King County Comprehensive Solid Waste Management Plan Update

Draft Supplemental Environmental Impact Statement

October 2026

King County
Department of Natural Resources and Parks
Solid Waste Division
waste prevention • resource recovery • waste disposal

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Fact Sheet

Project Title

King County Comprehensive Solid Waste Management Plan Update

Nature and Location of Proposed Action and Alternatives

The King County Department of Natural Resources, Solid Waste Division, proposes to update the 2019 King County Comprehensive Solid Waste Management Plan (March 2019).

Location

King County, Washington

Proponent

King County Department of Natural Resources, Solid Waste Division

Responsible Official and Lead Agency

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Required Approvals

The King County Comprehensive Solid Waste Management Plan Update is required to be adopted by King County Ordinance.

Authors and Principal Contributors

This Draft Supplemental Environmental Impact Statement (SEIS) has been prepared under the direction of the King County Executive. Authors and contributors to the Draft SEIS include staff from the King County Solid Waste Division and Parametrix, Inc.

Date of Draft SEIS Issuance

October 6, 2026

Comment Deadline for Draft SEIS

November 20, 2026

Commenting on the Draft SEIS

Comments may be submitted through several methods as noted below:

Mail. Comments sent by mail should be addressed to King County Solid Waste Division, Attn: Patty Liu, Project Manager, 201 S Jackson Street, Suite 6400, Seattle, WA 98104-3855.

Email. Please send comments to the State Environmental Policy Act responsible official at swdcompplan@kingcounty.gov.

Public Meetings. Public meetings will be held to share information about the King County Comprehensive Solid Waste Management Plan update and to obtain input from the community. Participants will be able to provide comments on the Draft SEIS.

- Thursday, October 22, 2026, from 6 to 7 p.m.
  Kent Commons Community Center (Olympic Room), 525 4th Avenue N, Kent, WA 98030
- Tuesday, October 27, 2026, from 6 to 7 p.m.
  White Center Library, 1409 SW 107th Street, Seattle, WA 98146
- Thursday, October 29, 2026, from 12 to 1 p.m.
  Via Zoom, https://us06web.zoom.us/j/82109140166
  Prior registration not necessary
- Tuesday, November 3, 2026, from 6 to 7 p.m.
  Third Place Commons, 17171 Bothell Way NE, Lake Forest Park, WA 98155
- Tuesday, November 10, from 6 to 7 p.m.
  Highland Middle School, 15027 Bel-Red Road, Bellevue, WA 98007

Comments will be accepted both in written and verbal form. A court reporter will be present at all in-person meetings and via breakout room during the virtual public meeting.

Spanish interpretation will be available during the virtual public meeting. Additional interpreters will be available for in-person meetings when requested at least 72 hours in advance. Interpretation requests can be sent to swdcompplan@kingcounty.gov or by phone to 206-477-4466, TTY: 711.

Date of Final SEIS Issuance

King County anticipates issuing a Final SEIS by mid-2027.

Timing of Final Agency Action

The King County Council is anticipated to approve the King County Comprehensive Solid Waste Plan Update in October 2029.

Type and Timing of Subsequent Environmental Review

No subsequent environmental review is expected for the Comprehensive Solid Waste Management Plan update. Subsequent project-level environmental review will be completed, as needed, for project actions occurring under the updated plan.

Location of Background Information

Background and supporting information not included with this Draft EIS is on file with the King County Solid Waste Division and can be made available on request.

Draft SEIS Availability

This Draft SEIS is available for review on King County's website, and paper copies of the document are available at King Street Center, 201 S Jackson Street, Seattle, Washington, and all King County Library full-service locations (drop box locations have been excluded) during normal business hours.

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Acronyms and Abbreviations

ADT	average daily trips
BMP	best management practice
BNSF	BNSF Railway
C&D	construction and demolition
CARA	critical aquifer recharge area
CETA	Washington State Clean Energy Transformation Act
CFR	Code of Federal Regulations
CHRLF	Cedar Hills Regional Landfill
dBA	A-weighted decibel
Ecology	Washington State Department of Ecology
EIA	U.S. Energy Information Administration
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPR	Extended Producer Responsibility
feet/vehicle	feet per vehicle
GHG	greenhouse gas
GMA	Growth Management Act
ILA	interlocal agreement
IMF	intermodal facility
K	thousand
KCC	King County Code
MSW	municipal solid waste
$MTCO_2e$	metric tons of carbon dioxide equivalent
MWP	mixed waste processing
NAAQS	National Ambient Air Quality Standards
NPDES	National Pollutant Discharge Elimination System

plan	King County Comprehensive Solid Waste Management Plan
$PM_{2.5}$	particulate matter with diameters generally 2.5 micrometers and smaller
PSCAA	Puget Sound Clean Air Agency
RCW	Revised Code of Washington
RNG	renewable natural gas
SEIS	supplemental environmental impact statement
SEPA	State Environmental Policy Act
SMP	Shoreline Master Program
SWD	King County Solid Waste Division
TAP	toxic air pollutant
UPRR	Union Pacific Railroad
USC	U.S. Code
vehicle/day	vehicles per day
WAC	Washington Administrative Code
WEBR	waste export by rail

1. Summary

1.1 Proposed Action

The King County Solid Waste Division (SWD) provides garbage transfer, disposal, and recycling services for approximately 1.9 million people across King County, serving the unincorporated areas of the county and 37 of its 39 incorporated cities (all cities except the cities of Seattle and Milton). SWD proposes to update the King County Comprehensive Solid Waste Management Plan (plan), which will guide municipal solid waste (MSW) management for the next 6 years and addresses long-term disposal after the Cedar Hills Regional Landfill (CHRLF) reaches capacity. King County (County) prepared the Final Environmental Impact Statement (EIS) in 2019 for the adoption of its 2019 plan (King County 2019). This Draft Supplemental EIS (SEIS) serves as a supplement to the 2019 Final EIS and addresses additional or new potential impacts associated with King County's current proposed plan update and long-term disposal alternatives.

1.2 Proposed Plan Amendments

1.2.1 Circular Economy (Sustainable Materials Management)

The plan update would rename and revise the Sustainable Materials Management chapter to emphasize a circular economy approach. The proposed amendments focus on minimizing waste, reducing demand for virgin materials, increasing reuse and resource recovery, and incorporating socially responsible practices into materials management.

The amendments would expand education and assistance related to composting, upstream waste reduction, green building, deconstruction, building-material reuse, recycling, and organics collection. They would also support implementation of Washington's Extended Producer Responsibility (EPR) program for packaging and paper products.

The updates to the Circular Economy chapter of the plan are within the range of alternatives as described in the 2019 EIS and are not anticipated to result in significant adverse environmental impacts.

1.2.2 Solid Waste Transfer and Processing System

The proposed amendments would emphasize safe, equitable, reliable, and flexible transfer services. They would support periodic evaluation of transfer station service levels, improved access to recycling, emergency debris planning, resource recovery, sustainable facility design, customer service, and operational efficiency.

The amendments primarily emphasize improving existing facilities and operations rather than developing major new transfer facilities.

The updates to the Solid Waste Transfer and Processing System chapter of the plan are within the range of alternatives as described in the 2019 EIS and are not anticipated to result in significant adverse environmental impacts.

1.2.3 Landfill Management and Solid Waste Disposal

The principal new decision addressed in the Draft SEIS is how SWD would manage MSW after the CHRLF reaches capacity. SWD commissioned a study of five disposal technologies, which was documented in the 2025 King County Long-Term Waste Disposal Options Study: waste export by rail (WEBR), mass burn,

gasification, pyrolysis, and refuse-derived fuel (King County 2025a). Gasification, pyrolysis, and refuse-derived fuel were determined not to be feasible for King County's waste stream. These technologies have not been proven at the scale needed to meet the County's disposal needs and are better suited to process homogenous feedstock (e.g., all plastics) not the more varied waste stream from municipalities. Therefore, the Draft SEIS evaluates WEBR, mass burn with ash disposal by WEBR, and a hybrid of the two approaches using a smaller mass burn facility. For the purposes of evaluating and comparing alternatives in this Draft SEIS, SWD is using an assumed tonnage and waste diversion scenario of 666,950 tons of waste annually.

Under each alternative, MSW would be collected from residents, businesses, and other sources. From the transfer stations, MSW would then be hauled to a new, central mixed waste processing (MWP) facility, where it would be sorted to remove potentially reusable or recyclable materials from the waste stream. All alternatives would require siting, constructing, and permitting the new MWP facility. From the MWP facility, MSW would be transported to an intermodal facility (IMF) to be exported by rail or to a mass burn facility to be processed with residual ash exported by rail, as described in more detail below.

1.2.3.1 Description of the Alternatives

Alternative 1: WEBR (No Action)

Under Alternative 1: WEBR, MSW would be transported by rail from an IMF facility in King County to an existing regional landfill in eastern Washington or Oregon. This alternative would rely primarily on existing rail, intermodal, and landfill infrastructure to provide efficient, cost-effective waste transport and disposal (King County 2025a). While SWD does not currently export MSW by rail, it was included as part of Alternative 1: WEBR (No Action) in the 2019 Final EIS, which was to "complete Cedar Hills Regional Landfill as currently permitted, then export to an out-of-county landfill" (King County 2019).

Alternative 2: Mass Burn + Ash Export

Under Alternative 2: Mass Burn + Ash Export, King County's MSW would be preprocessed and incinerated at a new mass burn waste-to-energy facility. Based on the King County Long-Term Waste Disposal Options Study (King County 2025a), burning 666,950 tons of waste at such a facility would generate approximately 685.8 million megajoules of energy annually, equivalent to the annual electricity use of approximately 17,650 homes. Approximately 20% of the processed material, or 133,400 tons annually, would remain as bottom ash and fly ash requiring disposal by rail at a permitted ash monofil, which is a specialized landfill that accepts only one type of material. Approximately 5% of the material, or 33,350 tons annually, is estimated to be recoverable for recycling.

This alternative would reduce the amount of material transported to regional landfills and has the lowest estimated global warming potential—18,395 metric tons of carbon dioxide equivalent ($MTCO_2e$)—after accounting for energy-generation offsets (King County 2025a). However, it would require siting, constructing, and permitting a new mass burn facility and controlling emissions from the combustion process.

Alternative 3: Hybrid

Alternative 3 would combine WEBR with a smaller mass burn facility. Approximately 367,200 tons of MSW would be processed at the mass burn facility, while approximately 299,750 tons of unprocessed waste would be exported by rail to the same landfills mentioned in Alternative 1. Incineration would produce approximately 73,440 tons of ash requiring disposal by rail and approximately 18,360 tons of recoverable

metal for recycling. The facility would generate approximately 134.5 million megajoules of energy annually, equivalent to the annual electricity use of approximately 3,500 homes (King County 2026b).

Table 1.2-1 summarizes the differences between the three alternatives.

Table 1.2-1. Summary of Proposal Alternatives

Factor	Alternative 1: WEBR (No Action)	Alternative 2: Mass Burn + Ash Export	Alternative 3: Hybrid
Annual MSW evaluated	666,950 tons	666,950 tons	666,950 tons
Primary approach	Export MSW to existing regional landfills by rail	Process MSW at a mass burn facility and export residual ash by rail	Process part of the MSW at a smaller mass burn facility and export the remainder by rail
MSW processed by mass burn	None	666,950 tons	367,200 tons
MSW exported by rail	666,950 tons	None	299,750 tons
Ash exported by rail	Not applicable	133,400 tons	73,440 tons
Metals recovered	Not applicable	33,350 tons	18,360 tons
Estimated energy production [a]	None	685.8 million megajoules, equivalent to 17,650 homes	377.4 million megajoules, equivalent to 9,700 homes

Source: King County 2025a, King County 2026b

CETA = Washington State Clean Energy Transformation Act; MSW = municipal solid waste; WEBR = waste export by rail.

[a] Due to the 2019 CETA, energy produced by the mass burn facility cannot be sold for retail use within Washington but could be used on-site or sold to markets outside of Washington.

1.2.3.2 Summary of Impacts, Mitigation Measures, and Significant Unavoidable Adverse Impacts

Table 1.2-2 summarizes the impacts, avoidance and minimization measures, and the potential for significant unavoidable adverse impacts related to the long-term disposal alternatives considered in the plan update.

Table 1.2-2. Summary of Impacts, Mitigation, and Significant Unavoidable Adverse Impacts

Alternatives for Landfill Management and Solid Waste Disposal	Impacts, Mitigation, and Significant Unavoidable Adverse Impacts
Alternative 1: WEBR (No Action)	**Impacts and Mitigation** • Construction and operation of a new MWP facility would cause localized earthwork, dust, runoff, vegetation disturbance, noise, traffic, and land use impacts. Impacts would be reduced through the siting, permitting, and development review process; use of BMPs; and stormwater management. Any new MWP facility would undergo a project-level environmental review and permitting process to identify environmental impacts and appropriate avoidance, minimization, and mitigation measures. • Increased rail activity would increase fuel use and emissions and traffic near intermodal, MWP, and landfill facilities. It would also result in additional delays and vehicle queuing at at-grade rail crossings. The use of existing rail, intermodal, and landfill infrastructure and the use of sealed waste containers and operational controls, such as running trains during low traffic periods, would reduce impacts. • Alternative 1 would have a non-renewable energy demand of approximately 580 million megajoules (approximately 73 million for transport needs). • Alternative 1 would generate approximately 55,600 $MTCO_2e$ of GHG emissions annually. **Significant Unavoidable Adverse Impacts** • With the implementation of available avoidance, minimization, and mitigation measures, there would be no significant unavoidable adverse impacts.
Alternative 2: Mass Burn + Ash Export	**Impacts and Mitigation** • Construction and operation of a new MWP and mass burn facility would cause localized earthwork, dust, runoff, vegetation disturbance, noise, traffic, and land use impacts. Impacts would be reduced through the siting, permitting, and development review process; use of BMPs; and stormwater management. Any new MWP and mass burn facility would undergo a project-level environmental review and permitting process to identify environmental impacts and appropriate avoidance, minimization, and mitigation measures. • Operation of a mass burn facility would reduce exported waste, generate energy, and recover metals; however, it would increase air emissions of toxic constituents, including carcinogens. Use of best available control technology such as filters would be required to maintain air quality compliance. • Export of left over bottom and fly ash to a permitted monofill would be required. • Wastewater, stormwater, and water use would be managed through treatment, use of BMPs, and reuse where feasible to maintain quality compliance. • Alternative 2 would have a non-renewable energy demand of approximately 610 million megajoules (approximately 14 million for transport needs); however, it would produce approximately 1.3 billion megajoules of energy for a net energy production of approximately 686 million megajoules. • Alternative 2 would generate approximately 18,400 $MTCO_2e$ of GHG emissions annually. **Significant Unavoidable Adverse Impacts** • With the implementation of available avoidance, minimization, and mitigation measures, there would be no significant unavoidable adverse impacts.

Alternatives for Landfill Management and Solid Waste Disposal	Impacts, Mitigation, and Significant Unavoidable Adverse Impacts
Alternative 3: Hybrid	**Impacts and Mitigation** • Construction and operation of a new MWP and mass burn facility would cause localized earthwork, dust, runoff, vegetation disturbance, noise, traffic, and land use impacts. Impacts would be reduced through the siting, permitting, and development review process; use of BMPs; and stormwater management. Impacts would be slightly less than Alternative 2 with a smaller mass burn facility. Any new MWP and mass burn facility would undergo a project-level environmental review and permitting process to identify environmental impacts and appropriate avoidance, minimization, and mitigation measures. • Operation of a mass burn facility would reduce exported waste, generate energy, and recover metals; however, it would increase air emissions of toxic constituents, including carcinogens. Use of best available control technology such as filters would be required to maintain air quality compliance. • Export of left over bottom and fly ash to a permitted monofill would be required. • Increased rail activity would increase fuel use, emissions, and traffic near intermodal and landfill facilities. It would also increase traffic delays and vehicle queuing at at-grade rail crossings. The use of existing rail, intermodal, and landfill infrastructure and the use of sealed waste containers and operational controls, such as operating trains during low-traffic periods, would reduce impacts. • Impacts would be split between the mass burn facility and export system rather than concentrated in one disposal method. • Alternative 3 would have a non-renewable energy demand of 596 million megajoules (approximately 40.5 million megajoules for transport needs); however, it would produce approximately 730.5 million megajoules of energy, for a net energy production of approximately 134.5 million megajoules. • Alternative 3 would generate approximately 35,100 $MTCO_2e$ of GHG emissions annually. **Significant Unavoidable Adverse Impacts** • With the implementation of available avoidance, minimization, and mitigation measures, there would be no significant unavoidable adverse impacts.

BMP = best management practice; GHG = greenhouse gas; MSW = municipal solid waste; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MWP = mixed waste processing; WEBR = waste export by rail.

2. Introduction

2.1 Objectives of the Proposal

SWD provides garbage transfer, disposal, and recycling services for approximately 1.9 million people across the County, serving the unincorporated areas of the county and 37 of its 39 incorporated cities (all cities except the cities of Seattle and Milton). SWD does not provide waste management services on Tribal lands.

SWD proposes to update its Comprehensive Solid Waste Management Plan. The overall purpose of the plan update is to describe strategies for managing King County's solid waste over the next 6 years, with consideration of the next 20 years, in compliance with Washington State requirements for comprehensive solid waste planning under Chapter 70A.205 of the Revised Code of Washington (RCW) and its implementing regulations in Washington Administrative Code (WAC) chapters 173-304, 173-350, and 173-351.

Specific objectives of this proposal are to revise goals, policies, and actions in the plan update to achieve the following:

- Respond to King County policy directives relevant to solid waste management that have been introduced since the 2019 plan.
- Meet customer service needs while being cost efficient with resources.
- Maximize cost-effective waste prevention, waste reduction, and recycling while maintaining adequate transfer and disposal capabilities for nonrecycled waste.
- Prepare for alternative disposal options to the CHRLF, which is anticipated to reach capacity by 2040.
- Design, operate, and maintain the solid waste system in a manner that protects the environment and conserves energy and natural resources.
- Comply with federal, state, and local regulations governing solid waste management.
- Respond to issues raised by the public, partner cities, unincorporated area councils, the Solid Waste Advisory Committee, the Metropolitan Solid Waste Advisory Committee, and the solid waste industry as part of the public involvement process for the plan.

Taken together, the plan sets out how King County's vision for healthy, safe, thriving communities in a waste-free King County can be realized.

2.2 Background

The need for the plan update is to comply with Washington State requirements for comprehensive solid waste planning under Chapter 70A.205 RCW and its implementing regulations in chapters 173-304, 173-350, and 173-351 WAC. Under RCW 70A.205.035, cities may either prepare their own plans or participate in the development of a single plan that covers the incorporated and unincorporated areas of the county. Within King County, 37 cities (all cities in the county except the cities of Seattle and Milton) chose to participate in the development of a single plan and signed interlocal agreements (ILAs) with King County that establish King County as the solid waste planning authority. The original ILAs were 40-year agreements with an expiration of 2028. The ILAs have subsequently been extended through 2040.

King County last updated and adopted its plan in 2019 and developed an EIS in compliance with the State Environmental Policy Act (SEPA) to support adoption of the plan (King County 2019). This Draft SEIS serves as a supplement to the 2019 Final EIS and addresses additional or new potential impacts associated with King County's current proposed plan update and long-term disposal alternatives.

In 2024, SWD, in collaboration with the cities, began preparation of the plan update. For the most part, the plan update proposes to continue the goals and policies of the 2019 plan with some minor modifications. One exception, however, is that King County must determine how to dispose of its MSW once the CHRLF reaches the end of its operational lifespan. SWD evaluated alternative options for long-term waste disposal as part of its planning process in 2019 but ultimately chose to extend the life of the landfill at that time.

2.3 Public Involvement and Scoping

King County conducted early public engagement to support scoping for the SEIS for the plan update. In June and early July 2025, King County held five public scoping meetings. Four in-person meetings were held at locations across King County, and one virtual meeting was offered to increase accessibility. Interpretation services were offered at all of the events. In addition, an online open house was available throughout the scoping period for community members who were unable to attend scheduled meetings. These meetings invited participants to comment on proposed disposal options and to identify priorities for analysis in the SEIS.

To promote awareness of and attendance at the scoping meetings, King County published social media posts and news releases and distributed updates through an email listserv. King County also placed advertisements and conducted outreach in coordination with ethnic media outlets. These efforts were intended to expand access to information and provide meaningful opportunities for participation by frontline communities and other historically underrepresented populations.

2.4 Benefits and Disadvantages of Reserving Implementation

SEPA rules require that an EIS evaluate the benefits and disadvantages of delaying implementation of the proposal. Attention is given to the potential for foreclosing future options by implementing the proposal (WAC 197-11-440).

The only apparent benefit of delaying adoption and implementation of the plan is that it would delay short-term construction and operational impacts associated with the new waste management facilities and processes. Disadvantages of a substantial delay in implementation include the following:

- A delay in opportunities to increase the diversion of material from the waste stream by improving existing waste prevention, waste reduction, recycling, and composting programs.
- A potential decline in service levels at King County transfer stations as population and employment in the area grow due to delayed facility and operational improvements.
- There would be less time to prepare for the landfill management and disposal options to be selected by King County and ILA partner cities, which could increase costs and potentially foreclose options due to insufficient time for implementation.

It is difficult to accurately predict the remaining capacity and lifetime of the CHRLF due to external factors such as population growth, recycling and reuse practices and policies, and large economic fluctuations that affect disposal rates. As a result of this uncertainty, King County is choosing to prepare, approve, and

adopt the plan update as soon as possible to allow more time for refinement or revision, especially if necessitated by public comment or unforeseen factors that affect the timeline for landfill closure.

2.5 Organization of the Draft SEIS

As stated above, in 2019 King County issued a Final EIS for the adoption of its 2019 plan (King County 2019). This document serves as a supplement to the 2019 Final EIS and addresses additional or new potential impacts associated with King County's proposed plan update. As with the 2019 Final EIS, this document is divided into the following sections corresponding to the different components of the regional solid waste system and the different chapters of the plan update:

- The Circular Economy (formerly Sustainable Materials Management.)
- Solid Waste Transfer and Processing System.
- Landfill Management and Solid Waste Disposal.

WAC 197-11-400(1) states that the purpose of an EIS is to "ensure that SEPA's policies are an integral part of the ongoing programs and actions of state and local government." Because the subject of this EIS is a proposed nonproject plan, as mandated by WAC 197-11-442, the level of detail of the analysis is consistent with the broad programmatic issues to be resolved. For example, while an analysis of the environmental impacts of each solid waste disposal alternative is provided, it is largely for the purpose of comparing the different alternatives, identifying the types of mitigation measures needed, if any, and determining whether any significant adverse impacts cannot reasonably be mitigated. More in-depth analysis of impacts cannot be completed until details of the alternatives are known, such as the size and location of specific facilities. SEPA requires that King County conduct additional environmental review for any government actions arising from the plan update, particularly those involving major capital improvements.

Where relevant, this Draft SEIS discusses the beneficial aspects of the plan alternatives; however, the benefits of the alternatives are not balanced against the negative aspects when disclosing the potential for significant adverse impacts. Based on the analysis in the SEIS as well as other relevant information and analysis in the plan update, King County and participating cities will select the facilities, programs, and services to be included in the regional solid waste management system over the next six to 20 years.

3. The Circular Economy (Sustainable Materials Management)

3.1 Description of Updates

The proposed policy amendments to the Circular Economy chapter of the plan (formerly the Sustainable Materials Management chapter) emphasize the importance of minimizing waste and integrating socially responsible practices into sustainable materials management. Specific updates include expanding educational opportunities related to composting, upstream waste reduction, and resource recovery; assisting cities with implementing green building policies, codes, and practices; supporting proper deconstruction requirements, building reuse, and the reuse of building materials; and promoting environmental stewardship by strengthening recycling and organics participation in multifamily communities.

3.2 Impacts and Mitigation Measures

The updates to the Circular Economy chapter of the plan are within the range of alternatives as described in the 2019 EIS.

The plan amendments are aimed at reducing emissions, decreasing the need for virgin materials, and regenerating natural systems. The updates encompass not only reducing, reusing, and recycling, but also improving design and production, making informed purchasing decisions, and transforming how products are managed at the end of their life cycle. EPR supports this approach by helping shift responsibility for product life-cycle management to producers.

EPR requires companies that make consumer products to fund the residential recycling system and ensure their packaging and paper products get recycled. SWD supported the adoption of a statewide EPR program for packaging and paper products, which resulted in the passage of the Recycling Reform Act in 2025, and will continue to support implementation to ensure a successful program launch in 2030 and beyond.

The amendments support expanded education, outreach, and infrastructure to increase waste prevention, recycling, and composting across King County's solid waste service area. In addition, they support the continued development of regional and local composting infrastructure, incentives, and outreach for single-family and multifamily residential developments, schools, institutions, businesses, and other nonresidential buildings.

King County would also work with cities to implement and enforce construction and demolition (C&D) material recycling and handling requirements, promote outreach for permitting and enforcement staff, explore options to increase diversion of materials, and help ensure C&D materials are managed in an environmentally sound and socially responsible manner.

These updates would result in additional environmental benefits beyond what would occur under the existing plan and are not anticipated to have significant adverse environmental impacts.

4. Solid Waste Transfer and Processing System

4.1 Description of Updates

The proposed updates to the Solid Waste Transfer and Processing System chapter of the plan would seek to develop safer, more equitable transfer stations, making recycling easier for everyone and focusing on multifamily residences. The updates would continue to support reliable transfer services, regional coordination, community engagement, and sustainable facility design while placing greater emphasis on customer service, operational efficiency, and resource recovery.

4.2 Impacts and Mitigation Measures

The updates to the Solid Waste Transfer and Processing System chapter of the plan are within the range of alternatives as described in the 2019 EIS.

The amendments seek to improve the safety, equity, reliability, and flexibility of the solid waste transfer and processing system. The amendments support periodic evaluation of transfer station level-of-service criteria to ensure the system continues to meet current and future community needs. They also strengthen emergency planning by prioritizing MSW services and recycling-related debris during emergency conditions. Rather than focusing on major new facilities, the amendments emphasize improving existing facilities, increasing customer service and efficiency, and supporting resource recovery and regional coordination. These changes help make the transfer system function more effectively as part of a broader sustainable materials management system.

These updates would result in additional environmental benefits beyond what would occur under the existing plan and are not anticipated to have significant adverse environmental impacts.

5. Landfill Management and Solid Waste Disposal

5.1 Description of Alternatives

In preparation for its plan update, SWD commissioned a comparative analysis of the following five different disposal methods, which was documented in the 2025 King County Long-Term Waste Disposal Options Study: 1) WEBR, 2) mass burn with residual WEBR, 3) gasification with residual WEBR, 4) pyrolysis with residual WEBR, and 5) refuse-derived fuel. The report compared the five disposal options across the following six main evaluation criteria: environmental, economic, operating history, logistics, social, and capacity. Further, each disposal method was evaluated across low-, medium-, and high-waste tonnage scenarios of 367,202 tons; 666,950 tons; and 1,018,367 tons, respectively, projected for the year 2040 when the CHRLF is anticipated to reach capacity (King County 2025a).

The tonnage scenarios incorporate different waste composition profiles based on anticipated diversion rates for items such as food, paper, and plastics, meaning those types of materials are removed from the waste stream to varying degrees. The high-tonnage scenario assumes minimal diversion rates, while the medium-and low-tonnage scenarios incorporate reductions in tonnage across different waste streams based on varying assumptions for diversion.

Through the analysis, King County determined that gasification, pyrolysis, and refuse-derived fuel disposal options would not be feasible for its waste stream, leaving WEBR and mass burn as the two viable alternatives. In addition, SWD decided to evaluate a third, hybrid alternative between WEBR and mass burn. The alternatives are described below.

For the purposes of evaluating and comparing alternatives in this Draft SEIS, SWD is using the medium-tonnage/medium-diversion scenario of 666,950 tons. The initial collection and transport process would be the same under all alternatives, meaning that MSW is collected from residents, businesses, and other sources and taken to a local transfer station. From the transfer stations, MSW would then be hauled to a new, central MWP facility, where it would be sorted to remove potentially reusable or recyclable materials from the waste stream. The size of the MWP facility site would be from 10 to 27 acres. From the MWP facility, MSW would be transported to an IMF to be exported by rail or to a mass burn facility to be processed with residual ash exported by rail, as described in more detail below.

5.1.1 Alternative 1: WEBR (No Action)

Under Alternative 1: WEBR, MSW would be exported by train to an out-of-county landfill. King County would enter into a contract with a waste company service provider, which would contract directly with the BNSF Railway (BNSF) or the Union Pacific Railroad (UPRR) to haul the waste to a regional landfill. WEBR is a common method of transporting MSW in the region; the City of Seattle and several neighboring jurisdictions, including Kitsap County, Thurston County, Skagit County, and Snohomish County, currently export their solid waste by rail.

Prior to export, MSW would be hauled from transfer stations to be preprocessed at a central MWP facility, then compacted and placed into 40- to 48-foot-long intermodal shipping containers, each capable of accommodating an average payload of 25 to 28 tons. The containers would be hauled to an IMF where they would be loaded on to rail cars to be transported to a regional landfill. The containers would be

double-stacked onto railroad well cars to maximize the payload per rail car and reduce transportation costs on a per-ton, per-intermodal-container and/or per-railroad-well-car basis (Figure 5.1-1). Under the medium-tonnage/medium-diversion scenario, it is estimated that BNSF or UPRR would need to add new train service three times a week to haul MSW to the one of the regional landfills or add additional rail cars to existing trains travelling to one of the landfills up to six times a week. Considering both outbound and inbound trips, this would result in up to 6 new train trips a week or up to 12 trips of longer trains hauling waste. See Section 5.2.8, Transportation for more detail on how the number of train trips was estimated.

Figure 5.1-1. Double-Stacked Rail Cars

For this analysis, the WEBR alternative assumes the use of existing railroad track, IMF, and waste-disposal landfill infrastructure and capacity to provide efficient, cost-effective waste transport and disposal (King County 2025a). This use makes it possible to capitalize on existing rail transportation and private-sector landfill infrastructure and the experience of neighboring jurisdictions and the railroads over the past several decades. In addition, it is assumed that all MSW will be transferred by rail from an IMF within King County. In other words, no county waste will cross into neighboring counties to an IMF located outside of King County.

Three primary regional landfills in the Pacific Northwest—the Columbia Ridge Landfill and Green Energy Plant in Arlington, Oregon; the Finley Buttes Landfill in Boardman, Oregon; and the Roosevelt Regional Landfill in Roosevelt, Washington—are actively receiving waste by rail, either directly from an IMF at the receiving end or indirectly by truck from a nearby IMF (Figure 5.1-2).

The Roosevelt Regional Landfill is served by BNSF, while the Columbia Ridge and Finley Buttes landfills are served by UPRR. All three landfills collect and beneficially reuse their landfill gas (methane) emissions. Combined, these three landfills have a projected capacity of over 360 years. Table 5.1-1 lists the ownership, location, serving railroad, and remaining capacity for each of these three landfills.

Figure 5.1-2. Landfills and IMFs Served by Rail

Table 5.1-1. Pacific Northwest Landfills Accepting Waste by Rail

Landfill	Owner/Operator	Location	Serving Railroad	Remaining Capacity
Columbia Ridge Landfill and Green Energy Plant	Waste Management (doing business as WM)	Arlington, OR	UPRR	320 million tons (120 years)
Finley Buttes Landfill	Waste Connections	Boardman, OR	UPRR	131 million tons (200 years)
Roosevelt Regional Landfill	Republic Services	Roosevelt, WA	BNSF	120 million tons (40 years)

BNSF = BNSF Railway; UPRR = Union Pacific Railroad.

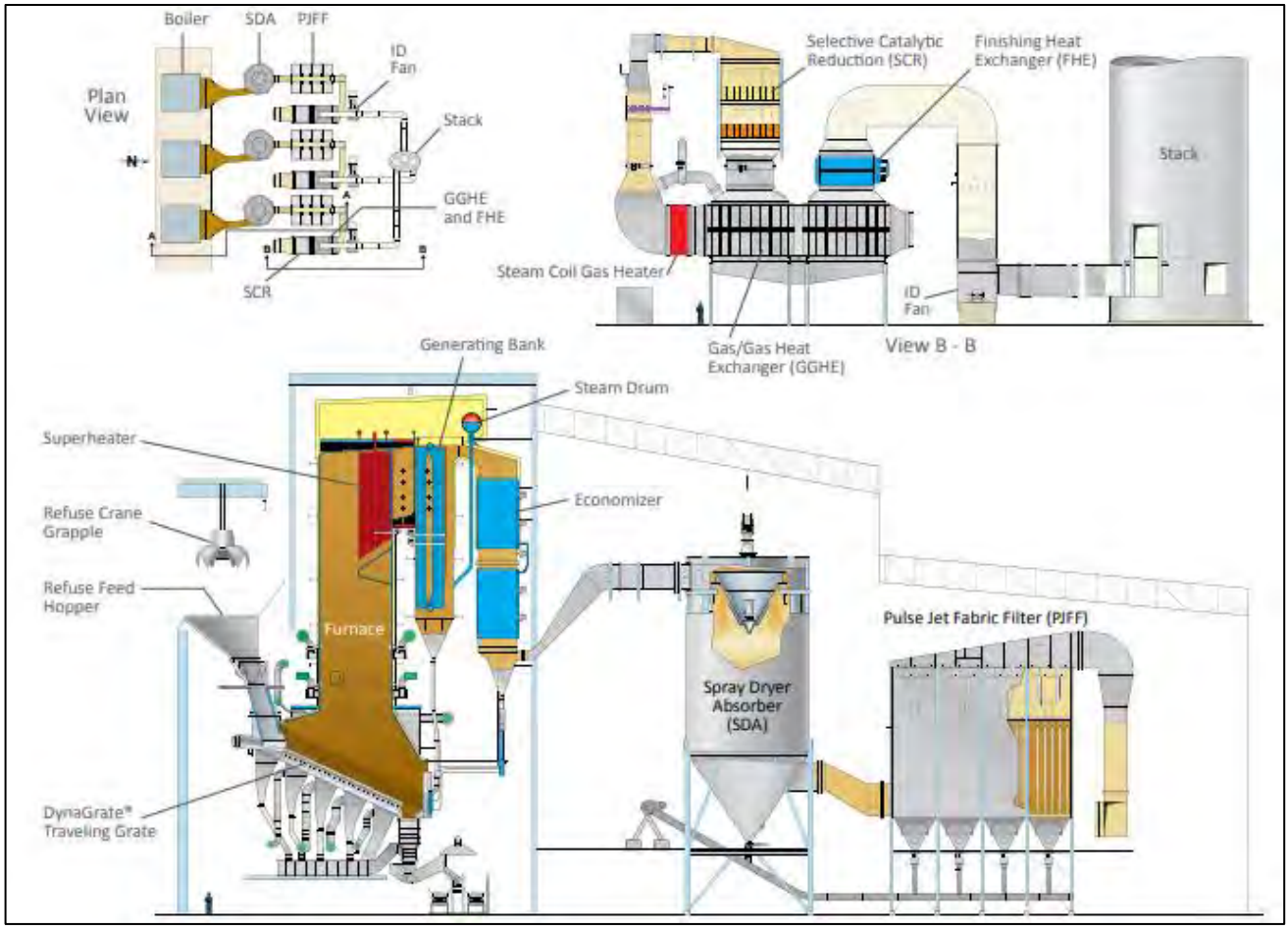
5.1.2 Alternative 2: Mass Burn + Ash Export

Under Alternative 2: Mass Burn + Ash Export (herein referred to as Alternative 2: Mass Burn), MSW would be taken to a mass burn facility for incineration. Mass burn is a well-established MSW disposal option with over 70 plants in the United States, including in Spokane, Washington (King County 2025a). According to the King County Long-Term Waste Disposal Options Study, the mass burn facility site would require 15 to 25 acres under the medium-waste/medium-diversion scenario, depending on available access, existing infrastructure, and land use buffer requirements (King County 2025a).

Mass burn facilities typically produce energy in the form of high-pressure steam that can be used directly for industrial processes, heating, or to generate electricity. The technology allows for the use of a wide range of waste energy values. Most waste values range from 10.5 to 14 gigajoules per ton, but mass burn units can combust waste with an energy value as low as 7 gigajoules per ton. The King County Long-Term Waste Disposal Options Study found that under the medium-waste/medium-diversion scenario, a mass burn facility would be expected to produce approximately 685,761,000 megajoules of energy per year, enough to power approximately 17,650 homes each year (King County 2025a; EIA 2025).

Similar to Alternative 1: WEBR, MSW would first be hauled from transfer stations to be preprocessed at a central MWP facility, then compacted and placed into 40- to 48-foot-long intermodal shipping containers, each capable of accommodating an average payload of 25 to 28 tons, to be hauled to the mass burn facility. At the mass burn facility any remaining large, inert material and hazardous waste would be removed, and large bulky items would be broken down or shredded to reduce their size. Grapple cranes or loaders would then place the waste into hoppers that transfer it to combustion chambers. The combustion process is sustained by the continual fuel from the waste stream, injected air, and heat in the combustion chamber, producing a considerable amount of thermal energy. The thermal energy then heats water pipes that produce steam, which can be used to power turbines to generate electricity (Figure 5.1-3).

The waste-to-energy process produces bottom ash collected in the combustion chamber and fly ash that is captured in the air pollution control equipment. Bottom ash is composed of post combustion solid waste (ash) and non-combustible residuals such as metal, rock, and concrete. Fly ash consists of the lighter particulate matter and other compounds produced by the combustion process. Both types of ash would need to be disposed of by rail at a separate facility. Prior to disposal, recyclable metals would be collected from the ash using magnets and eddy current technologies. This analysis assumes 20% ash residual (bottom ash and fly ash) and 5% recovered metals by weight (tons) for the process, which could result in approximately 133,400 tons of ash and 33,350 tons of metal annually based on the medium-tonnage/medium-diversion scenario.



(King County 2025a)

Figure 5.1-3. Typical Mass Burn Facility Layout

To dispose of the bottom ash, King County would enter into a contract with a waste company service provider, which would contract directly with BNSF or UPRR to haul the waste to the Columbia Ridge, Finley Buttes, or Roosevelt regional landfills. These landfills are capable of receiving and disposing of bottom ash at specially permitted ash monofills within their facilities.

Under the 2019 Washington State Clean Energy Transformation Act (CETA), King County would not be allowed to sell electricity to the grid for use by retail customers in the state. The law requires that the State's electric utilities fully transition to clean, renewable, and nonemitting resources by 2045, but it does not consider electricity from waste to be a renewable resource like water, wind, or solar. The law does not, however, prohibit waste-to-energy facilities from operating; King County could use the generated electricity to power the facility itself, sell it to out-of-state customers, or sell it to in-state wholesale or district heating customers.

5.1.3 Alternative 3: Hybrid

Under Alternative 3: Hybrid, approximately half of the county's MSW would be taken to a mass burn facility, and the remaining would be exported by rail. Under the medium-tonnage/medium-diversion scenario, the mass burn facility site would require 10 to 20 acres and would process approximately 367,200 tons of MSW annually, which would be expected to produce approximately 134,500,000

megajoules of energy per year, enough to power approximately 3,500 homes (King County 2025b; EIA 2025). As with the mass burn facility under Alternative 2, approximately 20% of the tonnage would be removed as bottom ash and fly ash, and 5% would be removed as metals, which could result in approximately 73,440 tons of ash residual that would need to be exported by rail and 18,360 tons of metal that could be recycled annually. The process for collecting, hauling, preprocessing, and incinerating the waste would be the same as described under Alternative 2: Mass Burn.

The remaining MSW, approximately 299,750 tons under the medium-tonnage/medium-diversion scenario, would be exported by rail in addition to the approximately 73,440 tons of bottom ash from the mass burn facility. The process for collecting, hauling, preprocessing, and exporting the waste to one of the three regional landfills in eastern Washington and Oregon would be the same as described for Alternative 1: WEBR.

5.2 Affected Environment, Impacts, and Mitigation Measures

This section discusses the existing conditions within the study area, generally defined as SWD's service area, which comprises the entirety of King County except for the cities of Seattle and Milton. For some elements of the environment, the study area also includes the BNSF and UPRR rail corridors shown in Figure 5.1-2 that connect King County to the Columbia Ridge, Finley Buttes, and Roosevelt regional landfills by way of Yakima and the Tri-Cities or by way of Vancouver, Washington, and Portland, Oregon.

For the purpose of this analysis, none of the alternatives include any expansion, upgrades, or other physical changes to the BNSF or UPRR rail lines between King County and the regional landfills or to the regional landfills themselves. The landfills operate under existing permits and approvals and remain subject to ongoing environmental oversight by the Washington State Department of Ecology (Ecology) for the Roosevelt Regional Landfill and the Oregon Department of Environmental Quality for the Columbia Ridge and Finley Buttes landfills.

5.2.1 Earth

5.2.1.1 Policy and Regulatory Framework

Some of the primary laws and regulations guiding the impacts to geology and soils that may be applicable to the proposal include the following:

State

- The Washington State Growth Management Act (GMA), Chapter 36.70A RCW, which requires all cities and counties to identify critical areas, including geologically hazardous areas within their jurisdictions.

Local

- King County Code (KCC) for Chapter 21A.24, Critical Areas, which governs development in and protection of critical areas, including geological hazard areas such as steep slopes and landslide-prone and seismic hazard areas.
- Critical areas regulations for the incorporated cities within King County, which govern development in and protection of critical areas within their respective jurisdictions.

5.2.1.2 Affected Environment

King County lies between Puget Sound to the west and the Cascade Range to the east. The land is characterized by a series of glacially carved valleys and lowlands that trend north-south through the Puget Sound Lowlands, rising through foothills and ultimately to the heavily forested peaks of the Cascades. Throughout the county, numerous freshwater streams and rivers feed major lakes such as Lake Sammamish and Lake Washington, and ultimately flow into the marine waters of Puget Sound.

Soils within the county vary by landscape. Within large areas of the county, low permeability glacial till underlies the surface soils, usually at depths of a few feet. These soils reflect geologically recent glacial and alluvial activity as well as human activity. The original soils in the urban areas within the county have typically been modified by excavation and filling.

King County and its incorporated cities have mapped geologically hazardous areas, including landslide and erosion-prone areas, abandoned mining areas, and seismic risk areas. Landslide and erosion-prone areas are typically associated with steep slopes. Hazardous mining areas that may be subject to surface subsidence are primarily associated with past coal mining in the area from Newcastle through Renton and south to Black Diamond. The entire Puget Sound region is located in a seismically active area and is at substantial risk for major earthquakes. A heightened hazard from earthquakes in the Puget Sound region occurs in unconsolidated soils, which tend to amplify seismic motions. Unconsolidated soils are present over large areas of the county's major river valleys and in areas of older, nonengineered fill in urban areas.

5.2.1.3 Impacts and Mitigation Measures

All Alternatives

An MWP facility was included as an assumed facility in the King County Long-Term Waste Disposal Options Study and would be constructed as part of all three alternatives (King County 2025a). Facility construction could involve substantial soil disturbance and excavation, depending on the location, topography, and existing conditions of the site. However, a localized analysis of potential impacts is not yet feasible because a site for the MWP facility has not been selected. Reasonable avoidance and minimization measures to address potential impacts from construction could include the following:

- Implementing a site selection process that identifies sites with a minimal need for construction on steep slopes or geologically critical areas, such as landslide prone or seismically hazardous areas.
- Conducting appropriate geotechnical engineering during design and construction to ensure stable long-term foundation and site conditions.
- Implementing best management practices (BMPs) during construction to minimize the extent and duration of exposed disturbed soils and to manage construction-related runoff.

The actual impacts of constructing a new MWP facility, along with avoidance, minimization, or mitigation measures to address those impacts, would be evaluated during the project-level environmental review and permitting process.

Closure of the CHRLF under all three alternatives would not result in impacts to geology and soils because no further expansion would occur and monitoring procedures are currently in place.

Alternative 1: WEBR (No Action)

Alternative 1: WEBR would be implemented using existing railways and IMF(s) within King County, and each of the three regional landfills currently under consideration has existing capacity to receive additional waste tonnage. There would be no additional impacts to earth under this alternative beyond the potential impacts of constructing a new MWP facility as described for all alternatives above.

Alternative 2: Mass Burn

Under Alternative 2: Mass Burn, King County would construct a new, centralized mass burn facility as well as an MWP facility as described under all alternatives above. Constructing these facilities at previously undeveloped sites could involve substantial soil disturbance and excavation. The site area affected by construction of a mass burn facility could be up to 25 acres. (By comparison, the entire CHRLF site is approximately 920 acres.) Depending on the location, topography, and existing conditions of the site, construction of the mass burn facility could result in substantial soil disturbance and excavation. However, a localized analysis of potential impacts is not yet feasible because a site for the mass burn facility has not been selected. Reasonable avoidance and minimization measures to address potential impacts from construction could include the following:

- Implementing a site selection process that identifies sites with minimal need for construction on steep slopes or geologically critical areas, such as landslide-prone or seismically hazardous areas.
- Conducting appropriate geotechnical engineering during design and construction to ensure stable long-term foundation and site conditions.
- Implementing BMPs during construction to minimize the extent and duration of exposed disturbed soils and to manage construction-related runoff.

As with the MWP facility, the actual impacts of constructing a new mass burn facility, along with avoidance, minimization, or mitigation measures to address those impacts, would be evaluated during the project-level environmental review and permitting process.

The export by rail of ash and materials unable to be processed at the mass burn facility would not result in any earth impacts, as described for Alternative 1.

Alternative 3: Hybrid

Alternative 3: Hybrid would include the construction of a new centralized mass burn facility as described in Alternative 2: Mass Burn, though smaller at up to 20 acres, as well as the MWP facility described for All alternatives above. Construction of these facilities under Alternative 3 would have the same nature of impacts described above.

The export by rail of MSW and ash unable to be processed at the mass burn facility would not result in any earth impacts, as described in Alternative 1 and Alternative 2.

5.2.1.4 Significant Unavoidable Adverse Impacts

Construction of any new waste management facilities under any of the alternatives would be required to comply with King County and local critical area regulations, as applicable. With the implementation of available avoidance, minimization, and mitigation measures, none of the alternatives would result in any significant unavoidable impacts to geology or soils.

5.2.2 Air

5.2.2.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies guiding the protection of air quality and strategies to address climate change that may be applicable to the proposal include the following:

Federal

- Clean Air Act, U.S. Code (USC) for Title 42, Section 85, which defines the U.S. Environmental Protection Agency (EPA) responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer and establishes the National Ambient Air Quality Standards (NAAQS).

State

- CETA, Chapter 19.405 RCW, which requires that the State's electric utilities fully transition to clean, renewable, and nonemitting resources by 2045.
- Washington Clean Air Act, Chapter 70A.15 RCW, which is intended to preserve, protect, and enhance air quality and establishes county- and multi-county-level air pollution control authorities.
- Chapter 173-476 WAC, Ambient Air Quality Standards, which establishes State limits for the atmospheric concentration of the six criteria pollutants listed in the NAAQS.
- Washington Climate Commitment Act, Chapter 70A.65 RCW, which caps and reduces greenhouse gas (GHG) emissions from Washington's largest emitting sources and industries to help Washington achieve its commitment to reducing GHG emissions by 95% by 2050.

Local

- Puget Sound Clean Air Agency (PSCAA) Regulations, which control the emission of air contaminants from all sources within King, Kitsap, Pierce, and Snohomish Counties, and implement the requirements of the federal Clean Air Act and Washington Clean Air Act.
- Title 10 KCC, King County Solid Waste Code, which governs solid waste handling, storage, collection, transportation, treatment, utilization, processing, and final disposal of solid waste generated in the county.
- 2025 King County Comprehensive Plan Policies, which include countywide reduction targets for GHG emissions and other related policies.

Air quality is regulated by a variety of federal, state, and regional regulations. At the federal level, criteria air pollutants are common air pollutants that can harm health and the environment, can cause property damage, and are subject to the NAAQS. These standards have been established for the following criteria air pollutants: carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, particulate matter with an aerodynamic diameter of 10 microns or smaller (PM_{10}), fine particulate matter with an aerodynamic diameter of 2.5 microns or smaller ($PM_{2.5}$), and lead (EPA 2023). Because emissions of ozone cannot be calculated directly, volatile organic compounds and nitrogen oxides (precursors to ozone formation) are used as surrogates.

Based on monitoring information for criteria air pollutants collected over a period of years, Ecology and the EPA designate regions as either attainment or nonattainment areas for the criteria air pollutants. Once a nonattainment area achieves compliance with the NAAQS, the area is considered an air quality maintenance area.

In compliance with the 1990 Clean Air Act Amendments, Washington State adopted the Washington Clean Air Act in 1991, which includes ambient air quality standards for criteria air pollutants that are at least as stringent as the federal standards in the protection of health and the environment. The Washington Clean Air Act is administered by Ecology and, in the central Puget Sound region, the PSCAA.

Washington State regulations control 389 chemicals that are referred to as toxic air pollutants (TAPs) (Chapter 173-460 WAC). For each TAP, this regulation defines an acceptable source impact level (provided as a concentration) and defines a small quantity emission rate and a de minimis emission value (both provided as emission rates). Ecology requires review and approval of a notice of construction for a new or modified TAP source. The notice of construction application must demonstrate that the increase in emissions of TAPs from the new or modified source are low enough to protect human health and safety from potential carcinogenic and other toxic effects.

PSCAA regulates odorous emissions through Section 9.11 of Regulation I, which prohibits emission of any air contaminant in sufficient quantity, character, or duration to be injurious to human health, property, or plant or animal life. Section 9.11 also requires that odors not interfere with the enjoyment of life or property. In addition to PSCAA's Regulation I, odor at solid waste facilities is regulated by the King County Solid Waste Code. These regulations prohibit odors that interfere with the health and enjoyment of life or property beyond the facility boundary.

5.2.2.2 Affected Environment

Climate Conditions and Local Air Quality

Weather in the Puget Sound region is characterized by sunny, mild days in summer and cloudy, wet days in winter. Average temperatures in January range from slightly below freezing to the mid-40s°F. During July, average maximum temperatures range from 73°F to 78°F, with minimum temperatures near 50°F (WRCC 2025). Prevailing winds are predominantly from the south or southwest during the wet season and from the northwest in the summer. Occasionally, severe winter storms produce strong northerly winds.

Seasonal meteorological conditions, topography, and land uses largely control air quality by enhancing or preventing air pollutant dispersion. Wind prevents pollutants from concentrating, which disperses pollutants to areas of lower concentration. Periods of low-wind velocity, however, can allow pollutants to concentrate and temperatures to increase, causing chemical reactions between volatile organic compounds and nitrogen oxides that produce smog, the primary component of which is ground-level ozone. These conditions occur primarily during winter months when upper layers of warmer air block cooler air from rising, trapping pollutants near the ground, known as a temperature inversion. These inversion patterns can persist for as long as several days, potentially resulting in exceedances of local, state, and national air quality standards. In recent years however, wildfire smoke has also contributed to periodic exceedances of air quality standards for $PM_{2.5}$ during the late summer months (PSCAA 2025).[1]

According to the PSCAA's 2025 Air Quality Data Summary (PSCAA 2025), air quality in the study area is good, below the standards for the criteria air pollutants listed in the NAAQS; no part of King County is currently in nonattainment or maintenance status. Although below the NAAQS, the two pollutants that pose the greatest concern in the study area according to PSCAA are $PM_{2.5}$ and ozone, which tend to be more of a concern during the summer months (PSCAA 2025).

[1] Wildfire smoke is considered an exceptional event by EPA, and air quality exceedances since wildfires are excluded from any required regulatory action (PSCAA 2025).

Greenhouse Gases

GHGs, which include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, and a variety of other gases, trap heat in the atmosphere. The primary human activities that release GHGs include fossil fuel combustion for transportation, heating, and electricity; agricultural practices that release methane, such as livestock production and crop residue decomposition; and industrial processes that release smaller amounts of gases with high global warming potentials, such as sulfur hexafluoride. Solid waste landfills are included with certain large facilities and transportation fuel suppliers that must report their GHG emissions to Ecology (Chapter 173-441 WAC).

According to the most recent King County Greenhouse Gas Inventory Report, buildings contributed about 44%, transportation contributed about 43%, and waste accounted for about 2% of GHG emissions across King County in 2023 (King County 2026a).

Air Quality and MSW Facilities

The primary air quality issues at MSW disposal facilities are the potential for odor and emissions of hazardous air pollutants, including, but not limited to, vinyl chloride, ethyl benzene, toluene, and benzene, each of which can cause adverse health effects with sufficient exposure (EPA 2025b). Potential impacts also include fugitive dust emissions during waste transport at the site, landfilling, and landfill cell construction.

Odors are distinctive, often unpleasant smells. Many odors can be linked to specific compounds, termed odoriferous compounds. However, no clear quantitative relationship exists between the concentration of odoriferous compounds and the strength of the odors perceived by individuals. A wide variety of sources of potential odors exist in the Puget Sound region, including facilities that handle human-related waste such as wastewater, MSW, and organics (yard and food waste).

The decomposition of solid waste at MSW landfills produces gas. Landfill gas consists primarily of methane and carbon dioxide, which are odorless and nontoxic, as well as trace levels of odorous and toxic constituents. Federal and state regulations set strict operational criteria for landfill gas control systems and require systematic monitoring to ensure that criteria are met. If those criteria are not met, changes must be made to the landfill gas control system on a specified schedule until the criteria are met (40 CFR Part 60, Subpart Cc; Chapter 173-351 WAC). Some landfill gas is not collected during placement of active waste or prior to placement of daily, interim, or final cover systems. Uncollected landfill gas is referred to as fugitive emissions.

5.2.2.3 Impacts and Mitigation Measures

All Alternatives

All three alternatives would include the construction and operation of a new MWP facility, the transport of MSW between facilities, and the export of MSW and/or residual ash by rail. The primary air quality issues associated with all three alternatives include vehicle and equipment emissions during construction of the MWP facility, operations at waste management facilities, and waste transport; fugitive dust during construction of the MWP facility, operations at the facilities, and waste transport; odor at the transfer stations, MWP facility, during transport, and at the receiving landfill or mass burn facility; and landfill gas emissions.

Reasonable avoidance and minimization measures to address these potential impacts could include the following:

- Developing and implementing a fugitive dust control plan during construction.
- Limiting soil exposure during grading and excavation activities.
- Minimizing idling of vehicles and equipment when not in use.
- Sweeping paved roadways to reduce mud and dust.
- Fully enclosing waste facility buildings, except for the entry/exit points, to reduce off-site noise, odor, and dust.
- Using mechanical exhaust ventilation systems with filtration media and creating negative air pressure in the waste facility buildings for odor and dust control.
- Installing a misting system or equivalent technology at waste facilities for odor and dust control.
- Removing fully loaded transfer trailers from the station in the same order that they are filled.
- Fully enclosing transfer trailers that have an open end for waste compaction and maintaining end doors and door seals to reduce the potential for odor, spills, and litter.
- Paving surfaces where trucks operate.
- Cleaning waste facilities on a regular basis.

The actual impacts of constructing and operating any new waste management facility, along with avoidance, minimization, or mitigation measures to address those impacts, would be evaluated during the project-level environmental review and permitting process.

The Columbia Ridge, Finley Buttes, and Roosevelt regional landfills are located in rural areas where air quality is typically good. Each landfill has a system in place to capture and treat landfill gas emissions (see Section 5.2.5, Energy and Natural Resources). None of the alternatives would affect the landfills' ability to operate under their existing landfill gas management systems. Similarly, closure of the CHRLF would not adversely affect air quality as a long-term post-closure maintenance plan is required by state law to ensure that its environmental control systems for gas, leachate, and stormwater are managed after closure.

Alternative 1: WEBR (No Action)

Under Alternative 1: WEBR, in-county emissions could increase with the addition of an MWP facility and closure of the CHRLF as trucks would be transferring MSW from a transfer station to the MWP facility and then to an IMF, as opposed directly from a transfer station to the CHRLF. However, the extent of increased emissions, if any, would depend on the location of the MWP facility in relation to the transfer stations and IMF.

The extent of increased emissions by additional rail traffic would depend on which regional landfill was selected to receive the exported waste. In general, the air quality impacts from additional rail traffic are likely to be insignificant with regard to the number of existing BNSF and UPRR trains travelling along those routes; the transportation involved would represent a small percentage of total traffic (all modes) in those areas.

The King County Long-Term Waste Disposal Options Study evaluated several environmental factors as points of comparison between the disposal options. One factor was the global warming potential, expressed in metric tons of carbon dioxide equivalent, which standardizes the impact of different GHGs into a single comparable value based on their global warming potential. This report determined the global

warming potential of Alternative 1: WEBR to be 55,588 $MTCO_2e$ for the medium-tonnage/medium-diversion scenario (King County 2025a). This value was attributable to diesel used in rail transport and the potential for landfill gas to escape from the regional landfill before it is captured.

Alternative 2: Mass Burn

Under Alternative 2: Mass Burn, a new mass burn facility would be constructed and operated in addition to a new MWP facility, which would result in the same types of impacts as described for all alternatives above. However, the primary air quality concern associated with Alternative 2: Mass Burn would be the emissions produced by incineration and, to a lesser extent, odor. Air pollutants and odor concerns include the following:

- Particulates.
- Metals (e.g., cadmium in association with particulates, mercury as a vapor).
- Acidic gases.
- Carbon monoxide and nitrous oxides.
- Organic compounds resulting from incomplete combustion, including dioxins, furans, and other potentially toxic compounds.

The emissions from the mass burn process could impact air quality, potentially affecting the health of people, animals, and plants from the release of toxic chemicals. However, various technologies for waste-to-energy conversion have been employed worldwide, primarily in North America, Europe, and Asia. Several mass burn and refuse-derived fuel facilities with proven commercial track records over many decades have concurrently demonstrated the ability of best available emission control technologies to achieve facility compliance with air quality regulations (King County 2025a).

For example, the Spokane Regional Solid Waste System has operated a mass burn waste-to-energy facility with a capacity of up to 800 tons per day since 1991. The monitoring and permit renewal record indicates that overall the facility complies with air quality standards, although occasional exceedances have occurred. For example, in June 2010, there was a temporary violation of the emissions limit for mercury. In 2022, the emissions were within the operating permit limits and within federal standards for new facilities (Table 5.2-1). The current air operating permit is available on the Spokane Regional Clean Air Agency's website (SRCAA 2026).

Table 5.2-1. Spokane Waste to Energy 2022 Emissions

Parameter	Actual Emissions (% of current permit limit)	Actual Emissions (% of federal standards for new facilities)
Particulate	6	7
Opacity	12	12
Sulfur dioxide	8	8
Hydrogen chloride	9	10
Carbon monoxide	15	15
Nitrogen oxides	83	91
Dioxins/Furans (total)	5	11
Cadmium	0	1
Lead	0	1
Mercury	2	2

Source: City of Spokane, n.d., Waste to Energy Emissions.

Federal standards for waste-to-energy facilities have been upgraded since the Spokane facility was built. In 1995, EPA required the use of Maximum Achievable Control Technology air standards. From 1990 to 2000, 66 waste-to-energy incinerators cut their emissions in organic, metal, and acid gas by more than 90% (Jackson 2002).

Spokane's facility and other mass burn facilities using emission control technologies demonstrate that such facilities can be operated with no known significant air quality impacts. More uncertainty exists for technologies that have not been in place commercially for an extended period. Nonetheless, any mass burn facility constructed in the county could not operate without appropriate air quality permits requiring a clear demonstration that the best available technology would be employed to adequately treat air emissions.

The King County Long-Term Waste Disposal Options Study determined the global warming potential of Alternative 2 to be 18,395 $MTCO_2e$ for the medium-tonnage/medium-diversion scenario, compared with 55,588 $MTCO_2e$ for Alternative 1 (King County 2025a). This value was attributable to the diesel used in rail transport and the incineration process itself. While mass burn technology produces more GHG emissions than WEBR, the electricity produced offsets those emissions by replacing other electricity sources. However, the offsets would not be realized within King County as the retail sale of the electricity would be required to be out of state and the majority of electricity in the area is from hydropower rather than fossil fuels.

Other environmental impacts include air emissions from the transportation of MSW to the mass burn facility from transfer stations and MWP facility. In addition, the residual bottom and fly ash, estimated to be 20% of the feedstock, would need to be exported by rail to an ash monofill, which is available at each of the three landfill options. Impacts on air quality from the rail transfer would be similar to those described for Alternative 1: WEBR but proportionately lower because of the lower volume of material. Recyclables, such as recovered metals, would have to be hauled away for off-site recycling.

Air emissions from a mass burn facility sufficiently sized to handle King County's MSW would be regulated under federal standards of performance for large municipal waste combustors (40 CFR 60 Subpart Eb). The facility would be classified as a major source under Chapter 173-401 WAC and would be required to obtain and maintain an air operating permit from the PSCAA. The permit would contain requirements related to maximum allowable emissions as well as monitoring, recordkeeping, and reporting. Facilities are required to employ best practices and best available control technologies to maximize the efficiency of combustion and limit air emissions, and typically include the following (NRC 2000):

- Screening incoming waste to reduce noncombustible waste.
- Maintaining a consistent thermal input rate by mixing and homogenizing waste prior to injection.
- Optimizing temperature and oxygen and carbon monoxide concentrations during furnace operations.
- Ensuring that a maximum gas flow rate limit is not exceeded to allow adequate waste residence time in the combustion chamber.
- Regularly monitoring emission control equipment to ensure proper operation.
- Providing proper periodic training and certification of plant operators.

Odor control BMPs would be the same as those described for all alternatives above.

Alternative 3: Hybrid

The primary air quality concerns associated with Alternative 3: Hybrid would be similar to those described for all alternatives, Alternatives 1: WEBR, and Alternative 2: Mass Burn, due to the emissions produced by the use of fuels during transport, incineration of MSW, and landfill gas.

While the nature of impacts under Alternative 3 would be the same as described for Alternative 1 and Alternative 2, certain emissions would be less, depending on the source of the emissions. For example, because there would be fewer tons of MSW exported by rail under Alternative 3, rail transportation-related emissions and emissions associated with landfill gas would be less than under Alternative 1. Similarly, because fewer tons would be processed through a mass burn facility, emissions associated with the incineration of MSW and export of ash would be less than under Alternative 2.

The global warming potential of Alternative 3 falls between Alternative 1 and Alternative 2 at 35,122 $MTCO_2e$ (King County 2026b). This value is derived from the emissions from rail transport of MSW and bottom ash and fly ash in addition to the incineration process itself, including the electricity offsets produced by the mass burn facility.

Avoidance and minimization measures for Alternative 3: Hybrid would be the same as those listed for Alternative 1: WEBR and Alternative 2: Mass Burn above, including BMPs, best practices, and best available control technologies.

5.2.2.4 Significant Unavoidable Adverse Impacts

Construction and operation activities under any of the alternatives would be required to comply with applicable federal, state, and local regulations concerning the development and operation of solid waste management facilities and the transport of solid waste, including controlling odor and emissions. With the implementation of available avoidance, minimization, and mitigation measures, none of the alternatives would result in any significant unavoidable impacts to air quality.

5.2.3 Water

5.2.3.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies concerning water resources that may be applicable to project are discussed below:

Federal

- Clean Water Act, 33 USC 125, which establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
- Safe Drinking Water Act, 42 USC 300, which regulates public drinking water and its sources (i.e., rivers, lakes, reservoirs, springs, groundwater wells).

State

- Flood Control Management Act, Title 86 RCW, which designates flood control districts and floodplain management provisions.
- Shoreline Management Act, Chapter 90.58 RCW and chapters 173-26 and 173-27 WAC, which regulate the state's shorelines.
- Water Quality Standards for Surface Waters, Chapter 173-201A WAC, which establishes water quality standards for surface waters in the state.

- Water Quality Standards for Groundwater, Chapter 173-200 WAC, which implements the Water Pollution Control Act (Chapter 90.48 RCW) and the Water Resources Act of 1971(Chapter 90.54 RCW).
- National Pollutant Discharge Elimination System (NPDES) permit program, Chapter 173-200 WAC, which establishes a state individual permit program, applicable to the discharge of pollutants and other waste and materials to the surface waters of the state.
- State Waste Discharge permit program, Chapter 173-216 WAC, which implements a state permit program for discharge of waste materials from industrial, commercial, and municipal operations into ground and surface waters of the state and into municipal sewerage systems.
- Special Incinerator Ash Management Standards, Chapter 173-306 WAC, which governs the management and disposal of special incinerator ash.

Local

- Title 9 KCC, Local Surface Water Management, which provides for the comprehensive management of stormwater runoff and surface water and erosion control, including programs to reduce flooding, erosion, and sedimentation; prevent and mitigate habitat loss; enhance groundwater recharge; and prevent water quality degradation through the implementation of a rigorous permit review, construction inspection, enforcement, and maintenance program.
- Title 12 KCC, Water, which outlines rules and regulations for King County public drinking water systems, including protections for critical water supply areas.
- Title 13 KCC, Water and Sewer Systems, which designates critical water supply areas and ensures consistency between sewer and water system comprehensive plans and adopted King County plans, policies, and land use controls.
- Title 21A KCC, Zoning, which includes the county's shoreline and critical areas regulations, and other provisions related to the use and development of land in unincorporated King County.
- Title 28 KCC, Metropolitan Functions, which includes the administration and implementation of the rules and regulations for disposal of industrial waste into the metropolitan sewerage system.
- The King County Shoreline Master Program (SMP), which is composed of Chapter 6, Shorelines of the Comprehensive Plan, and implementing regulations found in KCC 21A.25, Shorelines.
- Critical area and shoreline codes and regulations for the incorporated cities within King County, which govern development within their respective jurisdictions.
- Development codes for the incorporated cities within King County, that govern protection of water resources, including water supply.

5.2.3.2 Affected Environment

Surface Waters

Surface waters exist on land surfaces before, during, and after stormwater runoff occurs and include, but are not limited to, the water found on ground surfaces and in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, wetlands, and Puget Sound, including shallow groundwater. King County has six major river watersheds that carry flows from the Cascade Mountains to Puget Sound. These rivers—the South Fork Skykomish, Snoqualmie, Sammamish, Cedar, Green, and White rivers—flow through a range of land uses including forestry, agriculture, and highly urbanized areas.

The quality of surface waters (i.e., the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose) is protected through the implementation of water quality standards authorized by the federal Clean Water Act. Water quality standards are established to sustain public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife.

King County and many of its incorporated cities regulate the discharge of water pollutants under Ecology's NPDES Municipal Stormwater General Permit. This permit requires existing and new developments to implement BMPs for designs related to stormwater flow control and the protection of water quality.

King County's shoreline jurisdiction includes nearly 2,000 miles of saltwater coastline, river floodplains, and extensive lakes as well as the marine shorelines and associated waters, sections of all rivers, and larger streams that occur in unincorporated King County (King County 2018, 2022). Shorelines include all marine shorelines, lakes with a surface area greater than 20 acres, and rivers and streams with 20 cubic feet per second mean annual flow or greater. Shorelands are defined as those areas extending landward for 200 feet from the ordinary high water mark, floodways, contiguous floodplain areas landward 200 feet from such floodways, and all associated wetlands and river deltas. King County includes the 100-year floodplain in its shoreline jurisdiction. In addition, state regulations further define shorelines of statewide significance to include Puget Sound shorelines on Vashon-Maury Island; lakes with a surface area of greater than 1,000 acres; and rivers with 1,000 cubic feet per second mean annual flow or greater.

Wetlands

Wetlands are defined by King County's Critical Areas Ordinance as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Because of its size, variety of landforms, and diverse landscapes (marine to alpine), the county includes a large diversity of wetlands.

King County currently requires site-specific critical area designations when reviewing development applications and requires permittees to offset impacts on wetlands and their buffers with compensatory mitigation actions on the same site as the impacts, off-site, or through the purchase of credits from King County or another approved mitigation provider.

Flood Hazard Areas

Flood hazard areas are designated as critical areas by the State of Washington, for which King County sets the policies and regulations under its Critical Areas Ordinance, consistent with federal law. Flood hazard areas may contain one or more features such as floodplains, special flood hazard areas, zero-rise flood fringe, zero-rise floodways, Federal Emergency Management Agency floodways, coastal flood zones, and channel migration zones. Flood hazard areas are areas subject to inundation by the base flood or at risk from channel migration, including, but not limited to, an aquatic area, wetland, or closed depression. The base flood elevation is defined as the height that surface waters have a 1% chance of reaching or exceeding in any given year and is often referred to as the 100-year flood elevation.

If flood and channel migration hazards associated with rivers and tributary streams are not well managed, they can pose extensive risks to people who live and work in the river floodplains. Along rivers, streams, and shorelines in the county, approximately 500 flood facilities, including levees, dikes, and

bank revetments, have been constructed and maintained to reduce the risk of flooding and deter channel migration, allowing areas that may otherwise be naturally inundated by floodwaters to be used for agriculture, industry, infrastructure, and urban development (King County 2018).

The effects of climate change are anticipated to result in a rise in sea level and an increase in storm surges along coastal shorelines. These climate-related effects could increase the frequency of flooding and may, in turn, lead to negative effects on coastal areas as well as stream structure and function as a result of increased erosion and sedimentation. In addition, wildfires can change the hydrologic properties of soil, causing water to run off more easily and increasing flooding when paired with a lack of vegetation, leading to sudden catastrophic events (WDNR 2025).

Groundwater

In King County, groundwater is used for drinking water, irrigation, and industrial uses. It also replenishes streams, lakes, and wetlands to supply water for fish and wildlife. An estimated 30% of King County's population, or more than half a million people, rely on groundwater wells for drinking water (King County 2025b). Within unincorporated King County, most groundwater wells are located in rural areas, and a majority of these wells are for individual domestic use as opposed to public water systems. King County has five designated groundwater management areas and a Groundwater Protection Program that provides management, policy, and technical expertise to help protect the quality and quantity of the groundwater resources in King County.

Critical aquifer recharge areas (CARAs) are designated as critical areas by the Washington State, for which King County sets the policies and regulations that protect their functions and values under its Critical Areas Ordinance. CARAs are defined by King County as areas that have a high susceptibility to groundwater contamination, areas of medium susceptibility to groundwater contamination that are located within a sole-source aquifer or are within a wellhead protection area for a municipal or district drinking water system, or areas that are over a sole-source aquifer on Vashon-Maury Island. Susceptibility to groundwater contamination can occur where there is a combination of permeable soils, permeable subsurface geology, and groundwater close to the ground surface. The goal of establishing CARAs is to protect the community's drinking water by preventing pollution and maintaining supply. CARAs are categorized so that greater control can occur where land use activities present a high risk for polluting sensitive aquifers.

5.2.3.3 Impacts and Mitigation Measures

All Alternatives

Under all alternatives, construction of the MWP facility could cause erosion and sediment runoff during grading and excavation activities, leading to short-term impacts to the water quality of nearby waterbodies. Construction vehicles and equipment could leak fuel or other fluids that could contaminate nearby waterbodies as well. In addition, development of the MWP facility could result in an increase of the area of pollution-generating impervious surfaces, which would increase the volume and rate of stormwater runoff from the site, further increasing the potential for water quality impacts.

These potential impacts could be avoided through standard avoidance and minimization measures, including the following:

- Development of a stormwater pollution prevention plan for the facility consistent with the latest adopted King County or other locally adopted surface water design manuals, which would describe procedural and structural pollution-prevention, erosion and sediment control, and spill prevention BMPs.
- Implementation of stormwater flow control and treatment measures to minimize impacts to water quality from any increased stormwater runoff.
- Compliance with King County or local stormwater management regulations.

Further, site selection and construction of the MWP facility would require adherence to local, state, and federal regulations centered on water resources, as discussed in the Policy and Regulatory Framework section above. For example, CARAs, wetlands, streams, lakes, and marine waters are all regulated under KCC 21A.24, Critical Areas. The code requires that sequential measures are followed to avoid impacts to critical areas and their buffers including avoidance, minimization, rectification, reduction or elimination, compensation, and monitoring. The actual impacts of constructing a new MWP facility, along with avoidance, minimization, or mitigation measures to address those impacts, would be evaluated during the project-level environmental review and permitting process.

Under all alternatives, the amount of leachate per ton of waste that would be produced from the MSW that is exported to a landfill in eastern Washington or Oregon would be lower compared to existing conditions due to the lower amount of rainfall and drier climate in that region. Therefore, the opportunity for contamination by leachate would be unlikely due to climatic conditions. Further, the potential for the receiving landfill to affect surface water and groundwater is mitigated through ongoing compliance with federal, state, and local regulations. These regulations include the NPDES regulations for discharge of wastewater to surface waters, state criteria for MSW landfills and incinerators, and other similar state and local regulations.

Leachate at the CHRLF will continue to be produced after the landfill is closed but will gradually diminish over time. The leachate and surface water management systems at the landfill have prevented significant leachate contamination of surface water and groundwater to date and a long-term postclosure maintenance plan is required by state law to ensure the environmental control systems (i.e., gas, leachate, stormwater) are managed after closure.

Alternative 1: WEBR (No Action)

Under Alternative 1: WEBR, site selection and construction of the MWP facility has the potential for short-term construction and long-term water quality impacts as described for all alternatives above. In addition, the export of waste by rail could increase the frequency of train derailments, which could impact adjacent water resources along the haul route from spilled diesel fuel and other fluids as well as MSW. However, the increased risk would be negligible in relation to the existing rail traffic along the haul route. Because MSW does not contain dangerous waste, severe and long-term environmental consequences resulting from an accident would be minimal, with impacts remediated through standard clean-up and removal operations.

Alternative 2: Mass Burn

Alternative 2: Mass Burn would likely have greater potential to affect water resources than Alternative 1: WEBR because two facilities, a MWP facility and a mass burn facility (up to 25 acres), would need to be sited, whereas Alternative 1 would require only one facility. The larger combined facility footprints would increase the potential for construction-related erosion and sedimentation as well as long-term stormwater management impacts during construction and operation as described for all alternatives above.

Impacts of a mass burn facility on water resources depends on the design of the facility and available technology. Some information sources indicate that recent mass burn facilities have been designed as zero-discharge facilities, using recirculated and reclaimed water (King County 2017); other sources indicate water is used and discharged to the environment (Denison and Rusten 1990). For the purposes of this EIS, a conservative analysis assumes that water would be used and discharged.

Boilers and scrubbers may produce contaminated liquid effluents. In addition, water may be used to cool ash as it exits the combustion chamber to allow safe handling and transport. Because that water comes into contact with ash, excess water not absorbed by the ash may contain very high levels of salts and heavy metals dissolved from the ash (Denison and Rusten 1990).

State regulations administered by Ecology provide the primary regulatory framework for controlling waste discharges and protecting surface water and groundwater quality. Under Chapter 173-306 WAC, floor and surface drains serving ash collection, storage, and handling areas may not be connected to drains that convey uncontaminated stormwater runoff. These regulations require water used in the combustion process to be managed through one of the following methods:

- Reuse within the facility.
- Discharge to surface waters under a NPDES permit issued pursuant to Chapter 173-220 WAC.
- Discharge to groundwater under a State Waste Discharge permit issued pursuant to Chapter 173-216 WAC.
- Discharge to a municipal sewer system under a State Waste Discharge permit issued pursuant to Chapter 173-216 WAC.

Discharges from a mass-burn facility to King County's regional wastewater system would also require approval through King County's Industrial Waste Program, which may require pretreatment or additional treatment prior to discharge. BMPs and other measures required through the state and local permitting processes would be expected to prevent water pollution associated with the ash collection, storage, and handling areas of a mass burn facility.

Operating a mass burn facility may also require large quantities of water for the boilers. For a facility of the size that King County would likely need (approximately 2,000 tons per day under the medium-waste/medium-diversion scenario), average water needs would be approximately 365 gallons per minute with some technologies (Gardoni et al. 2015). If the water source is a groundwater aquifer, the potential exists for depleting the aquifer if water withdrawal exceeds recharge. Construction of the mass burn facility would require a site-specific evaluation as part of its environmental review and permitting process to assess the level of impact on water resources. Potential impacts of a mass burn facility on groundwater quantity could be mitigated by limiting the amount of groundwater withdrawal or using a surface water source if one is available.

The export of ash by rail under Alternative 2: Mass Burn could potentially increase the frequency of train derailments, which could cause spillage of diesel fuel and other fluids and incinerator ash that could impact adjacent water resources. There would be a smaller increase in rail traffic and a smaller risk of derailment compared to Alternative 1. Ash has the potential for contaminants that are considered hazardous. State management standards (Chapter 173-306 WAC) require incinerator ash to be transported to off-site facilities in covered and sealed vehicles or containers, which would avoid impacts on surface water or groundwater resources during standard transport operations.

Alternative 3: Hybrid

Similar to Alternative 2: Mass Burn, site selection under Alternative 3: Hybrid could have a greater potential to affect water resources than Alternative 1: WEBR because two facilities, an MWP facility and a mass burn facility, would need to be sited, whereas Alternative 1 would require only a single facility. However, Alternative 3 would be expected to result in slightly fewer construction-related erosion and sedimentation impacts and long-term stormwater management impacts on water resources than Alternative 2 because the mass burn facility would be smaller (up to 20 acres), resulting in a reduced overall facility footprint and correspondingly lower potential for water resource impacts.

Also similar to Alternative 2, a mass burn facility under Alternative 3 could produce contaminated liquid effluents from boilers and scrubbers and excess water from dissolved ash may contain very high levels of salts and heavy metals (Denison and Rusten 1990). With a smaller mass burn facility, Alternative 3 would likely generate less water that has the potential for contamination. As with Alternative 2, regulations administered by Ecology and King County would control waste discharges and protect surface water and groundwater quality.

Compared with Alternative 2, operating a mass burn facility under Alternative 3 would require less water for the boilers. It is also likely that a smaller facility would have comparatively less possibility of depleting a groundwater aquifer if that were to be the water source. Like Alternative 2, construction of a mass burn facility under Alternative 3 would require a site-specific evaluation as part of its environmental review and permitting process to assess the level of impact on water resources and may need to limit the amount of groundwater withdrawal or use a surface water source if available.

The export of MSW and ash under Alternative 3: Hybrid could potentially increase the frequency of train derailments, which could cause spillage of diesel fuel and other fluids, MSW, and incinerator ash. There would be a smaller increase in rail traffic and corresponding risk of derailment than Alternative 1, but a larger increase in rail traffic and corresponding risk of derailment than Alternative 2. As with Alternative 2, state management standards (Chapter 173-306 WAC) would require incinerator ash to be transported to off-site facilities in covered and sealed vehicles or containers, which would avoid impacts on surface water or groundwater during standard transport operations.

5.2.3.4 Significant Unavoidable Adverse Impacts

Construction and operation activities under any of the alternatives would be required to comply with applicable federal, state, and local regulations concerning the development and operation of solid waste management facilities and the transport of waste materials, including the protection and use of water resources. With the implementation of available avoidance, minimization, and mitigation measures, none of the alternatives would result in any significant unavoidable adverse impacts on water resources.

5.2.4 Plants and Animals

5.2.4.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies guiding the protection of wildlife and habitat resources that may be applicable to the project include the following:

Federal

- Endangered Species Act, 16 USC 1531, which establishes protections for fish, wildlife, and plants that are listed as threatened or endangered.
- Migratory Bird Treaty Act, 16 USC 703-712, which prohibits the taking of protected migratory bird species without prior authorization.
- Bald and Golden Eagle Protection Act, 16 USC 668-668C, prohibits the taking of bald or golden eagles.

State

- Fish and Wildlife, Title 77 RCW, which includes regulations to preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish in state waters and offshore waters.
- Department of Fish and Wildlife, Title 220 WAC, sets out department rules related to the preservation, protection, perpetuation, and management of fish and wildlife of the state, including fish passage.

Local

- Title 21A KCC, Zoning, which includes the county's shoreline and critical areas regulations, and other provisions related to the use and development of land in unincorporated King County.

5.2.4.2 Affected Environment

King County has a diverse array of landscapes and habitats, ranging from the Puget Sound Lowlands to the Cascade Mountain highlands. These habitats are home to over 200 species of breeding and nonbreeding birds, over 70 species of mammals, over 20 species of amphibians and reptiles, over 200 species of freshwater and marine fish, over 500 species of invertebrates, and thousands of vascular plant species (King County 2025c).

Excluding the Puget Sound marine environment, which forms the county's western border and is dominated by shoreland and open-water ecosystems (King County 2008), King County has the following three major ecoregions: the Puget Lowland, the North Cascades, and the Cascades ecoregion. Ecoregions are the largest units of biodiversity used by King County for landscape-level planning (King County 2025d). These three ecoregions can be described as follows:

- The Puget Lowland ecoregion, comprising the Eastern Puget Riverine Lowlands, Eastern Puget Uplands, and Central Puget Lowlands subregions, is the largest ecoregion, with over one-third of the county's total area, although much of it is within incorporated cities of western King County. This ecoregion contains relatively low biodiversity in the western lowlands, which are dominated by urban and suburban land uses, but species and habitat diversity increase in the eastern uplands where agriculture and forest production lands are protected by King County.

- The Cascades ecoregion, comprising the Western Cascades Lowlands and Valleys and Western Cascades Montane Highlands subregions, is in the southeastern portion of the county and is almost entirely within unincorporated King County. This ecoregion contains the Cedar River, Green River, and White River watersheds and is dominated by agriculture and timber harvest.
- The North Cascades ecoregion, comprising the North Cascades Lowland Forests, North Cascades Highland Forests, and North Cascades Subalpine/Alpine subregions, is in the northeastern and east central parts of the county. It consists of mostly unincorporated King County from the upslope valleys of King County's major rivers systems (Skykomish, Tolt, and Snoqualmie rivers) to the alpine forests. This ecoregion is characterized by dense timber and includes the least disturbed landscapes in King County (Alpine Lakes and Henry M. Jackson wilderness areas).

The Washington Department of Fish and Wildlife uses the Priority Habitats and Species Program to identify priority habitats with unique or significant value to multiple species based on a unique vegetation type, dominant plant species, or specific habitat feature. Of the 20 types of priority habitats in Washington, King County is home to 13 types, including six terrestrial habitats (biodiversity areas and corridors, herbaceous balds, old growth/mature forest, Oregon white oak woodlands, Westside prairie, and riparian); three aquatic habitats (freshwater wetlands and fresh deepwater, instream, and Puget Sound nearshore), and four habitat features (caves, cliffs, snags and logs, and talus) (WDFW 2025). Several of these habitat types are also designated as Habitats of Local Importance in the current King County Comprehensive Plan (King County 2024b).

In addition, King County critical area regulations (KCC 21A.24) restrict development activities in fish and wildlife habitat conservation areas, which include active breeding sites and the surrounding areas for the following nine species: bald eagle, great blue heron, marbled murrelet, northern goshawk, osprey, peregrine falcon, northern spotted owl, Townsend's big-eared bat, and Vaux's swift. Wildlife habitat conservation areas also protect all active breeding sites of any federal- or state-listed endangered, threatened, sensitive, and candidate species, as well as King County Species of Local Importance. Impacts to habitat conservation areas are evaluated on a case-by-case basis during project design and construction.

The Washington Natural Heritage Program identifies special-status plant species found in King County, 26 of which are Endangered Species Act-listed or proposed species.

5.2.4.3 Impacts and Mitigation Measures

All Alternatives

Under all alternatives, development of an MWP facility could involve substantial vegetation removal, depending on the condition of the proposed site. As with development of any waste-related facility, site selection criteria would take into consideration the presence of nearby wetlands, waterbodies, and other types of critical habitat, particularly habitat that supports endangered or threatened species. Impacts on wildlife, if any, could be minimized through avoidance, minimization, and mitigation measures as follows:

- Designing the site to avoid impacts to designated wildlife habitat areas.
- Developing a wildlife management plan.
- Revegetating the site with species of value to native wildlife.
- Purchasing land for wildlife habitat protection.

The actual impacts of constructing and operating any new waste management facility, along with avoidance, minimization, or mitigation measures to address those impacts, would be evaluated during the project-level environmental review and permitting process.

Under all alternatives, when operations cease at CHRLF the remaining disturbed areas would be revegetated with native species, which could increase wildlife use of the site.

Alternative 1: WEBR (No Action)

In addition to impacts from the construction of a new MWP facility as described in the All Alternatives section above, Alternative 1: WEBR could result in impacts to wildlife habitat along the rail corridor between King County and the regional landfills due to an increase in rail traffic. The additional trains could increase the frequency of train derailments, which could impact adjacent wildlife habitat along the haul route due to spilled diesel fuel and other fluids as well as MSW. However, the increased risk would be negligible in relation to the existing rail traffic along the haul route. Because MSW does not contain dangerous waste, severe and long-term environmental consequences to wildlife and habitat resulting from an accident would be minimal, with impacts remediated through standard clean-up and removal operations. Noise associated with additional rail trips per week would increase commensurately with the number of additional trains. Impacts from additional noise are also expected to be minimal because wildlife in the vicinity of the rail lines is already habituated to noise associated with existing rail operations.

Alternative 2: Mass Burn

In addition to the construction of a new MWP facility described for all alternatives above, Alternative 2: Mass Burn would develop a mass burn facility, which would require a site area of up to 25 acres. The nature of impacts, and the avoidance, minimization, and mitigation measures to address those impacts, would be the same as described for the MWP facility, although potential impacts would be greater than for Alternative 1.

Air emissions from the operation of the mass burn facility could impact air quality and potentially affect the health of plants and animals from the release of toxic chemicals, as described in Section 5.2.2, Air.

The export of ash by rail under Alternative 2: Mass Burn could potentially increase the frequency of train derailments, which could cause spillage of diesel fuel and other fluids and incinerator ash that could impact adjacent habitat. There would be a smaller increase in rail traffic and smaller risk of derailment compared to Alternative 1: WEBR. Ash has the potential for contaminants that are considered hazardous. State management standards (Chapter 173-306 WAC) require incinerator ash to be transported to off-site facilities in covered and sealed vehicles or containers, which would avoid impacts to nearby habitat during standard transport operations. As with Alternative 1, effects from the additional rail traffic are expected to be minimal as wildlife in the vicinity of the existing rail lines are habituated to the noise from existing rail operations.

Alternative 3: Hybrid

Development of a mass burn and MWP facility at previously undeveloped sites under Alternative 3: Hybrid could involve substantial soil disturbance and excavation as described for All Alternatives and Alternative 2: Mass Burn above. Development of these sites under Alternative 3 would likely have less impacts than Alternative 2 because it would not require as much land for the smaller mass burn facility, though it would have greater impacts than Alternative 1: WEBR.

Air emissions from the operation of the mass burn facility could impact air quality and potentially affect the health of plants and animals through the release of toxic chemicals, but it is expected this would be to a lesser degree than Alternative 2 because the facility would be burning less MSW.

Under Alternative 3, there would be fewer train trips generated compared to Alternative 1 as there would be less material to haul. The potential impacts from derailment and noise compared to Alternative 1 would be less because trains would not be operating as often, which would reduce both the opportunity for derailment and frequency of noise.

Because Alternative 3 has less opportunity for derailment, there is less potential for the release of incinerator ash, which could be harmful to plants and animals. As with Alternative 2, state management standards (Chapter 173-306 WAC) would require incinerator ash to be transported to off-site facilities in covered and sealed vehicles or containers, which would avoid impacts on nearby habitat during standard transport operations. Similarly, effects from the additional rail traffic are expected to be minimal as wildlife in the vicinity of the existing rail lines are habituated to the noise from existing rail operations.

5.2.4.4 Significant Unavoidable Adverse Impacts

Construction and operation activities under any of the alternatives would be required to comply with applicable federal, state, and local regulations concerning the development and operation of solid waste management facilities and the transport of solid waste, including for the protection of wildlife and habitat. With the implementation of available avoidance, minimization, and mitigation measures, none of the alternatives would result in any significant unavoidable adverse impacts on plants or animals.

5.2.5 Energy and Natural Resources

5.2.5.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies concerning energy and natural resources that may be applicable to the project include the following:

Local

- Chapter 76.09 KCC, Forest Practices, which governs all forest practices in nonfederal lands.
- 2025 King County Countywide Planning Policies, which include policies to promote and support forestry, agriculture, and mineral extraction, to protect the natural resources related to those uses, and other related policies.
- Title 21A KCC, Zoning, which includes King County's development standards, design standards, shoreline and critical areas regulations, and other provisions related to the use and development of land in unincorporated King County.
- Zoning, land use, and shoreline codes and regulations for the incorporated cities within King County, which govern development within their respective jurisdictions.

5.2.5.2 Affected Environment

King County natural resources include agricultural lands for food production, forest lands for recreation and timber production, and lands for mineral extraction. In addition to implementing policies and regulations to manage privately owned agricultural, forest, and mineral resource lands, King County also manages more than 14,000 acres of natural and working resource lands through its Department of Natural Resources and Parks. These lands include historic farmlands, working forest lands, and protected riparian ecosystems. Currently, there are over 3,500 acres of zoned mineral lands within

unincorporated King County, although not all of these lands are actively used for mining. There is no active oil or natural gas production in Washington, and development of new oil and gas extraction sites is prohibited within unincorporated King County.

Energy in the form of petroleum-based fuels and electricity is used to transport King County's solid waste to disposal sites and to operate waste management facilities, including transfer stations and landfills. Petroleum-based fuels result from the processing of crude oil, a nonrenewable natural resource, while electricity comes from a variety of renewable and nonrenewable sources.

Waste disposal can result in energy production as a by-product, for which the total production amount depends on the chosen disposal method and how the energy is captured. Landfills produce methane gas, which is captured and used to either produce electricity or is processed into renewable natural gas (RNG). Each of the regional landfills being considered uses landfill gas to produce energy.

At the Columbia Ridge Landfill, landfill gas is sent to engines that generate about 12.8 megawatts of electricity, which is sent to Seattle City Light. The Columbia Ridge Landfill also added a 12,000-cubic-feet-per-minute RNG facility, which will complement the existing landfill gas electrical energy system. Construction was completed in October 2025 (Andrus 2025).

The Finley Buttes Landfill collects its landfill gas and routes it to suitable energy recovery systems or combustion devices. The combined heat and power system allows for the sale of 25 million kilowatts per year to the local utility, Pacific Corp, and over 45,000 therms (heat) per month to a local food processing plant, Cascade Specialties (King County 2025a).

At the Roosevelt Regional Landfill, the majority of landfill gas is captured for processing into RNG; in 2022, 99% of the gas was processed into RNG with only 1% flared (King County 2025a).

5.2.5.3 Impacts and Mitigation Measures

All Alternatives

All alternatives would include the siting and development of an MWP facility, which would require fuel and other energy sources such as natural gas and electricity to construct and operate. All alternatives would also require the use of fuel and other types of energy to transport MSW and for the operation of buildings, vehicles, and equipment at transfer stations, IMFs, and, for Alternative 2 and Alternative 3, a mass burn facility. The nature of impacts from the use of energy for the construction and operation of solid waste facilities and the transport of MSW and residual ash would be the same for all alternatives; the difference would be in the amount of energy used.

Siting and development of the MWP facility would be subject to either King County or city land use and zoning codes, which seek to preserve agricultural, forest, and mineral resource lands. However, there still are allowances for developing solid waste facilities on these lands under special use permits or as an essential public facility. If the MWP facility was developed within agricultural, forest, or mineral lands, it would represent a minor reduction in acreage of those lands and would not result in a significant adverse impact on natural resources in the county.

As described under the Affected Environment section above, the regional landfills currently being considered for waste export by rail use landfill gas to produce energy, and the quantity of waste that would be sent to these landfills under all alternatives would not affect this energy production.

Last, under all alternatives, CHRLF would continue to use energy to operate its environmental control systems for gas, leachate, and stormwater.

Alternative 1: WEBR (No Action)

As described for all alternatives above, Alternative 1: WEBR would result in fuel and energy use from the construction and operation of a MWP facility, operations at solid waste faculties, and for hauling MSW by truck and by rail. King County intends to electrify the fleet by 2040, which would eliminate diesel emissions. However, rail transport occurs primarily by diesel-powered locomotives, which is unlikely to change in the near future.

The King County Long-Term Waste Disposal Options Study estimated the nonrenewable energy demand for Alternative 1 at approximately 580,000,000 megajoules, of which nearly 73,000,000 megajoules is for transport. However, approximately 40,000,000 megajoules would be offset by the production of energy derived from landfill gas, for a total net demand of approximately 540,000,000 megajoules (King County 2025a). The actual fuel and energy use systemwide would be influenced by the specific location and distribution of disposal-related facilities. As discussed in Section 5.2.8, Transportation, the distance that MSW would need to be hauled from transfer stations to an MWP facility and then to an IMF would not substantially increase from the amount required to transport waste from transfer stations to the CHRLF. While the export of MSW by rail would require the use of additional fuel to power the trains travelling back and forth, the additional fuel needed for the additional trains would be a small fraction of the fuel used systemwide by BNSF and UPRR.

Alternative 2: Mass Burn

Alternative 2: Mass Burn would develop a mass burn facility in addition to an MWP facility as described for all alternatives above. As with the MWP facility, siting and development of the mass burn facility would be subject to either King County or city land use and zoning codes, which seek to preserve agricultural, forest, and mineral resource lands. However, there are still allowances for developing solid waste facilities on these lands under special use permits or as an essential public facility. If the mass burn facility was developed within agricultural, forest, or mineral lands, it would represent a minor reduction in acreage of those lands and would not result in a significant adverse impact on natural resources in the county.

Like Alternative 1: WEBR, Alternative 2: Mass Burn would utilize diesel trucks to transfer waste to an MWP facility from local transfer stations, but its final destination would be at the mass burn facility instead of an IMF. In general, if disposal-related facilities can be sited near each other, less fuel would be used for transporting materials between facilities.

Alternative 2 also includes a rail component. However, the quantity of bottom ash and fly ash (20% of the mass burn feedstock by weight) exported to the regional landfill would be much lower compared with Alternative 1, and the corresponding amount of diesel locomotive energy required for transportation would also be lower. The King County Long-Term Waste Disposal Options Study estimated that the nonrenewable energy demand for Alternative 2 would be approximately 610,000,000 megajoules, of which approximately 14,000,000 megajoules is for transport (King County 2025a).

As described in Section 5.1.2, Alternative 2: Mass Burn + Ash Export, mass burn is a type of waste-to-energy technology that heats and burns MSW, producing heat that is used to create steam that is then used to generate electricity. Under the medium-tonnage/medium-diversion scenario the mass burn

facility could produce up to 1,300,000,000 megajoules of energy for a net production of approximately 685,761,000 megajoules. (King County 2025a). According to the U.S. Energy Information Administration (EIA), the average annual amount of electricity sold to a U.S. residential electric-utility customer in 2022 was 10,791 kilowatt-hours (EIA 2025). Using a conversion ratio of one kilowatt-hour to 3.6 megajoules, the mass burn facility would be expected to produce enough energy to power about 17,650 homes each year. However, due to state regulatory restrictions, this electricity could not be directly sold to customers but could be used to run the facility, sold out of state, or sold in state to wholesale or district heating customers.

Alternative 3: Hybrid

Alternative 3: Hybrid would develop a mass burn facility in addition to an MWP facility as described for Alternative 2: Mass Burn above, although the mass burn facility would be smaller. As with Alternative 2, siting and development of the mass burn facility would be subject to either King County or city land use and zoning codes, which seek to preserve agricultural, forest, and mineral resource lands. If the mass burn facility was developed within agricultural, forest, or mineral lands, it would represent a minor reduction in acreage of those lands and would not result in a significant adverse impact on natural resources in the county.

Similar to Alternatives 1: WEBR and Alternative 2: Mass Burn, Alternative 3: Hybrid would use diesel trucks to transfer waste from transfer stations to the MWP facility and to the final destinations of the IMF or mass burn facility. The energy use would be similar to Alternative 1: WEBR.

For the rail component for Alternative 3, the quantity of material transported would be approximately half of all MSW generated in the county in addition to the residual bottom and fly ash from the mass burn process, reducing the diesel locomotive energy required. Accordingly, Alternative 3 is estimated to require 596,000,000 megajoules of nonrenewable energy, of which approximately 40,500,000 megajoules is for transport, substantially lower than Alternative 1: WEBR but much greater than Alternative 2: Mass Burn (King County 2025b).

As discussed in Alternative 2: Mass Burn, the mass burn facility would generate electricity and/or industrial and residential heating components. SWD estimates that under the medium-tonnage/medium-diversion scenario, the mass burn facility could generate approximately 730,500,000 megajoules of energy per year for a net production of approximately 134,500,000 megajoules, enough to power about 3,500 homes each year (King County 2025b). Alternative 3: Hybrid faces similar restrictions for the sale of this energy within Washington.

5.2.5.4 Significant Unavoidable Adverse Impacts

Development of the MWP and mass burn facilities would be completed in compliance with King County or local jurisdiction land use, zoning, and development regulations and would not represent a substantial loss of natural resources if built within agricultural, forest, or mineral lands. All alternatives would require the use of additional energy, although Alternative 2 and Alternative 3 would offset their use enough to become net energy producers. The additional fuel required for exporting MSW by rail under all alternatives would be minor in relation to the existing fuel requirements of BNSF and UPRR. As a result, there would be no significant unavoidable adverse impacts on energy and natural resources.

5.2.6 Environmental Health

5.2.6.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies concerning environmental health that relate to the project include the following:

Noise – State

- Washington State Noise Control Ordinance, Chapter 173-60 WAC, which governs noise levels in the state, including construction noise.

Noise – Local

- KCC 12.86, Noise, which governs noise levels in unincorporated King County.
- Noise ordinances for the incorporated cities within King County, which govern noise levels within their respective jurisdictions.

Human Health – Federal

- Solid Waste Disposal Facility Criteria, Final Rule, 40 CFR Parts 257 and 258, which set forth location restrictions, requirements for facility design and operations, groundwater monitoring, corrective action measures, and landfill closure standards.
- Toxic Substances Control Act, 15 USC 2601 et seq, which provides the EPA with authority to require reporting, recordkeeping and testing requirements, and restrictions relating to chemical substances and/or mixtures.

Human Health – State

- Criteria for Municipal Solid Waste Landfills, Chapter 173-351 WAC, which establishes similar location restrictions, requirements for facility design and operations, groundwater monitoring, corrective action measures, and landfill closure standards at the state level.
- Chapter 173-350 WAC, which provides regulatory standards for non-MSW landfills, waste in piles, inert wastes, contaminated soils, and waste versus commodities.

5.2.6.2 Affected Environment

Noise

Noise is described as excessive or unwanted sound and is measured using a weighted logarithmic scale to better approximate how the human ear responds to different sound levels. The noise measurement unit is the A-weighted decibel (dBA). Sound levels from different sources combine logarithmically along this scale. For example, two noise sources, each producing a sound level of 50 dBA, combine to produce a sound level of 53 dBA. Similarly, the doubling of traffic on a street increases sound levels by about 3 dBA, which is the smallest change in noise level perceptible to the average human ear.

Most local jurisdictions establish limits on the levels and durations of noise crossing property boundaries. Allowable maximum sound levels typically depend on the land-use zone of the source of the noise and the receiving property. Local jurisdictions typically identify several noise sources or activities that are exempt from the maximum-allowable noise limits. These exemptions commonly include sounds created by vehicles traveling on public roads and sound created by warning devices, such as backup alarms when not operated continuously for more than brief periods. Also, sounds from construction equipment and blasting are typically exempt from noise limits during daytime hours.

In general, ambient noise levels are highest in urban areas and near roadways, construction sites, and similar noisy locations. Ambient levels in urban areas are typically 60 dBA or higher, while noise levels in rural areas away from particularly noisy locations may be 50 dBA or lower (EPA 1974).

Human Health Risk

In the context of solid waste management, human health risks may occur through exposure to toxic compounds via water (primarily groundwater), via air contamination, or through disease via animal vectors. In general, the levels of toxins in air and groundwater are low throughout the study area. A variety of local, state, and federal regulations are intended to limit the levels of contaminants in the surface waters and groundwaters and in the air as discussed in Section 5.2.3, Water and Section 5.2.2, Air.

Disease transmission can occur through human contact with animals, primarily mammals, birds, and insects. The regulations for solid waste management listed above also include requirements for the control of potential animal disease vectors.

C&D debris may contain materials such as asbestos and lead-based paint that pose a human health risk. The EPA has promulgated regulations for the safe handling and disposal of asbestos, lead-based paint, and other materials that pose a potential health risk.

5.2.6.3 Impacts and Mitigation Measures

Noise

All Alternatives

All alternatives would include the construction and operation of a new MWP facility; truck traffic between the transfer stations, MWP facility, and IMF and/or mass burn facility; and additional train traffic along railway routes between King County and the regional landfills.

Construction of the MWP facility would generate noise through the operation of motor vehicles and equipment as well as by activities such as demolition, jackhammering, and pile driving. Typical construction noise can range from approximately 75 dBA for truck and vehicle operation to 101 dBA for impact activities such as pile driving, as measured from 50 feet (FHWA 2006). Although temporary, this noise could be intrusive to residents and other sensitive receptors depending on their proximity to the construction site. Construction would occur primarily during daytime hours, except when required and within local noise ordinance procedures for a variance. Typical avoidance and minimization measures to reduce noise impacts could include the following; specific avoidance and minimization measures would be determined during the project-level environmental review and permitting process:

- Developing a noise and vibration control plan.
- Avoiding nighttime construction in residential neighborhoods.
- Locating stationary equipment as far as possible from noise-sensitive receptors.
- Constructing noise barriers, such as temporary walls, between construction activities and noise-sensitive receptors.
- Using alternative construction methods to minimize the use of impact equipment.

Noise sources at the transfer centers, MWP facility, and IMFs may include the operation of small to large trucks and equipment as part of their normal activities managing and transferring waste and loading and moving shipping containers. The additional truck traffic transporting King County's MSW would not lead

to substantial changes in noise levels along the established, heavily used traffic routes where the new waste-haul trips would represent a small proportion of the overall traffic. However, moderate increases in truck traffic concentrating in the immediate vicinity of the MWP facility and IMF and the activities at the facilities could increase perceived noise levels. If the MWP facility is in an industrial area with high ambient noise, noise impacts may not be noticeable. Measures to limit noise impacts at the IMF and MWP facility could include the following:

- Selecting a location with no nearby noise-sensitive land uses.
- Enclosing or shielding waste unloading and loading activities.
- Minimizing equipment idling.
- Limiting or avoiding nighttime waste-hauling and facility operations.

The regional landfills are existing facilities located in rural areas where existing noise levels are comparatively low and noise-sensitive land uses are at a low density. Exporting King County's waste would generate additional activity at the receiving landfill and its associated IMF, which would contribute to operational noise. However, this contribution would be negligible in relation to the existing activity occurring at these facilities.

Similarly, the addition of up to three new trains per week to export MSW from King County to a regional landfill would cause incremental noise levels along the BNSF or UPRR rail corridor. However, this increase would be negligible given the amount of existing train traffic along these corridors.

Closure of the CHRLF would reduce noise in the surrounding area because operations activities would no longer occur.

Alternative 1: WEBR (No Action)

The anticipated noise impacts for Alternative 1: WEBR and avoidance and minimization measures to address those impacts would be the same as described for all alternatives above.

Alternative 2: Mass Burn

The noise impacts under Alternative 2: Mass Burn would be the same as described for all alternatives above with the addition of impacts from the construction and operation of a mass burn facility, which would be similar to those as described for construction and operation of the MWP facility.

Noise generated from construction and operation of the MWP facility and truck traffic between the transfer stations, MWP facility, and mass burn facility would be the same as described for all alternatives above. The export of bottom ash and fly ash by rail under Alternative 2 would share similar noise impacts as described for all alternatives, although these impacts would be less than Alternative 1: WEBR due to the lower quantity of waste being transported.

Alternative 3: Hybrid

The noise impacts under Alternative 3: Hybrid would be the same as described for all alternatives above with the addition of impacts from the construction and operation of a mass burn facility, which would be similar to those as described for construction and operation of the MWP facility.

Noise generated from construction and operation of the MWP facility and truck traffic between the transfer stations, MWP facility, and mass burn facility would be the same as described for all alternatives

above. In addition, the export of MSW and bottom ash and fly ash by rail would have similar noise impacts as described above for all alternatives, although these impacts would be less than Alternative 1: WEBR but more than Alternative 2: Mass Burn due to the quantity of waste being transported.

Human Health Risk

All Alternatives

The operation and use of transfer stations, the MWP facility, IMFs, and landfills under all three alternatives would present similar risks to human health, which could include release of contaminants to surface water, groundwater, and air and disease through animal vectors. These facilities would implement similar BMPs to mitigate these impacts, including, but not limited to, leachate and methane monitoring, pest control to reduce disease vectors, and adherence to local and state regulations to ensure human health and safety.

Further, these facilities would operate and continue operating under state and local regulations that address the design and operation of solid waste facilities, including Chapter 173-350 WAC, Solid Waste Handling Standards; Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills; and Chapter 173-304 WAC, Minimum Functional Standards for Solid Waste Handling, which now applies only to incinerator ash, having been otherwise superseded by Chapter 173-350 WAC and Chapter 173-351 WAC). These solid waste regulations control the handling and disposal of solid waste as well as the collection, conveyance, treatment, and ultimate disposal of the liquid (leachate) and gas by-products resulting from waste decomposition.

Best management and engineering practices are in place at the CHRLF and other regional landfills to ensure the health and safety of the surrounding area. Such practices include operating and maintaining environmental control systems to manage the landfill gas, leachate, stormwater, and surface water. The CHRLF would continue operating and maintaining its environmental management systems after it closes.

Alternative 1: WEBR (No Action)

Human health impacts from the operation and use of transfer stations, the MWP facility, IMFs, and landfills under Alternative 1: WEBR would be the same as described for all alternatives above. No significant impacts to human health would result along the railway that transports materials or at the proposed out-of-county landfill facilities as no hazardous waste materials would be included in MSW.

Alternative 2: Mass Burn

Human health impacts from the operation and use of transfer stations, the MWP facility, IMFs, and landfills under Alternative 2: Mass Burn would be the same as described for all alternatives above.

The mass burn facility would generate residual gases and incombustible solids (ash). The residual ash consists of particles removed from the residual gas (fly ash) as well as the ash remaining in the combustion chamber (bottom ash). Ash contains various constituents with the most abundant being silica, calcium, and iron as well as various trace metals, such as lead, cadmium, and zinc (NRC 2000). Residual ash can be disposed of in landfills specially designed to receive incinerator ash or processed for metal recovery. In areas outside Washington, residual ash can be processed for reuse, such as for roadbed material. In Washington, Chapter 173-306 WAC, Special Incinerator Ash Management Standards, requires the ash generated to be carefully managed and disposed of in a properly constructed ash monofill because of the presence of potentially toxic constituents in the ash; ash monofils are

available at each of the three landfill options. Measures available to safely handle and process waste-to-energy facility ash include the following:

- Storing ash on the facility site only in sealed containers or enclosed structures that have adequate air and water pollution control to prevent unintended releases to the atmosphere, surface water, or groundwater.
- Minimizing the time that ash is stored on the facility site.
- Transporting ash only in sealed containers to prevent unintended releases.
- Performing regular ash sampling, environmental systems monitoring, and recordkeeping.

As described in Section 5.2.2.2, Affected Environment, waste-to-energy processes can generate a variety of air pollutants, including particulates, metals (e.g., arsenic, chromium, lead, particulates, mercury vapor), acidic gases, carbon monoxide and nitrous oxides, and organic compounds resulting from incomplete combustion, including dioxins, furans, and other potentially toxic compounds that can cause various health effects, including cancer.

The operation of a mass burn facility would emit carcinogens, primarily due to the combustion of plastics that releases toxins such as furans, dioxins, and other substances that are known to cause cancer. However, this potential impact is based on hazard presence (type and quantity of chemicals emitted) instead of exposure, so results should be interpreted as comparing the production of chemicals associated with cancer, not morbidity. Additional detail and assumptions about the generation of cancer-causing emissions as a result of mass burn can be found in the King County Long-Term Waste Disposal Options Study (King County 2025a).

These air emissions could impact air quality and potentially have an effect on the health of humans, animals, and plants. Development of a mass burn facility would require a project-level evaluation of the impacts to human health as part of an environmental review during the siting and permitting process for the facility, which would identify avoidance, minimization, and mitigation measures to address these risks. Further, emissions would be subject to the air quality regulations and standards described in Section 5.2.2, Air.

Alternative 3: Hybrid

Human health impacts from the operation and use of transfer stations, the MWP facility, IMFs, and landfills under Alternative 3: Hybrid would be the same as described for all alternatives above.

Impacts from the operation of the mass burn facility under Alternative 3 would be the same as described under Alternative 2: Mass Burn. However, the impacts would likely be less due to the lower amount of MSW being processed through the mass burn facility.

5.2.6.4 Significant Unavoidable Adverse Impacts

The operation of solid waste facilities under any of the alternatives would be required to comply with applicable federal, state, and local regulations concerning noise impacts and human and environmental health protection. With the implementation of available avoidance, minimization, and mitigation measures, none of the alternatives would result in significant unavoidable adverse noise or environmental health impacts.

5.2.7 Land and Shoreline Use

5.2.7.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies that guide land and shoreline use in unincorporated King County include the following:

State

- Shoreline Management Act, Chapter 90.58 RCW, and chapters 173-26 and 173-27 WAC, which regulate the state's shorelines.

Local

- The King County Comprehensive Plan, which governs land use within unincorporated King County, including the siting of essential public facilities.
- Title 21A KCC, Zoning, which includes King County's development standards, design standards, shoreline and critical areas regulations, and other provisions related to the use and development of land in unincorporated King County.
- The King County SMP, which is composed of Chapter 6 of the current plan, shorelines, and implementing regulations found in KCC 21A.25, Shorelines.
- 2025 King County Countywide Planning Policies, which establish the framework for developing comprehensive plans, including land use and development patterns within unincorporated King County.
- Comprehensive plans developed by the incorporated cities within King County, which govern land use within their respective jurisdictions.
- Zoning, land use, and shoreline codes and regulations for the incorporated cities within King County, which govern development within their respective jurisdictions.

5.2.7.2 Affected Environment

Land Use

The affected environment primarily includes unincorporated King County and cities served by SWD (all cities within the county, except Seattle and Milton). In addition, it includes the BNSF and UPRR rail corridors that travel through numerous counties, cities, and Tribal lands in Washington and Oregon. Land and shoreline use within the study area range from rural low-intensity uses to high-intensity urban uses. Counties, cities, and Tribal governments each have a variety of plans, implementing ordinances, and other measures to guide and regulate land uses within their jurisdictions.

In accordance with the GMA, King County distinguishes the following three overarching land use categories within unincorporated areas of the county: the Urban Area, the Rural Area, and Natural Resource Lands. King County utilizes these GMA land use categories as part of its planning framework to protect the Rural Area and Natural Resource Lands from the expansion of urban growth, consistent with the GMA and King County Comprehensive Plan.

Figure 5.2-1 shows the King County Comprehensive Plan land use map, depicted in Chapter 1 of the 2024 King County Comprehensive Plan (King County 2024b). The land use map shows the 20-year vision for preferred land-use patterns within unincorporated King County by identifying specific land-use designations for the Urban Area, the Rural Area, and Natural Resource Lands in addition to incorporated cities and Tribal lands. The land use map designations indicate the general locations and extents of

various land uses, including agriculture, forestry, housing, commerce, industry, recreation, open spaces, and other uses in unincorporated areas. Each land use designation is implemented through zoning classifications and development regulations, ensuring consistency between the King County Comprehensive Plan and the development regulations that implement the plan's goals and policies.

Incorporated cities within King County have also developed their own comprehensive plans and land use maps designating the general location and extent of residential, commercial, industrial, recreational, open space, and other land uses. Similarly, the cities' land use plans are implemented through zoning classifications and development regulations to ensure consistency with their comprehensive plans.

Shorelines

As described in Section 5.2.3, Water, King County's shoreline jurisdiction includes nearly 2,000 miles of coastline, rivers, and lakes and their associated shorelands. The county's shorelines are regulated by the County's SMP, which establishes different shoreline environment designations that reflect local shoreline conditions, ecological functions, and development. The SMP establishes policies and regulatory measures to guide use and development specific to each shoreline environment designation. In general, the SMP protects natural resources, encourages land uses that require a waterfront location, and encourages public access to public shorelines. Specifically, the SMP establishes mandatory preferences for uses that are unique to or dependent upon a shoreline location.

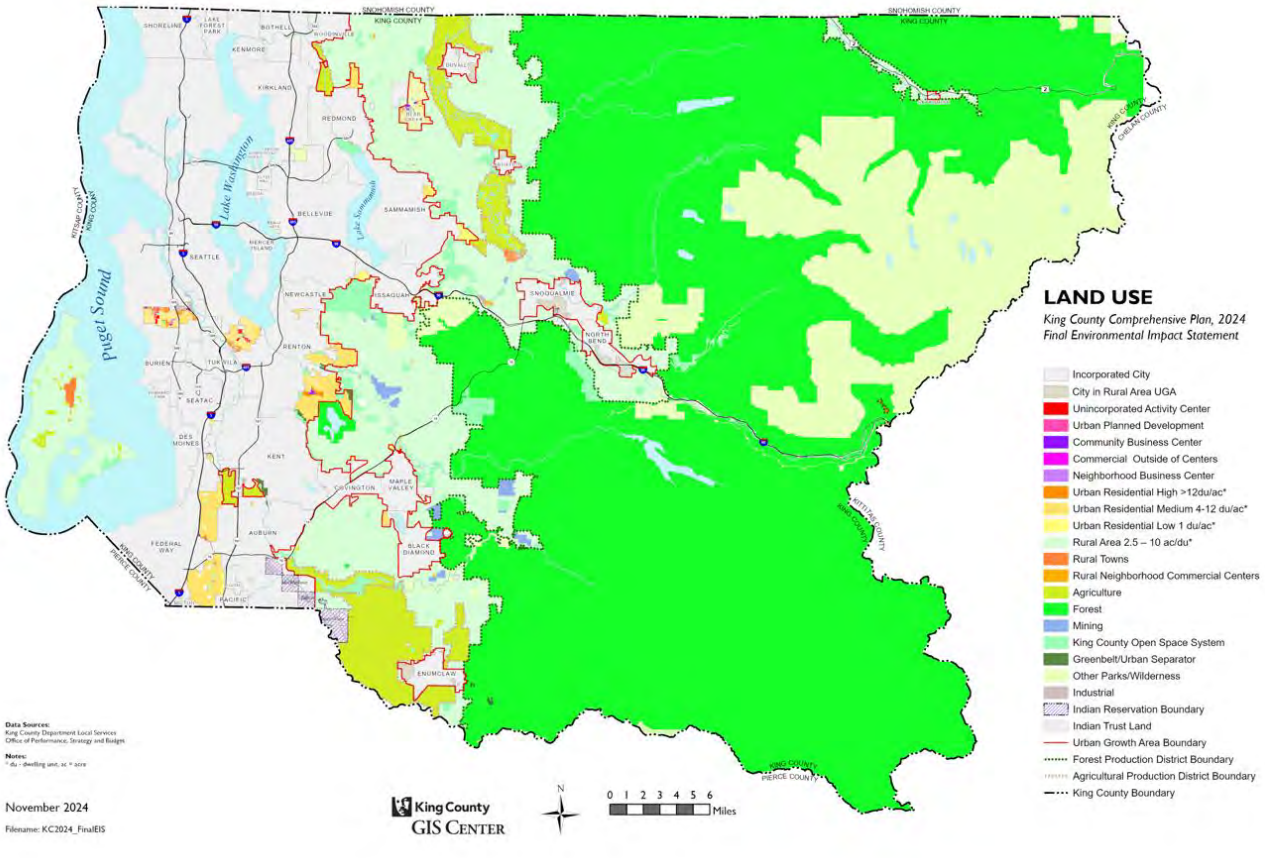


Figure 5.2-1. 2024 King County Comprehensive Plan Land Use Map

5.2.7.3 Impacts and Mitigation Measures

All Alternatives

An MWP facility was included as an assumed facility in the King County Long-Term Waste Disposal Options Study and would be constructed under all three alternatives (King County 2025a). It is not yet known where this facility would be located. As described in Section 5.2.5, Energy and Natural Resources, solid waste facilities such as transfer stations would be allowed within the Rural Area or on Natural Resource Lands, either by special permit or as a designated essential public facility. However, they would be more likely to be sited within the Urban Area because the King County Comprehensive Plan generally discourages essential public facilities from locating in the Rural Area or on Natural Resource Lands (King County 2024b).

King County would need to conduct a separate project-level site analysis and environmental review for the MWP facility as part of its development and permitting process. If a site cannot be found on which the MWP facility would be allowed by permit, the King County Comprehensive Plan outlines a detailed process for siting essential public facilities equitably to avoid disproportionate impacts on any population or community. To minimize the potential for incompatibility with nearby land uses, as well as to avoid other social, economic, and environmental impacts, King County would undertake a site selection process that prioritizes locations with adequate separation from sensitive land uses and ecological resources, consistent with any applicable comprehensive plans and compatible with surrounding land use designations and zoning classifications (King County 2024b). Specifically, King County Comprehensive Plan Policy F-431 requires a siting analysis that includes the following:

a. An inventory of similar existing essential public facilities in King County and neighboring counties, including their locations and capacities.
b. A forecast of the future needs for the essential public facility.
c. An analysis of the historical, current, and potential social, equity, health, and economic impacts and benefits and burdens to communities receiving or surrounding the facilities.
d. An analysis of the proposal's consistency with policies F-425 through F-430 (concerning siting of essential public facilities).
e. An analysis of alternatives to the facility, including decentralization, conservation, demand management, and other strategies.
f. An analysis of economic and environmental impacts, including mitigation of any existing essential public facility as well as of any new site(s) under consideration as an alternative to expansion of an existing facility.
g. An analysis of potential climate change impacts on the essential public facility, including consideration of sea level rise and options for reducing climate change impacts on the facility, including locating the facility outside of the mapped 500-year floodplain along the marine shoreline (except for water-dependent facilities, such as wastewater treatment facilities and associated conveyance infrastructure).
h. To the extent allowable under the GMA, the locational criteria in policies R-327 and R-328 (concerning siting of public schools and institutions).
i. A cumulative impact analysis to include all other facilities, public or private, that may pose health risks, located near the proposed facility.

Depending on where the MWP facility would be located, changes to existing land use designations and zoning classifications could be required to allow the siting of the facility. As with any new development,

land use impacts associated with the MWP facility could result, such as a perceived incompatibility with surrounding land uses or character of the surrounding environment. However, these impacts could be avoided or minimized through such strategies as avoiding ecologically sensitive habitat and shoreline areas; ensuring adequate buffers; and landscaping between adjacent land uses, facility design, and other measures to reduce impacts as discussed in Section 5.2.2, Air; Section 5.2.5, Energy and Natural Resources; Section 5.2.6, Environmental Health; and Section 5.2.8, Transportation.

Alternative 1: WEBR (No Action)

The actual export of MSW by rail would have no direct effects on land or shoreline use in King County because waste would be exported to one or more out-of-county landfills. MSW from King County would be hauled by rail to the Columbia Ridge, Finley Buttes, or Roosevelt landfills, all of which would continue to operate in compliance with their permits and applicable regulations within their respective zoning classifications. No expansions of these landfills are anticipated to be necessary under this alternative, and trains exporting waste from King County would travel along existing rail lines. There would be no changes to existing land use designations or zoning classifications from the use of those existing, operating landfill facilities or for the export of waste by rail along existing, operating rail lines. No land use or shoreline impacts are expected as a result.

Alternative 2: Mass Burn

Alternative 2: Mass Burn would involve the siting and construction of a new mass burn facility in addition to an MWP facility. As with the MWP facility described for all alternatives above, SWD would have to undertake a separate project-level site analysis and environmental review for the mass burn facility as part of its development and permitting process. While the mass burn facility would be allowed within the Rural Area or on Natural Resource Lands, either by special permit or as a designated essential public facility, it would likely be sited within the Urban Area because the King County Comprehensive Plan generally discourages essential public facilities from locating in the Rural Area or on Natural Resource Lands (King County 2024b). If a site cannot be found on which the mass burn facility would be allowed by permit, it would need to go through a siting process as an essential public facility, as described for the MWP facility above.

Depending on where the mass burn facility would be located, changes to existing land use designations and zoning classifications could be required to allow the siting of the facility. As with any new development of this scale, other land use impacts associated with the mass burn facility could result, such as a perceived incompatibility with surrounding land uses or character of the surrounding environment. However, these impacts could be avoided or minimized through such activities as avoiding ecologically sensitive habitat and shoreline areas; ensuring adequate buffers; and landscaping between adjacent land uses, facility design, and measures to reduce other impacts as discussed in Section 5.2.2, Air; Section 5.2.5, Energy and Natural Resources; Section 5.2.6, Environmental Health; and Section 5.2.8, Transportation.

As described for Alternative 1: WEBR, the export of bottom and fly ash by rail under Alternative 2 would have no direct effects on land or shoreline use because waste would be exported to one or more existing out-of-county landfills on existing rail and haul routes.

Alternative 3: Hybrid

As described for Alternative 1: WEBR, the export of MSW, bottom ash, and fly ash by rail under Alternative 3: Hybrid would have no direct effects on land or shoreline use in King County because waste would be exported to one or more existing out-of-county landfills on existing rail and haul routes.

Similar to Alternative 2: Mass Burn, King County would need to conduct a separate project-level site analysis and environmental review for both the MWP facility and mass burn facility as part of their development and permitting process. The siting process, potential land use impacts, and avoidance and minimization measures to address those impacts would be the same as described for all alternatives and Alternative 2 above.

5.2.7.4 Significant Unavoidable Adverse Impacts

Construction and operation activities under any of the alternatives would be required to comply with applicable local regulations concerning the development and operation of solid waste management facilities and the transport of solid waste, including consistency with local land use, zoning, and shoreline codes. With the implementation of available avoidance, minimization, and mitigation measures, none of the alternatives would result in any significant unavoidable adverse impacts on land or shoreline use.

5.2.8 Transportation

5.2.8.1 Policy and Regulatory Framework

Some of the primary laws, regulations, and policies concerning transportation that may be applicable to the project are discussed below:

State

- Title 47 RCW, Public Highways and Transportation, which sets out state legislative policies, regulations, and laws related to statewide transportation facilities, including state highways and roadways, freight corridors, state ferry systems, multimodal programs, and other transportation-related activities.

Local

- Title 14 KCC, Roads and Bridges, which sets out policies and regulations and laws related to King County transportation facilities, including traffic control, road standards, right-of-way requirements, nonmotorized transportation, concurrency, and intersection standards, among other items.
- 2021 King County Countywide Planning Policies, which establish the framework for developing comprehensive plans, including the transportation element.

5.2.8.2 Affected Environment

The transportation system in King County includes highways and roadways, public transit, rail, nonmotorized transportation, and air travel. Freight transport, including the transport of solid waste, is a major function of the regional transportation system throughout the county. Key elements of the regional freight system include roadway corridors used for truck transport and railroads used for train transport. While freight corridors primarily include the major interstates and U.S. and state highways in the county, a much wider network of arterials and local access roadways are used for waste collection and transport through residential, commercial, and industrial areas. Solid waste from the region is hauled along the Class I freight railroad system within King County, which includes BNSF and UPRR.

In general, the density of the roadway network and traffic volumes on individual roadways are proportional to the density and intensity of land use in the region, with the highest road densities and traffic volumes occurring in urban areas. Portions of major highways in the region sustain traffic volumes of over 100,000 vehicles per day, while roadways in the least populated peripheries of the region may experience traffic volumes of several hundred or fewer vehicles per day. Currently, portions of many roadways and highways throughout the central Puget Sound region are congested, particularly around major metropolitan areas and during commute times in the mornings and evenings.

On average, there are approximately 2,000 trips made each day by private individuals and commercial haulers to bring MSW to transfer stations throughout the county. From the transfer stations, approximately 100 King County vehicles transport waste daily to the CHRLF for permanent disposal, for a total of 200 outbound and inbound truck trips (King County 2026c).

According to the Washington State Rail Plan 2019–2040 (WSDOT 2020), a total of 4.5 million tons of waste and scrap were hauled by rail in Washington in 2016, approximately 3.7% of the total 122 million tons of freight hauled by rail statewide. By 2040, the amount of waste and scrap hauled by rail is anticipated to grow to 6.6 million tons statewide, representing a smaller 3% share of the overall anticipated 216.2 million tons of rail freight. Table 5.2-2 shows the estimated and forecasted rail tonnage of various commodities for 2016 and 2040, respectively.

Table 5.2-2. 2016 and 2040 Forecasted Rail Flows in Washington by Commodities

Commodity	2016 Rail Tonnage (millions)	2040 Forecasted Rail Tonnage (millions)[a]
Cereal grains	26.0	57.1
Other agricultural products	16.9	50.5
Coal	11.9	5.7
Mixed freight	10.7	14.6
Wood products	9.2	15.8
Crude petroleum oil	7.5	7.7
Animal Feed	5.9	9.9
Petroleum and coal products	4.6	4.5
Waste/scrap	4.5	6.6
Fertilizers	3.5	5.2
Other	21.5	38.7
Total	**122.0**	**216.2**

Source: WSDOT, 2020, Washington State Rail Plan 2019–2040.

[a] Based on the moderate growth scenario as described in the Washington State Rail Plan 2019–2040.

In 2016, on average, up to 40 trains traveled daily between Seattle and Vancouver, 34 trains traveled daily between Vancouver and Pasco in Washington, and up to 14 trains traveled daily between Portland and Hinkle in Oregon. However, the route along the Columbia River (on the Washington side) is already near capacity and could exceed capacity by 2040 if demand for freight by rail continues to grow (WSDOT 2020).

5.2.8.3 Impacts and Mitigation Measures

All Alternatives

As described above, under all three alternatives the MSW now disposed of at the CHRLF would be transported by truck from local transfer stations to a central MWP facility before being hauled to an IMF for export by rail or to a mass burn facility for incineration. The result would be a reduction in truck traffic on haul routes to the CHRLF and a commensurate increase in truck trips on roads leading to an MWP facility and then to an IMF or mass burn facility. While congestion on roadways to and from the MWP facility and to and from an IMF or mass burn facility would potentially increase as a result, a localized analysis of traffic impacts is not feasible at this stage because specific sites for an MWP facility, receiving IMF(s), or mass burn facility have not yet been selected. A traffic analysis to identify any impacts, along with avoidance, minimization, and mitigation to address those impacts, would be prepared as part of the environmental review and permitting process for the MWP and mass burn facilities.

Table 5.2-3 shows the estimated daily container hauls from existing transfer stations for the medium-tonnage scenario as estimated in the King County Long-Term Waste Disposal Options Study (King County 2025a). Based on this estimate, which accounts for peak months higher than the annual average, approximately 72 container hauls or 144 round-trip truck trips would occur daily between the transfer stations and the MWP facility, and another 144 round-trip truck trips would occur between the MWP facility and an IMF or mass burn facility. This estimate is in comparison to the approximately 100 daily container hauls or 200 daily round-trip truck trips to CHRLF at present.

Table 5.2-3. Estimated Daily Container Hauls, Alternative 1: WEBR

Daily Container Hauls	MSW
Annual tons	666,950
Peak percentage	109%
Average annual tons (annual tons × peak percentage)	726,976
Average daily tons (annual tons / 365 days)	1,992
Tons per container	28
Peak estimated daily container hauls (one way)	72
Number of truck trips (to and from facility)	144

MSW = municipal solid waste; WEBR = waste export by rail.

Alternative 1: WEBR (No Action)

To help determine the potential regional traffic impacts due to additional railway traffic related to the WEBR alternative, King County conducted an analysis of motor vehicle delay at two types of typical at-grade railroad crossings (King County 2026d). At-grade crossings are defined as those locations where a railroad track intersects with a roadway at the same level or elevation. The study looked at the following two options for hauling the waste by rail: 1) adding new (additional) trains to haul the MSW and 2) adding additional rail cars to existing trains already hauling MSW. The study compared motor vehicle delay at different times of day for two crossing types, each representing a unique roadway configuration and daily traffic volume. All scenarios assume the need to haul approximately 12,826 tons of MSW per week, or approximately 458 containers, each containing 28 tons of MSW.

Table 5.2-4 summarizes the potential railroad crossing delay if the railroad were to add new train service for hauling MSW approximately 3 times per week, for a total of 6 new crossing events per week from

outbound and inbound trains. The study assumed that each train would consist of 152 containers carrying 28 tons each, double-stacked on 76 rail cars. It would be approximately 5,434 feet long. As can be seen in the table, depending on the crossing type and time of day, each rail crossing could result in a 2 minute, 18 second delay for up to 96 vehicles. Assuming an inbound and outbound trip occur on the same day, a range of 32 to 192 vehicles, representing 0.3% to 0.8% of average daily trips (ADT), could be affected 3 days per week.

Depending on the length of the queue and the proximity of nearby roadway intersections, motor vehicles at the back of the railroad crossing queue may be delayed longer if there is a traffic signal present and the signal timing does not allow all traffic to pass through the intersection. These impacts can be minimized by intersection improvements such as signal timing adjustments at specific intersections and by capacity improvements along rail corridors.

Table 5.2-4. Summary of Rail Event Impacts by Crossing Type, New Train Service

Crossing Type	Time of Day	Hourly Traffic Volume [a]	Vehicles Impacted [b]	Crossing Delay [c]
Type 1: 4 lanes, 25K ADT vehicles/day	5 p.m. (peak hour)	2,500	96	2 min, 18 sec
Type 1: 4 lanes, 25K ADT vehicles/day	After 8 p.m. (evening)	1,000	38	2 min, 18 sec
Type 2: 2 lanes, 10K ADT vehicles/day	5 p.m. (peak hour)	1,000	38	2 min, 18 sec
Type 2: 2 lanes, 10K ADT vehicles/day	After 8 p.m. (evening)	400	16	2 min, 18 sec

ADT = average daily trips; K = thousand; vehicle/day = vehicles per day.

[a] Evening trips (> 8 p.m.) assumed 4% of ADT would occur during that hour. Peak hour trips (5 p.m.) assumed that 10% of ADT would occur during that hour.

[b] The total number of vehicles in queue, in both directions, across all lanes. Vehicle length is assumed to be 25 feet per vehicle.

[c] Assumes a train length of 5,434 feet with a speed of 35 mph through the intersection.

Table 5.2-5 summarizes the potential railroad crossing delay if the railroad were to add cars to existing trains hauling waste. The study assumed that 76 containers, each carrying 28 tons and double-stacked on 38 rail cars, would be added to an existing train 6 days per week, for a total of 12 new crossing events per week from outbound and inbound trains. The additional rail cars would extend the length of existing trains by 2,717 feet. As can be seen in Table 5.2-5, depending on the crossing type and time of day, each crossing could result in 12 to 36 vehicles added to an existing traffic queue. Assuming an outbound and inbound rail trip per day, a range of 12 to 72 additional vehicles, or 0.1% to 0.3% of ADT, would be added to existing traffic queues 6 days per week, with an additional 54 second delay for all vehicles in that queue.

Depending on the length of the queue and the proximity of nearby roadway intersections, motor vehicles at the back of the railroad crossing queue may be delayed longer if there is a traffic signal present and the signal timing does not allow all traffic to pass through the intersection. These impacts can be minimized by intersection improvements such as signal timing adjustments at specific intersections and by capacity improvements along rail corridors.

Table 5.2-5. Summary of Rail Event Impacts by Crossing Type, Add Rail Cars to Existing Trains

Crossing Type	Time of Day	Hourly Traffic Volume [a]	Additional Vehicles Impacted per Rail Event [b]	Additional Crossing Delay [c]
Type 1: 4 lanes, 25K ADT vehicles/day	5 p.m. (peak hour)	2,500	36	54 sec
Type 1: 4 lanes, 25K ADT vehicles/day	After 8 p.m. (evening)	1,000	16	54 sec
Type 2: 2 lanes, 10K ADT vehicles/day	5 p.m. (peak hour)	1,000	16	54 sec
Type 2: 2 lanes, 10K ADT vehicles/day	After 8 p.m. (evening)	400	6	54 sec

ADT = average daily trips; feet/vehicle = feet per vehicle; K = thousand; vehicle/day = vehicles per day.

[a] Evening trips (> 8 p.m.) assumed 4% of ADT would occur during that hour. Peak hour trips (5 p.m.) assumed that 10% of ADT would occur during that hour.

[b] The additional number of vehicles in queue, in both directions, across all lanes. Vehicle length is assumed to be 25 feet/vehicle.

[c] Delay is based on a train speed of 35 mph through the intersection.

Railroads are often able to minimize negative impacts from increased rail traffic by scheduling trains to run overnight. However, this mitigation strategy is dependent on sufficiently low rail demand and therefore cannot be guaranteed for the coming decades. Over the past decade, largely driven by railroad safety mandates, railroads have been working with local jurisdictions to minimize and eliminate highway-railroad at-grade crossings, which could help reduce traffic impacts.

Additional rail traffic could add more congestion to existing rail lines. Both the UPRR and BNSF lines are well-traveled routes that have relatively high rail traffic. As noted previously, the Washington State Rail Plan 2019–2040 (WSDOT 2020) estimated that in 2016, up to 40 trains traveled daily between Seattle and Vancouver, 34 trains traveled daily between Vancouver and Pasco in Washington, and up to 14 trains traveled daily between Portland and Hinkle in Oregon on average. The route along the Columbia River was already near capacity in 2016 and could exceed capacity by 2040 if demand for freight by rail continues to grow (WSDOT 2020).

The Washington State Rail Plan 2019–2040 (WSDOT 2020) estimates that Washington's freight rail traffic will total approximately 216 million tons annually by 2040, of which approximately 6.6 million tons (about 3%) will be waste and scrap. Should King County's estimated 666,950 tons of disposed waste in 2040 be added to the rail system, total waste and scrap would represent about 3.4% of Washington's freight rail traffic. While the addition of three new trains per week may add to overall capacity constraints that increase the need for capacity enhancements in the relevant rail corridors, it would not constitute a substantial increase in relation to the existing rail traffic along BNSF and UPRR rail lines to the landfills.

Traffic-generating activities associated with out-of-county disposal also include disposal operations at the landfill. Disposal of King County's waste would increase traffic at receiving IMFs used in conjunction with transport of waste from the end of the rail line to the landfill. In general, the impact of the incremental traffic increase associated with disposal of the county's waste would depend on background traffic levels at those facilities. If substantial traffic impacts appear likely at a particular disposal location, SWD could reduce the county's contribution to those traffic levels by contracting with more than one landfill.

Alternative 2: Mass Burn

Under Alternative 2: Mass Burn, traffic levels for a mass burn facility would be comparable to Alternative 1: WEBR, though slightly greater. As described under the impacts for All Alternatives above, there would be approximately 144 daily round trips to deliver MSW from local transfer stations to an MWP facility, and 144 daily round trips to deliver MSW from the MWP facility to the mass burn facility. However, Alternative 2 would result in additional truck traffic as bottom ash and fly ash from the mass burn facility would still need to be hauled off by rail and recovered recyclables would need to be transported to recycling facilities.

As stated in Section 5.1, Description of Alternatives, it is assumed that bottom ash and fly ash would equate to 20% of the overall tonnage, or approximately 133,400 tons annually, and recyclables would equate to 5% of the overall tonnage, or approximately 33,350 tons annually. Using the same assumptions for hauling MSW, there would be an additional 36 round-trip truck trips for disposal of bottom ash and fly ash and transporting metals to recyclers. The estimated number of truck trips entering and leaving the mass burn facility would therefore be approximately 180 trips per day for the medium-tonnage/medium-diversion scenario of 666,950 tons (Table 5.2-6).

Table 5.2-6. Estimated Daily Container Hauls, Alternative 2: Mass Burn

Daily Container Hauls	Mass Burn	Ash and Recyclables
Annual tons	666,950	166,750
Peak percentage	109%	109%
Average annual tons (annual tons × peak percentage)	726,976	181,758
Average Daily Tons (annual tons / 365 days)	1,992	498
Tons per container	28	28
Peak estimated daily container hauls (one way)	72	18
Number of truck trips (to and from facility)	144	36

Alternative 2 would also result in additional rail traffic between King County and a landfill. Using the same assumptions for train freight loads and weight as for Alternative 1: WEBR, the removal of bottom ash and fly ash would require 46 rail cars, or less than one train, per week. At this time, it is not known whether containers hauling ash could be added to existing trains hauling waste or whether they would be held until there were enough cars to necessitate a new train. Either option would result in the same anticipated traffic queueing and delay impacts per crossing as described under Alternative 1, which would not be considered significant impacts to traffic operations. Similarly, neither option would result in significant impacts to railroad operations given the amount of existing rail traffic along BNSF and UPRR lines.

Alternative 3: Hybrid

Under Alternative 3: Hybrid, King County would process approximately 367,200 tons of MSW through a mass burn facility and export approximately 373,190 tons of MSW and ash by rail. Using the same assumptions as described for Alternative 1: WEBR and Alternative 2: Mass Burn, which account for peak months that are higher than the annual average, Alternative 3 would result in a total of approximately 64 round-trip truck trips from an MWP facility to haul MSW to an IMF for export by rail, 80 round-trip truck trips from an MWP facility to haul MSW to the mass burn facility, and 16 truck trips to haul bottom ash and fly ash from the mass burn facility and transport metals to recyclers (Table 5.2-7). This is in addition

to the 144 daily round trip truck trips between local transfer stations and the MWP facility, as described under impacts for all alternatives.

Table 5.2-7. Estimated Daily Container Hauls, Alternative 3: Hybrid

Daily Container Hauls	MSW	Mass Burn	Ash and Recyclables
Annual tons	299,750	367,200	91,800
Peak percentage	109%	109%	109%
Average annual tons (annual tons × peak percentage)	326,728	400,248	100,062
Average daily tons (annual tons / 365 days)	895	1,097	274
Tons per container	28	28	28
Peak estimated daily container hauls (one way)	32	40	10
Number of truck trips (to and from facility)	64	80	20

MSW = municipal solid waste.

As stated above, Alternative 3 would haul 299,750 tons of MSW and 73,440 tons of bottom ash and fly ash to a regional landfill by rail. Using the same assumptions for train freight loads and length as for new train service under Alternative 1: WEBR, the removal of bottom ash and fly ash would require one to two additional trains hauling 76 rail cars per week or adding 38 rail cars to an existing train three to four times per week. Either option would result in the same anticipated traffic queueing and delay impacts per crossing as described under Alternative 1, which would not be considered significant impacts to traffic operations. Similarly, neither option would result in significant impacts to railroad operations given the amount of existing rail traffic along BNSF and UPRR lines.

5.2.8.4 Significant Unavoidable Adverse Impacts

There would be no significant adverse impacts to the railroad as a result of the additional train traffic. With the implementation of avoidance and minimization measures to address traffic congestions around the MWP and mass burn facilities and to address delay and queuing at railroad crossings, none of the alternatives are anticipated to have significant unavoidable adverse impacts on transportation.

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