

7-A
AFFECTED ENVIRONMENT:
PLANTS AND ANIMALS

**FINAL
ENVIRONMENTAL
IMPACT STATEMENT**

**Brightwater
Regional Wastewater
Treatment System**

APPENDICES

Affected Environment: Plants and Animals Appendix 7-A

August 2003

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Introduction

King County has prepared a Draft Environmental Impact Statement (Draft EIS) and Final Environmental Impact Statement (Final EIS) on the Brightwater Regional Wastewater Treatment System. The Final EIS is intended to provide decision-makers, regulatory agencies and the public with information regarding the probable significant adverse impacts of the Brightwater proposal and identify alternatives and reasonable mitigation measures.

King County Executive Ron Sims has identified a preferred alternative, which is outlined in the Final EIS. This preferred alternative is for public information only, and is not intended in any way to prejudice the County's final decision, which will be made following the issuance of the Final EIS with accompanying technical appendices, comments on the Draft EIS and responses from King County, and additional supporting information. After issuance of the Final EIS, the King County Executive will select final locations for a treatment plant, marine outfall and associated conveyances.

The County Executive authorized the preparation of a set of Technical Reports, in support of the Final EIS. These reports represent a substantial volume of additional investigation on the identified Brightwater alternatives, as appropriate, to identify probable significant adverse environmental impacts as required by the State Environmental Policy Act (SEPA). The collection of pertinent information and evaluation of impacts and mitigation measures on the Brightwater proposal is an ongoing process. The Final EIS incorporates this updated information and additional analysis of the probable significant adverse environmental impacts of the Brightwater alternatives, along with identification of reasonable mitigation measures. Additional evaluation will continue as part of meeting federal, state and local permitting requirements.

Thus, the readers of this Technical Report should take into account the preliminary nature of the data contained herein, as well as the fact that new information relating to Brightwater may become available as the permit process gets underway. It is released at this time as part of King County's commitment to share information with the public as it is being developed.

This technical appendix contains additional information to support Chapter 7, Plants, Animals, and Wetlands, of the Brightwater Final EIS. Specifically, this appendix contains three parts. Part 1 provides additional information on federal and state regulations relevant to the Brightwater project with respect to fish, wildlife, and sensitive areas (wetlands, streams, etc.).

Part 2 contains a more detailed evaluation of existing conditions including wetlands, streams, vegetation, and wildlife habitat for special status species on each candidate portal site evaluated in the Final EIS. For brevity, this information is summarized in a series of matrices in Chapter 7 of the Final EIS under the discussion of conveyance for each proposed Brightwater system.

Part 3 of this technical appendix contains a more comprehensive list of species observed in the alternative outfall zones to supplement the information on marine resources in Chapter 7.

Regulatory Environment

Federal Regulations

The primary federal laws that regulate activities in or near wetlands and activities that affect plants and animals are Sections 401, 402, and 404 of the Clean Water Act (CWA), 33 USC §§1341, 1342, and 1344, Section 10 of the Rivers and Harbors Act, and the Coastal Zone Management Act of 1972, 16 USC §§ 1541-1464. Federal actions are subject to the 1969 National Environmental Policy Act (NEPA), 42 USC § 4321-4307f. In addition, wildlife and plant species listed as federally threatened or endangered and their critical habitat are protected under the Endangered Species Act of 1973, 16 USC § 1531-1544. The Magnuson-Stevens Act protects spawning, breeding, and feeding habitat (referred to as Essential Fish Habitat (EFH)) for federally ESA-listed species. The federal Migratory Bird Treaty Act of 1918 (16 USC §703, et seq.) provides limited protection to all migratory birds. The bald eagle is also protected by the Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250). The Marine Mammal Protection Act of 1972 provides protection for all marine mammals

Washington State Regulations

The primary Washington State regulations that govern activities in or near wetlands and streams and that afford some protection of fish and wildlife habitat are the Shoreline Management Act (SMA) of 1971 (RCW 90.58), the State Hydraulic Code (RCW 75.20.100-140), the Growth Management Act (GMA)(RCW 37.70A), the Forest Practices Act (FPA)(RCW 76.09), and the Floodplain Management Program. The CWA Section 401 Certification and Coastal Zone Management consistency determinations are issued by the Washington State Department of Ecology. Section 402 permits under the federal CWA (also known as National Pollutant Discharge Elimination System permits) are issued by the Washington State Department of Ecology (RCW 90.48.260). The Washington Department of Natural Resources (WDNR) owns and regulates most streams within the State of Washington and an Aquatic Lands Lease must be obtained for work within these waterbodies. WDNR also has a five-tier stream typing system (Types 1 through 5, see Conveyance Corridor section) based on stream flow, width, and fish presence (WAC 222-16-030), which has recently been replaced by a four-tier interim water typing system (Types S, F, Np, Ns) (WAC 222-16-031, see Conveyance Corridors section of the Plants, Animals, and Wetlands Technical Appendix). The interim stream typing system will be used until WDNR produces stream typing maps, where typing was assigned to streams through use of a multi-parameter model. All information in this Draft EIS was evaluated using the five-tier stream typing system; future study will use the four-tier stream typing system, where appropriate.

The Model Toxics Control Act (MTCA, Chapter 70.105D RCW) and the associated rules (Chapter 173-340 WAC) establishes standards to remediate hazardous substance contamination of soils and groundwater, which would pose a threat to plants, animals, and wetlands (see Chapter 4, Earth and Groundwater for further discussion of MTCA).

State endangered, threatened, candidate, sensitive, and monitor species and priority habitats are designated by the Washington Department of Fish and Wildlife (WDFW) and the Washington Department of Natural Resources.

Local Regulations

Local jurisdictions in Washington typically regulate development in critical areas, which include wetlands, fish and wildlife habitat, and frequently flooded areas. The following jurisdictions within the treatment plant or corridor project areas have habitat preservation or conservation zones: Cities of Edmonds, Shoreline, Lake Forest Park, Woodinville, Kenmore, Mountlake Terrace, Bothell, Brier, Town of Woodway, and King and Snohomish Counties.

The Washington Growth Management Act requires local jurisdictions to develop and implement Critical Areas Ordinances (CAOs). Most CAOs specify ratings for wetlands based on size, type, characteristics and/or sensitivity to impacts (for example, Class 1 through 4). Standard buffers for each wetland class (for example, 100-foot buffers for Class 1 wetlands) are typically required. Mitigation usually is required for impacts to wetlands and to fish and wildlife habitat, if avoidance of impacts is not possible. Replacement of lost wetland area and functions usually is required for unavoidable impacts. CAOs typically specify standard replacement ratios (for example, create 2 acres of wetland for every acre disturbed). Some local jurisdictions, typically in conjunction with State requirements, also require mitigation measures for impacts or modifications to fish habitat such as restoration of riparian vegetation and replacement of fish-impassable culverts. Other mitigation measures, such as removal of non-native plants and replanting with native plants, maybe required as well. Detailed critical areas code requirements for the above-listed jurisdictions are provided in the Plants and Animals Technical Appendix.

Snohomish County Code

Wetlands, streams, and fish and wildlife habitat in unincorporated Snohomish County are regulated by the Snohomish County Code Chapter 32.10, which was revised and reissued in 1998. Wetlands are rated by the County according to their relative degrees of functions and values, with Category 1 being the most valuable and offering the most protection and Category 4 being the least valuable. Stream typing in Snohomish County follows the state water typing system (WAC 222-16-030) (the state typing system is now being replaced by a new system), which is based on channel width, flows, and presence of salmonids. Standard protective buffers are required for wetlands and streams, with larger buffers applied to rural areas and smaller buffers applied to areas within the Urban Growth Boundary (UGB). The Plants, Animals, and Wetlands appendix in the Draft EIS provides more information on Snohomish County wetland buffer and mitigation requirements.

Salmon Habitat Management Plan Administrative Rule

In December 1999, in response to the federal ESA listing of threatened chinook salmon, Snohomish County issued a Salmon Habitat Management Plan Administrative Rule (HMP Rule). This rule requires that a Habitat Management Plan be prepared for development projects that may affect fish and wildlife habitat conservation areas (FWHCA) that have a primary association with any ESA-listed threatened or endangered salmonid species. Also, the rule requires that a

150-foot "no development," plus an additional 150 foot "100 percent stormwater infiltration" buffer be required for all chinook-bearing streams and the lower 0.25-mile of all Type 3 streams that are tributary to chinook-bearing waters including wetlands associated with these streams. Structures are allowed in the outer 150-foot buffer, if 100 percent of the stormwater from the new impervious area can be infiltrated into the soils. These buffers also apply to wetlands associated with streams that meet the criteria for protection under HMP Rule. These buffers can be reduced by up to 25 percent, if the buffer area can be enhanced and an enhancement plan is approved by Snohomish County. In-kind replacement ratios are specified for clearing of FWHCA buffer areas pursuant to the HMP Rule (Table 1).

Table 1. Replacement Ratios

Vegetation Type	Area Replaced: Area Disturbed
Forested	2:1
Scrub-shrub	1.5:1
Herbaceous (non-woody)	1:1

The HMP Rule is flexible in that project applicants can propose mitigation that deviates from the standard measures described above if approved by Snohomish County, provided they achieve equivalent or greater protection to the functions and values of the FHWCA over that which would have been achieved under the standard requirements.

Snohomish County requires replacement of functions and values of wetlands, streams, and their buffers that are not subject to the HMP Rule. Wetland and buffer replacement ratios are a minimum of one (replacement value) to one (existing value). Because the County requires replacement of functions and values, lost wetlands and/or buffers and stream buffers may be replaced at a ratio greater than 1-acre replacement for every 1-acre of lost wetland in order to achieve replacement of lost functions and values. Snohomish County Code Chapter 32.10 allows stream relocation, if a mitigation plan has been approved by the County.

Project Authorization and Scope of Work

This technical report presents the results of sensitive areas studies conducted for the proposed Brightwater conveyance system located in northern King County and southern Snohomish County, Washington. This system will include one of three alternative conveyance corridors under consideration by the King County Wastewater Treatment Division for development of a secondary wastewater treatment plant (See Chapter 3 of the Final EIS for figures of each alternative conveyance corridor). The Route 9–195th Street and Route 9–228th Street corridor alternatives would convey wastewater to the Route 9 treatment plant alternative and would convey treated wastewater to Puget Sound. The Unocal corridor would convey wastewater to the proposed Unocal treatment plant alternative and would convey treated wastewater to Puget Sound. The preferred conveyance corridor alternative is the Route 9–195th Street corridor.

Site Description

Route 9–195th Street Corridor

The Route 9–195th Street System Alternative consists of a conveyance corridor including both an influent pipeline to a treatment plant built at the Route 9 site in unincorporated Snohomish County north of Woodinville, and an effluent pipeline to an outfall (Zone 75) off Point Wells. Tunneling is proposed for installation of the pipeline, which would require construction of portals along the corridor.

The influent pipeline would connect to the existing wastewater system in Kenmore and extend to the treatment plant beneath NE Bothell Way, 80th Avenue NE, NE 195th Street, SR 522, and SR 9. Influent from the North Creek pump station in Bothell would connect to the influent line underneath NE 195th Street via 120th Avenue NE. From the treatment plant, the effluent pipeline would extend to the Zone 7S outfall at Puget Sound beneath SR 9, SR 522, NE 195th Street, Ballinger Way NE, and 244th Street SW (Snohomish County designation) / NW 205th Street (King County designation).

The Route 9–195th Street corridor is located within portions of unincorporated Snohomish County, unincorporated King County, Shoreline, Woodway, Edmonds, Lake Forest Park, Kenmore, Bothell, and Woodinville.

Nine portals are proposed along the Route 9–195th Street corridor, including five primary portals (Portals 11, 44, 41, 5, and 19) and four secondary portals (Portals 45, 7, 27, and 23). Primary portals are proposed for launching and retrieving the tunnel boring machine, spoils receiving, and providing lining supplies to the tunnel.

The primary portal sites would cover 1 acre (retrieval portals) or 2 acres (launch portals) and would include a portal shaft, a crane, an electric substation, a storage, muck stockpile area, a fuel tank, a workshop, offices, parking, a truck staging/loading/cleaning zone, and stormwater settlement ponds. Secondary portals may or may not be required, to be decided during final

design. Secondary portals (less than 1 acre in size) may be required for temporary ventilation shafts, standby emergency egress, deep ground improvement, and/or supply of backfill grout.

The conveyance corridor crosses underneath many streams and associated wetlands, including Little Bear Creek, North Creek, Little Swamp Creek, Swamp Creek, an unnamed tributary to Lake Washington, the east and west forks of Lyon Creek, McAleer Creek, two unnamed tributaries to Lake Ballinger, and Barnacle Creek (tributary to Puget Sound).

Between three and seven candidate portal sites have been selected for each of the primary and secondary portal siting areas. Sensitive areas identified on these sites include wetlands, streams, associated buffers, and mature forest.

Route 9–228th Street Corridor

The Route 9–228th Street System Alternative includes several of the same elements as the 195th Street System Alternative: the Route 9 treatment plant site, the influent portion of the corridor, and the outfall zone. From the treatment plant, the effluent pipeline would extend to the Zone 7S outfall at Puget Sound beneath 228th Street, 100th Avenue West, and 244th Street SW (Snohomish County designation) / NW 205th Street (King County designation). Tunneling is proposed for installation of the pipeline, which would require construction of portals along the corridor.

The Route 9–228th Street corridor is located within portions of unincorporated Snohomish County, unincorporated King County, Shoreline, Woodway, Edmonds, Mountlake Terrace, Brier, Kenmore, Bothell, and Woodinville.

Eleven portals are proposed along the Route 9–228th Street corridor, including seven primary portals (Portals 11, 44, 41, 39, 33, 26, and 19) and four secondary portals (Portals 37, 30, 3/24, and 22/23). Primary and secondary portals would be constructed in the same manner as described for the Route 9–195th Street and Unocal corridors.

The primarily tunneled conveyance corridor crosses underneath many streams and associated wetlands, including Little Bear Creek, an unnamed tributary to Little Bear Creek, Palm Creek, North Creek, unnamed tributaries to North Creek, Perry Creek, Swamp Creek, an unnamed tributary to Swamp Creek, the east fork of Lyon Creek, an unnamed tributary to the east fork of Lyon Creek, Hall Creek, and Barnacle Creek (tributary to Puget Sound).

Between three and seven candidate portal sites have been selected for each of the primary and secondary portal siting areas. Sensitive areas identified on these sites include wetlands, streams, associated buffers, and mature forest.

Unocal Corridor

The Unocal Conveyance System Alternative includes a treatment plant located at the Unocal site in the City of Edmonds; an influent pipeline to carry wastewater from existing King County pipelines in Bothell, Kenmore, and Lake Forest Park to the treatment plant; and a marine outfall

located west of the Unocal site. Tunneling is proposed for installation of the pipeline, which would require construction of portals along the corridor.

The influent pipeline would connect to the existing wastewater system in Bothell and extend to the treatment plant beneath local roads, NE Bothell Way, Ballinger Way NE, 244th Street SW (Snohomish County designation) / NW 205th Street (King County designation), and Edmonds Way. The Unocal corridor is located within portions of Bothell, unincorporated King County, unincorporated Snohomish County, Edmonds, and Woodway.

Seven portals are proposed along the Unocal corridor, including four primary portals (Portals 14, 11, 7, and 3/24) and four secondary portals (Portals 13, 12, 10, and 5). Primary and secondary portals would be constructed in the same manner as described for the Route 9–195th Street and 228th Street corridors.

The primarily tunneled conveyance corridor crosses underneath many streams and associated wetlands, including an unnamed tributary to the Sammamish River, North Creek, Little Swamp Creek, Swamp Creek, an unnamed tributary to Lake Washington, Lyon Creek, the east fork of Lyon Creek, McAleer Creek, two unnamed tributaries to Lake Ballinger, and Willows Creek.

Between three and seven candidate portal sites have been selected for each of the primary and secondary portal siting areas. Sensitive areas identified on these sites include wetlands, streams, associated buffers, and mature forest.

Methods

Review of Existing Documentation

Existing sensitive areas including wetlands, streams, and fish and wildlife habitats on or adjacent to candidate portal sites along the alternative conveyance corridors are characterized using existing information and aerial photography. Year 2002 aerial photographs and geographic information system (GIS) data from both King and Snohomish Counties are used for mapping habitats within the project areas. Existing information has been obtained from the U.S. Fish and Wildlife Service (USFWS), Washington Department of Natural Resources (WDNR), Washington Department of Fish and Wildlife (WDFW), National Wetlands Inventory (NWI), published reports by King and Snohomish Counties, and local inventories and information databases.

Field Investigation

Limited wetland, stream, and wildlife surveys were performed at each of the candidate portal sites from public rights-of-way during field studies conducted in 2002 and 2003. Wetlands were identified in the field based on vegetation and hydrology indicators described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997).

Classification and Rating

Wetlands and streams are classified and rated according to various federal, state, and local systems. Classifications and ratings are derived based on information obtained during the review of existing documentation and field investigations. All classifications and ratings are preliminary, because observations were made from aerial photographs and public rights-of-way.

Wetlands and streams are classified according to the U.S. Fish and Wildlife Service system (Cowardin et al. 1979). This system is based on evaluation of attributes such as vegetation class, hydrologic regime, and substrate. In addition, wetlands are classified according to the hydrogeomorphic (HGM) system, which uses the geomorphic setting and sources of hydrology to define wetland classes (Brinson 1993).

Wetlands are rated using the Washington Department of Ecology wetland rating system for western Washington (Ecology 1993). This rating method is a four-tiered wetland categorization system based on wetland acreage, species diversity, and number of wetland classes. The four categories are ranked, with Category 1 wetlands exhibiting outstanding features and Category 4 wetlands having minimal attributes.

Wetlands and streams are also rated according to local city and county codes, which have rating systems similar to that of Ecology (1993). Many local rating systems rate streams higher if they support salmonids. Streams are rated higher if they have documented presence of salmonids or if they are tributary to streams with documented salmonid presence.

Habitat assessment methods described in *Wildlife–Habitat Relationships in Oregon and Washington* (Johnson and O’Neil 2001) are used to describe and evaluate habitat types. These methods are similar to the King County (1993) wildlife study guidelines for State Environmental Policy Act (SEPA) reviews.

Findings

The following sections present sensitive areas discovered on or directly adjacent to each of the candidate portal sites within each portal siting area. Table 2 presents the classification, rating, and local jurisdiction of each aquatic resource on or directly adjacent to each candidate portal site. See Chapter 7 for figures that present an aerial photograph of each portal siting area with respective boundaries for candidate portal sites, aquatic resources, and upland forest.

Route 9–195th Street Corridor

Influent Tunnel

The influent tunnel for the Route 9–195th Street corridor includes Portal Siting Areas 11, 44, and 41. The same influent tunnel and associated portals would be used for the Route 9–228th Street corridor.

Portal Siting Area 11

Portal Siting Area 11 consists of moderate- to high-density urban habitat located in the downtown area of the City of Kenmore.

Candidate Site A

Site A is located at the intersection of Juanita Drive NE and NE 175th Street. The Burke-Gilman Trail borders the north boundary of the site.

Urban and Mixed Environs

Site A consists of a gravel parking area used to store boats on trailers, small retail and commercial businesses, an office building, gravel parking lots, and an asphalt parking lot. The sparse vegetation present consists of nonnative landscape trees and shrubs, Scotch broom, Himalayan blackberry, and cottonwood.

Table 2. Classifications, Ratings, and Local Jurisdiction for Aquatic Resources on or Adjacent to Each Candidate Portal Site

Corridor	Portal Siting Area ^a	Candidate Portal Site ^b	Aquatic Resource Number	Name or Type	USFWS Classification ^c	HGM Wetland Classification ^d	Preliminary Ecology Wetland Rating ^e	Local Jurisdiction	Preliminary Local Rating ^f
Influent Tunnel to Route 9 Site (Route 9–195th Street and 228th Street)	11	A, B, and C	–	–	–	–	–	–	–
			67c	tributary to Little Swamp Creek	R2SB	–	–	City of Kenmore	2
		C	57a	wetland	PFO, PSS, PEM	riverine	2	City of Kenmore	2
	44		67c	tributary to Little Swamp Creek	R2SB	–	–	City of Kenmore	2
		D	57c	wetland	PFO, PSS, PEM	riverine	2	City of Kenmore	2
		E	58	wetland	PFO, PEM	riverine	2	City of Kenmore	2
		A	130	wetland	POW, PSS	depressional	3	City of Bothell	2
			61b	North Creek	R2SB	–	–	City of Bothell	1
			53	wetland	PSS, PEM	riverine	1	City of Bothell	1
	41	C	–	–	–	–	–	–	–
		D	52a	tributary to Sammamish River	R2SB	–	–	City of Bothell	2
		W	–	–	–	–	–	–	–

Table 2 (contd). Classifications, Ratings, and Local Jurisdiction for Aquatic Resources on or Adjacent to Each Candidate Portal Site

Corridor	Portal Siting Area ^a	Candidate Portal Site ^b	Aquatic Resource Number	Name or Type	USFWS Classification ^c	HGM Wetland Classification ^d	Preliminary Ecology Wetland Rating ^e	Local Jurisdiction	Preliminary Local Rating ^f
Effluent Tunnel to Point Wells (Route 9–195th Street)	41			See influent tunnel to Route 9 site (Route 9–195th Street and 228th Street)					
	44			See influent tunnel to Route 9 site (Route 9–195th Street and 228th Street)					
		A	142	wetland	PFO	depressional	3	City of Kenmore	2
		C	143	wetland	PFO	slope	3	City of Lake Forest Park	2
	45		144	wetland	PFO	slope	3	City of Kenmore	2
		D	145	wetland	PFO	riverine	3	City of Kenmore	2
			146	stream	–	–	–	City of Kenmore	2
		A	–	–	–	–	–	–	–
			79	Brugger's Bog	PSS	riverine	2	City of Shoreline	3
	7	B	77	west fork of Lyon Creek	R2SB	–	–	City of Shoreline	2
			79	Brugger's Bog	PSS	riverine	2	City of Shoreline	3
		C	77	west fork of Lyon Creek	R2SB	–	–	City of Shoreline	2
	5	B, G, and X	–	–	–	–	–	–	–
			83b	Lake Ballinger	L2OW	–	–	City of Mountlake Terrace	no rating
27	A	83a	tributary to Lake Ballinger	R2SB	–	–	City of Mountlake Terrace	no rating	

Table 2 (contd). Classifications, Ratings, and Local Jurisdiction for Aquatic Resources on or Adjacent to Each Candidate Portal Site

Corridor	Portal Siting Area ^a	Candidate Portal Site ^b	Aquatic Resource Number	Name or Type	USFWS Classification ^c	HGM Wetland Classification ^d	Preliminary Ecology Wetland Rating ^e	Local Jurisdiction	Preliminary Local Rating ^f
Effluent Tunnel to Point Wells (Route 9–195th Street) (cont.)	27 (cont.)	A (cont.)	92	wetland	PFO	lacustrine fringe	1	City of Mountlake Terrace	no rating
		B	141	wetland	PFO, PEM	slope	3	City of Shoreline	2
		C	83b	Lake Ballinger	L1OW, L2OW	–	–	City of Edmonds	no rating
			92	wetland	L2AB, L2EM	lacustrine fringe	1	City of Edmonds	1
	22/23	A, C, D, E, and F	–	–	–	–	–	–	
	19	A	138	stream	R2SB	–	–	Town of Woodway	3
			139	wetland	PSS	slope	–	Town of Woodway	3
			138	stream	R2SB	–	–	Town of Woodway	3
		C	139	wetland	PSS	slope	–	Town of Woodway	3
			97	stream	R2SB	–	–	Town of Woodway	3
			147	wetland	PEM	riverine	3	Snohomish County (urban)	3
		E	154	wetland	PEM	depressional	3	Snohomish County (urban)	4
			97	stream	R2SB	–	–	City of Shoreline	3
			137	Barnacle Creek	R2SB	–	–	City of Shoreline	3
			140	wetland	PSS	riverine	3	City of Shoreline	3

Table 2 (contd). Classifications, Ratings, and Local Jurisdiction for Aquatic Resources on or Adjacent to Each Candidate Portal Site

Corridor	Portal Siting Area ^a	Candidate Portal Site ^b	Aquatic Resource Number	Name or Type	USFWS Classification ^c	HGM Wetland Classification ^d	Preliminary Ecology Wetland Rating ^e	Local Jurisdiction	Preliminary Local Rating ^f
Effluent Tunnel to Point Wells (Route 9–228th Street)	39	B	34a	Palm Creek	R2SB	–	–	City of Bothell	2
		C and D	–	–	–	–	–	City of Bothell	–
	37	A	148	wetland	PEM, PSS	riverine	3	City of Bothell	2
		C	149	wetland	PEM, POW	depressional	4	City of Bothell	3
			150	wetland	PEM	depressional	3	City of Bothell	3
		D	21	wetland	PFO	riverine	2	City of Bothell	2
			23a	Perry Creek	R2SB	–	–	City of Bothell	2
			132a	stream	R2SB	–	–	City of Bothell	2
			134	wetland	PFO	depressional	3	City of Bothell	2
	33	A	12	tributary to west fork of Swamp Creek	R2SB	–	–	City of Brier	no rating
		C	12a	wetland	PFO	riverine	1	City of Brier	1
			13	wetland	PFO, POW	depressional	3	Snohomish County (urban)	3
		D	67a	west fork of Swamp Creek	R2SB	–	–	City of Brier	no rating
	30	A	8	east fork of Lyon Creek	R2SB	–	–	City of Brier	no rating
			9	wetland	PFO	riverine	3	City of Brier	3
B		8	east fork of Lyon Creek	R2SB	–	–	City of Brier	no rating	
		131	wetland	PSS	depressional	4	City of Brier	4	
C		8	east fork of Lyon Creek	R2SB	–	–	City of Brier	no rating	
		9a	wetland	PFO	riverine	3	City of Brier	3	

Table 2 (contd). Classifications, Ratings, and Local Jurisdiction for Aquatic Resources on or Adjacent to Each Candidate Portal Site

Corridor	Portal Siting Area ^a	Candidate Portal Site	Aquatic Resource Number	Name or Type	USFWS Classification ^b	HGM Wetland Classification ^c	Preliminary Ecology Wetland Rating ^d	Local Jurisdiction	Preliminary Local Rating ^e
Effluent Tunnel to Point Wells (Route 9–228th Street) (cont.)	26	A	4	Hall Creek	R2SB	–	–	City of Mountlake Terrace	no rating
		C	–	–	–	–	–	–	–
			4	Hall Creek	R2SB	–	–	City of Mountlake Terrace	no rating
		D	5	wetland	PSS, POW	riverine	2	City of Mountlake Terrace	no rating
	3/24	A, B, C, D, E, and F	–	–	–	–	–	–	
	22/23	See effluent tunnel to Point Wells (Route 9, 195th Street).							
	19	See effluent tunnel to Point Wells (Route 9, 195th Street).							
Influent Tunnel to Unocal Site	14	A	52a	stream	R2SB	–	–	City of Bothell	2
			52b	stream	R2SB	–	–	City of Bothell	2
			52	wetland	PFO, PSS, PEM	riverine	2	City of Bothell	1
		B	52a	stream	R2SB	–	–	City of Bothell	2
		D	151	wetland	PEM	depressional	4	City of Bothell	3
	13	A	62	Horse Creek	R2SB	–	–	City of Bothell	2
			63	Sammamish River	R2UB	–	–	City of Bothell	1
		B	63	Sammamish River	R2UB	–	–	City of Bothell	1
C		–	–	–	–	–	–	–	

Table 2 (contd). Classifications, Ratings, and Local Jurisdiction for Aquatic Resources on or Adjacent to Each Candidate Portal Site

Corridor	Portal Siting Area ^a	Candidate Portal Site	Aquatic Resource Number	Name or Type	USFWS Classification ^b	HGM Wetland Classification ^c	Preliminary Ecology Wetland Rating ^d	Local Jurisdiction	Preliminary Local Rating ^e
Influent Tunnel to Unocal Site (cont.)	12	C and E	129	wetland	PEM, PSS	riverine	1	City of Kenmore	1
	11	See effluent tunnel to Point Wells (Route 9–195th Street)							
		A	72	Lyon Creek	R2SB	–	–	City of Lake Forest Park	no rating
			81	McAleer Creek	R2SB	–	–	City of Lake Forest Park	no rating
	10	C	152	wetland	PFO	riverine	3	City of Lake Forest Park	3
		D	72	Lyon Creek	R2SB	–	–	City of Lake Forest Park	no rating
		E	153	wetland	PEM	depressional	4	City of Lake Forest Park	3
	7	See effluent tunnel to Point Wells (Route 9–195th Street)							
	5	See effluent tunnel to Point Wells (Route 9–195th Street)							
	3/24	See effluent tunnel to Point Wells (Route 9–195th Street)							

^aPortal siting areas are 72 acres each. See Chapter 7 for figures that depict aquatic resource [AR] identification and aerial photographs for each portal siting area.

^bCandidate portal sites are a minimum of 1 acre each. See Chapter 7 for figures that depict AR identification and aerial photographs for each candidate portal site.

^cUSFWS classifications describe the dominant vegetation structure in the wetland. Major groupings are palustrine [freshwater wetland (PFO = forested, PSS = scrub-shrub, PEM = emergent, POW = open water)]; riverine [stream or river (R2SB = lower perennial, R2UB = unconsolidated bottom)]; and lacustrine [lakes (L1OW = limnetic {deep} open water, L2OW = littoral {shallow} open water)]. (Cowardin et al. 1979).

^dHGM classifications describe the position in the landscape occupied by the wetlands. Major groups include *depressional* = occupying a geographic depression; *riverine* = associated with a stream or river; *lacustrine fringe* = associated with a lake; and *sloped* = hillside seeps (Brinson 1993).

^eThese ratings were developed by Washington Department of Ecology based on functional attributes that wetlands provide. Class 1 wetlands have highly valued functions, whereas Class 3 wetlands provide minimal functional value (Ecology 1993). These ratings are based on current information and preliminary investigation of the portals and could change in the future.

^fThese ratings are based on applicable city, town, and county regulations, which were developed in a manner similar to the Ecology ratings. These ratings are based on current information and preliminary investigation of the portals and could change in the future. Details on the underlying rationale and implications of these ratings can be found in Part 1 of Appendix 7-A, Affected Environment, Plants and Animals.

Candidate Site B

Site B is located south of Site A and west of Juanita Drive NE.

Urban and Mixed Environs

Site B consists of undeveloped industrial land. The site is a large gravel parking lot used to store cars.

Candidate Site C

Site C is located at the intersection of 68th Avenue NE and 181st Street.

Urban and Mixed Environs

Site C consists of a parking lot, grocery store, and shopping center. Nonnative landscape trees line 181st Street.

Portal Siting Area 44

Portal Siting Area 44 consists of medium-density urban habitat located in the City of Kenmore. This urban matrix contains patches of riparian wetland and upland forest.

Candidate Site C

Site C is an undeveloped lot located east of 80th Avenue NE and south of NE 203rd Street. Currently, there is no public access to Site C.

Agriculture, Pasture, and Mixed Environs

Site C is an undeveloped lot dominated by herbaceous, emergent, and shrub vegetation. The site has been cleared in the past and may have been used as pasture.

Open Water- Lakes, Rivers, Streams

Site C contains two small headwater tributaries (AR 67c) to Little Swamp Creek (AR 67b).

Scrub-Shrub and Emergent Wetlands

The western portion of Site C contains a scrub-shrub and emergent wetland (AR57a) that is a floodplain wetland associated with Little Swamp Creek (AR 67b) and a tributary (AR 67c) to Little Swamp Creek. The two headwater tributaries on the site may also have wetlands along their margins.

Upland Forest

Mature mixed forest lies adjacent to the east boundary of Site C. Douglas fir, big-leaf maple, sword fern, and Himalayan blackberry are typical species present.

Candidate Site D

Site D is located at the intersection of 80th Avenue NE and NE 195th Street.

Agriculture, Pasture, and Mixed Environs

Site D is used primarily as a horse training and exercise facility. Much of the site consists of bare soil, gravel, and patchy grass.

Urban and Mixed Environs

Site D contains a large shed for storing horses and a single-family residence.

Forested and Emergent Wetlands

The northwest portion of the site contains a forested and emergent wetland (AR-57c) that extends off-site along 80th Avenue NE. Dominant wetland vegetation on-site includes red alder, reed canarygrass, cattail, soft rush, and willows.

Upland Forest

Mature mixed forest lies adjacent to the east boundary of Site D. Douglas fir, big-leaf maple, sword fern, and Himalayan blackberry are typical species present.

Candidate Site E

Site E is located adjacent to the north side of NE 195th Street and west of 80th Avenue NE.

Urban and Mixed Environs

The eastern portion of Site E consists of a single-family residence, chicken coop, shed, lawn, and gardens interspersed among wetlands.

Agriculture, Pasture, and Mixed Environs

The western portion of Site E is cleared and contains pasture grass.

Forested and Emergent Wetlands

The site contains forested and emergent wetlands on the eastern portion of the site. A portion of forested wetland (AR 58) at the southeast corner of the site extends east and north of the site. The site contains a seasonally wet, emergent pasture wetland that extends through the center of the site and north of the site, where it connects to AR 58. In addition to pasture grass, vegetation on the site includes soft rush, bracken fern, red stem dogwood, thimbleberry, willows, and reed canarygrass.

Portal Siting Area 41

Portal Siting Area 41 consists of medium-density urban habitat located in the City of Bothell. This urban matrix contains patches of riparian wetlands, depressional wetlands, and upland forest.

Candidate Site A

Site A is located at the intersection of NE 195th Street and North Creek Parkway.

Urban and Mixed Environs

Site A is in the process of being developed. The site is primarily paved with asphalt for parking and concrete for the foundation of a building. A narrow line of landscaped trees, shrubs, and lawn are located along the boundaries of the site adjacent to NE 195th Street and North Creek Parkway.

Open Water- Lakes, Rivers, Streams

The main stem of North Creek (AR 61b) flows adjacent to the north boundary of the site. A tall dike with a gravel walking trail on top separates the site from North Creek.

Scrub-Shrub and Emergent Wetlands

Scrub-shrub and emergent wetlands (AR 53) adjacent to North Creek (AR 61b) lie adjacent to the north boundary of Site A. A tall dike with a gravel walking trail on top separates the site from the wetland. Typical vegetation associated with AR 53 includes reed canarygrass, Sitka and Pacific willows, Oregon ash, red alder, black cottonwood, and Himalayan blackberry. A scrub-shrub wetland (AR 130) with an open-water component is located adjacent to the east boundary of the site. A gravel walking trail separates the site from the wetland. Aquatic bed vegetation includes water parsley along the banks. Dominant emergent vegetation along the shallow, inundated margins includes cattails and reed canarygrass. Pockets of scrub-shrub vegetation also occur within this complex including Sitka willow, Himalayan blackberry, reed canarygrass, and stinging nettles. Birch snags occur along the eastern edge of the wetland.

Candidate Site C

Site C is located at the intersection of NE 195th Street and 120th Avenue NE.

Urban and Mixed Environs

The western portion of Site C is an undeveloped lot vegetated primarily with lawn. This portion of the site is used as park space. The site is surrounded by medium-density urban development composed of commercial office space and ball fields.

Upland Forest

The eastern and southern portions of the site contain upland forest on a hillside. The forest is dominated by Douglas fir, big-leaf maple, western red cedar, red alder, vine maple, salmonberry, trailing blackberry, and sword fern.

Candidate Site D

Site D is located on the west side of 120th Avenue NE.

Urban and Mixed Environs

Site D is a baseball field. The site is surrounded by medium-density urban development composed of commercial office space. Sparse vegetation along the perimeter of the site includes nonnative landscape trees and shrubs.

Open Water- Lakes, Rivers, Streams

A tributary to the Sammamish River (AR 52a) flows south along the west boundary of the site. This tributary is a straight, channelized stream that receives runoff from the North Creek business park. The narrowly buffered channel is vegetated with weeping willow, reed canarygrass, Douglas spirea, and landscape trees and shrubs.

Candidate Site W

Site W is located at the intersection of Beardslee Boulevard, Ross Road, and NE 195th Street NE.

Urban and Mixed Environs

Site W is mostly undeveloped and contains five single-family residences. Grass yards cover most of the site. Occasional trees include Douglas fir, big-leaf maple, western red cedar, western hemlock, fruit trees, and landscape trees. Patches of Himalayan blackberry are common at the perimeters of the site.

Effluent Tunnel

The effluent tunnel for the Route 9–195th Street corridor includes Portal Siting Areas 41, 44, 45, 7, 5, 27, 22/23, and 19.

Portal Siting Area 41

See description above for the Route 9, 195th Street influent tunnel.

Portal Siting Area 44

See description above for the Route 9, 195th Street influent tunnel.

Portal Siting Area 45

Portal Siting Area 45 consists of medium-density urban habitat. This urban matrix contains patches of riparian wetlands, slope wetlands, and upland forest. Candidate portal Sites A and D are located in the City of Kenmore. Candidate portal Site C is located in the City of Lake Forest Park.

Candidate Site A

Site A is located between 55th Avenue NE and 58th Avenue NE.

Urban and Mixed Environs

Site A contains a vacant single-family residence. The remainder of the site is undeveloped and is vegetated with mowed grass and small patches of Douglas spirea, reed canarygrass, and Himalayan blackberry. The site is surrounded by medium-density urban habitat composed of single-family residences.

Forested Wetlands

Site A is adjacent to a forested wetland (AR 142) located north of the site. A portion of the wetland buffer may extend onto Site A. Dominant wetland vegetation includes black cottonwood, red alder, Himalayan blackberry, and reed canarygrass. Dominant wetland buffer vegetation includes Douglas fir and western hemlock.

Candidate Site C

Site C is located across the street from Site A off 55th Avenue NE.

Urban and Mixed Environs

The eastern portion of Site C contains single-family residences adjacent to 55th Avenue NE.

Forested Wetlands

Site C likely contains a forested wetland (AR 143) in the central portion of the site between single-family residences and an upland forested hillside. Dominant vegetation includes Japanese knotweed and black cottonwood.

Upland Forest

The western portion of the site contains upland forest on a hillside that slopes down toward the east. Dominant vegetation includes Douglas fir, red alder, and Himalayan blackberry.

Candidate Site D

Site D is located south of NE 193rd Street.

Urban and Mixed Environs

Site D contains single-family residences and Linwood Park. The household properties are well-forested with Douglas fir, western red cedar, and red alder. The park contains open lawn areas with forested perimeters.

Open Water- Lakes, Rivers, Streams

An unnamed tributary (AR 146) to Lake Washington traverses Site D. The stream flows through residential back yards and a wetland within Linwood Park.

Forested Wetlands

Site D contains two forested wetlands (ARs 144 and 145). AR 144 is located at the base of a hillside behind single-family residences. AR 145 is located at the southern end of Linwood Park and is associated with the unnamed tributary (AR 146) to Lake Washington. Dominant vegetation within the wetlands includes red alder, salmonberry, horsetail, Himalayan blackberry, and reed canarygrass.

Portal Siting Area 7

Portal Siting Area 7 consists of medium-density urban habitat in the City of Shoreline. This urban matrix contains patches of riparian wetlands.

Candidate Site A

Site A is located east of 25th Avenue NE.

Urban and Mixed Environs

Site A consists of ballfields, a running track, and tennis courts associated with the Aldercrest Learning Center. Site A is surrounded by medium-density urban development that includes primarily single-family residences and apartments.

Candidate Site B

Site B is located west of 25th Avenue NE and across from Site A.

Urban and Mixed Environs

Site B is a King County Department of Transportation facility used for storing equipment and materials and for refueling vehicles. Site B is surrounded by medium-density urban development that includes primarily single-family residences, a park, and apartments. The site is mostly cleared of vegetation and contains covered structures for vehicles and graveled staging and parking areas.

Open Water- Lakes, Rivers, Streams

The west fork of Lyon Creek (AR 77) is adjacent to the northern boundary of the site.

Scrub-Shrub Wetlands

A scrub-shrub wetland (AR 79) associated with the west fork of Lyon Creek (AR 77) is adjacent to the northern boundary of the site (see description for candidate Site C).

Candidate Site C

Site C is located west of 25th Avenue NE and directly north of Site B.

Urban and Mixed Environs

Site C is Brugger's Bog Park. The park is surrounded by medium-density urban development that includes primarily single-family residences, apartments, and a King County Department of Transportation storage facility. The site contains a mix of lawn areas, a stream, a wetland, and forest.

Upland Forest

A small patch of forest is located in the western portion of the site. Dominant vegetation present includes Douglas fir and red alder.

Open Water- Lakes, Rivers, Streams

The west fork of Lyon Creek (AR 77) flows through the site. The upper reach of the stream on the site is poorly vegetated with lawn and Himalayan blackberry. The lower reach is surrounded by scrub-shrub wetland (see below).

Scrub-Shrub Wetlands

A scrub-shrub wetland (AR 79), referred to as Brugger's Bog, is associated with both sides of the west fork of Lyon Creek (AR 77) on the eastern portion of the site. The wetland is permanently flooded and saturated by the stream. Brugger's Bog (AR 79) is dominated by Pacific and Sitka willows, red-stem dogwood, and a diverse herbaceous understory that consists of dominant reed canarygrass.

Portal Siting Area 5

Portal Siting Area 5 consists of medium-density urban habitat in the City of Shoreline. This urban matrix contains patches of riparian wetland and upland forest.

Candidate Site B

Site B is located along the west side of Ballinger Way NE and north of Forest Park Drive NE.

Urban and Mixed Environs

Site B is occupied by the Washington Tree Service. Site B is surrounded by medium-density urban development that includes primarily commercial properties and single-family residences. The site is primarily impervious and is sparsely vegetated with landscaping trees and shrubs. The southwestern perimeter of Site B has a mix of native trees including western white pine, Douglas fir, western hemlock, and western red cedar.

Candidate Site G

Site G is located adjacent and southeast of Site B along the west side of Ballinger Way NE.

Urban and Mixed Environs

Site G consists of two parcels that include commercial office buildings. One of the parcels is owned by the Washington Tree Service, which also owns Site B. Site G is surrounded by medium-density urban development that includes primarily commercial properties and single-family residences. Most of the site is cleared of vegetation and includes gravel areas, asphalt areas, and buildings. Very few landscape trees and shrubs are located at the northern portion of the site.

Candidate Site X

Site X is located at the southeast intersection of Ballinger Way NE and 15th Avenue NE in the City of Shoreline.

Urban and Mixed Environs

Site X is occupied by a Chevron gas station and a Citibank building. Medium-density urban development surrounds the site, including commercial properties, single-family residences, a movie theater, restaurants, retail stores, and parking lots. Site X is primarily impervious and is sparsely vegetated with landscaping trees and shrubs. The southern perimeter of the site has a

mix of native trees including western white pine, Douglas fir, western hemlock, and western red cedar.

Portal Siting Area 27

Portal Siting Area 27 consists of medium-density urban habitat. This urban matrix contains Lake Ballinger and patches of riparian wetlands, perched wetlands, and upland forest. Candidate portal Site A is in the City of Mountlake Terrace, Site B is in the City of Lake Forest Park, and Site C is in the City of Edmonds.

Candidate Site A

Site A is located immediately north of Ballinger Way NE and southeast of Lake Ballinger.

Urban and Mixed Environs

Site A is located on the southwest portion of the Nile Temple golf course. Medium-density urban habitat surrounds the site and includes primarily single-family residences and a cemetery. Narrow stands of mature Douglas fir trees are located throughout the southeastern half of the site. The western edge is adjacent to a forested wetland (see below).

Forested Wetlands

Adjacent to the western boundary of the site is a forested wetland (AR 92) associated with an unnamed tributary (AR 83a) to Lake Ballinger (AR 83b) and the fringe of Lake Ballinger. The dominant tree species is red alder and the dominant understory species is salmonberry. Other species include western hemlock, horsetail, and Himalayan blackberry. Several red alder snags occur in this area. Dominant plant species in the upland buffer along Ballinger Way NE include cascara, big-leaf maple, and Douglas fir.

Candidate Site B

Site B is located at the intersection of Lake Ballinger Way and First Avenue NE.

Urban and Mixed Environs

Site B is located at the northwest corner of Holy Rood Cemetery. Medium-density urban development surrounds the site and includes primarily single-family residences and apartment buildings. Common plant species in these areas include Douglas fir, big-leaf maple, birch, lawn grasses, and landscape trees and shrubs.

Upland Forest

A patch of upland forest occurs in the southwest portion of Site B. Common plant species present include Douglas fir, western hemlock, red alder, Pacific madrone, beaked hazelnut, thimbleberry, and Indian plum.

Forested and Emergent Wetlands

A small forested and emergent wetland (AR141) is located in the northern portion of the site. Dominant species in this wetland include red alder, salmonberry, spirea, and reed canarygrass. Other species present include western crabapple, Sitka willow, and Himalayan blackberry.

Candidate Site C

Site C is located east of 76th Avenue W along the southwest edge of Lake Ballinger.

Urban and Mixed Environs

Site C consists of medium-density urban habitat that includes primarily single-family residences and an undeveloped lot. Common species in this area include Douglas fir, cedar, lawn grasses, western white pine, and landscape trees and shrubs.

Open Water- Lakes, Rivers, Streams

Lake Ballinger (AR 83b) abuts the eastern edge of Site C.

Aquatic Bed and Emergent Wetlands

Lacustrine wetlands (AR 92) associated with Lake Ballinger are located along the shoreline. Aquatic bed and emergent vegetation present includes white water lily, yellow pond-lily, common cattail, yellow iris, and hardstem bulrush.

Portal Siting Area 22/23

Candidate portal sites within Portal Siting Area 22/23 can be used for the preferred Route 9–195th Street corridor or the Route 9–228th Street corridor. The two portal siting areas overlap slightly. Portal Siting Area 22 is located just west of Portal Siting Area 23. Portal Siting Area 22/23 consists of medium-density urban habitat. This urban matrix contains patches of upland forest. Candidate portal Sites A and D are in the City of Edmonds, and Sites C, E, and F are in the City of Shoreline.

Candidate Site A

Site A is located on the east side of Firdale Avenue.

Urban and Mixed Environs

Site A is a commercial area known as the Firdale Village, which includes retail shops and restaurants. The surrounding area is occupied by medium-density urban habitat consisting of single-family and multifamily residences and a narrow commercial zone along NW 205th Street / 244th Street SW. Sparse landscape shrubs are located throughout the parking lots. A thin strip of trees that includes primarily Douglas fir and western red cedar is located along the northern edge of Site A.

Candidate Site C

Site C is located at the southwest intersection of NW 205th Street / 244th Street SW and 8th Avenue NW.

Urban and Mixed Environs

Site C is a medium-density urban habitat consisting of single-family residential development. Typical plant species in this area include Douglas fir, big-leaf maple, lawn grasses, and landscape trees and shrubs. An upland forest is located within and adjacent to Site C (see below).

Upland Forest

A small patch of conifer forest occurs in the central portion of the site and extends beyond the western edge of the site. Dominant species include Douglas fir, western hemlock, and western red cedar.

Candidate Site D

Site D is located east of Site A along Firdale Avenue.

Urban and Mixed Environs

Site D is occupied by medium-density urban development consisting of single-family residences. Dominant plant species include lawn grasses and landscape trees and shrubs.

Upland Forest

Small patches of forest occur along the western portion of the site and adjacent to the southeastern edge of the site. Common species present include Douglas fir, big-leaf maple, red alder, Himalayan blackberry, sword fern, and trailing blackberry.

Candidate Site E

Site E is located southwest of Site C on the west side of 10th Avenue NW.

Urban and Mixed Environs

Site E is located in an area of medium-density urban habitat developed with single-family residences. Typical species in this area include Douglas fir, big-leaf maple, lawn grasses, and landscape trees and shrubs. An area of upland forest is present within the western portion of the site (see below).

Upland Forest

A patch of conifer forest occupies the western portion of Site E. Dominant species present include Douglas fir, western red cedar, and western white pine.

Candidate Site F

Site F is located east of Site C along the south side of 244th Street SW.

Urban and Mixed Environs

Site F consists of single-family residences. The site is surrounded by medium-density urban habitat developed with single-family residences. Typical species in this area include scattered mature Douglas fir, lawn grasses, and landscape trees and shrubs.

Portal Siting Area 19

Portal Siting Area 19 consists of medium-density urban habitat. This urban matrix contains Puget Sound and associated shoreline and patches of riparian wetlands, isolated wetlands, and upland forest. Candidate portal Site A is located in the Town of Woodway, Site C is in unincorporated Snohomish County, and Site E is in the City of Shoreline.

Candidate Site A

Site A is located at the intersection of Richmond Beach Drive NW and NW 205th St / 244th Street SW.

Urban and Mixed Environs

Site A is undeveloped. Medium-density urban development consisting of single-family residences surrounds the site to the east and south. Common species in this surrounding area include big-leaf maple and landscape trees and shrubs. The Chevron facility at Point Wells is located west of the site (Site C). Small patches of Himalayan blackberry, thistles, and mixed grasses occur in this surrounding area. An upland forest is adjacent to the site on the north, and a scrub-shrub wetland and an unnamed stream are located on the site (see below).

Upland Forest

An upland forest abuts the north boundary of Site A. Vegetation at the edges of the forest is younger and shrub-dominated, whereas the inner forest is mature and tree-dominated. Red alder, Scouler's willow, big-leaf maple, Himalayan blackberry, and reed canarygrass dominate the edge of the forest, immediately adjacent to Site A. Douglas fir, grand fir, western red cedar, big-leaf maple, and red alder dominate the inner forest.

Scrub-Shrub Wetland

A scrub-shrub wetland (AR139) is located in the central portion of Site A, adjacent to a parking lot. Typical species present include Pacific and Sitka willows, red alder saplings, and reed canarygrass.

Open Water- Lakes, Rivers, Streams

An unnamed stream (AR138) flows across the southeast corner and along the south perimeter of Site A. The banks of the upper reach of the stream on the site are vegetated with red alder, big-leaf maple, Indian plum, Himalayan blackberry, salmonberry, trailing blackberry, water parsley, and lady fern. The banks of the lower reach have recently been planted with red-stem dogwood.

Candidate Site C

Site C is located west of Site A, along both the east and west sides of Richmond Beach Drive NW.

Urban and Mixed Environs

Site C is located on the southern portion of the Chevron facility at Point Wells. On the west side of Richmond Beach Drive, Site C is an undeveloped, cleared lot. The site is scattered with minimum vegetation including Himalayan blackberry, thistle, and mixed grasses. Two adjacent railroad tracks run north-south between Site C and the west edge of Richmond Beach Drive. On the east side of Richmond Beach Drive, Site C is primarily paved and contains one small building.

Upland Forest

On the east side of Richmond Beach Drive, a forested hillside lies adjacent to the west boundary of Site C. Vegetation at the edges of the forest is younger and shrub-dominated, whereas the inner forest vegetation is mature and tree-dominated. Red alder, Scouler's willow, big-leaf maple, Himalayan blackberry, and reed canarygrass dominate the edge of the forest, immediately adjacent to Site A. Douglas fir, grand fir, western red cedar, big-leaf maple, and red alder dominate the inner forest.

Open Water- Lakes, Rivers, Streams

The Puget Sound shoreline is adjacent to the western edge of Site C. An unnamed stream (AR 138) is piped to Puget Sound underneath Richmond Beach Drive, the two adjacent railroad tracks, and Site C. A short segment of the stream surfaces between Richmond Beach Drive and the railroad tracks. Another unnamed stream (AR 97) flows west toward the southeast corner of Site C. The stream surfaces in a ditch on the east side of the two adjacent railroad tracks and flows south for approximately 200 feet where it is piped under the two adjacent railroad tracks to the beach adjacent to Puget Sound.

Scrub-Shrub and Emergent Wetlands

The scrub-shrub wetland (AR 139) located on Site A lies directly adjacent to the east boundary of Site C located east of Richmond Beach Drive. Typical species present include Pacific and Sitka willows, red alder, and reed canarygrass. Small, linear emergent wetlands are associated with unnamed streams (AR 138, AR 97) within the ditch between the two adjacent railroad tracks and Richmond Beach Drive. The dominant species is watercress.

An emergent, isolated wetland (AR 154) is located at the southern portion of Site C west of Richmond Beach Drive and the railroad tracks. Small portions of the wetland have permanent shallow surface water. Typical species present include tapertip rush, duckweed, cattail, red alder, pacific willow, and horsetail.

Candidate Site E

Site E is located west of Richmond Beach Drive NW in the City of Shoreline.

Urban and Mixed Environs

A King County pump station is located on Site E. Medium-density urban habitat developed with single-family residences surrounds the site to the north, east, and south. Common species in this area include big-leaf maple, lawn grasses, and landscape trees and shrubs.

Open Water- Lakes, Rivers, Streams

Two sets of railroad tracks separate Site E from Puget Sound. Within the drainage ditch adjacent to the railroad tracks, an unnamed stream (AR 97) flows south into Site E from the north. Barnacle Creek (AR 137) flows into the site from the east. In the northern portion of the site the two streams converge into a single channel that flows south through a scrub-shrub wetland (AR 140), then flows west under the railroad tracks and discharges to the beach adjacent to Puget Sound.

Scrub-Shrub Wetland

A scrub-shrub wetland (AR 140) is located in the northern portion of Site E. Typical species present include Pacific and Scouler's willows, horsetail, Himalayan blackberry, and water parsley.

Route 9–228th Street Corridor

Influent Tunnel

The influent tunnel for the Route 9–228th Street corridor includes Portal Siting Areas 11, 44, and 41. The same influent tunnel and associated portals would be used for the Route 9–195th Street corridor.

Portal Siting Area 11

See description above for the Route 9, 195th Street influent tunnel.

Portal Siting Area 44

See description above for the Route 9, 195th Street influent tunnel.

Portal Siting Area 41

See description above for the Route 9, 195th Street influent tunnel.

Effluent Tunnel

The effluent tunnel for the Route 9–228th Street corridor includes Portal Siting Areas 39, 37, 33, 30, 26, 3/24, 22/23, and 19.

Portal Siting Area 39

Portal Siting Area 39 consists of medium-density urban habitat in the City of Bothell. This urban matrix contains patches of riparian wetland and upland forest.

Candidate Site B

Site B is located south of 228th Street SE.

Urban and Mixed Environs

Site B consists of one single-family residence and undeveloped land. Common vegetation includes black cottonwood, red alder, Himalayan blackberry, lawn grasses, and Scotch broom.

Open Water- Lakes, Rivers, Streams

Palm Creek (AR 34a), a tributary to North Creek (AR 61b), flows near the east perimeter of Site B. Typical vegetation along the banks includes reed canarygrass and Himalayan blackberry.

Upland Forest

An upland deciduous forest occurs on the west portion of Site B. This riparian area is associated with North Creek. Typical tree species include black cottonwood and red alder. The understory includes Himalayan blackberry, beaked hazelnut, and Indian plum.

Candidate Site C

Site C is located east of Site B and south of 228th Street SE.

Urban and Mixed Environs

Site C is occupied by a single-family residence at the north portion of the site. The southern portion of the site is undeveloped and sapling-dominated. Common vegetation includes Douglas fir, red alder, black cottonwood, and mixed grasses.

Candidate Site D

Site D is located between Sites B and C.

Urban and Mixed Environs

Site D is occupied by a single-family residence at the northern portion of the site. The southern portion of the site is undeveloped and dominated by grasses. Common vegetation includes black cottonwood, red alder, Himalayan blackberry, lawn grasses, and reed canarygrass.

Upland Forest

An upland deciduous forest lies adjacent to the southwest perimeter of Site D. This riparian area is associated with North Creek. Typical tree species include black cottonwood and red alder. The understory includes reed canarygrass and Himalayan blackberry.

Portal Siting Area 37

Portal Siting Area 37 consists of medium- to high-density urban habitat in the City of Bothell. This urban matrix contains patches of riparian wetlands and isolated wetlands.

Candidate Site A

Site A is located south of 228th Street SE along the Bothell-Everett Highway.

Urban and Mixed Environs

Site A is undeveloped and partially cleared with two building foundations from a single-family residence remaining on the site. Surrounding medium-density urban development includes restaurants, a retail shopping center, and single-family residences. Common species present include Douglas fir, Himalayan blackberry, mixed grasses, and deciduous landscape trees.

Scrub-Shrub and Emergent Wetlands

A small emergent and scrub-shrub wetland (AR 148) associated with an unnamed tributary to Perry Creek is located at the southwest edge of Site A and extends beyond the site to the west and south. Dominant emergent vegetation that extends onto the site includes reed canarygrass, soft rush, creeping buttercup, and sawbeak sedge. The scrub-shrub habitat is located southwest of Site A. Dominant scrub-shrub vegetation includes red alder saplings, willows, and cattails.

Candidate Site C

Site C is located at the intersection of 228th Street SE and 9th Avenue SE.

Urban and Mixed Environs

Site C includes medium-density urban habitat with two single-family residences. Surrounding medium-density urban development includes a hotel, a parking lot, a restaurant, and single-family residences. Common species present include red alder, Lombardy poplar, and Himalayan blackberry.

Forested and Emergent Wetlands

A small, isolated, depression wetland (AR 149) is located at the east edge of the site. This emergent wetland has dominant reed canarygrass. Subdominant vegetation includes horsetail, skunk cabbage, cottonwood, and red alder.

A small, isolated, depression wetland (AR 150) is also located adjacent to the north boundary of the site. This forested and emergent wetland includes a small portion of open-water habitat. The dominant emergent vegetation is cattails. The edge of the open-water habitat has a forested component that includes red alder, cottonwood, western red cedar, salmonberry, Himalayan blackberry, and Lombardy poplar. Pacific willows are located at the east end of this wetland.

Candidate Site D

Site D is located north of Site C, along 9th Avenue SE.

Urban and Mixed Environs

Site D consists of single-family residences, undeveloped land, and a small wetland (see below). Surrounding medium-density urban development includes single-family residences, a hotel, a parking lot, and a restaurant. The upland areas on the site have scattered trees including Douglas

fir and red alder. The understory consists of grasses, thistle, trailing blackberry, and Himalayan blackberry.

Forested Wetlands

A small, isolated wetland (AR 134) located in the central portion of Site D consists of forested habitat. The dominant species present is mature cottonwood. Dominant species in the understory include soft rush and thick-head sedge. Occasional species include Sitka willow and creeping buttercup.

A mixed, forested riparian wetland (AR 21) lies adjacent to the northeast and east edges of Site D. This wetland is associated with Perry Creek (AR 23a) and an unnamed tributary (AR 132a). Common species present include western hemlock, Douglas fir, cottonwood, red alder, western red cedar, salmonberry, and vine maple.

Open Water- Lakes, Rivers, Streams

Perry Creek (AR 23a) flows adjacent to the eastern edge of the site. An unnamed tributary (AR 132a) to Perry Creek flows near the northern edge of the site and into Perry Creek near the northeast corner of the site.

Portal Siting Area 33

Portal Siting Area 33 consists of medium-density urban habitat. This urban matrix contains riparian wetlands and patches of upland forest. Candidate portal Site A is located in the City of Brier, and Sites C and D are in unincorporated Snohomish County.

Candidate Site A

Site A is located west of Locust Way at the end of Barker Road.

Urban and Mixed Environs

Site A is mostly undeveloped and cleared, with some storage buildings. The land is used for heavy equipment storage. The site has small patches of forest that contain Douglas fir, black cottonwood, western red cedar, and Himalayan blackberry. The surrounding area consists of medium-density urban habitat that includes single-family residences.

Forested Wetlands

A forested wetland (AR 12a) associated with an unnamed tributary (AR 12) to the west fork of Swamp Creek (AR 67a) lies adjacent to the northeast perimeter of the site. Common species present include red alder, black cottonwood, western red cedar, Pacific ninebark, Himalayan blackberry, hardhack, creeping buttercup, salmonberry, red-stem dogwood, and stinging nettles.

Candidate Site C

Site C is located at the northeast intersection of Locust Way and 228th Street SW.

Urban and Mixed Environs

Site C consists of a storage facility and vacant land. Medium-density urban development surrounding the site includes primarily single-family residences. Vegetation on the site includes Douglas fir, red alder, and Himalayan blackberry.

Upland Forest

Adjacent to the western perimeter of Site C is a deciduous forest that forms a corridor along the west fork of Swamp Creek (AR 67a). Typical species include red alder, black cottonwood, western red cedar, salmonberry, Douglas fir, and Himalayan blackberry. There may be a riparian wetland associated with Swamp Creek, based on the presence of hydrophytic vegetation and red alder snags visible from Locust Way.

Forested Wetlands

A forested wetland with open-water habitat (AR 13) lies adjacent to the east and north perimeters of Site C. This wetland occurs along the toe of a slope east of the west fork of Swamp Creek. Common species in this wetland include red alder, black cottonwood, willows, salmonberry, Himalayan blackberry, and reed canarygrass.

Candidate Site D

Site D is located southwest of Site C at the southwest intersection of Locust Way and 228th Street SW.

Urban and Mixed Environs

Site D consists of medium-density urban habitat that includes single-family residences, upland forest, and undeveloped land. Vegetation in the northeast portion of the site includes lawn grasses, red alder, and black cottonwood.

Open Water- Lakes, Rivers, Streams

The west fork of Swamp Creek (AR 67a) flows through the west portion of Site D and continues adjacent to the south perimeter of the site.

Upland Forest

Upland forest forms a corridor along the west fork of Swamp Creek (AR 67a) along the western and southern portions of the site. Dominant species include black cottonwood and red alder with an understory of lawn grasses and scattered shrubs. Other species include Indian plum and common hawthorn.

Portal Siting Area 30

Portal Siting Area 30 consists of medium-density urban habitat in the City of Brier. This urban matrix contains patches of riparian wetlands, isolated wetlands, and patches of upland forest.

Candidate Site A

Site A is located northwest of the intersection of 35th Avenue W and 232nd Street SW.

Urban and Mixed Environs

Site A is the northern portion of the Brier Elementary School playfield. The site is dominated by lawn grasses. Medium-density urban habitat surrounding the site is developed with single-family residences.

Upland Forest

Upland forest is located along the northeast and east perimeters of site A. The dominant species is Douglas fir. Other species include black cottonwood, western hemlock, red alder, and Himalayan blackberry.

Forested Wetlands

A forested wetland (AR 9) is located along the western edge of Site A. The wetland is associated with the east fork of Lyon Creek (AR 8). Typical vegetation includes red alder, western red cedar, salmonberry, vine maple, Pacific willow, creeping buttercup, and skunk cabbage.

Open Water- Lakes, Rivers, Streams

The east fork of Lyon Creek (AR 8) flows south near the western edge of the site.

Candidate Site B

Site B is located at the southeast intersection of 35th Avenue W and 228th Street SW.

Urban and Mixed Environs

Site B is occupied by medium-density urban habitat developed with single-family residences. Common species in this area include Douglas fir and lawn grasses.

Scrub-Shrub Wetlands.

A perched, scrub-shrub wetland (AR 131) lies adjacent to the east side of the site. The wetland occurs near the top of the slope above the east fork of Lyon Creek (AR 8). Common vegetation present includes Pacific and Sitka willows, Himalayan blackberry, and reed canarygrass.

Candidate Site C

Site C is located north of site A, across 228th Street SW.

Urban and Mixed Environs

Site C consists of undeveloped and vacant land. The surrounding area is occupied by medium-density urban habitat developed with single-family residences.

Upland Forest

Upland forest occupies the western half of the site. Common species include Douglas fir, western red cedar, Himalayan blackberry, English ivy, and swordfern.

Forested Wetlands

A forested wetland (AR 9a) associated with the east fork of Lyon Creek occupies the eastern half of the site. Typical species include red alder, western red cedar, salmonberry, vine maple, Pacific willow, creeping buttercup, and skunk cabbage.

Open Water- Lakes, Rivers, Streams

The east fork of Lyon Creek (AR 8) flows south through the western half of Site C.

Portal Siting Area 26

Portal Siting Area 26 consists of medium-density urban habitat in the City of Mountlake Terrace. This urban matrix contains patches of riparian wetland and upland forest.

Candidate Site A

Site A is located at the Ballinger Playfield, at the intersection of 228th Street SW and Lakeview Drive.

Urban and Mixed Environs

Site A is cleared and contains playfields and a tennis court. Turf grass dominates the site. Medium-density urban habitat surrounding the site includes single-family and multifamily residences and parks.

Open Water- Lakes, Rivers, Streams

Hall Creek (AR 4) flows south along the western perimeter of the site. Vegetation along the stream channel includes red alder, Himalayan blackberry, salmonberry, and white oak.

Candidate Site C

Site C is located northwest of Site A along Highway 99.

Urban and Mixed Environs

Site C consists of a large commercial retail building and a parking lot. Medium-density urban development occupies the surrounding area and includes single-family and multifamily residences and commercial lots. Common species in the surrounding area include Douglas fir, western red cedar, lawn grasses, and a mixture of landscape trees and shrubs.

Candidate Site D

Site D is located north of Site A on the north side of 228th Street SW.

Urban and Mixed Environs

The northern portion of Site D contains three single-family residences. Most of the site is undeveloped. Medium-density urban habitat surrounding the site is developed with single-family and multifamily residences. Common species present include Douglas fir, western red cedar, lawn grasses, and landscape trees and shrubs.

Upland Forest

A patch of forest occurs on the western portion of the site. Common species include western red cedar, western white pine, Douglas fir, western hemlock, red alder, Pacific madrone, Oregon grape, bracken fern, laurel, English ivy, Japanese knotweed, and Himalayan blackberry.

Scrub-Shrub Wetlands

A scrub-shrub wetland (AR 5) occurs adjacent to Hall Creek (AR 4) on the eastern portion of the site. Some permanently flooded, open-water areas occur within the wetland. Typical species include black cottonwood, red alder, western red cedar, Pacific and Sitka willows, Himalayan blackberry, salmonberry, red-stem dogwood, and cattails.

Open Water- Lakes, Rivers, Streams

Hall Creek (AR 4) flows south through the eastern portion of the site.

Portal Siting Area 3/24

Candidate portal sites within Portal Siting Area 3/24 could be used for the preferred Route 9–228th Street corridor or the Unocal corridor. The two portal siting areas overlap slightly. Portal Siting Area 3 is located just northwest of Portal Siting Area 24.

Portal Siting Area 3/24 consists of medium-density urban habitat in the City of Edmonds. This urban matrix contains patches of upland forest.

Candidate Site A

Site A is located north of Edmonds Way (SR 104).

Urban and Mixed Environs

Site A consists of property under development that is primarily cleared. Medium-density urban development surrounding the site includes single-family residences, commercial properties, a gas station, a bank, and a car wash. A vegetated steep slope is located on the western portion of the site. The dominant vegetation is black locust. Common species include red alder, Douglas fir, and Himalayan blackberry.

Candidate Site B

Site B is located along 228th Street SW between 92nd Avenue W and 93rd Avenue W.

Urban and Mixed Environs

Site B is primarily an asphalt parking lot used by a church across the street. A few Douglas fir trees and landscape trees and shrubs are located in the parking strips. Medium-density urban development surrounding the site consists of single-family residences.

Candidate Site C

Site C is located southeast of Site A along Edmonds Way (SR 104).

Urban and Mixed Environs

Medium-density urban development on the site includes single-family residences.

Upland Forest

A patch of forest occurs through the western and southern portions of Site C. Common species include Douglas fir, red alder, Oregon grape, western red cedar, and sword fern.

Candidate Site D

Site D is located at the intersection of Edmonds Way (SR 104) and 232nd Street SW.

Urban and Mixed Environs

Medium-density urban habitat on the site includes single-family residences. Common species present include Douglas fir, Pacific madrone, Scotch broom, bentgrass, and Himalayan blackberry.

Candidate Site E

Site E is located south of Site D along Edmonds Way (SR 104).

Urban and Mixed Environs

Medium-density urban habitat on the site is developed with single-family residences. Surrounding areas include single-family and multifamily residences and commercial properties. Interspersed across the site are large, mature conifer trees including Douglas fir and western red cedar.

Candidate Site F

Site F is located southwest of Site E.

Urban and Mixed Environs

Site F is forested and undeveloped. Medium-density urban development surrounding the site consists of single-family and multifamily residences.

Upland Forest

Site F is part of an upland forest that extends beyond the site to the northwest and northeast. Dominant tree species include mature Douglas fir and western red cedar. Other subdominant species include red alder, salmonberry, Himalayan blackberry, and hybrid knotweed.

Portal Siting Area 22/23

See description above for the Route 9, 195th Street effluent tunnel.

Portal Siting Area 19

See description above for the Route 9, 195th Street effluent tunnel.

Unocal Corridor

Influent Tunnel

The influent tunnel for the Unocal corridor includes Portal Siting Areas 14, 13, 12, 11, 10, 7, 5, and 3/24.

Portal Siting Area 14

Portal Siting Area 14 consists of medium-density urban habitat in the City of Bothell. This urban matrix contains patches of riparian wetlands.

Candidate Site A

Site A is located south of North Creek Parkway S and west of 120th Avenue NE.

Urban and Mixed Environs

Site A is a park referred to as North Creek Field 3. The site is surrounded by medium-density urban habitat composed of commercial office space and ball fields. The site primarily contains lawn grasses.

Open Water- Lakes, Rivers, Streams

Unnamed tributaries to the Sammamish River flow along the west (AR 52a) and south (AR 52b) edges of the site. Lombardy poplars line the banks of AR 52a.

Forested, Scrub-Shrub, and Emergent Wetlands

A forested, scrub-shrub, and emergent wetland (AR 52) is located south of Site A. The canopy of the forested community is dominated by Oregon ash and black cottonwood. The shrub stratum underlying the forest canopy is dominated by Pacific crabapple and serviceberry; subdominant species include red-stem dogwood, red elderberry, and invasive Himalayan blackberry. The herbaceous stratum within and adjacent to the forest includes stinging nettles, cattails, invasive reed canarygrass, and bitter nightshade.

The scrub-shrub community is dominated by Sitka and Scouler's willows and includes subdominant red alder, black cottonwood, Nootka rose, and Himalayan blackberry. Snowberry occurs in adjacent upland areas. Emergent coverage within the scrub-shrub community is dominated by reed canarygrass and patches of stinging nettles and purple loosestrife.

The emergent communities contain dominant reed canarygrass.

Candidate Site B

Site B is located north of Site A across North Creek Parkway S.

Urban and Mixed Environs

Site B is a park referred to as North Creek Field 2. The site is surrounded by medium-density urban habitat composed of commercial office space and ball fields. The site primarily contains lawn grasses.

Open Water- Lakes, Rivers, Streams

An unnamed tributary to the Sammamish River (AR 52a) flows along the west edge of Site B. Lombardy poplars line the banks of AR 52a.

Candidate Site D

Site D is located east of 120th Avenue NE.

Urban and Mixed Environs

Site D is an undeveloped area south of the Seattle Times facility and its adjacent parking lot. The site is surrounded by medium-density urban habitat composed of commercial office space, multifamily residences, and ball fields. The site is cleared and primarily contains grasses. The western boundary of the site is lined with landscape trees and shrubs.

Emergent Wetlands

Site D contains an emergent, depressional wetland (AR 151) dominated by soft rush.

Portal Siting Area 13

Portal Siting Area 13 consists of medium- to high-density urban habitat in the City of Bothell. This urban matrix contains patches of riparian wetland and upland forest.

Candidate Site A

Site A is located south of Woodinville Drive (SR 522) between 100th Avenue NE and 101st Avenue NE.

Urban and Mixed Environs

Site A is a gravel parking lot. Medium- to high-density urban habitat comprises the surrounding area, which includes downtown Bothell. Commercial buildings include numerous retail stores and a grocery store. The sparse vegetation within this commercial area includes Douglas fir, black cottonwood, and landscape trees and shrubs.

Open Water- Lakes, Rivers, Streams

The Sammamish River (AR 63) flows near the southern perimeter of the site. A small tributary known as Horse Creek (AR 62) flows adjacent to the west perimeter of the site and into the Sammamish River. A buffer of approximately 40 feet has been revegetated along the east side of Horse Creek. Common species present include red-stem dogwood and Douglas fir.

Candidate Site B

Site B is located south of Woodinville Drive (SR 522) along the Sammamish River.

Urban and Mixed Environs

Site B is used for light industrial activities. Medium- to high-density urban development comprises most of the surrounding area, which includes downtown Bothell. Commercial buildings include numerous retail stores and a grocery store. Sparse vegetation on the site includes Himalayan blackberry, red alder, and landscape trees and shrubs.

Open Water- Lakes, Rivers, Streams

The Sammamish River (AR 63) flows adjacent to the southern perimeter of Site B.

Candidate Site C

Site C is high-density urban habitat located along Bothell Way NE (SR 522) and west of Site A.

Urban and Mixed Environs

Site C consists of commercial buildings including fast food and equipment rental businesses. Medium- to high-density urban habitat comprises most of the surrounding area, which includes downtown Bothell. Sparse vegetation on Site C includes Douglas fir, English ivy, and landscape tree species.

Portal Siting Area 12

Portal Siting Area 12 consists of medium density urban habitat located in the City of Kenmore. This urban matrix contains patches of riparian wetland and upland forest.

Candidate Site C

Site C is located at the intersection of 80th Avenue NE and NE 182nd Place.

Agriculture, Pasture, and Mixed Environs

A landscaped yard adjacent to a single-family residence makes up the eastern portion of Site C. Dominant vegetation includes big-leaf maple, landscape shrubs, and lawn. The western portion of the site is used as horse pasture.

Emergent Wetlands

The western portion of the site contains an emergent pasture wetland connected to an expansive floodplain wetland (AR 129) associated with Swamp Creek (AR 67) and Little Swamp Creek (AR 67b), which contains forested, scrub-shrub, and emergent wetlands. Wetland vegetation on Site C consists entirely of pasture grasses. Site C lies approximately 450 feet east of the undisturbed portion of AR 129.

Candidate Site E

Site E is located at the intersection of 80th Avenue NE and NE 185th Street.

Agriculture, Pasture, and Mixed Environs

Site E is an undeveloped single-family residential lot currently used as pasture.

Emergent Wetlands

The entire Site E contains an emergent pasture wetland that is connected to an expansive floodplain wetland (AR 129) associated with Swamp Creek (AR 67) and Little Swamp Creek (AR 67b), which contains forested, scrub-shrub, and emergent wetlands. Wetland vegetation on Site E consists entirely of pasture grasses. Unlike Site C, Site E abuts an undisturbed portion of AR 129.

Portal Siting Area 11

See description above for the Route 9, 195th Street influent tunnel.

Portal Siting Area 10

Portal Siting Area 10 consists of medium- to high-density urban habitat in the City of Lake Forest Park. This urban matrix contains patches of riparian wetlands.

Candidate Site A

Site A is located near the intersection of Ballinger Way NE (SR 104) and NE 178th Street.

Urban and Mixed Environs

Medium-density urban habitat at the site includes single-family residences on large lots, groves of mature conifers, and Lyon Creek (AR 72) that flows through the southwest corner of the site. Common species include Douglas fir, western red cedar, western white pine, nonnative cedars, monkey puzzle, lawn grasses, and landscape species.

Open Water– Lakes, Rivers, Streams

Lyon Creek (AR 72) flows just within the southwest perimeter of the site.

Candidate Site C

Site C, known as Animal Acres Park, is located at the intersection of Brookside Boulevard NE and NE 178th Street.

Urban and Mixed Environs

Animal Acres Park includes open grass areas, mature conifers, riparian wetland, and McAleer Creek (AR 81). The dominant species in the park proper is Douglas fir. Medium-density urban habitat, primarily single-family residences, surround the site.

Open Water- Lakes, Rivers, Streams

McAleer Creek (AR 81) flows through the western half of Site C.

Forested Wetlands

Site C contains a forested wetland (AR 152) associated with McAleer Creek (AR 81). Dominant vegetation includes red alder.

Candidate Site D

Site D is high-density urban habitat located along the south side of Ballinger Way NE (SR 104).

Urban and Mixed Environs

Site D is located at the north end of Lake Forest Park Center. Medium- to high-density urban development includes retail buildings and a parking lot. Deciduous landscape trees are scattered along the western margin of the parking lot.

Open Water- Lakes, Rivers, Streams

Lyon Creek (AR 72) flows adjacent to the west perimeter of Site D.

Candidate Site E

Site E is located along NE 178th Street south of Site A.

Urban and Mixed Environs

Medium-density urban habitat includes single-family residences on well-vegetated lots. Common species include Douglas fir, big-leaf maple, western red cedar, western white pine, and salmonberry.

Emergent Wetlands

An emergent wetland (AR 153) is located along the eastern portion of the site. The wetland consists of the front yards of single-family residences.

Portal Siting Area 7

See description above for the Route 9, 195th Street effluent tunnel.

Portal Siting Area 5

See description above for the Route 9, 195th Street effluent tunnel.

Portal Siting Area 3/24

See description above for the Route 9, 195th Street effluent tunnel.

Special Status Species

Special status species include those listed as state endangered, state threatened, state sensitive, or state candidate species by the Washington Department of Fish and Wildlife (WDFW), as well as species federally listed as endangered, threatened, candidate, or species of concern, by the U.S.

Fish and Wildlife Service or the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries).

Table 3 presents special status species that may occur in terrestrial and freshwater portions of the portal siting areas along the Unocal and Route 9 conveyance corridors. A review of literature and results of habitat reconnaissance surveys were evaluated to determine the potential presence of special status species. Information sought included species distribution and typical habitat requirements. Additional studies are necessary to determine with certainty whether these species actually occur within the portal siting areas.

The priority habitats and species (PHS) database administered by the Washington Department of Fish and Wildlife (WDFW) was used as a source of literature for species distribution (WDFW 2002a). Maps generated by the PHS database identified the locations of bald eagle nests and territories in the vicinity of the conveyance corridors. A bald eagle nest is located near portal siting area 11 near the confluence of the Sammamish River (aquatic resource [AR] 63) with Lake Washington. The nest is within one half-mile of candidate sites A and C; and within one quarter-mile of candidate site B. Portal siting area 19 is located within the Edmonds bald eagle territory and three bald eagle nests are located within one mile. In addition, the PHS database identified fish species documented as occurring in the vicinity of the conveyance corridors (see Table 4).

Fish Resources

The identified corridors are located within the Cedar-Sammamish drainage basin (water resource inventory area [WRIA] 8) in King and Snohomish Counties (WDF 1975). Streams and water bodies potentially affected by portal sites include the following major surface water subbasins within WRIA 8 (identified from east to west): North Creek subbasin, Swamp Creek subbasin, Lyon Creek subbasin, McAleer Creek subbasin, and Puget Sound subbasin. North Creek and Swamp Creek flow into the Sammamish River. Lyon Creek and McAleer Creek flow into Lake Washington. Unnamed streams in the vicinity of Portal Siting Area 19 flow into Puget Sound.

For each of these subbasins, the following sections describe the quality of fish habitat. This information, along with habitat factors of decline, is summarized in Table 4. Additional information on stream water quality is provided in Chapter 6.

North Creek

North Creek, a tributary to the Sammamish River, is approximately 12.6 miles in length and flows from its headwaters in the City of Everett to its mouth near Bothell. The headwaters area is heavily influenced by commercial and residential development (Fevold et al. 2001). The middle reaches are dominated by rural residential development and mixed riparian forests. The lower reaches are parallel to I-405, flowing through rural residential areas and a major industrial office park upstream of the mouth.

The upper reaches with forested cover greater than 50 percent also have woody debris frequency within the natural range (i.e., greater than 150 pieces per kilometer) (Fevold et al. 2001). The middle and lower reaches have woody debris frequency below the natural range. In the upper

reaches of North Creek and in lower Penny Creek, a tributary to North Creek, the distribution of pool habitat is generally correlated with intact riparian forest and instream woody debris. Overall, riffle and pool habitat is below the optimal range of 40 to 60 percent of the stream habitat. The highest-quality riffle habitat, with clean gravels and good-quality cover, is found in the upper reaches of the stream. A review of scientific literature indicates that overall, the habitat quality of North Creek rates low for lower reaches, medium-low for middle reaches, and high for upper reaches, based on agency standards (Fevold et al., 2001).

In addition to salmonids (Table 4), North Creek contains freshwater mussel beds (Fevold et al. 2001).

Table 3. Special Status Species that May Occur along Unocal and Route 9 Conveyance Corridors

Common Name	Scientific Name	Federal Status	WA State Status	Portal Siting Area with Supporting Habitat																													
				Unocal Corridor							Influent to Route 9			Route 9–228th Street Corridor						Route 9–195th Street Corridor													
				14	13	12	11	10	7	5	3	11	41	44	39	37	33	30	26	24	22	19	41	44	45	7	5	27	23	19			
Mammals^a																																	
Bat, Pacific western big-eared	<i>Corynorhinus townsendii townsendii</i>	species of concern	candidate	X	X	X	X	X	X	X	X	X	X	X						X	X	X		X	X		X	X		X	X		X
Myotis, Yuma	<i>Myotis yumanensis</i>	species of concern	—	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X		X	X		X	X		X	X		X
Birds^b																																	
Crane, Sandhill	<i>Grus canadensis</i>	—	endangered		X	X	X						X				X	X		X			X				X			X		X	
Eagle, bald	<i>Haliaeetus leucocephalus</i>	threatened	threatened	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X		X	X		X	X		X	X		X
Falcon, American peregrine	<i>Falco peregrinus anatum</i>	species of concern	species of concern	X	X	X	X	X			X		X							X				X				X			X		X
Falcon, Peale's peregrine	<i>Falco peregrinus peale</i>	—	endangered	X	X	X	X	X			X		X							X				X				X			X		X
Flycatcher, willow	<i>Empidonax traillii</i>	species of concern	—	X	X	X	X	X	X	X	X	X	X	X						X	X	X		X	X	X	X	X	X	X	X	X	X
Goshawk, northern	<i>Acciptier gentilis</i>	species of concern	candidate			X		X	X		X		X	X						X	X	X		X	X		X	X		X	X		X
Grebe, Western	<i>Aechmophorus occidentalis</i>	—	candidate				X					X								X								X			X		X
Lark, streaked horned	<i>Eremophila alpestris strigata</i>	candidate	—			X							X							X				X			X			X		X	

Table 3. (contd) Special Status Species that May Occur along Unocal and Route 9 Conveyance Corridors

Common Name	Scientific Name	Federal Status	WA State Status	Portal Siting Area with Supporting Habitat																									
				Unocal Corridor							Influent to Route 9			Route 9–228th Street Corridor							Route 9–195th Street Corridor								
				14	13	12	11	10	7	5	3	11	41	44	39	37	33	30	26	24	22	19	41	44	45	7	5	27	23
Birds (cont.)																													
Loon, common	<i>Gavia immer</i>	–	candidate				X					X																X	X
Martin, purple	<i>Progne subis</i>	–	candidate				X	X				X																	X
Merlin	<i>Falco columbarius</i>	–	candidate				X	X	X		X	X	X	X	X	X			X				X	X	X	X	X	X	X
Murrelet, marbled	<i>Brachyramphus marmoratus marmoratus</i>	threatened	threatened																	X									X
Shrike, Loggerhead	<i>Melanerpes Lewis</i>	–	candidate				X						X		X	X										X	X		X
Sparrow, Oregon vesper	<i>Poecetes gramineus affinis</i>	candidate	–	X	X				X			X	X	X	X	X	X					X	X	X	X	X	X	X	X
Swift, Vaux's	<i>Chactura vauxi</i>	–	candidate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wood-pecker, pileated	<i>Dryocopus pileatus</i>	species of concern	candidate	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Amphibians and Reptiles^c																													
Frog, red-legged	<i>Rana aurora</i>	species of concern	–		X	X	X	X	X	X		X	X	X	X	X	X						X	X	X	X	X	X	X
Frog, tailed	<i>Ascaphus trueii</i>	species of concern	–					X	X	X			X	X	X	X	X			X			X	X	X	X		X	
Toad, western	<i>Bufo boreas</i>	species of concern	candidate	X								X				X	X						X						

Table 3. (contd) Special Status Species that May Occur along Unocal and Route 9 Conveyance Corridors

Common Name	Scientific Name	Federal Status	WA State Status	Portal Siting Area with Supporting Habitat																							
				Unocal Corridor								Influent to Route 9			Route 9–228th Street Corridor							Route 9–195th Street Corridor					
				14	13	12	11	10	7	5	3	11	41	44	39	37	33	30	26	24	22	19	41	44	45	7	5
Fish^d																											
Lamprey, Pacific	<i>Entosphenus tridentatus</i>	species of concern	–	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
Lamprey, river	<i>Lampetra ayresi</i>	species of concern	candidate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
Kokanee	<i>Oncorhynchus nerka</i>	–	candidate			X	X	X		X	X	X	X	X	X	X		X							X	X	
Salmon, chinook	<i>Oncorhynchus tshawytscha</i>	threatened	candidate	X	X	X	X	X		X	X	X	X	X	X	X		X							X	X	
Salmon, coho	<i>Oncorhynchus kisutch</i>	candidate	–	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X	X	
Trout, bull	<i>Salvelinus confluentus</i>	threatened	candidate		X	X	X				X	X				X									X		
Butterflies^e																											
Johnson's hairstreak	<i>Mitoura johnsoni</i>	–	candidate							X								X	X	X	X				X	X	X
Puget blue	<i>Plebejus icarioides blackmorei</i>	–	candidate	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Valley silverspot	<i>Speyeria zerene bremnerii</i>	–	candidate	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Plants^f																											
White-topped aster	<i>Aster curtus</i>	species of concern	sensitive			X						X	X						X						X		X
Bristly sedge	<i>Carex comosa</i>	–	sensitive	X		X		X	X		X	X	X	X		X			X	X		X		X	X		X

Table 3. (contd) Special Status Species that May Occur along Unocal and Route 9 Conveyance Corridors

Common Name	Scientific Name	Federal Status	WA State Status	Portal Siting Area with Supporting Habitat																								
				Unocal Corridor								Influent to Route 9			Route 9–228th Street Corridor							Route 9–195th Street Corridor						
				14	13	12	11	10	7	5	3	11	41	44	39	37	33	30	26	24	22	19	41	44	45	7	5	27
Plants (cont.)																												
Golden paintbrush	<i>Castilleja levisecta</i>	threatened	endangered		X									X	X				X		X			X				
Tall bugbane	<i>Cimicifuga elata</i>	species of concern	threatened											X	X			X	X		X			X	X		X	X
Pale larkspur	<i>Delphinium leucophaeum</i>	species of concern	endangered		X	X								X	X				X		X	X			X		X	
Water howellia	<i>Howellia aquatilis</i>	threatened	threatened	X	X	X		X	X	X			X	X	X	X	X				X	X	X	X	X	X		
Torrey's peavine	<i>Lathyrus torreyi</i>	species of concern	threatened				X	X	X	X			X	X	X	X			X		X	X	X	X	X	X	X	
White meconella	<i>Meconella oregana</i>	candidate	threatened		X	X	X	X					X	X	X				X		X	X	X	X	X		X	
Branching montia	<i>Montia diffusa</i>	–	sensitive	X	X		X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Adder's tongue	<i>Ophioglossum pusillum</i>	–	threatened		X	X	X	X	X				X	X		X			X		X	X	X	X	X		X	
Hairy-stemmed checker-mallow	<i>Sidalcea hirtipes</i>	–	endangered		X								X	X					X		X			X		X		
Flat-leaved bladderwort	<i>Utricularia intermedia</i>	–	sensitive	X	X	X	X	X	X	X			X	X	X	X	X				X	X	X	X	X	X		

^aIngles 1965, Nagorsen et al. 1993, Burke Museum 2003a, ESIN 2003, WDNR 2003.

^bSibley 2003, USFWS 1997, USFWS 1986, ESIN 2003, WDNR 2003.

^cBurke Museum 2003b, Corkran et al. 1996, ESIN 2003, WDNR 2003.

^dESIN 2003, WDNR 2003, Fevold et al. 2001, Kerwin 2001, King County 2002a, WDFW 1998, WDFW 2002a, WDFW 2002b.

^eWeeks 1997, Xerces 2003, ESIN 2003, WDNR 2003.

^fESIN 2003, WDNR 2003, WDNR 2000.

Table 4. Habitat Factors of Decline for Salmonids Present in Streams and Waterbodies Near Portal Siting Areas

Stream / Water Body	Recently Documented Salmonid Presence^a	Portal Siting Areas Near Stream / Water Body	Habitat Factors of Decline^c
North Creek	Chinook ^b , coho ^b , sockeye, kokanee ^b , steelhead, coastal cutthroat trout	37, 39, 41	Impassable culverts, transport of sediment from runoff, channel incision, lack of large woody debris recruitment and subsequent loss of channel complexity, cleared riparian zones, lack of stream canopy coverage, high seasonal stream temperature, low dissolved oxygen levels, increased frequency and duration of peak flows due to impervious surfaces within the drainage basin.
Swamp Creek	Chinook ^b , coho ^b , sockeye, kokanee ^b , coastal cutthroat trout	12, 33, 44	Impassable culverts, transport of sediment from runoff, streambank scouring and over widening of the stream channel from storm events, channel incision, hardened streambanks, lack of large woody debris recruitment and subsequent loss of channel complexity, cleared riparian zones, lack of stream canopy coverage, high seasonal stream temperature, low dissolved oxygen levels, high concentrations of metals and diazinon, increased frequency and duration of peak flows due to impervious surfaces (approximately 52 percent) in the drainage basin.
Lyon Creek	Coho ^b , sockeye, steelhead, coastal cutthroat trout	7, 10, 30	Impassable culverts, transport of sediment from runoff, hardened stream banks / loss of floodplain connectivity, lack of off-channel habitat, lack of large woody debris recruitment and subsequent loss of channel complexity, overdevelopment of riparian areas and lack of refugia, pesticide runoff from the drainage basin, high seasonal stream temperature.
McAleer Creek	Chinook ^b , coho ^b , sockeye, kokanee ^b , steelhead, coastal cutthroat trout	5, 10, 26	Downstream of Interstate-5 (I-5), factors include an anadromous fish barrier (culvert) beneath Interstate-5, transport of sediment from runoff and mass wasting, channel incision and erosion from storm events, lack of large woody debris recruitment and subsequent loss of channel complexity, high seasonal stream temperature, and increased frequency and duration of peak flows due to impervious surfaces (17-20 percent) in the drainage basin.
Sammamish River	Chinook ^b , coho ^b , sockeye, steelhead, rainbow trout, coastal cutthroat trout	11, 13, 14	Channel straightening, transport of sediment from runoff, lack of large woody debris recruitment and subsequent loss of channel complexity, overdevelopment of riparian areas and lack of refugia, lack of riverside canopy coverage, high seasonal temperature, non-native fish populations.
Lake Washington	Chinook ^b , coho ^b , sockeye, kokanee ^b , steelhead, coastal cutthroat trout	11	Contaminants (e.g., pesticides), hardened shorelines, lack of native lakeside vegetation, increased predation mortality, loss of large woody debris, reduced shallow water habitat, disturbance of substrate composition in front of bulkheads, shading from overwater structures, lowered lake levels, non-native fish populations, increased lake temperature.
Puget Sound Drainages	Chinook ^b , coho ^b , chum, and coastal cutthroat trout	19	Impassable culverts, transport of sediment from runoff, overdevelopment of riparian areas and lack of refugia, pesticide runoff from drainage basin.

^aFevold et al., 2001; Kerwin, 2001, King County 2002a, WDFW 2002a, WDFW 2002b.

^bSpecial Status Species.

^cKerwin, 2001.

Swamp Creek

The headwaters of Swamp Creek are located in Snohomish County. The stream flows south into King County, where it drains into the Sammamish River. The entire Swamp Creek basin is located within the urban growth areas of Snohomish and King Counties.

According to King County (2002a), Swamp Creek lacks channel complexity and connectivity, and is affected by altered hydrology and streamflow. The stream is experiencing increased sedimentation and altered sediment transport processes, and it has a degraded riparian zone and poor water quality. A review of agency standards and pertinent scientific literature indicates that riffle and pool habitat in Swamp Creek does not meet the recommended one-to-one riffle-to-pool ratio, and each of these habitats is below the optimal 40 to 60 percent range. Overall, the habitat quality of Swamp Creek primarily rates low to medium-low, based on agency standards (Fevold et al. 2001).

In addition to salmonids (Table 4), Swamp Creek contains freshwater mussel beds (Fevold et al. 2001).

Lyon Creek

Lyon Creek originates in Mountlake Terrace at an elevation of 390 feet, where the stream begins to drop steeply through most of its course before leveling out to a broad plain near the mouth in Lake Forest Park on Lake Washington. The large impervious surface areas in the basin cause high storm flows that undercut stream banks and scour the streambed, resulting in erosion problems and degradation of fish habitat. The spawning substrate, which is fair to poor, is consolidated in some areas and covered with fine sediments. The overall habitat suitability of the stream to support salmonids is good to fair based on agency criteria and comparisons among other local streams and pristine water quality conditions (Metro 1988, 1989, 1990).

McAleer Creek

McAleer Creek originates at the outlet of Lake Ballinger at an elevation of 280 feet and first flows through a sloped channel, then crosses under I-5 through a series of culverts, and subsequently flows through a steep, narrow valley before reaching a broad, flat plain near its mouth at Lake Washington.

The overall suitability of McAleer Creek habitat to support salmonids has been rated as good by Metro (1994), based on moderate summer temperatures, high dissolved oxygen levels, a good to fair biotic index rating, and good to fair spawning substrate. These evaluations are based on agency criteria and water quality comparisons with pristine conditions and other local streams.

Lake Ballinger is an approximately 100-acre lake located in the Cities of Mountlake Terrace and Edmonds. The lake is stocked annually with rainbow trout. Other game fishes known to occur in the lake are largemouth bass, perch, bullhead, catfish, and crappie. Anecdotal accounts exist of kokanee occurring in the lake (Washington Lakes 2002).

Sammamish River

The Sammamish River is approximately 13.8 miles in length and flows west and north from Lake Sammamish to the northeast end of Lake Washington. The Sammamish River provides access through the Seattle area for spawning salmonids from Puget Sound to the upper basins of the Cascade Mountains. The river serves as the main outlet of Lake Sammamish.

The Sammamish River has been modified extensively by the U.S. Army Corps of Engineers to minimize flooding. These modifications include dredging and channeling the river and construction of a weir at the outlet of Lake Sammamish to regulate flow. The overall salmonid habitat of the river was reduced in the 1960s when the river was dredged and straightened and much of the riparian vegetation was removed along most of the river.

The overall suitability of the Sammamish River habitat to support salmonids has been rated fair (Metro 1994). The river has poor to fair spawning substrate. These evaluations are based on agency criteria and water quality comparisons with pristine conditions and other local streams.

In addition to salmonids listed in Table 4, a single bull trout sighting, reported by WDFW (2002b) in July 2001, is the only documented sighting of bull trout in the Sammamish River in recent years (King County 2000).

Lake Washington

Lake Washington, the largest lake in King County, has generally good water quality (King County 2002c). The lake is known to have at least 28 fish species, including many introduced species (King County 2002c).

Puget Sound Tributaries

A series of small unnamed streams (AR 97, AR 138) and Barnacle Creek (AR 137) flow to Puget Sound in the vicinity of Portal Siting Area 19 near Point Wells. All three of these streams are short in length and flow through residential development. The three streams near Point Wells are not likely to support salmonid fish populations because of numerous fish barriers, such as undersized culverts beneath railroad tracks and roads.

Additional Information on Marine Resources

Table 5. Supplemental Biological Resource Information: Species Observed in Alternative Outfall Zones

Species	Scientific Name	Common Name	Zone 6	Zone 7S	Vicinity of outfall zones	Reference
Fish	<i>Sebastes maliger</i>	Quillback rockfish	●	●	●	1
	<i>Sebastes caurinus</i>	Copper rockfish	●	●	●	1
	<i>Sebastes auriculatus</i>	Brown rockfish	·	·	●	1
	<i>Sebastes flavidus</i>	Yellowtail rockfish	·	·	●	1
	<i>Oxylebius pictus</i>	Painted greenling	·	·	●	1
	<i>Ophiodon elongates</i>	Lingcod	·	·	●	1
	<i>Cymatogaster aggregata</i>	Shiner perch	●	●	●	1, 3, 4
	<i>Embiotoca lateralis</i>	Striped seaperch	·	·	●	1, 3
	<i>Rhacochilus vacca</i>	Pile perch	·	·	●	1, 3
	<i>Pleuronectes vetulus</i>	English sole	●	·	●	3
	<i>Pleuronectes bilineatus</i>	Rock sole	·	·	●	3
	<i>Platichthys stellatus</i>	Starry flounder	●	·	●	3
	<i>Pholis laeta</i>	Crescent gunnel	●	·	·	3
	<i>Apodichthys flavidus</i>	Penpoint gunnel	·	·	●	3
	<i>Enophrys bison</i>	Buffalo sculpin	●	·	·	3
	<i>Myoxocephalus polyacanthocephalus</i>	Great sculpin	●	·	●	3
	<i>Leptocottus armatus</i>	Staghorn sculpin	·	·	●	3
	<i>Aulorhynchus flavidus</i>	Tubesnout	·	·	●	3

● = Observed

· = Not observed

▪ **Table 5. (contd) Supplemental Biological Resource Information: Species Observed in Alternative Outfall Zones**

Species	Scientific Name	Common Name	Zone 6	Zone 7S	Vicinity of outfall zones	Reference
Fish (contd)	<i>Syngnathus leptorhynchus</i>	Bay pipefish	.	.	●	3
	<i>Gasterosteus aculeatus</i>	Threespine stickleback	.	.	●	3
	<i>Clupea harengus pallasii</i>	Pacific herring	.	.	●	1, 3
	<i>Merluccius productus</i>	Pacific hake	.	.	●	1
	<i>Theragra chalcogramma</i>	Walleye pollock	.	.	●	1
	<i>Ammodytes hexapterus</i>	Sand lance	●	●	.	2,3
	<i>Hypomesus pretiosus</i>	Surf smelt	.	●	●	2, 3
	<i>Onchorhynchus tshawytscha</i>	Chinook salmon	.	.	●	3
	<i>Onchorhynchus keta</i>	Chum salmon	.	.	●	3
	<i>Onchorhynchus kisutch</i>	Coho salmon	.	.	●	3
	<i>Onchorhynchus clarki</i>	Cutthroat trout	.	.	●	3
	<i>Onchorhynchus nerka</i>	Sockeye salmon	.	.	●	3
	<i>Onchorhynchus mykiss</i>	Steelhead trout	.	.	●	3
Marine Mammals	<i>Eumetopias jubatus</i>	Steller sea lion	.	.	●	2
	<i>Zalophus californianus</i>	California sea lion	.	.	●	2
	<i>Phoca vitulina</i>	Pacific harbor seal	.	.	●	2
	<i>Orcinus orca</i>	Killer whale	●	●	●	2
	<i>Phocoenoides dalli</i>	Dall's porpoise	●	●	●	2
	<i>Eschrichtius robustus</i>	Gray whale	●	●	●	2

● = Observed

. = Not observed

▪ **Table 5. (contd) Supplemental Biological Resource Information: Species Observed in Alternative Outfall Zones**

Species	Scientific Name	Common Name	Zone 6	Zone 7S	Vicinity of outfall zones	Reference
Marine Birds	<i>Uria aalge</i>	Common murre	●	●	●	1, 9
	<i>Histrionicus histrionicus</i>	Harlequin duck	●	●	●	1, 9
	<i>Brachyramphus marmoratus</i>	Marbled murrelet	●	·	●	1, 9
	<i>Gavia immer</i>	Common loon	●	·	●	2, 9
	<i>Melanitta perspicillata</i>	Surf scoter	●	·	●	7, 9
	<i>Aechmophorus occidentalis</i>	Western grebe	●	·	●	7, 9
	<i>Podilymbus podiceps</i>	Pied-billed grebe	●	·	●	9
	<i>Podiceps auritus</i>	Horned grebe	●	·	●	7, 9
	<i>Podiceps grisegena</i>	Red-necked grebe	●	·	●	7, 9
	<i>Phalacrocorax pelagicus</i>	Pelagic cormorant	●	·	●	7, 9
	<i>Phalacrocorax auritus</i>	Double-crested cormorant	●	·	●	7, 9
	<i>Ardea herodias</i>	Great blue heron	●	·	●	7, 9
	<i>Branta canadensis</i>	Canada goose	●	·	●	7, 9
	<i>Branta bernicla</i>	Brant	·	·	●	7
	<i>Melanitta nigra</i>	Black scoter	●	·	●	7, 9
	<i>Melanitta fusca</i>	White-winged scoter	·	·	●	7
	<i>Aythya marila</i>	Greater scaup	●	·	●	9
	<i>Bucephala albeola</i>	Bufflehead	●	·	●	7, 9
	<i>Anas americana</i>	American wigeon	●	·	●	7, 9
	<i>Bucephala clangula</i>	Common goldeneye	●	·	●	7, 9
<i>Bucephala islandica</i>	Barrow's goldeneye	●	·	●	7, 9	
<i>Mergus serrator</i>	Red-breasted merganser	●	·	●	7, 9	

● = Observed

· = Not observed

▪ **Table 5. (contd) Supplemental Biological Resource Information: Species Observed in Alternative Outfall Zones**

Species	Scientific Name	Common Name	Zone 6	Zone 7S	Vicinity of outfall zones	Reference
Marine Birds (contd)	<i>Mergus merganser</i>	Common merganser	●	·	●	9
	<i>Haliaeetus leucocephalus</i>	Bald eagle	●	·	●	7, 9
	<i>Ceryle alcyon</i>	Belted kingfisher	●	·	●	9
	<i>Calidris alba</i>	Sanderling	●	·	●	7, 9
	<i>Calidris alpina</i>	Dunlin	●	·	●	9
	<i>Calidris mauri</i>	Western sandpiper	●	·	●	9
	<i>Larus californicus</i>	California gull	●	·	●	7, 9
	<i>Larus philadelphia</i>	Bonaparte's gull	●	·	●	9
	<i>Larus glaucescens</i>	Glaucous-winged gull	●	·	●	7, 9
	<i>Larus thayeri</i>	Thayer's gull	●	·	●	7, 9
	<i>Larus delawarensis</i>	Ring-billed gull	●	·	●	9
	<i>Larus argentatus</i>	Herring gull	●	·	●	9
	<i>Larus occidentalis</i>	Western gull	●	·	●	9
	<i>Larus canus</i>	Mew gull	●	·	●	7, 9
	<i>Cerorhinca monocerata</i>	Rhinoceros auklet	●	·	●	9
<i>Cephus columba</i>	Pigeon guillemot	●	·	●	7, 9	
Macroinvertebrates	<i>Panopea abrupta</i>	Geoduck	●	●	●	5
	<i>Cancer magister</i>	Dungeness crab	●	●	●	2
	<i>Cancer productus</i>	Red rock crab	●	●	●	2
	<i>Tresus nuttallii</i>	Horse clam	●	●	·	5
	<i>Saxidomus giganteus</i>	Butter clam	●	●	●	10

● = Observed

· = Not observed

▪ **Table 5. (contd) Supplemental Biological Resource Information: Species Observed in Alternative Outfall Zones**

Species	Scientific Name	Common Name	Zone 6	Zone 7S	Vicinity of outfall zones	Reference
Macroinvertebrates	<i>Protothaca staminea</i>	Native littleneck clam	●	●	●	10
(contd)	<i>Clinocardium nuttalli</i>	Cockle	●	●	●	9
	<i>Pandulus platyceros</i>	Spot prawn	●	·	●	3
Macrophytes	<i>Zostera marina</i>	Eelgrass	●	●	●	4
	<i>Nereocystis luetkeana</i>	Bull kelp	·	●	●	4
	<i>Ulva lactuca</i>	Sea lettuce	●	●	●	4
	<i>Fucus distichus</i>	Rock weed	·	·	●	1
	<i>Laminaria saccharina</i>	Sugar kelp	·	●	●	4,10
	<i>Sargassum muticum</i>	Sargassum	·	·	●	4

NOTE: See Chapter 7 for a full citation of references cited in table

● = Observed

· = Not observed

1 King County, 2001a

2 King County, 2001b

3 King County, 2002a

4 Woodruff et al., 2001

5 Golder Assoc., 2002

6 Battelle et al., 2001

7 Pilchuck Audubon Society, 2002

8 King County, 2002e

9 Audubon Society, 2002

10 Dethier & Schoch, 2000

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