22	*15*	*29,859*
Scope 2				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
Total – Scope 2	*3,386*	*48*	*0*	*3,434*
Scope 3				
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
Total - Scope 3	*7,214,852*	*287*	*69,685*	*7,284,825*
Total	***7,248,060***	***357***	***69,700***	***7,318,118***
			CO_2eTotal	**7,318,118**

[1] CO_2, CH_4, and N_2O, 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.
Notes: Table 4.3.3-5 was Table 4-16 of the NEPA Final EA. Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

TABLE 4.3.3-6: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2037) PROPOSED ACTION (MT CO_2E PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
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[1]	0	0	0	0
Total - Scope 1	*30,138*	*23*	*15*	*30,176*
Scope 2				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
Total – Scope 2	*3,386*	*48*	*0*	*3,434*
Scope 3				
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
Total - Scope 3	*7,723,767*	*287*	*74,605*	*7,798,659*
Total	***7,757,291***	***358***	***74,620***	***7,832,269***
			CO_2eTotal	**7,832,269**

[1] CO_2, CH_4, and N_2O, 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.
Notes: Table 4.3.3-6 was Table 4-17 of the NEPA Final EA. Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

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 the number of future aircraft operations would be the same.

Table 4.3.3-7 provides a comparison of the operational GHG emissions between the No Action Alternative and the Proposed Action for 2032 and 2037 conditions. **Table 4.3.3-8** provides a comparison of the operational GHG emissions between the No Action Alternative and the Hybrid Terminal Option for 2032 and 2037 conditions.

TABLE 4.3.3-7: SUMMARY OF GHG ANNUAL EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE (MT CO2E PER YEAR)

Scenario	CO_2	CH_4	N_2O	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*
2032 Increase in Emissions	***151,319***	***69***	***1,316***	***152,703***
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
2037 Increase in Emissions	***534,427***	***75***	***5,066***	***539,569***

Notes: Table 4.3.3-7 was Table 4-18 of the NEPA Final EA. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

TABLE 4.3.3-8: SUMMARY OF GHG ANNUAL EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE (MT CO2E PER YEAR)

Scenario	CO_2	CH_4	N_2O	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*
2032 Increase in Emissions	***155,223***	***70***	***1,318***	***156,611***
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
2037 Increase in Emissions	***534,427***	***75***	***5,066***	***539,569***

Notes: Table 4.3.3-8 was Table 4-19 of the NEPA Final EA. Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

According to this comparative analysis of GHG inventories, which was conducted pursuant to FAA guidelines, 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%) MT CO_2e over the No Action Alternative in 2032 and by 539,569 (7.4%) MT CO_2e in 2037. The Hybrid Terminal Option would increase Scope 1, 2 and 3 GHG emissions by 156,611 (2.2%) MT over the No Action Alternative in 2032 and by 539,569 MT (7.4%) 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, would help to reduce future GHG emissions.

The aggregate emissions from all Scope 1, 2 and 3 sources at SEA in 2024 were 6,989,379 MT CO_2e. For purposes of comparison to the present-day Port inventory, the emissions attributable to the Action Alternatives (i.e., the differences between emissions from the Proposed Action and No Action alternatives) represent 2.1% of the overall emissions in the present-day Port inventory in 2032 and 7.7% in 2037.

Additional Context for Scope 1, 2, and 3 Emissions

Scope 3 Emissions

The majority (93%) of all emissions modeled in the future Proposed Action, Hybrid Terminal Design Option, and No Action Alternative scenarios is from jet fuel dispensed and combusted throughout the full flights (a subset of Scope 3 emissions). The Port has no control or influence over these full-flight emissions, which have historically tracked with the number of aircraft operations at SEA. These aircraft fuel emissions accounted for 81% of all jet fuel dispensed in Washington State as of 2021. It is also helpful context to consider a smaller subset of aircraft-related emissions that occur near the airport, known as LTO (landing and take-off) emissions. LTO emissions occur below 3,000 feet altitude and also include aircraft holding and taxiing while on the ground at the airport. These LTO emissions accounted for 627,128 MT CO_2e, or 9% of total jet fuel-related emissions at SEA. An Intergovernmental Panel on Climate Change rule of thumb to estimate LTO emissions is to assume they are equal to 10% of fuel-dispensed emissions for any airport worldwide, suggesting that SEA has a very typical ratio of near-airport to full-flight GHG emissions.[18]

The difference in emissions from jet fuel dispensed between the No Action Alternative and the Proposed Action is 125,554 MT CO_{2e} in 2032, and 502,190 MT CO_2e in 2037. Given the fact that the emissions from jet fuel dispensed are the dominant contributor to total emissions, the relative size of the difference between the No Action Alternative and the Proposed Action in the forecasted years is notable. The differences between emissions from jet fuel dispensed under the No Action Alternative as compared to the Proposed Action are less than the total GHG emissions from all the other emission sources combined at the Airport, and also less than the total LTO emissions.

Moreover, the assessment of roadway emissions (another subset of Scope 3 emissions) likely overstates the emissions from those sources. The existing conditions emissions shown in Table 3.3.3-3 are higher than the Port's roadway emissions inventory for the same year because they do not take into consideration the Port's strong contractual mechanisms to require high MPG and electric vehicles in taxis and TNCs serving the airport, along with a more accurate source of MPG used for curbside and parking garage travelers. Thus, the figures for roadway emissions shown in the tables tend to overstate the emissions, which is a more conservative approach for assessing impacts. Due to the high efficiency and electric adoption rate of these vehicles, there are also expected to be lower roadway emissions in the future Action and No Action scenarios, thereby decreasing the overall totals as well as the difference between scenarios.

The Port will continue to minimize GHG emissions from these sources and other Scope 3 sources of emissions through collaboration with partners, including airlines.

Scope 1 and 2 Emissions

The Scope 1 and 2 emissions attributable to the Action Alternatives (i.e., the differences between emissions from the Proposed Action and the No Action Alternative) are 8,524 MT CO_2e in 2032 and 8,767 MT CO_2e in 2037. This likely overestimates the extent of the Scope 1 and 2 emissions and is therefore conservative. As described above, the existing conditions (Table 3.3.3-3), for Scope 1 and 2 emissions (i.e., those under the Airport's ownership and control) overstate the emissions compared to the Port's inventory for the same year because they do not consider minimization measures, including

[18] https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_5_Aircraft.pdf

the use of renewable natural gas (50% in the central boilers and 100% in the bus fleet). This practice is similarly omitted from these future scenario assumptions to be conservative. The analysis also does not take into consideration that the Port is obligated under the Clean Buildings Performance Standard (CBPS) and Clean Energy Transformation Act (CETA) to continue to reduce these emissions. The differences between the Action and No Action alternatives for Scope 1 and 2 are that the Action Alternatives conservatively assume a natural gas steam boiler in a new north terminal, which is highly unlikely to be the future fuel source due to the Port's requirements under CBPS.

Additionally, the Port has opted for a campus-wide decarbonization of its central mechanical plant as the CBPS compliance pathway, meaning all future terminal heating and cooling systems must be decarbonized by 2040.

Thus, while this SEPA analysis shows a modest increase in Scope 1 and 2 GHG emissions that is attributable to the Action Alternatives, the Port nevertheless expects to continue to make progress towards its Scope 1 and 2 reduction targets based on these ongoing measures that are not incorporated in this analysis.

Based on the analysis above and the minimization measures described below, the anticipated increase in GHG emissions attributable to the Action Alternatives, in the context of the Airport's sustainability efforts and climate goals, is not anticipated to result in a significant adverse impact on climate.

4.3.3.4 Minimization and Mitigation Measures

Minimization

The minimization measures used to address air quality impacts (see Section 4.3.1) would also minimize GHG emissions during construction. These include BMPs such as minimizing vehicle idling and ensuring that emission controls are installed on construction vehicles. The Port would adhere to FAA AC 150/5370-10H, *Standard Specifications for Construction of Airports*.

With respect to GHG emissions from operations, the Port takes a comprehensive approach to sustainability, focusing on emissions reductions, climate change mitigation, decreasing solar reflectivity (which reduces heat island effects), air quality improvements, and resource conservation. The Port has committed to achieving net-zero GHG emissions for Port-owned operations (i.e., Scope 1 and 2 emissions) by 2040. The Port's minimization efforts are most effective with respect to Scope 1 and 2 emissions because the Port has control over the sources of those emissions and because minimization options are more readily available. For example, as noted above, the Port has minimized GHG emissions by 45% since 2005 through use of renewable diesel, renewable electricity, and RNG, and continued progress is anticipated due to compliance with CBPS and CETA.

Even though the Port does not have control over Scope 3 emissions (most notably, aircraft emissions from fuel dispensed for full flight), the Port is pursuing minimization through collaboration with partners. The Port has committed to collaborating with customers and tenants to achieve carbon neutrality across the entire Port by 2050. To that end, the Port is playing a key role in efforts to facilitate the adoption and local production of SAF with airline partners. As recognized by the Washington State Legislature, SAF represents "the most significant near and midterm opportunity for aviation to reduce its greenhouse gas emissions."[19] The Port has set the goal to power every flight fueled at SEA with at least a 10% blend of SAF by 2028. In addition, new SAF fuel storage proposed under the Action

[19] Laws of 2023, Chapter 232, Sec. 1.

Alternatives would encourage airline operators to invest in and utilize SAF, thereby supporting airline, regional, and FAA goals to reduce GHG emissions.

Additionally, in collaboration with airline partners, the Port of Seattle released a report in 2020 in which it assessed the sources of SEA's Scope 3 GHG emissions and identified near- and mid-term strategies to meet the Port's goal of reducing Scope 3 emissions by at least 73,000 MT CO_2e per year. This strategy was intended to identify options in which airlines and the Port could invest to provide GHG reduction benefit for Scope 3 emissions while SAF becomes more commercially available. The strategy focuses on reducing emissions from aircraft taxi, landing and takeoffs, auxiliary power unit use, and ground transportation. According to the report, the seven most critical airline-related actions to reduce Scope 3 emissions are: (1) optimize use of pre-conditioned air and ground power; (2) reduce emissions from airside vehicles, (3) optimize aircraft taxiing activities, (4) implement efficiencies for the ground movement of cargo, (5) reduce emissions from passenger pick-up and drop-off, (6) promote the use of public transit by passengers and employees, and (7) enable green rideshare options connected to airline loyalty and partner programs. Cumulatively, these seven strategies are anticipated to reduce Scope 3 emissions at SEA by over 75,000 MT CO_2e per year. The Port is continuing to implement these strategies.

Independent of the Action Alternatives, the implementation of GHG-reduction efforts by the Port, local and state agencies, and other stakeholders (including airline operators) will help reduce GHG emissions from aircraft sources.

Mitigation

No mitigation is proposed.

4.3.3.5 Climate Adaptation

This section discusses climate change as it affects the Airport's operations and facilities. The preceding analysis discussed the GHG emissions that could be expected to result from construction and operation of the NTPs. The following analysis applies to both the Action and No Action alternatives; the global scale of climate change will determine the impacts to the Airport, regardless of the SAMP alternative selected. None of the NTPs included in either of the Action Alternatives is uniquely vulnerable to the effects of climate change in comparison to the existing airport considered in the No Action alternative. The analysis is required by Appendix A, Part Five of the Port's SEPA resolution, Consideration of Effects of Climate Change on Proposals/Projects.

Climate Adaptation

As discussed above, the ACROS tool was used to identify high climate change risks at the Airport under future conditions. The ACROS tool identified the following as high risk at the Airport due to future climate conditions:

- Failure of building envelope (roofing materials, external seals, and / or mold vulnerability).
- Potential for reduced throughput capacity for aircraft operations out of the Airport.

Additionally, Appendix C of the SEPA EIS includes a climate synthesis report completed for the Port after the publication of the NEPA EA (see *SEA SAMP NTP Climate Synthesis* in Appendix C). The analysis categorized the NTPs according to their project type (airfield, terminal, cargo, landside, airport/airline support, relocated buildings, demolished buildings, and overall program support projects) and then assessed potential impacts from identified climate threats. **Table 4.3.3-9** provides an overview of the potential risk for each project type. Further detail can be found in Appendix C**.**

TABLE 4.3.3-9: POTENTIAL RISK SUMMARY BY PROJECT TYPE

Climate Threat	Airfield	Terminal	Cargo	Landside	Airport/ Airline Support	Demolished Building	Overall Program Support
Deficiency in Precipitation	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Extreme Cold	Moderate	Low	Low	Low	Low	Low	Moderate
Extreme Heat	Moderate	Moderate	Moderate	Moderate	Moderate	Low	High
Heavy Precipitation	Moderate	High	High	High	High	Low	High
Heavy Snow, Ice, Sleet	Moderate	Low	Low	Moderate	Moderate	Low	Moderate
High Winds	Moderate	Low	Moderate	Low	Moderate	Low	Moderate
Wildfire	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate

The greatest threats to the SAMP NTPs are from heavy precipitation events, closely followed by extreme heat, drought, wildfire (primarily from air quality and regional impacts), and high winds. Of the seven climate threats discussed above, the extreme heat, heavy precipitation, deficiency in precipitation, and wildfire are expected to worsen in the Seattle region. This emphasizes the importance of addressing heavy precipitation, extreme heat, and deficiency in precipitation in the SAMP NTPs.

Neither the Proposed Action nor the Hybrid Terminal Option would be affected differently than the No Action Alternative by future climate conditions in the timeframe analyzed. Because of the minimization measures described below, the Port is taking action sufficient to protect the NTPs from the effects of climate change.

Minimization and Mitigation Measures

Minimization

SEA already has robust environmental and sustainable design programs and procedures in place to maximize resilience. Climate projections of worsening extreme precipitation have been incorporated into the stormwater utility master plan and into individual project improvements to airport drainage systems. Key operational practices such as the Port's Sustainable Evaluation Framework (SEF) play a critical role in incorporating resilience into capital project planning. These processes allow individual projects to evaluate resilience and sustainability considerations early in the planning and design process, which will support the climate resilience of the SAMP NTPs.

Table 4.3.3-10 lists the climate threats and the adaptation measures that increase SEA's resilience and prepare for the effects of climate change, independent of the Proposed Action.

TABLE 4.3.3-10: CLIMATE THREATS AND ADAPTATION ACTIONS

Threat	Adaptation Action
Deficiency in Precipitation	Individual project geotechnical investigations evaluate soil conditions and susceptibility to movement. Future projects may include water conservation measures which help mitigate the intensity of drought conditions.
Extreme Cold	This threat is not expected to worsen. Current airport operational procedures and design processes should be sufficient to cope with extreme cold events.
Extreme Heat	As assets are replaced, the airport will confirm they accommodate higher summer temperatures (via design criteria). Monitoring the airport's energy use relative to ambient air temperatures is on-going. Future energy efficiency measures will help mitigate additional demand needed for more extreme heat days.
Heavy Precipitation	As assets are replaced, the airport will confirm they accommodate increased rainfall intensity (via design criteria). SEA will continue to maximize conveyance capacity of the airport on a project-by-project basis. The Airport is re-examining the airport's design criteria (e.g., increasing to a 50- or 100-year storm event where possible) and conveyance modeling, particularly for stormwater systems.
Heavy Snow, Ice, and Sleet	This threat is not expected to worsen. Current airport operational procedures and design processes are expected to be sufficient to address winter storm events.
High Winds	High winds are currently included in SEA's design standards. Potential power outages due to high winds are addressed through the airport's Alternative Utility Facility generators.
Wildfire	Projects would utilize the SEF structure or other frameworks which may consider potential impacts from wildfires related to air quality.

Mitigation

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

4.3.3.6 Findings Specific to Port Commission Resolution 3650

Based on the above analysis, **Table 4.3.3-11** summarizes effects of the Proposed Action with respect to the significance considerations identified in Port Commission Resolution 3650.

TABLE 4.3.3-11: EVALUATION OF THE PROPOSED ACTION WITH RESPECT TO PORT OF SEATTLE SIGNIFICANCE CONSIDERATIONS

Significance Consideration	Response
1. Whether the proposal will significantly contribute, either directly, indirectly or cumulatively to greenhouse gas concentrations in the atmosphere.	The Proposed Action would contribute to greenhouse gas concentrations but not significantly. Using conservative assumptions, the Proposed Action would increase Scope 1, 2 and 3 GHG emissions by 152,703 (2.1 percent) CO_2e MT over the No Action Alternative in 2032 and by 539,569 (7.4 percent) CO_2e MT 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 from fuel dispensed for full flight).
2. The extent to which greenhouse gas emissions of the project have been mitigated as part of project design, or through other identified actions.	The analysis did not include the use of SAF or the increase in electric on-road vehicles and GSE due to limitations in the model. Both of these, as well as other improvements, will help to reduce future GHG emissions.
3. The economic and technical feasibility of mitigation options available	No mitigation is proposed. The Port has identified and is implementing minimization measures to reduce GHG emissions consistent with its Century Agenda GHG reduction targets. With respect to scope 1 and 2 emissions, the Port's minimization measures are not reflected in the analysis, such that the calculated emissions are conservative (meaning, tending to overstate). For example, the Port is increasingly using renewable natural gas (50% in the central boilers and 100% in the bus fleet) and is obligated under the Clean Buildings Performance Standard (CBPS) and Clean Energy Transformation Act (CETA) to continue to reduce scope 1 and 2 emissions. To that end, the Port has opted for a campus-wide decarbonization of its central mechanical plant as the CBPS compliance pathway, meaning all future terminal heating and cooling systems must be decarbonized by 2040. These minimization measures are economically and technically feasible and are likely to result in continued progress in Scope 1 and 2 emissions, consistent with the Port's targets. The Port does not have direct control over most of the Scope 3 emissions. Accordingly, the Port will continue to pursue minimization through collaboration with partners, including airport tenants and customers. The vast majority of Scope 3 emissions in these analyses are attributable to jet fuel dispensed and combusted throughout the full flight. Large commercial aircraft are among the sources of emissions that are the most difficult to decarbonize given current technology. SAF represents the most significant near and midterm opportunity for aviation to reduce its greenhouse gas emissions. Accordingly, the Port is playing an important role in facilitating the adoption and regional production of SAF with airline partners. In addition, new SAF fuel storage proposed under the Action Alternatives would encourage airline operators to invest in and utilize SAF, thereby supporting airline, regional, and FAA goals to reduce GHG emissions. Additionally, in collaboration with airline partners, the Port of Seattle released a report in 2020 in which it identified near- and mid-term strategies to meet the Port's goal of reducing Scope 3 emissions by at least 73,000 MT CO2e per year, focusing on Scope 3 emissions nearer to the airport. This strategy was intended to identify options in which airlines and the Port could invest to provide GHG reduction benefit for Scope 3 emissions while SAF becomes more commercially available. The strategies identified in the report are economically and technically feasible.

TABLE 4.3.3-11: EVALUATION OF THE PROPOSED ACTION WITH RESPECT TO PORT OF SEATTLE SIGNIFICANCE CONSIDERATIONS (CONTINUED)

Significance Consideration	Response
4. The aggregate Port greenhouse gas emission inventory and the relation of the project's emissions to the overall balance and trend of the inventory.	According to the most current Port inventory of airport-related emissions, the aggregate emissions from all Scope 1, 2 and 3 sources at SEA in 2024 was 6,989,379 MT CO2e. For purposes of comparison to the present-day Port inventory, the emissions attributable to the Action Alternatives (i.e., the differences between emissions from the Proposed Action and No Action alternatives) represent 2.1% of the overall emissions in the present-day Port inventory in 2032 and 7.7% in 2037. While this SEPA analysis shows a modest increase in Scope 1 and 2 GHG emissions that is attributable to the Action Alternatives, the Port nevertheless expects to continue to make progress towards its Scope 1 and 2 reduction targets based on ongoing measures that are described immediately above and are not incorporated in the modelled projections of emissions.
5. The effects of climate change on the project, including the vulnerability of the project to the specific impacts of climate change within a reasonable timeframe.	None of the NTPs included in either of the Action Alternatives is uniquely vulnerable to the effects of climate change in comparison to the existing airport considered in the No Action Alternative. The greatest climatological threats to the SAMP NTPs are from heavy precipitation events, closely followed by extreme heat, drought, wildfire (primarily from air quality and regional impacts), and high winds. Of the seven possible climate threat identified in the study, the climate science review identified that extreme heat, heavy precipitation, deficiency in precipitation, and wildfire are expected to worsen in the Seattle region. SEA already has robust environmental and sustainable design programs and procedures in place to maximize resilience. Climate projections of worsening extreme precipitation have been incorporated into the stormwater utility master plan and into individual project improvements to airport drainage systems. Key operational practices such as the Port's Sustainable Evaluation Framework (SEF) play a critical role in incorporating resilience into capital project planning. These processes allow individual projects to evaluate resilience and sustainability considerations early in the planning and design process, which will support the climate resilience of the SAMP NTPs.
6. Whether the proposal will conflict with applicable laws and regulations adopted for the purpose of reducing greenhouse gas emissions.	No, the proposal would not conflict with applicable laws and regulations identified in tables 3.3.3-1 and 3.3.3-1.
7. Guidance and policies adopted by other local governments, and state and federal agencies, including, but not limited to, the Washington State Department of Ecology, and the White House Council on Environmental Quality related to the consideration of climate change and greenhouse gas emission under SEPA and NEPA, 42 U.S.C. §§ 4321 et seq.	In preparing the analysis, the Port considered the work done by other local governments, including Sound Transit, and guidance from WSDE. The analysis in the SEPA EIS draws from the work completed by FAA for the NEPA Draft EA that was prepared following federal guidelines that have since been rescinded.

4.3.4 Earth

4.3.4.1 Impact Considerations

NEPA – Significant Impact Threshold

Earth resources were not considered in the NEPA EA per FAA Order 1050.1(F).

SEPA – Impact Considerations

The EIS considered the impacts from construction and operation of the SAMP NTPs that may cause infrastructure and / or the surrounding environs to become more susceptible to slope instability, erosion / accretion, or earthquake hazards.

4.3.4.2 Methods

The impact analysis was completed by evaluating whether any of the proposed NTP locations are within a mapped critical geologic area, including steep slopes. The analysis used information from available maps, reports, and relevant geology, soils, and seismic information to help further delineate and characterize potential hazards. Specific information on sources of fill materials is included as available. Actions that would occur in hazard areas are identified and described.

4.3.4.3 Earth Impacts

Alternative 1 – No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to geology, soils, topography, or erosion / accretion related to construction and operation of the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes to geology, soils, topography, or erosion / accretion in response to continuing increases in operations under the No Action Alternative.

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

The proposed NTP sites are located on highly urbanized land, and long-term effects on existing geologic and hydrogeologic conditions are anticipated to be limited. Most of the proposed NTP sites are in areas of relatively flat topography and stable slopes and consequently slope instability issues would be of minor concern.

Two of the NTPs are proposed in areas with steep slopes due to the constructed airfield embankments. These include the Westside Maintenance Campus (S07) and the fuel farm expansion (S01). Construction would include grading, filling, and terracing to bring the sites to approximately the airfield elevation, essentially adding to the existing airfield area. Suitable fill material excavated at a project location would be reused on-site or stockpiled for future use, if possible. Excess or unsuitable fill material would be exported.

The NTPs north of SR 518 are in areas mapped by the City of SeaTac as having steep slopes. These NTPs include off-site cargo (C02 and C03), north GT holding lot (L05), employee parking structure (L07), and CRDC (S10). Appropriate design and construction techniques would be used to minimize the likelihood of erosion or landslides. These could include terracing and retaining walls, and / or using the cut-and-fill method to create a level platform. The ILA between the Port and the City of SeaTac requires that the Port substantively comply with local critical area codes (SMC 15.700).

Because SEA is within a seismically active area, structures would be designed to withstand a major seismic event. Strong shaking has the potential to cause settlement, slope instability, and increased lateral pressure on retaining walls. Facilities would be designed in accordance with the Washington State Building Code and the Seismic Building Code, which would result in an increased resistance to seismic shaking and reduce risk to the project. Expansion of the fuel farm (S01) would also be required to comply with the Seismic Measures for Class 1 Facilities (WAC 173-180-330 and 340), which impose additional protective requirements for oil storage tanks and fuel transfer facilities. Where appropriate, ground improvement (engineering techniques to enhance soil strength and reduce settlement) would be considered during the design phase to provide additional stability.

Potential temporary impacts to geology and soils during construction of the NTPs could include erosion of exposed soils, sedimentation into nearby water bodies, or destabilization of slopes. These impacts would be minimized with construction BMPs, as described below.

Based on the above analysis, impacts to earth resources would not be significant.

4.3.4.4 Minimization and Mitigation Measures

Minimization

- Prior to design, each NTP would be assessed to determine the need for subsurface (geotechnical) exploration and analysis required to inform design criteria (e.g., ground improvement) to withstand earthquake or other geologic hazards.
- Any required fill would be sourced from clean, natural deposits, per Port Spec: Div 31 Earthwork 2.04 Material Requirements B Select Fill Material.
- To minimize potential impacts, an Erosion and Sedimentation Control Plan, including measures specific to site conditions, would be designed and implemented to minimize erosion and sedimentation. The plan would include elements for site stabilization, slope and drainageway protection, sediment retention, and dust control.

Mitigation

No mitigation is proposed.

4.3.5 Recreation

This section presents the results of the analysis of potential direct and indirect impacts to recreation as a result of the Proposed Action and alternatives. Recreational resources inside the GSA include 15 publicly owned parks or recreation areas. As described in Section 3.3.5, the NEPA EA evaluated recreational facilities as part of the Section 4(f) analysis. This section of the SEPA EIS incorporates the NEPA EA Section 4(f) impact analysis (Section 4.3.5) by reference. The terms “Section 4(f)” and “Section 4(f) resources” have been updated to “recreation” and “recreational resources” for the purposes of the SEPA analysis.

4.3.5.1 Impact Considerations

NEPA – Significant Impact Threshold

Table 4.3.5-1 presents the definitions of an impact to—or “use of”—a Section 4(f) resource.

TABLE 4.3.5-1: SECTION 4(F) IMPACT TYPES

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.

Note: Table 4.3.5-1 was Table 4-20 of the NEPA Final EA.

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.”

SEPA – Impact Considerations

The Port applied the same impact significance considerations for the SEPA recreation analysis as was used for the NEPA Final EA Section 4(f) properties.

4.3.5.2 Methods

Park and recreation facilities were identified through GIS analysis of King County park data and reviewing park maps for the cities of SeaTac and Burien. Direct impacts to parks were determined by comparing the proposed NTPs with the identified park facilities. Indirect impacts considered the impacts of noise on recreational facilities and activities. I

4.3.5.3 Recreation Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to recreation related to construction and operation of the NTPSs. Further, the Port does not anticipate making any changes to recreational properties in response to continuing increases in operations under the No Action Alternative.

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

Neither Action Alternative would permanently or temporarily physically impact any recreational properties within the GSA. The assessment of potential indirect impacts focused on changes in noise exposure and concluded that none of the recreational resources would experience a substantial impairment due to increases in noise from project operations or construction. See Section 4.3.10, Noise, for additional information on noise impacts. See Section 4.3.12, Surface Transportation, for additional information on effects to the Westside Trail related to surface transportation mitigation projects.

In conclusion, the Action Alternatives would not result in significant adverse impacts to recreation.

4.3.5.4 Minimization and Mitigation Measures

Minimization

No minimization measures have been identified.

Mitigation

No mitigation is proposed.

4.3.6 Hazardous Materials, Solid Waste, and Spill Prevention

This section presents the analysis of potential adverse impacts from exposure to hazardous materials, solid waste management and disposal, and applicable pollution prevention measures that could occur due to the Proposed Action and alternatives. Section 4.3.6 (Hazardous Materials, Solid Waste, and Pollution Prevention) of the NEPA EA is incorporated by reference. Additional information, including information on pollution prevention and recycling, can be found in Appendix F.

4.3.6.1 Impact Considerations

NEPA – 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.
- Adversely affect human health and the environment.

SEPA – Impact Considerations

The Port applied the same considerations as identified in the FAA's NEPA EA when evaluating the significance of any impacts from hazardous materials, solid waste, and pollution prevention. These considerations are consistent with SEPA and with Washington State regulations regarding hazardous materials and solid waste.

4.3.6.2 Methods

Potential impacts related to contaminated sites were identified by evaluating areas where soil disturbance for the NTPs would take place in or near areas of known contamination. Buildings proposed for demolition were evaluated for their potential to contain hazardous substances such as asbestos, lead, and mercury. Regulatory requirements and planning documents related to hazardous materials were reviewed and assessed for their ability to avoid or minimize potential releases to the environment during project construction and operation.

4.3.6.3 Hazardous Materials Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to hazardous materials related to construction and operation of the NTPs. However, the Port would expect to handle additional volumes of fuel to support the increased operations needed to accommodate additional passengers.

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 4.3.6-1** and depicted on **Exhibit 4.3.6-1.**

All work within an area of contamination would be conducted in accordance with the Port's Construction General Requirements for handling contaminated soil.[20] 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 excavated material 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,[21] 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.

[20] Port of Seattle Master Specification Section 02 61 13 – Handling Contaminated Soils.
[21] Port of Seattle Master Specification Section 02 61 13 – Handling Contaminated Soils.

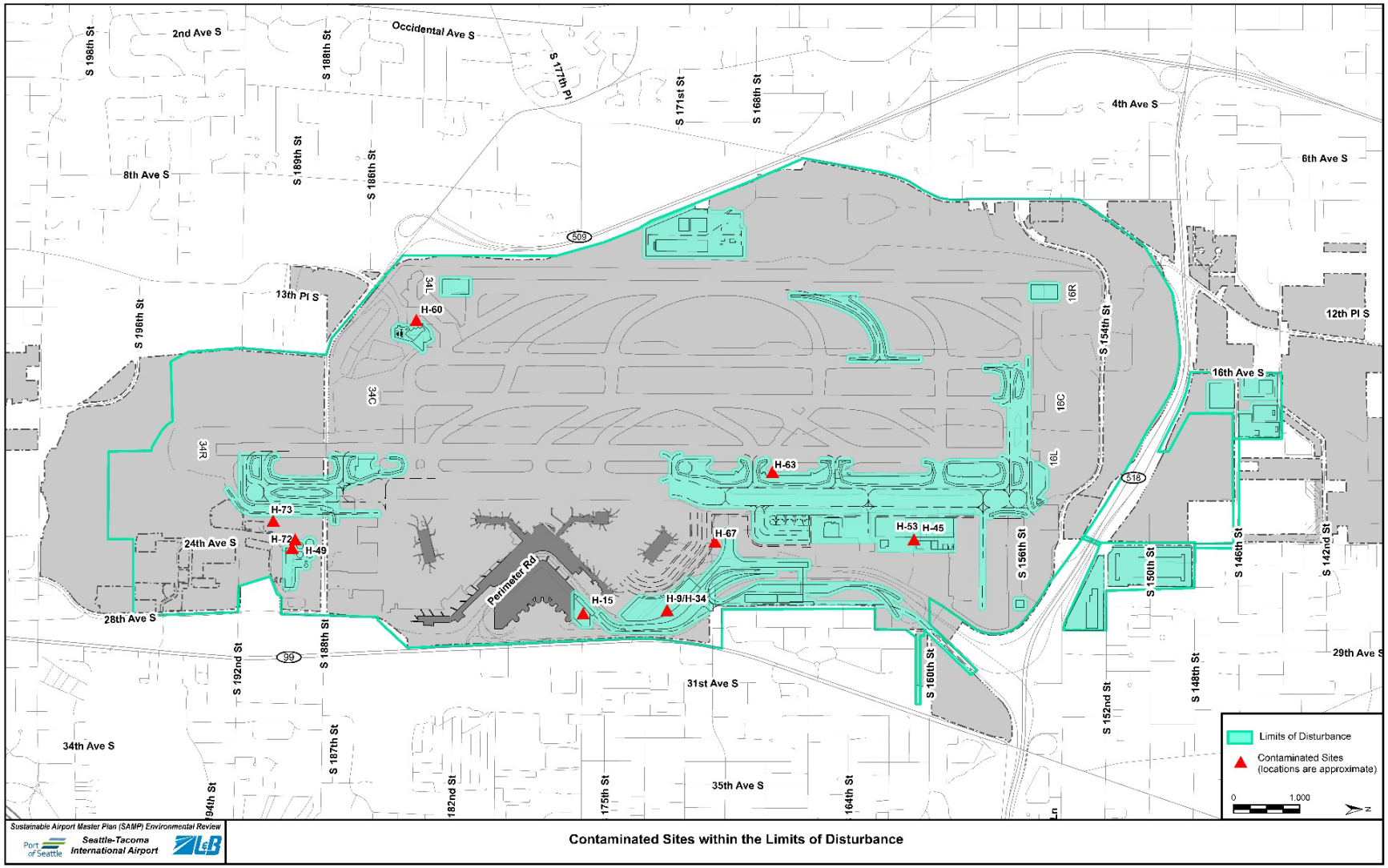
TABLE 4.3.6-1: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION WITHIN THE LIMITS OF DISTURBANCE

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. 161st St, Seattle, Washington, 98158 (Building 161A – TBR)	Cleanup Started	A08: Hardstand (North) S04: Fuel Rack Relocation
H-49	Swissport Fueling	12270	2350 S. 190th St, Seattle, Washington, 98188	Cleanup Started	S01: Fuel Farm Expansion
H-53	United Airlines Sea Tac International Airport	7040	2230 S. 161st 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.

Note: Table 4.3.6-1 was Table 4-21 in the NEPA Final EA.

EXHIBIT 4.3.6-1: CONTAMINATED SITES WITHIN THE LIMITS OF DISTURBANCE



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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)
- Model Toxics Control Act (RCW 70.105D.010)
- Dangerous Waste Regulations (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 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.[22] 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.[23] 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.

[22] Sea-Tac Airport Construction General Requirements, Section 01 57 23 – Pollution Prevention Planning and Execution.

[23] Sea-Tac Airport Construction General Requirements, Section 01 35 29T – Tenant Safety Management, Appendix A.

Per- and Polyfluoroalkyl Substances

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.

Risk of Explosion

The Action Alternatives include NTPs that would involve the use of flammable materials. They include Fuel Farm Expansion (S01), the ARFF facilities (S02 and S03), and Fuel Rack Relocation (S04). The Westside Maintenance Campus (S07) would also use and store flammable materials.

Given compliance with applicable regulations, construction protocols, and the BMPs described below, no significant impacts to / from hazardous materials would occur as a result of implementing the Action Alternatives.

Minimization and Mitigation Measures

Minimization

All flammable materials would be handled, stored, and disposed of in accordance with federal, state, and local requirements, thereby minimizing the risk of explosion. New structures for the storage or distribution of fuel would be designed according to the relevant safety standards intended to minimize the risk of releases and explosion. For example, the fuel storage tanks would be designed and constructed consistent with:

- API 650 (American Petroleum Institute standard for the design, fabrication, welding, erection, and inspection of vertical, aboveground, cylindrical, closed- or open-top welded steel storage tanks).
- UL 2085 (Underwriters Laboratories standard for protected aboveground tanks for storing flammable/combustible liquids).

Additionally, NTPs that dispense hazardous materials would include automatic shut-off valves to minimize risk of uncontrolled release and explosion.

Dangerous waste generated by construction or operation of the NTPs would be stored consistent with Chapter 173-303 WAC, to minimize risk of uncontrolled release and explosion.

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 (WAC 173-340-900)
- The Port's Environmental Agent Work Plan (Port of Seattle's Master Specification related to handling of contaminated soils and use of environmental agent(s). 02 61 13 - Contaminated Soil Handling)
- 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 would monitor contaminant levels in groundwater during and following completion of construction.

The Port committed to the following measure as part of the FAA's FONSI/ROD:

- Handling, storing, and disposing of hazardous materials in accordance with applicable federal, state and/or local regulations.

4.3.6.4 Solid Waste and Recycling Impacts

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 the Cedar Hills Regional Landfill's life until early 2038.[24]

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 lead to increased solid waste generation at the Airport. Waste generation forecasts, presented in **Table 4.3.6-2**, 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 4.3.6-2: 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.

Note: Table 4.3.6-2 was Table 4-22 in the NEPA Final EA.

[24] https://kingcounty.gov/en/dept/dnrp/waste-services/garbage-recycling-compost/solid-waste-facilities/cedar-hills-development, accessed May 2024.

The additional waste would not be significantly more than under 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 methods 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.

Minimization and Mitigation Measures

Minimization

The Port's existing Waste Diversion and Recycling Program will continue, and selected contractors would be expected to meet the goal of diverting at least 90 percent of construction debris from landfills.

Mitigation

No mitigation is proposed.

4.3.6.5 Spill Prevention, Planning, and Response Impacts

Alternative 1: No Action

Under the No Action Alternative, spill prevention planning and response measures would continue to follow applicable federal and state guidelines.

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

Under the Action Alternatives, spill prevention planning and response measures would continue to follow applicable federal and state guidelines. SPCC plans would be prepared and / or updated for all facilities triggering SPCC requirements.

No significant impacts to spill prevention, planning, and response have been identified.

Minimization and Mitigation Measures

Minimization

The preparation and maintenance of SPCC plans would minimize the risk of spills and reduce impacts if spills occur.

Mitigation

No mitigation is proposed.

4.3.7 Historic and Cultural Preservation

This section presents the results of the historic and cultural resources analysis conducted to determine whether the Action Alternatives would have the potential to adversely affect these resources. The analysis was conducted in accordance with 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. This SEPA EIS incorporates by reference Section 4.3.7 (Historic, Architectural, Archaeological, and Cultural Resources) of the NEPA EA. More information on the consultation and the analysis can be found in Appendix G.

4.3.7.1 Impact Considerations

NEPA – Significant Impact Threshold

In making a Section 106 effect determination and analyzing for reasonably foreseeable impacts under NEPA, 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 under Section 106 is not necessarily significant under NEPA. Resolution of adverse effects may be sufficient to avoid a significant impact.

SEPA – Impact Considerations

Similar to the approach utilized for the NEPA EA, the Port considered context and intensity, as well as the likelihood of an effect occurring, in evaluating the potential effects of the Action Alternatives on historic and cultural resources During the NEPA EA process, the Port and FAA completed the NHPA Section 106 process involving the FAA, Washington DAHP, and federally recognized Native American tribes. That process concluded that the Action Alternatives would not adversely affect any known cultural or historic resources.

4.3.7.2 Methods

Stell Environmental Enterprises, Inc. (Stell) completed a cultural resources survey of the SEA SAMP NTPs in February 2021 in accordance with a survey plan approved by DAHP. The methods for identifying historic properties included a combination of desktop research, subsurface testing, and on-site study of above ground features. A review of DAHP's Washington Information System for Architectural and Archaeological Records Data (WISAARD) predictive model indicated that the risk for cultural resources within the APE ranged from moderately low to high risk.

Stell also reviewed properties over 40 years of age or older within the APE to determine their potential eligibility for listing on the NRHP. In addition, a survey of 56 off-site properties near C02 and C03 was conducted in 2023, and the Washington Park Memorial Cemetery was surveyed in 2024. As described in Section 3.3.8, no NRHP-eligible resources were identified within the APE.

4.3.7.3 Historic and Cultural Preservation Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to properties that are listed on or eligible for the NRHP related to construction and operation of the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes to properties that are listed on or eligible for the NRHP in response to continuing increases in operations under the No Action Alternative.

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 under Section 106 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 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. The FAA submitted an updated finding of No Adverse Effect to DAHP on July 16, 2025, and DAHP concurred with the updated finding on July 21, 2025. Therefore, there would be no significant impacts to historic and cultural preservation. **Appendix G** contains copies of FAA's correspondence with DAHP and the tribes.

4.3.7.4 Minimization and Mitigation Measures

Minimization

No minimization measures have been identified.

Mitigation

The Port committed to the following measures as part of the FAA's FONSI/ROD:

- Developing and implementing an Inadvertent Discovery Plan during construction.
- Having an archaeological monitor on-site during ground disturbing activities for projects in C03, S10, T02, L03, L05, L07, and the southern half of C02.
    - The archaeological monitor shall work with the FAA and the Port to develop an archaeological monitoring scope and plan at least 60 days prior to construction.
    - The archaeological monitor shall provide all monitoring logs, photos, a summary of activities monitored and dates, and a synthesis of any background research that directly addresses the question of prior disturbance in the area to the FAA and the Port within 30 days following the completion of monitoring.

4.3.8 Land and Shoreline Use

4.3.8.1 Land Use

This section describes the analysis of potential adverse impacts to land use associated with the Proposed Action and alternatives Section 4.3.8, Land Use, of the NEPA EA is incorporated by reference. Section 4.3.10 of this SEPA EIS, Noise and Noise-Compatible Land Use, discusses potential impacts to sensitive land uses due to noise.

Additional information related to local land use plans and the analysis of those plans can be found in Appendix H.

Impact Considerations

NEPA – 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."

SEPA – Impact Considerations

There is no established significance threshold for land use under SEPA; however, SEPA requires evaluation of a proposed action's consistency with applicable land use plans and policies. The State Growth Management Act, RCW 36.70.547, protects airport development and operations from inconsistent or incompatible land uses being developed adjacent to the airport. Therefore, a significant impact could exist if adjacent uses conflicted with facilities or operations included in the Proposed Action.

Methodology

The NTPs were evaluated with respect to existing land uses and comprehensive land use plans within the GSA to determine if there would be potential inconsistencies.

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. Any changes in operations to accommodate continued growth in response to passenger demand 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 has 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 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 4.3.8-1** presents the local plans and describes how the Action Alternatives are consistent with each plan.

Construction and operation of the NTPs would not be inconsistent with local plans. There would be no significant impacts to land use.

Minimization and Mitigation Measures

Minimization

No minimization measures have been identified.

Mitigation

Because no inconsistencies with local plans were identified, no mitigation is proposed.

TABLE 4.3.8-1: CONSISTENCY WITH LOCAL PLANS

Plan	NTP 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.
Envision SeaTac 2044 (updated in 2024)	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.
Imagine Des Moines 2044 (updated in 2025)	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.
Burien 2044 Comprehensive Plan (updated in 2024)	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 2024 – 2044 Comprehensive Plan (2024)	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)	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.

Note: Table 4.4.8-1 is based on Table 4-23 of the NEPA Final EA, but the discussion of the local comprehensive plans was updated for the SEPA EIS.

4.3.8.2 Shoreline Use and Coastal Resources

This section describes the analysis of potential adverse impacts to shorelines and coastal resources regulated under the federal CZMA and Washington's SMA. Section 4.3.4, Coastal Resources, of the NEPA EA is incorporated by reference.

Impact Considerations

NEPA – 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.

SEPA – Impact Considerations

The Port applied the same considerations to determine impact significance for shoreline use as the NEPA EA used for coastal resources because the CZMA and the SMA have similar intent and requirements.

Methods

The proposed alternatives were assessed to determine whether they would be within the jurisdiction of local SMPs and, if so, whether the Action Alternatives would have the potential to result in adverse impacts to shorelines and coastal resources.

Shoreline Use and Coastal Resource Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to coastal resources or SMA-regulated shoreline areas related to construction and operation of the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes that would affect coastal or shoreline areas in response to continuing increases in operations under the No Action Alternative.

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 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 submitted a Negative Determination was submitted to the WSDE Federal Consistency Coordinator on July 2, 2024 (see Appendix E). WSDE did not have any questions or concerns regarding the Negative Determination.

If any NTPs trigger the need for individual Section 404 / 401 permits under the Clean Water Act, then the Port will be responsible for submitting a CZMA Consistency Certification form as part of the permit process. See Section 4.3.14, Water Resources, and Appendix M for more information on Section 401 and 404 compliance.

Construction and operation of the NTPs would not occur in a shoreline area that would require a Shoreline Substantial Development permit. Within the City of SeaTac, Angle Lake is the only shoreline that falls under the jurisdiction of the SMP, and there are no NTPs proposed for that area.

Based on this analysis, there would be no significant impacts to shorelines or coastal resources.

Minimization and Mitigation Measures

Minimization

No minimization measures have been identified.

Mitigation

No mitigation is proposed.

4.3.9 Energy and Natural Resources

This section describes the analysis of potential adverse impacts to energy and natural resources associated with the Proposed Action and alternatives. Section 4.3.9 (Natural Resources and Energy Supply) of the NEPA EA is incorporated by reference.

4.3.9.1 Impact Considerations

NEPA – 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.

SEPA – Impact Considerations

The Port applied the same impact significance considerations for energy and natural resources as the NEPA EA because these are the considerations typically applied in SEPA analysis.

4.3.9.2 Methods

Estimated future demand for electricity and natural gas under the No Action Alternative and the Action Alternatives was based on the increase in total passengers at SEA (see Chapter 1 for more information on passenger growth projections). Future demand for fuel was based on estimated increases in aircraft operations. Increases in natural resource consumption were evaluated qualitatively based on the types of materials expected to be used in construction of the NTPs.

4.3.9.3 Energy Supply Impacts

Alternative 1: No Action

Electricity and Natural Gas

Demand for electricity and natural gas at SEA would continue to increase under the No Action Alternative due to the increase in total number of passengers utilizing SEA. **Table 4.3.9-1** provides the anticipated electricity demand and **Table 4.3.9-2** provides the anticipated natural gas demand under No Action.

TABLE 4.3.9-1: 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: Table 4.3.9-1 was Table 4-24 of the NEPA Final EA. Estimates are based on the additional square footages of the projects included in the No Action Alternative.
MWH = megawatt-hours

TABLE 4.3.9-2: 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: Table 4.3.9-2 was Table 4-25 of the NEPA Final EA. 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 Alternative due to the projected increase in aircraft operations. The anticipated fuel demand is provided in **Table 4.3.9-3**. Because the No Action Alternative 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 4.3.9-3: 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: Table 4.3.9-3 was Table 4-26 of the NEPA Final EA. Projections are based on the ratio of usage per operation, based on 2022 actual data.
Sources: Port of Seattle data; Landrum & Brown analysis 2023.

<u>Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option</u>

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

Energy demands, including demand for fuels and electricity, would increase because of construction of the NTPs. Power needs would primarily be met through use of generators, but some projects may use Port-supplied power, which would increase demand on local utilities. Any impact on energy and natural resources is not expected to be significant based on the relatively small scale of individual projects over the construction duration.

While implementing the Action Alternatives would increase the demand for electricity (**Table 4.3.9-4**), 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 its Sustainable Evaluation Framework (described further below under Minimization and Mitigation Measures), 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.[25]

TABLE 4.3.9-4: 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

Note: Table 4.3.9-4 was Table 4-27 of the NEPA Final EA.

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 4.3.9-5**), 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.[26] 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.[27]

TABLE 4.3.9-5: 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

Note: Table 4.3.9-5 was Table 4-28 of the NEPA Final EA.

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 4.3.9-6 shows the projected Jet A, diesel, and gasoline fuel consumption for the Action Alternatives in 2032 and 2037. The Action Alternatives would address the storage concerns described above under the No Action Alternative and would 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.

[25] Bonneville Power Administration 2024–2028 Strategic Plan.

[26] Natural Gas Facts, Canadian Gas Association, https://www.cga.ca/natural-gas-statistics/natural-gas-facts/, accessed January 15, 2024.

[27] This Port of Seattle contract commenced in October of 2020 and is for a term of 10 years.

Based on the analysis described above and the minimization measures described below, impacts to energy would not be significant.

TABLE 4.3.9-6: 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: Table 4.3.9-6 was Table 4-29 of the NEPA Final EA. Projections are based on the ratio of usage per operation, based on 2022 actual data.
Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Minimization and Mitigation Measures

Minimization

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. New construction would comply with Washington State energy efficiency requirements for commercial buildings.

The NTPs would also comply with the Port's Sustainable Evaluation Framework,[28] a policy designed to help the Port advance its goal to become the greenest and most energy-efficient port in North America. The Sustainable Evaluation Framework process is designed to make more transparent and data-driven decisions to integrate sustainability and equity into building and operating Port facilities.

As noted above, reliance on fossil fuels to meet future jet fuel demand would be reduced by the use of SAF. The Port of Seattle was the first United States airport operator to set a specific timetable and goals for transitioning all airlines at SEA to commercially competitive SAF. The Fuel Farm Expansion (S01) would facilitate the Port's goal to power every flight fueled at SEA with at least a 10 percent blend of SAF by 2028. SAFs are jet fuels made from renewable or waste-derived sources, such as used cooking oil, wood waste, municipal solid waste, renewable electricity. They have been certified to the same safety standards and used in the same fueling systems and aircraft as petroleum Jet-A.

Mitigation

No mitigation is proposed.

4.3.9.4 Other Natural Resources Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to other natural resources (e.g., construction materials) related to construction and operation of the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes affecting other natural resources in response to continuing increases in operations under the No Action Alternative.

[28] Available for review at: https://www.portseattle.org/page/SEF.

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

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 impacts related to other natural resource usage would occur.

Minimization and Mitigation Measures

Minimization

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

Mitigation

No mitigation is proposed.

4.3.10 Noise (and Noise-Compatible Land Use)

This section presents the results of analysis of potential adverse impacts from aircraft and construction noise from 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 4.3.10-1** 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 4.3.10-1: ANNUAL-AVERAGE DAY OPERATIONS

Alternative	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total Operations
2032 No Action	531.98	108.88	542.11	96.21	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: Table 4.3.10-1 was Table 4-31 of the NEPA Final EA. 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 Impact Thresholds

NEPA – 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.

SEPA – Impact Considerations

The Port applied the same impact significance considerations for aircraft noise as the NEPA EA used for noise and noise-compatible land uses because FAA, as the agency with jurisdiction over aircraft noise, has determined that 65 DNL is the appropriate threshold for determining noise impacts. For construction noise, the Port considered the generation of offsite construction noise and compatibility with the applicable local noise standards.

4.3.10.2 Methods

Airport noise was modeled using AEDT Version 3f to predict noise contours based on predicted aircraft types and projected operational data.

Construction noise was modeled with FHWA's Roadway Construction Noise Model (TNM) Version 3.2 for NTPs with the potential to cause increases in noise above ambient levels at offsite sensitive noise receptors.

The Port conducted a literature review of recent studies that examined statistical relationships between aircraft noise and a range of potential human health effects.

4.3.10.3 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 (five have been sound insulated and one additional school is in the process of being 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 (five have been sound insulated and one additional school is in the process of being 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 4.3.10-1 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 4.3.10-2 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.

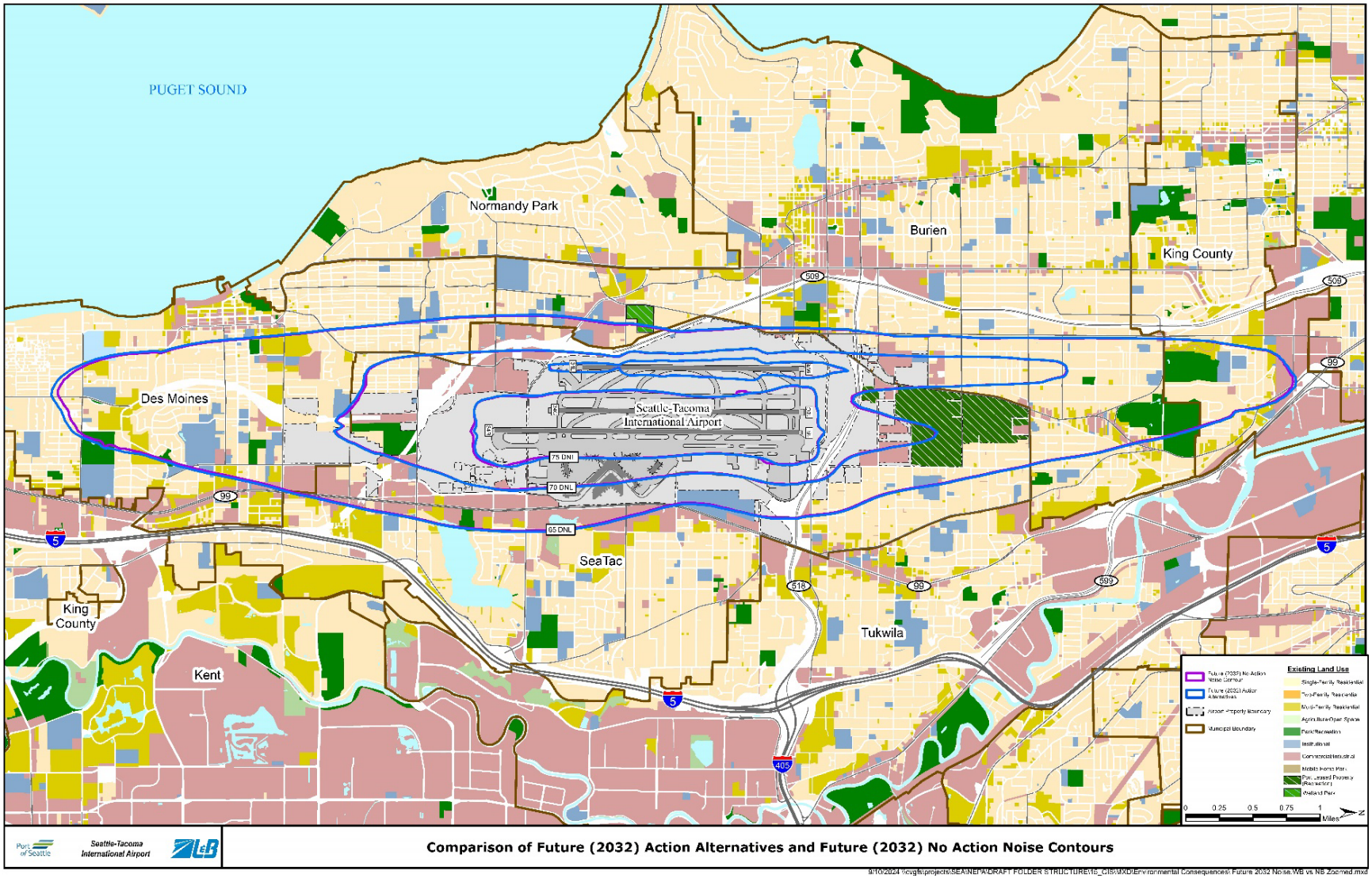
TABLE 4.3.10-2: HOUSING AND POPULATION WITHIN THE 65+ DNL COMPARISON (2032)

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

Notes: Table 4.3.10-2 was Table 4-32 in the NEPA Final EA. Data used to calculate the results in the table was based on a data set from 2024. Since that time, the data set has been updated, and the revised numbers will be presented in the Part 150 Study. It is not anticipated that the numbers have substantively changed. Ultimately, there is no 1.5 dB increase over noise sensitive facilities, therefore, there is no significant noise impact

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

EXHIBIT 4.3.10-1: 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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4.3.10.4 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 (five have been sound insulated and one additional school is in the process of being 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 (five have been sound insulated and one additional school is in the process of being 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 4.3.10-2 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 4.3.10-3 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.

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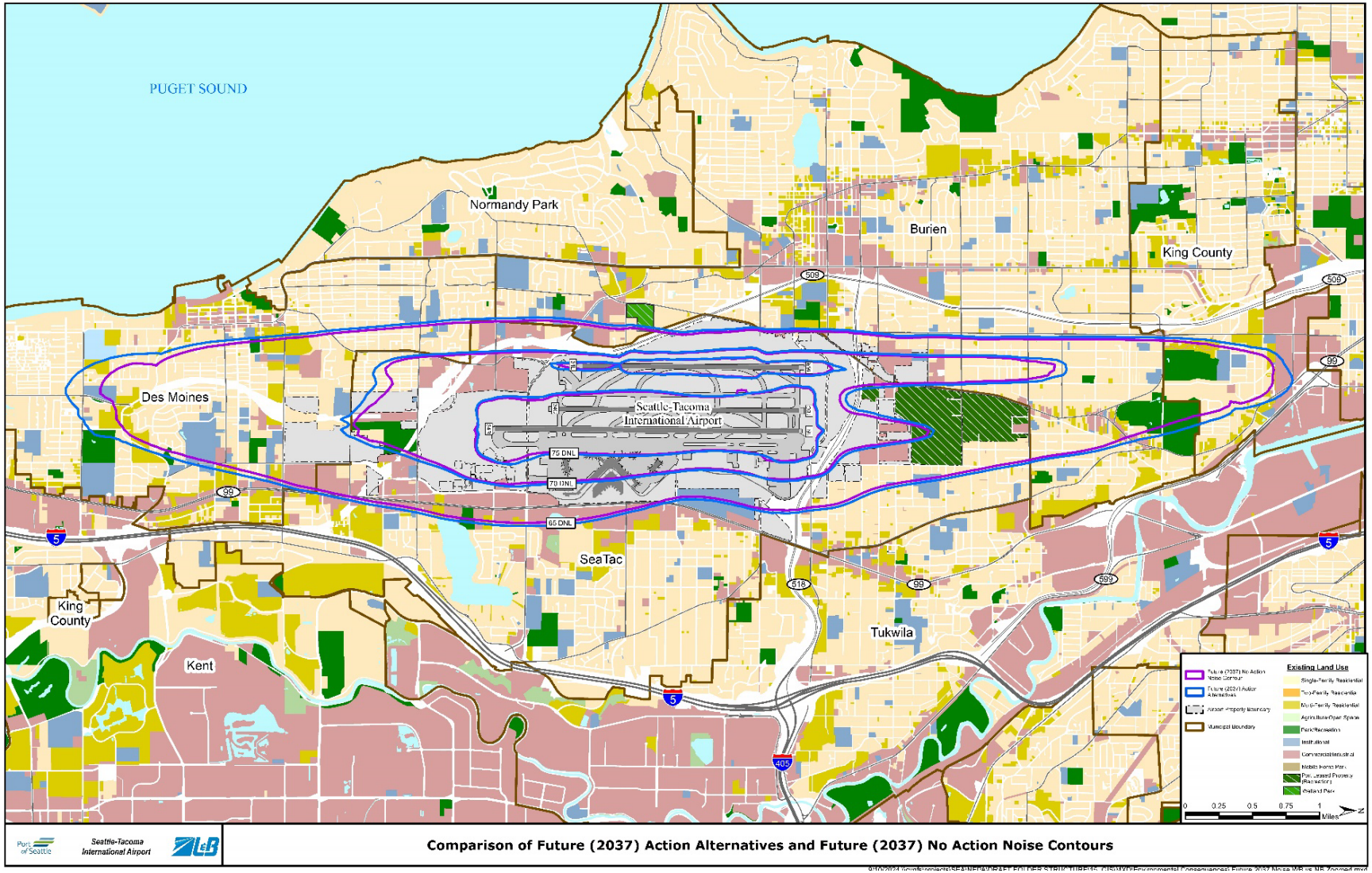
EXHIBIT 4.3.10-2: COMPARISON OF FUTURE (2037) ACTION ALTERNATIVES AND FUTURE (2037) NO ACTION NOISE CONTOURS



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

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TABLE 4.3.10-3: HOUSING AND POPULATION WITHIN THE 65+ DNL 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
Sound Insulation Completed						
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
Subtotal	*4,534*	*4,694*	*+160*	3,871	4,325	*+454*
Not Sound Insulated						
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
Subtotal	*4,984*	*5,161*	*+177*	3,295	4,692	*+1,397*
Total Housing Units	**9,518**	**9,855**	**+337**	**7,166**	**9,017**	**+1,851**
Total Estimated Population	**21,975**	**22,799**	**+824**	**16,297**	**20,736**	**+4,439**

Notes: Table 4.3.10-3 was Table 4-33 in the NEPA Final EA. Data used to calculate the results in the table was based on a data set from 2024. Since that time, the data set has been updated, and the revised numbers will be presented in the Part 150 Study. It is not anticipated that the numbers have substantively changed. Ultimately, there is no 1.5 dB increase over noise sensitive facilities, therefore, there is no significant noise impact.

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

Analysis of recent studies on the health effects of aviation noise has found that aircraft noise exposure at some levels can have impacts on levels of annoyance and sleep disturbance. These studies suggest that aircraft noise exposure has marginal potential effects on hypertension but does not affect the incidence of cardiovascular disease. See Appendix J for more information.

Based on the analysis described above and the minimization and mitigation measures described below, noise impacts would not be significant.

4.3.10.5 Minimization and Mitigation Measures

Minimization

SEA has a comprehensive aircraft noise reduction program in which the airport's Noise Programs Office works closely with FAA, the airlines, and the local communities to monitor existing noise programs and develop new ways of reducing airport and aircraft noise. The office has two primary focuses: sound insulation programs and noise abatement programs. SEA's Noise Programs Office is currently working on an update to its Part 150 program[29], which determines eligibility for sound insulation. Because it is not possible to predict how many individuals will opt into sound insulation, this analysis conservatively assumes that none of them will seek voluntary sound insulation. The Part 150 update is a separate process that is occurring in parallel with the SAMP NTPs environmental review.

[29] Information on the Part 150 Study Update is available online at: https://www.portseattle.org/page/sea-part-150-noise-study

SEA would continue to implement its voluntary noise abatement measures focused on reducing noise disturbances, including nighttime noise minimization measures, including:

- *Fly Quiet Incentive Program:* The Fly Quiet Incentive Program11 was adopted in 2002 to increase airline and pilot awareness of the effect of aircraft noise on local communities. This program includes annual Fly Quiet Awards for the top two airlines with the highest scores and the airline that shows significant improvement is given the third award. Air Canada, Frontier Airlines, and Air France are the recipients of the 2025 Fly Quiet Awards.
- *Late Night Noise Limitation Program*: In 2019, the Port implemented the Late-Night Noise Limitation Program, a voluntary program designed to reduce late night noise at the Airport by encouraging air carriers to fly during less noise-sensitive hours or transition to quieter aircraft. The program was developed to increase air carrier awareness of the impact of nighttime aircraft noise on local communities.
- *Aircraft Engine Runups*: The Port has also designated a restricted period for engine run-ups between 10:00 p.m. and 7:00 a.m. During these hours, run-ups are permitted only in exceptional circumstances with airport approval and must not exceed two minutes. Aircraft operators requiring extended run-ups between 6:00 a.m. and 7:00 a.m. may proceed only if the aircraft is scheduled to depart between 7:00 a.m. and 8:30 a.m. and has received prior authorization from the Airport.

To the extent that these minimization measures reduce aircraft noise levels in communities, any resultant annoyance or other health effects would also be expected to be minimized.

Mitigation

No mitigation is proposed.

4.3.10.6 Construction Noise

Construction Noise Impacts

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 24th Avenue S., west of 30th Avenue S., and south of S. 148th Street. Construction for C02 would start in 2026 (lasting approximately 18 months) and construction for C03 would start in 2028 (lasting around 16 months). As discussed in Section 1.3, Proposed Action, the timing of construction is subject to change. However, for consistency with the NEPA EA analysis, this SEPA EIS preserves the same assumptions for construction timing. Major construction activities are anticipated to be limited to daylight hours, and the Port has 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 of Washington and City of SeaTac requirements. Contractors would 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.

Based on the analysis described above, construction noise impacts would not be significant. Further, the minimization and mitigation measures described below would reduce or offset impacts.

Minimization and Mitigation Measures

Minimization

Construction-related noise increases would be minimized through strict adherence to the Port's Construction General Requirements and by meeting State of Washington and City of SeaTac requirements. Contractors would also utilize BMPs to reduce construction noise, as required by the FAA FONSI/ROD.

Mitigation

The Port committed to the following measure as part of the FAA's FONSI/ROD:

- Utilizing Best Management Practices (BMPs) to limit impacts during construction. This includes, but is not limited to, utilizing BMPs to minimize surface transportation impacts, protect against sediment and soils entering nearby streams or creeks, reduce construction noise, and minimize increases in air emissions and water usage.

4.3.11 Socioeconomics and Environmental Justice

This section presents the results of the analysis of potential impacts to socioeconomics and environmental justice 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. The review of impacts to children's health and safety risks that was included in the NEPA EA can be found in Appendix K.

4.3.11.1 Socioeconomic Impacts

Impact Considerations

NEPA – 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.

SEPA – Impact Considerations

Socioeconomic considerations are not specifically identified as SEPA elements of the environment under WAC 197-11-444. The regulations state that "socioeconomic" is not used in the statute and analysis of aspects of socioeconomics is not required. However, WAC 197-11-440(8) gives agencies the option to include additional analysis. Although the term "socioeconomic" is not used in the SEPA statute, it is retained here for consistency with the NEPA Draft and Final EA.[30]

The Port has decided to include the analysis identified within the Draft and Final EAs to assist in decision-making and has used the scoping process and comments on the Draft NEPA EA to help identify issues of concern to citizens.

Methods

Socioeconomic data for the GSA and relevant reference areas was collected and analyzed to identify the overall socioeconomic environment. Data sources included U.S. Census 2024 American Community Survey 1-year and 5-year estimates, 2023 Puget Sound Regional Council projections, and *The Northwest Seaport Alliance, Port of Tacoma, and Port of Seattle Economic Impact Analysis*.[31] Socioeconomic impacts are assessed to determine the degree to which the Action Alternatives would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly.
- Disrupt or divide the physical arrangement of an established community.
- Cause extensive relocations of residential or business properties.
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities, or
- Produce a substantial change in the community tax base.

Alternative 1: No Action

Induced Economic Growth / Substantial Loss in Community Tax Base

SEA and the surrounding area would continue to experience economic growth under the No Action alternative due to the increase in forecasted passengers, although this increase would be smaller than under the Action Alternatives. Additional passengers would increase Airport revenue, concessions and retail-related revenue, and visitor-related revenue to the region from lodging, food / beverage, entertainment, and shopping. In addition, the increased demand for air travel without a corresponding increase in Airport capacity could result in increased airfare. While the economic impact of the No Action Alternative has not been quantified, it is anticipated that it would result in less gross tax revenue than the Action Alternatives, but 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.

[30] WAC 197-11-448

[31] Northwest Seaport Alliance, 2025, The Northwest Seaport Alliance, Port of Tacoma, and Port of Seattle Economic Impact Analysis. Prepared by Community Attributes, Inc. July 2, 2025.

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. Additional indirect growth in economic activity may occur from passengers using nearby hotels, restaurants, etc. These improvements would also have corresponding effects on tax revenue. The overall effect to the economic environment of the GSA would be beneficial and no adverse impacts to economic resources are expected.

The construction of capital projects like the SAMP NTPs usually results in increased employment and spending in the study area during the construction period. The extent of these impacts depends on the source of project funding and the makeup of work crews used during project construction. To the extent that construction uses funds that would not otherwise have been spent in the study area, it would result in income and job benefits to the study area. During construction, it is likely that some construction products would be purchased locally and that local firms and workers would be involved in construction. The use of workers and supplies from outside the study area would lessen any beneficial impacts.

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 24th Avenue S. from S. 150th 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 EIS assumed the access was eliminated to disclose the potential impacts. Drivers wanting to access 24th Avenue S. from S. 150th Street would have to utilize S. 152nd Street or S. 148th Street. This would add a maximum of 0.75 mile 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. 150th 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 Action Alternative would result in the relocation of residences. One business, the Doug Fox Lot, would be directly impacted by the Action Alternatives. 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, it is not considered a significant economic impact, and the loss of parking would largely be replaced by the new parking structure (T02).

The NEPA EA also identified PACCAR Aviation, located off Starling Drive, as being impacted by the proposed construction of the ARFF. The NEPA EA anticipated that the Port would either not renew the lease or would exercise termination rights within the lease. Since publication of the NEPA Final EA, however, PACCAR has elected to relocate to another airport in the region prior to the start of construction. This is anticipated to occur no later than the end of 2026.

Based on the analysis described above, socioeconomic impacts would not be significant.

Minimization and Mitigation Measures

Minimization

To minimize impacts from the Action Alternatives, the Port would offer employment assistance to the approximately 25 Doug Fox Lot employees.

Mitigation

No mitigation is proposed.

4.3.11.2 Environmental Justice Impacts

As noted in Section 3.3.12.2, the NEPA Draft EA, published in October 2024, included an environmental justice analysis consistent with then-current requirements. In January 2025, the two major federal EOs pertaining to environmental justice were revoked; agency regulations and guidance implementing those orders were subsequently canceled. As a result, FAA removed the environmental justice analysis from the SAMP NTP Final EA. However, the Port has determined that this SEPA EIS will include the environmental justice analysis completed for the NEPA Draft EA, supplemented by additional analysis pursuant to SEPA.

Impact Considerations

NEPA – Significant Impact Threshold[32]

Prior to the revocation of NEPA environmental justice requirements in January 2025, the FAA did not have an established significance threshold for environmental justice impacts. However, the FAA identified factors to consider when evaluating potential environmental justice impacts. The existence of these factors did not necessarily constitute a significant impact; rather, the FAA evaluated these factors in light of context and intensity to determine whether the impacts were significant. The factors considered included, but were 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 in another environmental impact category, yet may be considered significant when examined in the context of their effects on environmental justice populations. In addition to identifying adverse impacts, the evaluation also considered any benefits of the Action Alternatives to environmental justice populations, as well as minimization and mitigation measures.

[32] Because NEPA no longer requires the analysis of environmental justice, the FAA's significance factors are no longer in force. They are included here to provide context for the analysis.

SEPA – Impact Considerations

The SEPA EJ analysis incorporates the FAA's EJ analysis in the NEPA Draft EA by reference. The NEPA analysis concluded that the Action Alternatives did not result in any disproportionate and adverse impacts to environmental justice populations. The methods for the NEPA analysis were based on guidance from FAA's Order 1050.1F Desk Reference, as well as the EPA's Promising Practices Report. The SEPA analysis supplements that work with new studies, including an air dispersion evaluation and a human health risk assessment (discussed further in Section 4.3.1, Air Quality, and Appendix C). Through the use of the WADOH's EHD map and the Port's Equity Index (described in Section 3.3.12), this analysis also considers the specific environmental vulnerabilities of the populations in the EIS study areas to determine if the environmental effects of the Action Alternatives would add to existing vulnerabilities.

Methods

NEPA Draft EA Environmental Justice Analysis

Using the factors identified above, the FAA evaluated whether impacts not otherwise rising to a level of significance for another resource category might represent disproportionate and adverse effects, and / or a significant impact, for environmental justice purposes. All resource categories were evaluated for potential disproportionate and adverse impacts to environmental justice populations. More information on the methods used for the NEPA environmental justice analysis is provided in Appendix K**.**

SEPA Environmental Justice Analysis

The SEPA environmental justice analysis summarized the impact analysis for each SEPA element of the environment and identified any impacts with the potential to affect the SEPA environmental justice population(s) identified in Section 3.3.12. The analysis then determined whether and how the Proposed Action might affect the factors and indicators[33] identified in the WADOH EHD map and the Port Equity Index. These factors and indicators make communities more vulnerable to environmental and economic harm (e.g., poor air quality and high poverty rates). The steps in the analysis included:

1) Identify the study areas to be considered.
2) Identify the environmental justice populations within the study areas, using both the federal definition of environmental justice populations (low-income and minority) and the Washington State HEAL act definition of vulnerable populations.
3) Using the WADOH EHD map and the Port's Equity Index and Map, determine which portions of the study areas included SEPA environmental justice populations and their degree of vulnerability based on the WADOH EHD and Port's Equity Index rankings.
4) Review the factors and indicators used in the WADOH EHD map and the Port's Equity Index and Map to determine which factors or indicators could be affected by the impacts identified in the EIS from the Action Alternatives.

[33] The WADOH EHD mapping is based on a set of 19 factors within four categories (environmental exposures, environmental effects, sensitive populations, and socioeconomic factors), which are used to evaluate environmental disparities within communities. The Port's Equity Index identifies 30 indicators within four categories (economy, livability, accessibility, and environment), which are used to assess different aspects of equity. The terms "factors" and "indicators" are used in that context in the analysis.

5) Based on that analysis, determine which resource areas warrant evaluation for potential impacts to environmental justice populations.
6) Consider the impacts of the Action Alternatives on each potentially affected factor and indicator to determine whether the Action Alternatives would appreciably increase or decrease the vulnerability of an environmental justice population to that factor or indicator, and reach a conclusion regarding the degree (significance) of that impact, if any.

More information on the methods used for the SEPA environmental justice analysis is provided in Appendix K.

Alternative 1: No Action

The No Action Alternative would not include the development of the NTPs. Under the No Action Alternative, passengers and operations at SEA would continue to increase within the existing facilities, resulting in additional congestion within the Airport and traffic congestion on Airport and nearby off-Airport roadways. As a result of this congestion, environmental justice populations would be affected by air emissions, noise, and roadways that do not meet mobility standards.

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

NEPA Draft EA Environmental Justice Analysis

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 the 65+ DNL noise contour, a business closure, 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.[34] 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-listed species or other species fished by Native American Tribes. As a result, Native American Tribes are not anticipated to experience disproportionate and adverse impacts from the Action Alternatives.

[34] Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023.

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 the Port and other entities in 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.

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 mile 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 mile 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 4.3.11-1**, 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 4.3.11-1: 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%

Notes: Table 4.3.11-1 was Table 4-34 in the NEPA Draft EA. 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 24th Avenue S. from S. 150th Street would be eliminated, and one business would be relocated or closed. Drivers wanting to access 24th Avenue S. from S. 150th Street would have to utilize S. 152nd Street or S. 148th 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. This business is not registered as minority- or women-owned. The Doug Fox Lot has 24 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. 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 would be 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.[35] 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 4.3.11-2 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 4.3.11-2: 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 160th Street	Yes	N/A	No
98	Des Moines Memorial Drive / S. 168th Street	Yes	N/A	No
89	Pacific Hwy S. at S. 216th Street	Yes	N/A	No
93	Pacific Hwy S. at SR 516	Yes	N/A	No
14	Des Moines Mem. Drive / S. 144th Street	Yes	N/A	No
17	24th Ave. S. / S. 146th Street	Yes	N/A	No
48	8th Ave. S. / S. 156th Street	Yes	N/A	No

[35] 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 4.3.11-2: SUMMARY OF INTERSECTIONS (CONTINUED)

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

Note: Table 4.3.11-2 was Table 4-35 in the NEPA Draft EA.

Table 4.3.11-3 provides a summary of environmental justice impacts for the Action Alternatives by environmental resource category.

TABLE 4.3.11-3: SUMMARY OF NEPA 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

TABLE 4.3.11-3: SUMMARY OF NEPA ENVIRONMENTAL JUSTICE IMPACTS (CONTINUED)

Environmental Resource Category	Impact?	Does the Impact Cause a Disproportionate and Adverse Effect?	Significant Environmental Justice Impact?
Socioeconomics (Business Relocation)	Yes, closure of business employing individuals from 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

Note: Table 4.3.11-3 was Table 4-36 of the NEPA Draft EA.

NEPA Draft EA Environmental Justice Determination

The NEPA EA environmental justice analysis determined that none of the alternatives would result in significant impacts to environmental justice populations.

SEPA Environmental Justice Analysis

As described above under “Methods,” impacts identified within for each SEPA element of the environment in this EIS were evaluated using the four categories of factors (economic exposures, environmental effects, sensitive populations, and socioeconomic factors) in the WADOH EHD map and the indicators associated with the Port of Seattle’s Equity Index to determine whether any of the SAMP NTP impacts would be positively or negatively associated with those factors and indicators. Based on this assessment, the SEPA environmental justice analysis included more detailed discussions on air quality, transportation, socioeconomics, noise, water resources, and hazardous materials. **Table 4.3.11-4** summarizes the impacts of the NTPs by element of the environment, identifies which WADOH map factors and Port Equity Index indicators (if any) those impacts correlate to, and notes whether the analysis shows a significant impact to an environmental justice population. Appendix K includes the full analysis completed for SEPA.

The SEPA evaluation found that the Action Alternatives would result in impacts including increased air emissions, reductions in traffic performance, increases in noise, a decrease in tree canopy, and an increase in economic activity. However, none of the impacts would be significant., Further, the minimization and mitigation measures would reduce or offset impacts. In particular, the dispersion modeling analysis conducted for SEPA found that ground-level pollutant concentrations in the study area under the Action Alternatives would not exceed the health-based NAAQS. Modeling of toxic air pollutant concentrations in the study area concluded that neither acute non-cancer health risks nor cumulative cancer risk would increase significantly as a result of the Action Alternatives.

The Action Alternatives would support long-term economic growth in the region, as measured by new jobs. The effects on unemployment and jobs, two of the indicators in the Port’s Equity Index, are expected to be positive overall, as the Action Alternatives would create construction jobs and increase Airport-related jobs in the long term.

TABLE 4.3.11-4: SEPA IMPACT SUMMARY AND RELATIONSHIP TO WADOH MAP FACTORS AND PORT EQUITY INDEX INDICATORS

Element of the Environment	Description of Evaluation	Does the Impact from the Action Alternatives Cause an Adverse Effect?	Relationship to WADOH Map Factors	Relationship to Port Equity Index Indicator	Does the Analysis Show a Significant Impact to an EJ Population?
Air Quality	Operational and construction emissions were evaluated.	No violations of the National Ambient Air Quality Standards (NAAQS) were identified in either the emissions burden analysis or the dispersion modeling study. The results of the modeling completed for the NEPA analysis were affirmed by a dispersion modeling analysis and a human health risk assessment completed for the SEPA EIS. The dispersion modeling analysis found that ground-level pollutant concentrations in the study area under the Action Alternatives would not exceed the health-based NAAQS. Modeling of toxic air pollutant concentrations in the study area concluded that neither acute non-cancer health risks nor cumulative cancer risk would exceed applicable risk thresholds as a result of the Action Alternatives.	Environmental Exposures	Environment (Diesel 2.5 and PM2.5 emissions)	No

TABLE 4.3.11-4: SEPA IMPACT SUMMARY AND RELATIONSHIP TO WADOH MAP FACTORS AND PORT EQUITY INDEX INDICATORS (CONTINUED)

Element of the Environment	Description of Evaluation	Does the Impact from the Action Alternatives Cause an Adverse Effect?	Relationship to WADOH Map Factors	Relationship to Port Equity Index Indicator	Does the Analysis Show a Significant Impact to an EJ Population?
Plants and Animals	Evaluated effects to federal and state listed species, habitats, and other species of concern.	Removal of trees and vegetation would decrease habitat for animals and birds.	N/A	Environment (Urban Tree Canopy)	No
GHG and Climate	Evaluated GHG emissions and potential climate effects.	The Proposed Action would increase Scope 1, 2 and 3 GHG emissions by 152,703 (2.1%) MT CO_2e over the No Action Alternative in 2032 and by 539,569 (7.4%) MT CO_2e in 2037. The Hybrid Terminal Option would increase Scope 1, 2 and 3 GHG emissions by 156,611 (2.2%) MT over the No Action Alternative in 2032 and by 539,569 MT (7.4%) in 2037. The Port expects to continue to make progress towards its Century Agenda GHG emission reduction targets for Scope 1 and 2 emissions based on minimizations measures and regulatory compliance. The effects of those minimization measures and regulatory requirements are not incorporated in the calculations of emissions attributable to the Action Alternatives. Additionally, the Port will continue to minimize GHG emissions from Scope 3 sources of emissions through collaboration with partners, including airlines.	N/A	N/A	No

TABLE 4.3.11-4: SEPA IMPACT SUMMARY AND RELATIONSHIP TO WADOH MAP FACTORS AND PORT EQUITY INDEX INDICATORS (CONTINUED)

Element of the Environment	Description of Evaluation	Does the Impact from the Action Alternatives Cause an Adverse Effect?	Relationship to WADOH Map Factors	Relationship to Port Equity Index Indicator	Does the Analysis Show a Significant Impact to an EJ Population?
Earth	Evaluated potential impacts to geology, soils, topography, and erosion/accretion.	Some NTPs would require grading and filling. Compliance with current design standards and BMPs would minimize seismic and other geologic hazards.	N/A	N/A	No
Recreation	Evaluated potential for direct (property acquisition) and indirect (noise, light and glare, etc.) to parks and recreation facilities.	No direct or indirect effects on recreation were identified.	N/A	No	No
Hazardous Materials (Releases or Potential Releases to the Environment)	Evaluated potential spills from construction equipment and potential to encounter hazardous materials during construction.	Construction equipment uses hazardous materials and excavations could expose contaminated soil; demolition of existing buildings could expose contaminated or hazardous materials. Contractors would establish a contaminated media management plan to reduce risk.	N/A Note: the index focuses on hazardous waste facilities and other established sites	N/A Note: the index considers toxic release from facilities using the EPA's Risk-Screening Environmental Indicators model	No
Historic and Cultural Resources	Evaluated whether the Action Alternatives would affect properties listed or eligible for the National Register of Historic Places.	No impacts identified; Port will monitor during construction and follow an inadvertent discovery plan.	N/A	N/A	No

TABLE 4.3.11-4: SEPA IMPACT SUMMARY AND RELATIONSHIP TO WADOH MAP FACTORS AND PORT EQUITY INDEX INDICATORS (CONTINUED)

Element of the Environment	Description of Evaluation	Does the Impact from the Action Alternatives Cause an Adverse Effect?	Relationship to WADOH Map Factors	Relationship to Port Equity Index Indicator	Does the Analysis Show a Significant Impact to an EJ Population?
Land and Shoreline Use	Reviewed applicable land use plans and policies; evaluated effects to the coastal zone.	No; airport plans are consistent with local plans and land uses. No effects to coastal zone.	N/A	N/A	No
Energy and Natural Resources	Evaluated potential increased demand for energy, water, and construction materials under the Action Alternatives.	No adverse effect: while the Action Alternatives would increase demand, energy and water supply is available and construction materials have no supply chain issues.	N/A	N/A	No
Noise	Evaluated noise contours and potential for increased noise affecting noise-sensitive land uses in the GSA under the Action Alternatives compared to No Action.	Increased aircraft noise under the Action Alternatives would expand the 65+ DNL contour; however, these increases would not be significant. Construction-related noise increases would be minimized through strict adherence to the Port's Construction General Requirements, by meeting the State of Washington and City of SeaTac noise requirements and utilizing BMPs.	N/A	Environment (Noise Pollution)	No
Socioeconomic	Evaluated the potential for job/employment growth and business displacement.	The Action Alternatives would directly create new jobs and support long-term economic growth in the region. One business located on Port property would be displaced. Community cohesion would not be affected.	Socioeconomic Factors	Economy (Unemployment Rate, Median Household Income, and Estimated Jobs)	No

TABLE 4.3.11-4: SEPA IMPACT SUMMARY AND RELATIONSHIP TO WADOH MAP FACTORS AND PORT EQUITY INDEX INDICATORS (CONTINUED)

Element of the Environment	Description of Evaluation	Does the Impact from the Action Alternatives Cause an Adverse Effect?	Relationship to WADOH Map Factors	Relationship to Port Equity Index Indicator	Does the Analysis Show a Significant Impact to an EJ Population?
Surface Transportation (Vehicular Traffic; Rail Traffic; Transit, Parking, and Non-Motorized Facilities; Traffic Hazards)	Evaluated intersection performance throughout the transportation study area.	Yes, multiple intersections would have delay above standards in 2032 and / or 2037. A smaller number would see improved or stable performance. All impacts identified as significant would be mitigated.	Environmental Exposures	Accessibility (Pedestrian and Bike Facilities, Auto to Jobs Index, and Walkability Index)	No
Aesthetics, Light and Glare	Evaluated plans and effects on glare and ambient light.	No significant changes in light intensity compared to No Action.	N/A	N/A	No
Public Services and Utilities	Evaluated potential impacts on emergency services, schools, and public utilities.	No significant impacts identified.	N/A	N/A	No
Water Resources	Evaluated potential effects on wetlands, surface waters, floodplains, wastewater, and groundwater.	Less than 1 acre of wetlands would be filled under the Action Alternatives; treatment of runoff would minimize effects to stormwater. Port will monitor contaminant levels in groundwater during and following completion of construction.	Environmental Effects (wastewater)	N/A	No
Cumulative Impacts	Evaluated NTPs in context of the past, present, and reasonably foreseeable future projects.	No	Potential impacts discussed in topics above	Potential impacts discussed in topics above	No

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Minimization and Mitigation Measures

No mitigation (other than the measures integrated into the above assessment) is proposed.

4.3.12 Surface Transportation

This section describes the results of the surface transportation study analyzing the potential adverse impacts of the Proposed Action and alternatives. As previously noted in Section 3.3.13, this topic was also evaluated in the NEPA EA. This SEPA EIS incorporates by reference Section 4.3.12 of the NEPA EA and provides additional information on rail traffic; transit, parking, and nonmotorized facilities; and traffic hazards to meet the requirements of SEPA. More information about the analysis and the results can be found in **Appendix L**.

4.3.12.1 Impact Considerations

NEPA – 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 whether there are significant impacts.

SEPA – Impact Considerations

The Port applied the same impact significance considerations for surface transportation as the NEPA EA because reductions in LOS and disruptions of travel patterns are also used to evaluate impacts as part of SEPA analysis. The effects of the Action Alternatives on rail, transit, parking, nonmotorized facilities, and traffic safety were assessed to determine whether there is a reasonable likelihood that they would have more than a moderate adverse impact on these factors compared to the No Action Alternative.

4.3.12.2 Methods

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. As described in Section 3.3.13, the Synchro 11 software was used to analyze these intersections for the PM peak hour. The results for the No Action Alternative and the Action Alternatives were then compared to determine whether the Action Alternatives would result in increased vehicle delay or reduced LOS at the STSA intersections. The analysis measured average vehicle delay (in seconds) and LOS at each intersection. The intersection LOS was ranked from A to F, with A representing a free flow condition and F representing a high level of congestion and breakdown in traffic flow. The Port coordinated with WSDOT and the cities of Burien, Des Moines, and Tukwila on the analysis. More information on analysis methods is included in Appendix L.

Impacts to rail, transit, parking, and nonmotorized facilities were evaluated qualitatively by assessing whether the Action Alternatives would create greater demand and / or affect the supply of these services and facilities.

Historical collision data was obtained from WSDOT for the 5-year period from January 2018 through December 2022. The data was reviewed to determine if any of the existing study intersections have existing safety trends that could be exacerbated by construction of the NTPs or improved through planned improvements.

4.3.12.3 Surface Transportation Impacts

Alternative 1: No Action

By 2032, nine of the roadway intersections analyzed would fail to meet mobility standards under the No Action Alternative; 17 of the roadway intersections would fail under the 2037 No Action Alternative. These degradations would be due to background growth in traffic and / or travel pattern changes unrelated to the Action Alternatives and include additional traffic from increases in operations anticipated under the No Action Alternative.

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 would increase 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 4.3.12-1 and Table 4.3.12-2 show the Category 1 and Category 2 intersections for 2032 and 2037.[36] Appendix L includes information on the Category 3 and Category 4 intersections. The FAA considered the impacts to Category 1 intersections to be significant and required mitigation. With the required mitigation measures discussed below, the impacts to surface transportation are not significant.

TABLE 4.3.12-1: 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 144th Street	SeaTac (Burien)	E	E	F	201.3	E	F	222.1
17 - 24th Ave. S/S 146th St	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/51st Ave. S.	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	D	E	11.3
48 - 8th Ave. S./S. 156th St	SeaTac	E	Cat. 3	Cat. 3	Cat. 3	E	F	120.1
83 - Military Rd. S. / SB I-5 Ramps/S. 200th Street	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	D	E	9.9

[36] Based on coordination with WSDOT, Burien, Des Moines, and Tukwila Category 3 intersections 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 4.3.12-1: CATEGORY 1 INTERSECTIONS (CONTINUED)

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)
86 - Military Rd. S./NB I-5 Ramps	WSDOT	D	D	E	16.8	Cat.2	Cat.2	Cat.2
96 - 16th Ave. S/S 144th St	SeaTac	D	Cat. 3	Cat. 3	Cat. 3	B	E	30.6
98 - Des Moines Memorial Drive/S 168th Street	Burien	C	Cat. 3	Cat. 3	Cat. 3	C	D	9.9

Notes: Table 4.3.12-1 was Table 4-34 in the NEPA Final EA. NA = No Action, PA = Proposed Action, LOS = Level of Service, Delay (seconds).

TABLE 4.3.12-2: 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. 152nd 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 148th 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. 154th Street	WSDOT	D	F	F	6.8	F	F	21.2
33 - SR 518 WB Off-Ramp (Loop) / S. 154th Street	WSDOT	D	F	F	78.9	F	F	115.0
37 - International Blvd./S. 154th Street	WSDOT	E-Mitigated	F	F	2.2	F	F	4.6
49 - 1st Ave. S/SW 160th Street	Burien	D	E	E	0.4	E	E	1.4
54 - Host Rd./SR 518 On-Ramp / S. 160th Street	SeaTac/ Burien	E	Cat. 3	Cat. 3	Cat. 3	F	F	68.3
78 - NB I-5 Ramps/S. 188th 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. 216th 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 - 8th Ave. S./Des Moines Memorial Drive S.	Burien/ SeaTac	D / E	F	F	150.7	F	F	227.4
105 - 32nd Ave. S./S. 160th Street	SeaTac	E	F	F	47.2	F	F	72.4

TABLE 4.3.12-2: CATEGORY 2 INTERSECTIONS (CONTINUED)

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)
106 - Military Rd. S./S. 164th Street/42nd Ave. S.	SeaTac	E	Cat. 3	Cat. 3	Cat. 3	F	F	5.5
107 - 34th Ave. S./S. 170th Street	SeaTac	E	Cat. 4	Cat. 4	Cat. 4	F	F	0.7
109 - Military Rd. S./S. 216th Street	SeaTac	E	F	F	7.0	F	F	9.8

Notes: Table 4.3.12-2 was Table 4-35 in the NEPA Final EA. 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.

4.3.12.4 Rail Impacts

Alternative 1: No Action

Based on regional growth in population and travel demand, an increasing number of passengers are expected to utilize SEA under the No Action Alternative. The only rail line that directly serves SEA is Sound Transit's LINK light rail, which is discussed in Section 4.3.12.5. It is possible that limitations on airline capacity under No Action could result in increased use of Amtrak's rail service by travelers who would otherwise fly. However, research has shown that other modes of transportation, such as rail, are viable alternatives to air travel only for distances up to approximately 300 to 475 miles, depending on the speed of the rail line. Beyond this point, the use of rail or other modes of transportation either does not connect to the desired destinations or does so inefficiently. Based on this conclusion, the use of other modes of transportation in lieu of air travel from SEA would only address a small portion of the demand for short-distance trips. Of the top 20 markets the Airport serves, all but two (Boise and Spokane) are more than 475 air miles from SEA. Therefore, supplementing or replacing aircraft operations with other modes of transportation would not provide the efficient long-distance connections that customers expect from SEA.

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

Implementation of the Action Alternatives would not directly affect rail transportation; however, by providing additional capacity at SEA, it could reduce the demand for rail travel on shorter routes served by airlines. No adverse impacts to rail transportation are anticipated.

4.3.12.5 Transit, Parking and Nonmotorized Facilities Impacts

Alternative 1: No Action

Demand for transit, parking and facilities to serve nonmotorized travel at SEA would continue to increase under No Action due to the increase in total number of passengers utilizing SEA.

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

Transit

Construction activities may cause temporary disruptions to transit. These disruptions would be limited to the immediate vicinity of the construction site. Signage, lighting, and other safety measures would minimize impacts.

Transit and multimodal connections would be considered as part of NTP design. As an example, the Northeast Ground Transportation Center (L04) would provide terminal quality space for passengers arriving / departing on the elevated busway and Link light rail at the Airport Station to travel to and from the Main Terminal. Travelers would access the new terminal either by taking a bus or by using the elevated post-security pedestrian walkways from the north gates to the terminal and to the North Satellite.

Parking

As part of the Action Alternatives, the Doug Fox Airport Parking lot would be demolished to accommodate the Second Terminal and Parking (T02). The loss of parking would largely be replaced by the new parking structure. Any additional parking demand is expected to be accommodated by the large number of commercial lots near the Airport.

Nonmotorized Facilities

Construction activities may cause temporary disruptions to nonmotorized facilities. As with the temporary transit disruptions, these would be limited to the immediate vicinity of the construction site. Signage, lighting, and other safety measures would minimize impacts.

Active transportation (walking and biking) would be considered as part of NTP design. This could include sidewalks and / or a protected bike lane or multiuse path for NTPs that are located in areas frequented by pedestrians and bicyclists. Secure bicycle storage would be provided where appropriate (e.g., in conjunction with transit connections). E-bike and electric scooter parking spaces would also be considered.

Based on the analysis above, no adverse impacts to transit, parking, and nonmotorized facilities are anticipated.

4.3.12.6 Traffic Safety Impacts

Alternative 1: No Action

Due to regional growth and an increase in demand for air travel, motorized and non-motorized traffic volumes are expected to increase in the STSA by 2037. An increase in traffic volumes could increase the frequency (collisions per year) of both motorized and non-motorized collisions in the study area. Future planned improvement projects by local jurisdictions will include current road design standards and non-motorized facilities meant to reduce fatal and severe collisions. Additionally, completion of the SR 509 Phase 2 extension is expected to remove some regional trips from the local road network, which could lead to reduced collision frequencies. Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option.

The roadway network in the Action Alternatives would remain the same as in the No Action Alternative except for S 170th Street west of International Boulevard, which would be reconstructed to provide direct access to the existing and proposed terminals. As described below in Section 4.3.12.7, the Port has proposed mitigation at existing intersections to address additional traffic congestion resulting from the Action Alternatives. The proposed mitigation improvements were evaluated in terms of their ability to affect crash modification factors, which are used in transportation engineering to estimate the change in expected crash frequency after implementing a safety countermeasure. Overall, the mitigation improvements are not expected to increase existing collision rates, and they may contribute to reductions in collision rates at some intersections and along some high-injury collision segments. Appendix L includes more detailed information on the analysis of traffic safety impacts.

Based on the analysis above, no adverse impacts to traffic safety are anticipated.

4.3.12.7 Minimization and Mitigation Measures

Minimization

The Port implements commute trip reduction programs in accordance with state requirements. It also encourages the use of transit by Port employees and by Airport users. These measures reduce the amount of traffic generated by Airport operations.

Mitigation

Mitigation was proposed for Category 1, Category 2, and Category 3[37] intersections according to each jurisdiction's requirements. Meetings were held with the affected 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 4.3.12-3**. The proposed mitigation for Category 2 intersections is shown in **Table 4.3.12-4**.

TABLE 4.3.12-3: 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. 168th Street	City of Burien	Construct new signal, provide dedicated westbound left turn lane, and provide shared WB through and right turn lane. Westside Trail would be maintained or improved and no change in access would occur with the proposed mitigation.	A / B
14	Des Moines Memorial Drive at S. 144th 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	24th Ave. S. at S. 146th Street	City of SeaTac	Construct a signal and add leading protected northbound left turn phase.	B / B
48	8th Ave. S. at S. 156th 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 would be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	D / E
96	16th Ave. S. at S. 144th Street	City of SeaTac	Construct an eastbound right turn lane.	C / C

[37] 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 4.3.12-3: PROPOSED MITIGATION FOR CATEGORY 1 INTERSECTIONS (CONTINUED)

ID	Intersection	Jurisdiction/ Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
102	S. 152nd Street at Des Moines Memorial Drive S.	City of SeaTac	Construct single leg roundabout to consolidate three intersections (100, 101, and 102). Westside Trail would be maintained or improved and no change in access would occur with the proposed mitigation.	A / A
24	SR 518 WB Off-ramp at Des Moines Memorial Drive S	WSDOT	Construct single lane roundabout where WB approach would be converted to a left turn lane and yield right turn lane. Westside Trail would be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	A / A
42	SR 518 EB Off-ramp & 51st Avenue S.	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
83	Military Rd. S. at Southbound I-5 Ramps at S. 200th 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: Table 4.3.12-3 was Table 4-36 in the NEPA Final EA. 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 4.3.12-4: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
49	1st Ave S. at SW 160th 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 transportation improvement program (TIP).	N/A
89	Pacific Hwy S. at S. 216th 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.[38]	N/A

[38] The City of Des Moines' current traffic impact fee amount is $7,651.41 per PM peak hour trip.

TABLE 4.3.12-4: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS (CONTINUED)

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
54	Host Rd. at S. 160th Street / SR 518 Eastbound On-ramp	City of SeaTac	Construct a signal.	A / A
101	8th 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	34th Ave S. at S. 160th Street	City of SeaTac	Construct a roundabout.	A / A
106	Military Rd S. at S. 164th St at 42nd 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	34th Ave S. at S. 170th 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. 216th 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 SB Ramps at SW 148th Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
23	SR 518 EB Ramps and Des Moines Memorial Drive	WSDOT	Construct a roundabout. Design of the intersection would accommodate the West Side Trail connection along the east side of Des Moines Memorial Drive S. The Westside Trail would be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	A / A
28	SR 518 EB Off-Ramp at S. 154th St	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
33	SR 518 WB Ramp at S. 154th St	WSDOT	Construct a signal.	C / C

TABLE 4.3.12-4: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS (CONTINUED)

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
37	International Blvd at S. 154th Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
78	Northbound I-5 Ramps at S. 188th St	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

Note: Table 4.3.12-4 was Table 4-37 of the NEPA Final EA.

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 would be provided in accordance with the ILA between the City of SeaTac and the Port.

With the proposed mitigation, none of the affected intersections would experience a significant impact. As previously mentioned, mitigation was coordinated with the jurisdictions and will be completed by 2032.[39] The Port and the local jurisdictions are in the process of formalizing the mitigation commitments in a memorandum of understanding (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.

The Port committed to the following measures as part of the FAA's FONSI/ROD:

- Utilizing Best Management Practices (BMPs) to limit impacts during construction. This includes, but is not limited to, utilizing BMPs to minimize surface transportation impacts, protect against sediment and soils entering nearby streams or creeks, reduce construction noise, and minimize increases in air emissions and water usage.

4.3.13 Aesthetics/Light and Glare

This section describes the results of the visual effect impact analysis to identify potential adverse effects of the Proposed Action and alternatives. This SEPA EIS incorporates by reference Section 4.3.13, Visual Effects, of the NEPA EA.

4.3.13.1 Impact Considerations

NEPA – 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:

[39] Reference to the MOU agreements with each jurisdiction.

Aesthetics (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.
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

Light Emissions:

The degree to which the action has the potential to:

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

SEPA – Impact Considerations

The Port applied the same impact significance considerations for aesthetics, light and glare as the NEPA EA used for visual effects. These considerations are similar to those typically used for the analysis of aesthetics, light and glare under SEPA.

4.3.13.2 Methods

Aesthetics

The aesthetics analysis evaluated whether new Airport-related development under the Action Alternatives would affect viewsheds by adding new visual features and whether NTPs would adversely affect the character of the existing visual setting. As with light emissions, the analysis considered whether the proposed changes would occur within the AAA or whether they had the potential to affect off-site areas subject to the conditions of the ILA.

Light and Glare

The analysis for light and glare evaluated new light sources proposed for the Action Alternatives to determine whether they could be visible outside the AAA and, if so, what areas could be adversely affected by additional light and glare. The analysis was based on the types of additional lighting proposed, including height and intensity of the light source. Particular attention was given to whether additional lighting would be consistent with the lighting and visual screening requirements of the Port's ILA with the City of SeaTac.

4.3.13.3 Aesthetics Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. Changes to operations to accommodate additional passengers are not anticipated to 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.

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 4.3.13-1**), 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 4.3.13-1: EFFECTS TO AESTHETICS – 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.
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.

TABLE 4.3.13-1: EFFECTS TO AESTHETICS – EDGE PROPERTIES (CONTINUED)

Project Element	Potential Effects
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	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. 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.

Note: Table 4.3.13-1 was Table 4-40 in the NEPA Final EA.

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 4.3.13-2**). 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 4.3.13-2: EFFECTS TO AESTHETICS – 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 26th Avenue S. and S. 152nd Street. The existing site is mostly wooded, with several intersecting streets (S. 152nd Street and S. 150th 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.

Note: Table 4.3.13-2 was Table 4-41 in the NEPA Final EA.

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.

Minimization and Mitigation Measures

Minimization

Although no significant impacts are anticipated, to minimize impacts from the Action Alternatives the Port would implement applicable visual screening and lighting measures according to the Airport's Landscape Vision, Design Guidelines, and Standards.[40] In particular, Section 3.4 of the guidelines, Landscape Buffer and Screening Requirements, identifies standards for vegetative screening between Port property and other land uses.

In addition, the Port would work with the Washington Memorial Park cemetery to provide appropriate screening and visual context to minimize potential impacts to cemetery operations.

[40] Sea-Tac International Airport Landscape Vision, Design Guidelines, and Standards (2024), https://www.airportprojects.net/sampenvironmentalreview/2024-sea-landscape-standards/.

Mitigation

No mitigation is proposed.

4.3.13.4 Light and Glare Impacts

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. Changes to operations to accommodate additional passengers are not anticipated to create additional lighting sources or modify the activities associated with existing sources; consequently, no changes in light emissions are anticipated to 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 4.3.13-3**). 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 4.3.13-3: 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.

TABLE 4.3.13-3: EFFECTS FROM LIGHT EMISSIONS – EDGE PROPERTIES (CONTINUED)

Project Element	POTENTIAL EFFECTS
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.

Note: Table 4.3.13-3 was Table 4-38 in the NEPA Final EA.

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 4.3.13-4**) 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 4.3.13-4: 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 26th Avenue S. and S. 152nd 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 16th 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.

Note: Table 4.3.13-4 was Table 4-39 in the NEPA Final EA.

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. Because construction activity would occur in the daytime hours, light emissions would not adversely affect surrounding areas. Additional provisions for avoiding and minimizing construction impacts on nearby residents from projects within the City of SeaTac are included in the ILA. All other construction would occur in areas that are already used for aviation purposes. The changes in light intensity caused by the Action Alternatives would not cause significant impacts.

Minimization and Mitigation Measures

Minimization

Although no significant impacts are anticipated, to minimize impacts from the Action Alternatives the Port would implement certain minimization measures. Projects built on non-edge properties inside the AAA would be designed in accordance with the Port's most recent Design Guidelines and Standards.[41]

Mitigation

No mitigation is proposed.

[41] 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

4.3.14 Water Resources

This section presents the results of the analysis of potential adverse impacts to water resources, including wetlands, floodplains, surface waters, and groundwater, that would occur because of the Proposed Action and alternatives. This SEPA EIS incorporates by reference Section 4.3.14, Water Resources, of the NEPA EA. See Appendix M for more information on the inventory and analysis conducted.

4.3.14.1 Impact Considerations

NEPA – 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.

NEPA – Significant Impact Thresholds
Wetlands
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
Surface Waters
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
Floodplains
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
Groundwater
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

SEPA – Impact Considerations

The Port applied the same considerations as the NEPA EA to determine the effects of the Action Alternatives on water resources because they are consistent with applicable state and local permitting requirements.

4.3.14.2 Wetlands

Methods

As noted in Section 3.3.15, wetland delineations in the study area occurred in 2019, with additional field work and verification conducted in 2020 and 2024. Wetland assessments were based on a review of existing information on previously mapped wetlands, soil mapping, and other geographic and weather data, followed by field investigations, during which wetland boundaries were mapped on site.

Impacts were calculated by overlaying the footprint of the NTPs and associated utility features with mapped wetlands areas. Sources of mapped wetland areas used in this analysis include:

- Wetland delineated within the study areas (see Appendix M).
- Wetland mapping provided by the Port for areas extending outside of the delineation study areas.
- Wetland buffers based on the wetland classifications and buffer widths in the SeaTac Municipal Code.

Impact assessments are based on the overlap between wetlands identified in these GIS datasets and the NTP footprints, including utility features.

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes that would result in new effects to wetland resources or functions in response to continuing increases in operations under the No Action Alternative.

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 acre of wetlands as a result of construction-related activities.[42] Most of the individual projects in the Action Alternatives result in 0.02 acre 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 or the Port 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 floodwater 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.

[42] These numbers reflect all wetlands delineated and/or verified during the 2019-2024 wetlands delineations and verifications. What portions of delineated wetlands are deemed jurisdictional under applicable federal, state and local programs has been evolving and continues to evolve during development of the NEPA EA and this SEPA EIS. The specific acreages of wetlands subject to regulations will be determined when the Port proceeds with permits to impact those wetlands.

- 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 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, the Action Alternatives would not cause any significant wetland impacts . **Table 4.3.14-1** and **Exhibits 4.3.14-1** through **4.3.14-4** identify wetland impacts by NTP and associated projects.

TABLE 4.3.14-1: PERMANENT 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
Grand Total Impacted**	**0.79**		

Note: Table 4.3.14-1 was Table 4-42 in the NEPA Final EA.

* 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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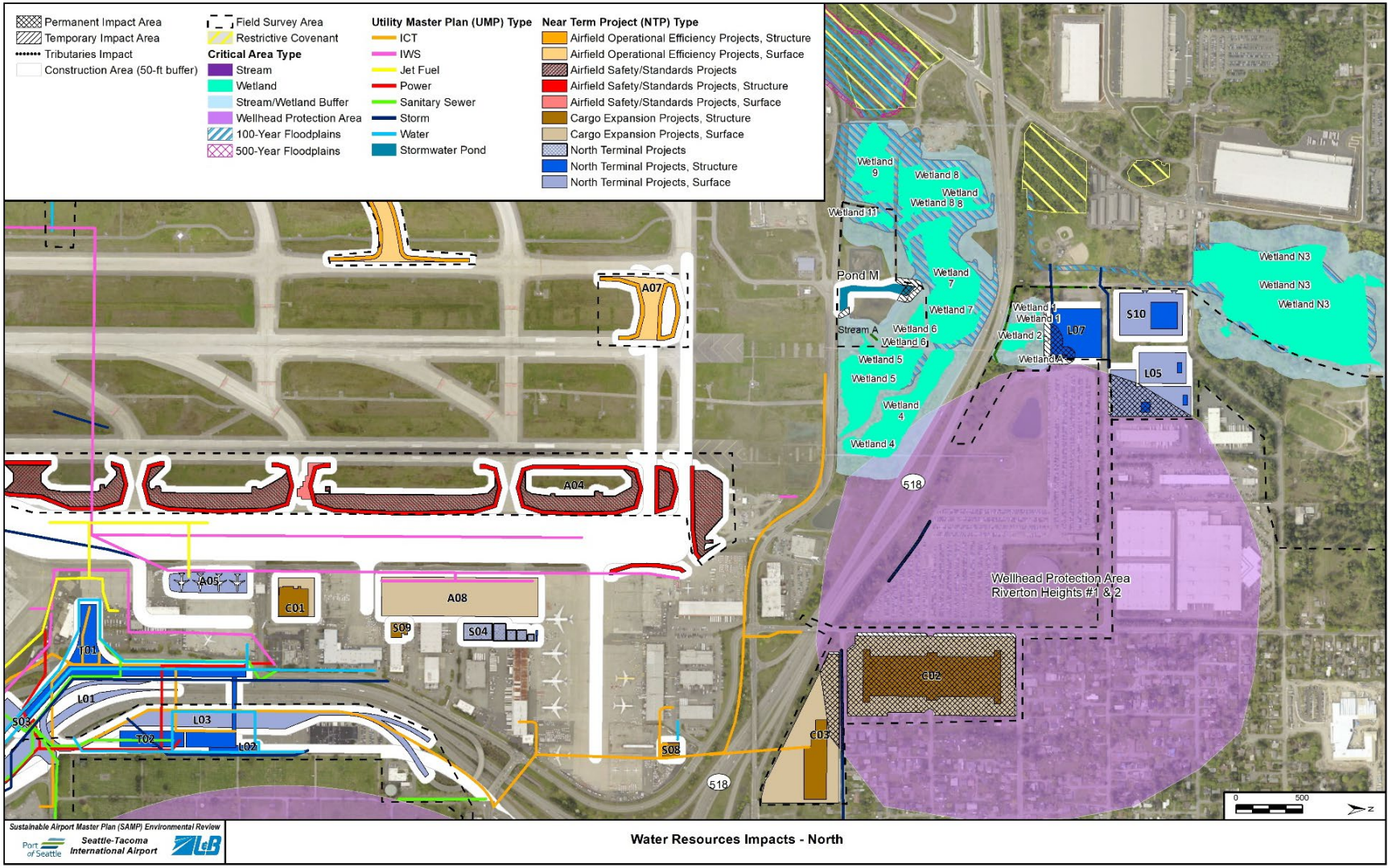
EXHIBIT 4.3.14-1: WATER RESOURCES IMPACTS – NORTH



Source: Parametrix, 2024.

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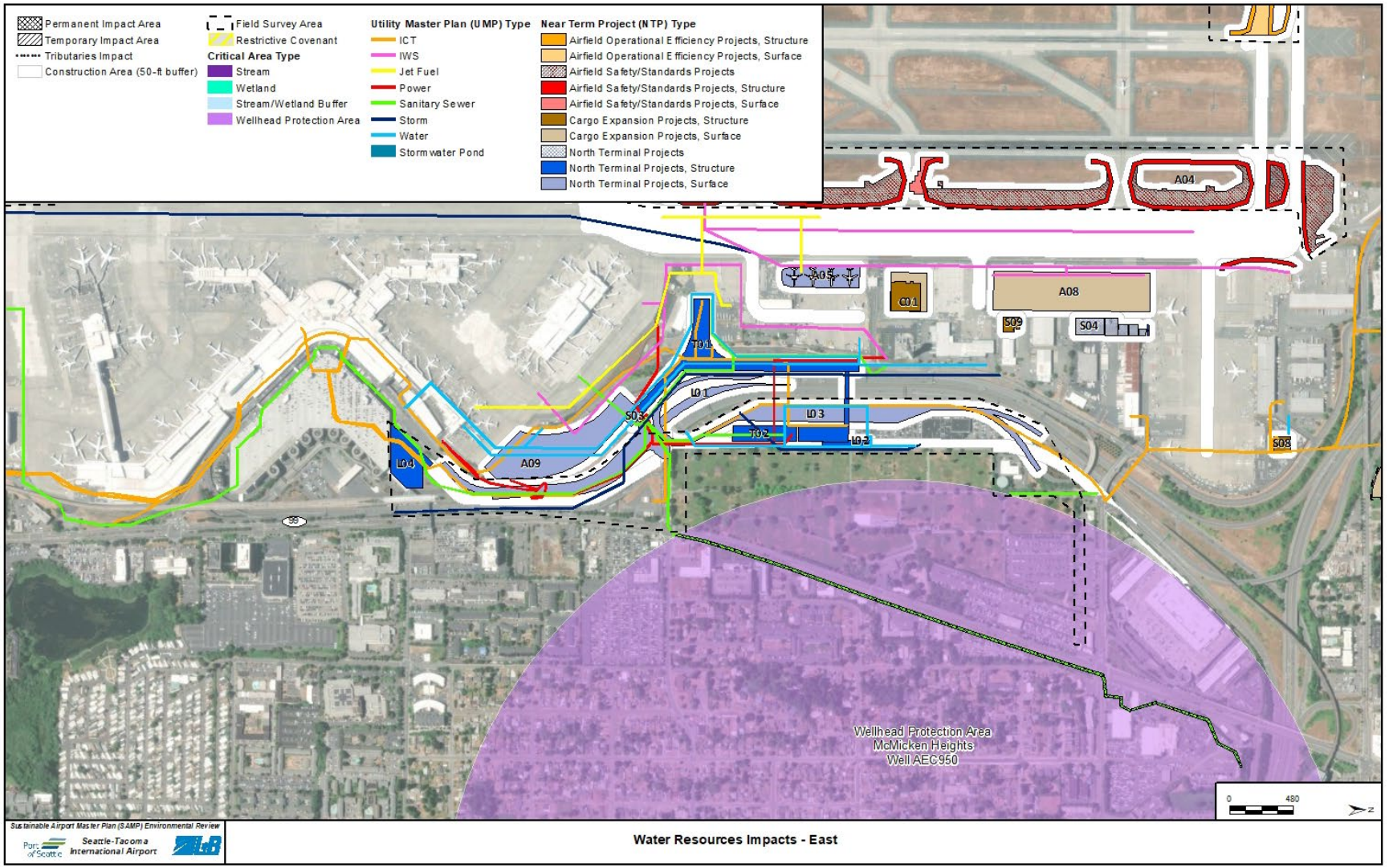
EXHIBIT 4.3.14-2: WATER RESOURCES IMPACTS – EAST



Source: Parametrix, 2024.

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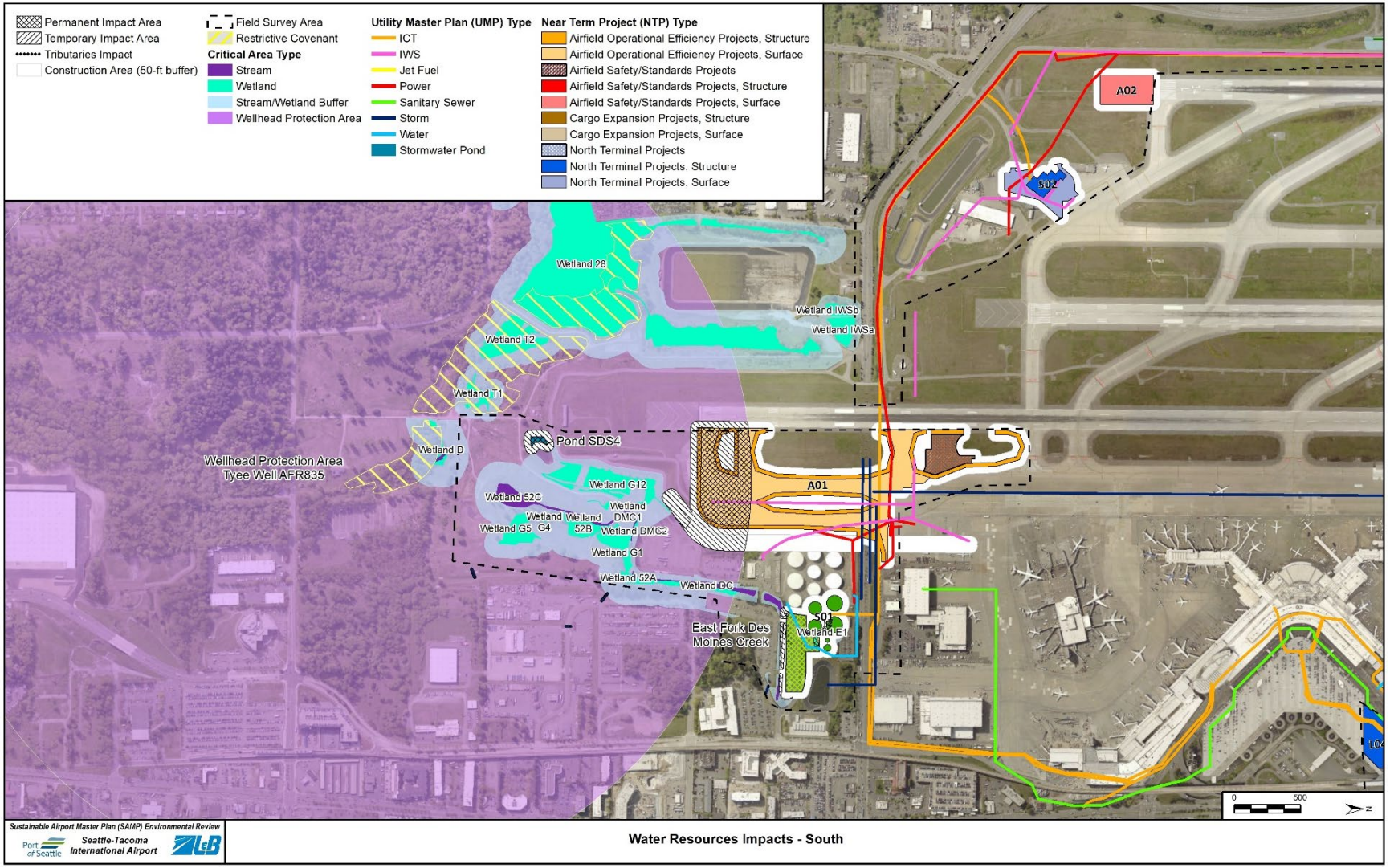
EXHIBIT 4.4.14-3: WATER RESOURCE IMPACTS – SOUTH



Source: Parametrix, 2024.

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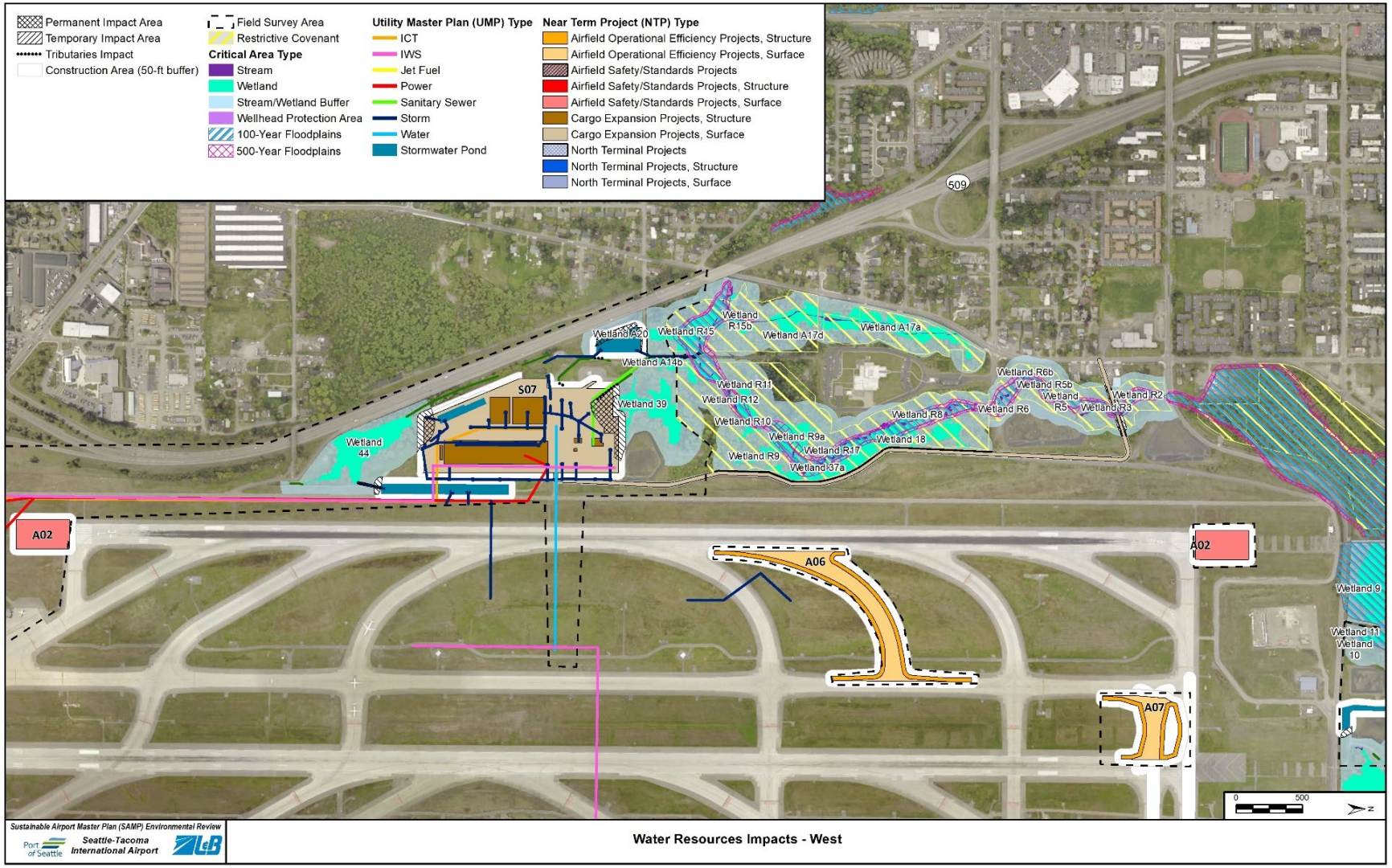
EXHIBIT 4.3.14-4: WATER RESOURCES IMPACTS – WEST



Source: Parametrix, 2024.

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The Action Alternatives would also result in total permanent wetland buffer impacts of 2.66 acres (**Table 4.3.14-2**). The requirement to provide compensatory mitigation for buffer impacts is guided by local critical area ordinances. The FAA and Port have 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 4.3.14-2: 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
Grand Total*	**2.66**	

Note: Table 4.3.14-2 was Table 4-32 in the NEPA Final EA.

* 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 acre of wetlands and 3.43 acres of wetland buffers (**Table 4.3.14-3**)[43]. 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.

[43] These numbers reflect all wetlands delineated and/or verified during the 2019-2024 wetlands delineations and verifications. What portions of delineated wetlands are deemed jurisdictional under applicable federal, state and local programs has been evolving and continues to evolve during development of the NEPA EA and this SEPA EIS. The specific acreages of wetlands subject to regulations will be determined when the Port proceeds with permits to impact those wetlands.

TABLE 4.3.14-3: 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
Grand Total*	**0.21**	**N/A**	**N/A**	**3.43**

Note: Table 4.3.14-3 was Table 4-44 in the NEPA Final EA.

* 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).

Minimization and Mitigation Measures

Minimization

Avoidance and minimization measures would be implemented, as practicable, during project design of the NTPs. 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 meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to BMPs in adherence with applicable federal, state, and local regulations.

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, state, and local requirements and guidelines. These guidelines are listed in the USACE and the USEPA's *Compensatory Mitigation for Losses of Aquatic Resources*,[44] and the WSDE interagency guidance contained in *Wetland Mitigation in Washington State: Parts 1 and 2*.[45]

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,

[44] 33 Code of Federal Regulations (CFR) Part 332 / 40 CFR Part 230.

[45] 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).

11 acres of wetland enhancement, almost 8 acres of preservation, and 80 acres of buffer enhancement.

Table 4.3.14-4 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 would comply with the compensatory mitigation ratios recommended by an interagency review committee composed of the USACE, USEPA, and WSDE.[46] For the purposes of this evaluation, it is conservatively assumed that all buffer impacts would be mitigated by reestablishing 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 4.3.14-4: 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)[1] Facilities	0.23 / III	0.46	0.92	1.84
Wetlands (permanent)[1] Storm Lines	0.01 / III	0.02	0.04	0.08
Wetlands (permanent)[1] Utility Lines	0.01 / II	0.03	0.06	0.12
Wetlands (permanent)[1] Stormwater Ponds	0.55 / III	1.10	2.75	4.40
	Total Areas*	**1.61**	**3.77**	**6.44**
Wetland (temporary)[2] Facilities	0.21 / III	N/A	N/A	N/A
Wetland (temporary)[2] Storm Lines	0.00	N/A	N/A	N/A
Wetland (temporary)[2] Utility Lines	0.00	N/A	N/A	N/A
Wetland (temporary)[2] Stormwater Ponds	0.00	N/A	N/A	N/A
	Total Areas*	**N/A**	**N/A**	**N/A**
Wetland Buffer (permanent)[3] Facilities	N/A	2.31	2.31	2.31
Wetland Buffer (permanent)[3] Storm Lines	N/A	0.24	0.24	0.24
Wetland Buffer (permanent)[3] Stormwater Ponds	N/A	0.11	0.11	0.11
	Total Areas*	**2.66**	**2.66**	**2.66**

Note: Table 4.3.14-4 was Table 4-45 in the NEPA Final EA.

* 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.
[1] Impacts to permanent wetlands would be permitted through the USACE.
[2] Temporary impacts to wetlands will be restored to their current state after construction.
[3] 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.

[46] Ibid.

The Port committed to the following measures as part of the FAA's FONSI/ROD:

- Developing a compensatory wetland mitigation plan to avoid and minimize wetland impacts.
- Obtaining all applicable permits prior to construction, including, but not limited to, a USACE Section 404 permit for discharge of dredged or fill material into waters of the US as well as a NPDES permit.
- Ensuring no vehicle or material storage occurs in wetland areas or other sensitive areas.

4.3.14.3 Surface Waters

Methods

Impacts were calculated by overlaying the footprint of the NTPs and associated utility features with mapped surface waters. Sources of mapped surface waters used in this analysis include:

- Streams delineated within the study areas (see Appendix M).
- Stream mapping provided by the Port for areas that extend outside of the delineation study areas.
- Stream buffers based on the SeaTac Municipal Code standards.

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes that would result in new effects to surface waters in response to continuing increases in operations under the No Action Alternative.

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 acre of streams and 0.01 acre of potentially jurisdictional ditches as a result of construction related activities (**Table 4.3.14-5**). 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 4.3.14-5: 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
Grand Total*	**0.02**		**0.12**

Note: Table 4.3.14-5 was Table 4-46 in the NEPA Final EA.

* 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 4.3.14-1 through **4.3.14-4** 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 acre 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 acre of Miller Creek. The Action Alternatives would also result in temporary stream buffer impacts totaling 0.20 acre. 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 4.3.14-6** identifies temporary stream and stream buffer impacts by project.

TABLE 4.3.14-6: 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
Grand Total*	**0.08**	**0.20**

Note: Table 4.3.14-6 was Table 4-47 in the NEPA Final EA.

* 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 deicing 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 September 1, 2021 and July 2, 2021, respectively. There were no changes to the NPDES permit; the renewed IWD permit has reduced effluent limits, effective October 1, 2022.

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 minimization and mitigation measures described below, 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.

Minimization and Mitigation Measures

Minimization

To minimize impacts from the Action Alternatives, the Port would meet all applicable regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal, state, and local 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 stormwater basins. 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.

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.[47] 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 4.3.14-7**). 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.

[47] 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 4.3.14-7: PLANNED STORMWATER CONTROLS BY AREA

Drainage Basin / Area Served[1]	Stormwater Controls to be Added / Modified[2]
SDW1b	• Expand detention volume by 4.4 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration. • Provide source controls where required, including oil / water separator.
SDW2	• 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). • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required, including oil / water separator.
SDE4 & SDE4X	• Expand detention volume by up to 2.0 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration. • Provide source controls where required, including oil / water separators. • Install canisters for water quality treatment.
SDN2/3/4	• Expand detention volume by up to 4.7 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration at SR 518 pond to offset storage requirements. • Provide source controls where required.
SDS4	• Expand detention volume by 0.1 acre-feet to address development within subbasin only (assuming no diversion from SDS3 / 5). • Expand bioretention swale footprint by 90 square feet or provide equivalent detention and treatment alternative. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required.
SDD05B	• Expand detention volume by 2.3 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required.
SDD06A	• Expand detention volume by 6.4 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required.

TABLE 4.3.14-7: PLANNED STORMWATER CONTROLS BY AREA (CONTINUED)

Drainage Basin / Area Served[1]	Stormwater Controls to be Added / Modified[2]

New Development North of SR 518	• Integrate on-site low impact development techniques as feasible.
	• Pursue opportunities for shallow / deep infiltration to offset storage requirements.
	• Provide source controls where required.
	• Implement local detention facilities and water quality treatment as follows:
	  ○ Offsite Cargo Phase 1 C02 and Offsite Cargo Phase 2 C03 – 14.1 acre-feet
	  ○ North GT Holding Lot (L05),[3] Employee Parking (L07), and CRDC (S10)[4] – 7.7 acre-feet

Note: Table 4.3.14-7 was Table 4-48 in the NEPA Final EA.

[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).

The Port committed to the following measures as part of the FAA's FONSI/ROD:

- Minimizing take associated with water quality degradation in Puget Sound from stormwater and wastewater discharges as described in the proposed action.
- Ensuring the project does not exceed the design specifications and creates no more than 51 acres of pollutant generating impervious surface (PGIS), unless otherwise coordinated with FAA, NMFS West Coast Region, and USFWS. The Port will be responsible for tracking development of the Proposed Action and amount of PGIS and notify the FAA if the Proposed Action will exceed 51 net acres of PGIS (for those projects that the FAA has authority over) prior to construction of the excess PGIS. The FAA will be responsible for coordinating with NMFS and/or USFWS if the PGIS exceeds 51 net acres.
- Providing the FAA with an as-built report including the total acres of PGIS within 30 days following project completion. The FAA will be responsible for coordinating the report with NMFS and USFWS. The FAA shall provide an as-built report including the total area of PGIS to NMFS within 90 days following project completion. This report should be sent to projectreports.wcr@noaa.gov including "Attn: WCRO2025-01881" within the subject line.
- Carrying out the operation and maintenance plans described in the Seattle-Tacoma International Airport Stormwater Pollution Prevention Plan (Port of Seattle 2022 or most recent) to ensure that facilities or systems that are used to manage stormwater and wastewater at SEA are properly operated and maintained. The Port shall maintain records of inspection and maintenance to document compliance with the standards provided in the Seattle-Tacoma International Airport Stormwater Pollution Prevention Plan (Port of Seattle 2022 or most recent). Records do not need to be provided to NMFS unless requested.
- The Port will submit reports to the FAA and the USFWS each biennium, or as agreed to and documented, for the record. Each report shall document the most recently implemented NTPs (and SDS or IWS improvements) and shall include a quantification of associated new and replaced PGIS. Reports shall be submitted to the Washington Fish and Wildlife Office in Lacey, Washington (WashingtonFWO@fws.gov) and copied to the Assistant Field Supervisor or assigned lead consultation biologist by December 31 of each year that activities are completed.

- Utilizing Best Management Practices (BMPs) to limit impacts during construction. This includes, but is not limited to, utilizing BMPs to minimize surface transportation impacts, protect against sediment and soils entering nearby streams or creeks, reduce construction noise, and minimize increases in air emissions and water usage.

4.3.14.4 Floodplains

Methods

Impacts were calculated by overlaying the footprint of the NTPs and associated utility features with FEMA floodplain mapping.[48]

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. While the Port periodically initiates construction projects intended to address operational and efficiency needs, the Port does not anticipate making any changes that would result in new effects to floodplains in response to continuing increases in operations under the No Action Alternative.

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

The Action Alternatives would not directly impact any floodplains or adversely affect any beneficial floodplain values. Two of the NTPs, Employee Parking Structure (L07) and CRDC (S10), are near floodplains but would not extend into the adjacent 100- or 500-year floodplain areas. The S. 157th Place access road included as part of the Westside Maintenance Project (S07) includes replacing a culvert and paving within a 100- and 500-year floodplain. The culvert would be designed to maintain the conveyance and storage capacity of the existing floodplain. Therefore, the Action Alternatives would not result in significant impacts to the floodplain because they would not result in (1) a considerable probability of loss of human life, (2) likely future damage associated with the encroachment that could be substantial in cost or extent, or (3) a notable adverse impact on the floodplain's natural and beneficial floodplain values.

Minimization and Mitigation Measures

Minimization

To minimize impacts from the Action Alternatives, 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).

Mitigation

The Port committed to the following measure as part of the FAA's FONSI/ROD:

- Designing the S. 157th Place access road and culvert replacement as part of S07 to maintain the conveyance and storage capacity of the existing floodplain.

[48] FEMA, n.d., Flood Map Service Center: Welcome! Available for review at: https://msc.fema.gov/portal/home.

4.3.14.5 Groundwater

Methods

Impacts were calculated by overlaying the footprint of the NTPs and associated utility features with mapped WHPA from King County[49] and the City of SeaTac.[50]

Alternative 1: No Action

Under the No Action Alternative, the Port would continue to operate SEA without the NTPs. The Port would not make any changes to groundwater, aquifers, or WHPAs that would cause exceedances of groundwater quality standards or contaminate aquifers used for public water supply in response to continuing increases in operations under the No Action Alternative.

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,[51] 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 Action Alternatives 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 WADOH 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.

Construction and operation of the Action Alternatives 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 would monitor groundwater during and following completion of construction. Therefore, no significant impacts to groundwater are anticipated.

[49] King County, n.d., King County GIS Open Data – Wellhead Protection Areas. Available for review at: King County WHPAs.
[50] City of SeaTac, 2024, City of SeaTac, Washington's Data Hub. Available for review at: City of SeaTac WHPAs, accessed on February 8, 2024.
[51] WAC 246-290-130 (WAC text) and WAC 246-290-135 (WAC text 2), accessed March 6, 2024.

Because the Action Alternatives 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 Minimization and Mitigation Measures) would reduce the likelihood that wells or WHPA would be adversely impacted during the construction or operation of the Action Alternatives.

Minimization and Mitigation Measures

Minimization

Potential impacts to groundwater resources due to construction and operation of the Action Alternatives 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.[52] 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.

Mitigation

The Port committed to the following measure as part of the FAA's FONSI/ROD:

- Monitoring contaminant levels in groundwater during and following completion of construction.

4.3.15 Public Services and Utilities

This section describes the potential adverse impacts to public services and utilities associated with the Proposed Action and alternatives. As previously noted in Section 3.3.16, aspects of this topic were also evaluated in several sections of the NEPA EA. These include the discussion of potential water supply impacts in Section 4.3.9 and the discussion of potential impacts to emergency services in Section 4.3.11. This SEPA EIS incorporates by reference the applicable portions of the NEPA EA and provides additional information on emergency services, water utilities, and sewer utilities. Electrical utilities are discussed in Section 4.3.9, Energy and Natural Resources. In Chapter 3, **Table 3.3.15-1** lists the EIS location of the analysis of public services and utilities that was drawn from the NEPA EA.

4.3.15.1 Impact Considerations

NEPA – Significant Impact Threshold

FAA Order 1050.1 does not require an analysis of impacts to public services and utilities that corresponds to the analysis required by SEPA. Therefore, there are no applicable impact thresholds under NEPA.

SEPA – Impact Considerations

The NTPs were assessed to determine whether the Action Alternatives would result in additional demands on public services and utilities that would exceed the anticipated capacity of the service providers.

4.3.15.2 Methods

Impacts on emergency services and water and sewer utilities were evaluated based on the projected increase in the number of passengers at SEA under future conditions and on new service required

[52] These are discussed in more detail in Appendix F.

because of NTP facilities. Where the Action Alternatives would increase the levels of service compared to No Action (for example, with respect to fire response capabilities), those increased levels of service were considered in the impact analysis.

4.3.15.3 Public Services and Utilities Impacts

Alternative 1: No Action

Emergency Services

Under the No Action Alternative, the number of passengers utilizing SEA would increase. Therefore, the need for emergency services would also increase. The existing Port Fire and Police departments would be prepared to handle the increased calls for service. Staffing level decisions consider call volumes; based on the increase in calls, it would be necessary to hire additional staff and provide additional facilities to meet FAA requirements.

Water Utility

Because the total number of passengers utilizing SEA is expected to continue to increase, there would be additional demand on water supply associated with this alternative (see **Table 4.3.15-1**). There is an ample supply of water to accommodate this increase in demand.

TABLE 4.3.15-1: PROJECTED WATER USAGE (GALLONS)

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

Note: Table 4.3.15-1 was Table 4-30 in the NEPA Final EA.

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

As with water, sewer demand would also be expected to increase under the No Action Alternative. The Airport's sewer infrastructure is capable of meeting the increased demand.

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

Emergency Services

The Primary ARFF Facility (S02) is proposed to replace the existing ARFF facility that would be displaced by the North Gates NTP (T01). The Secondary ARFF Facility (S03) would provide ambulatory response to the terminals and concourses, fuel spill and fire response to the concourse ramp areas, and backup emergency response to the airfield. The Secondary ARFF would allow first responders to reach airfield incidents more quickly. Therefore, the Action Alternatives would have a beneficial impact on emergency service provision.

Water Utility

The Action Alternatives would result in an increase in demand for water compared to the No Action Alternative. **Table 4.3.15-1** shows estimated future water usage, which was calculated based on the projected number of future passengers and the average gallons used per passenger. The increase in water usage compared to No Action would be approximately 2% in 2032 and approximately 7.7 % in 2037. In addition to passenger use, water service would be required at new facilities constructed as part of the NTPs. Because there is an ample supply of water to handle this increase in demand, no significant impact related to water usage would occur.

Demands on utilities may increase slightly during construction of the NTPs. Water would primarily be provided by water trucks, but some projects may use Port-supplied water, which would increase demand on the local utility. However, this demand would be minimal and temporary in nature and would not create a significant impact on local utilities.

Sewer Utility

As with water utilities, the Action Alternatives would result in increased demand for sewer service compared to No Action due to the increase in passengers. This increase would generally be proportional to the increase in water demand. Sewer service would also be required at new facilities constructed as part of the NTPs. There is adequate capacity in the sewer system to handle this increase in demand and would not create a significant impact on sewer utilities.

Based on the analysis described above there would be no significant impacts to public services and utilities.

4.3.15.4 Minimization and Mitigation Measures

Minimization

No minimization measures are proposed.

Mitigation

The Port committed to the following measure as part of the FAA's FONSI/ROD:

- Utilizing Best Management Practices (BMPs) to limit impacts during construction. This includes, but is not limited to, utilizing BMPs to minimize surface transportation impacts, protect against sediment and soils entering nearby streams or creeks, reduce construction noise, and minimize increases in air emissions and water usage.