Fact Sheet for NPDES Permit WA0024490

City of Everett Water Pollution Control Facility

July 29, 2015

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for the City of Everett Water Pollution Control Facility (WPCF). This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing a NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the Everett WPCF, NPDES permit WA0024490, were available for public review and comment from July 30, 2015, until August 30, 2015. For more details on preparing and filing comments about these documents, please see *Appendix A - Public Involvement Information*.

The City reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, wastewater discharges, or receiving water prior to publishing this draft fact sheet for public notice. The City also offered comments on proposed permit conditions during their initial review. *Appendix G - Response to Comments* includes Ecology's responses to these comments.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as *Appendix G*, and publish it when issuing the final NPDES permit. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the legal history contained in the facility's permit file.

Summary

The Everett WPCF has two parallel treatment systems: a trickling filter/solids contact (TF/SC) system and an aeration/oxidation pond (lagoon) system. The trickling filter system discharges treated wastewater to Port Gardner Bay; the lagoon system discharges to the Snohomish River. The proposed permit authorizes discharges from both treatment systems and from 13 combined sewer overflow outfalls located within the northern portion of the City of Everett.

Ecology issued the previous permit for this facility on September 1, 2009. The proposed permit includes the same limits as the previous permit for outfall 100, with the exception of increased mass limits for $CBOD_5$ and TSS that result from an increase in treatment capacity for the facility. The proposed permit includes effluent limits on outfall 015 for Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), seasonal "Equivalent $CBOD_5$" (renamed NBOD+CBOD), fecal coliform bacteria, and total residual chlorine that are similar to the previous permit. The proposed permit adjusts the performance-based limits on Total Suspended Solids for the lagoon system and includes water quality-based limits on pH and ammonia. It also includes a seasonal flow limit to mitigate against potential temperature impacts from the lagoon system.

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I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to domestic wastewater NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC).
- Technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC).
- Water quality criteria for surface waters (chapter 173-201A WAC).
- Water quality criteria for groundwaters (chapter 173-200 WAC).
- Whole effluent toxicity testing and limits (chapter 173-205 WAC).
- Sediment management standards (chapter 173-204 WAC).
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC).

The following additional regulations apply to communities operating collection systems with Combined Sewer Overflows:

- Submission of plans and reports for construction and operation of combined sewer overflow reduction facilities (chapter 173-245 WAC).
- US EPA CSO control policy (59 FR 18688).

These rules require any treatment facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See *Appendix A - Public Involvement Information* for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in *Appendix G*.

II. Background Information

Table 1. General Facility Information

Facility Information	
Applicant:	City of Everett
Facility Name and Address:	Everett Water Pollution Control Facility 4027 4th Street South East Everett, Washington 98205
Type of Treatment:	Combined Aerated/Facultative Lagoon System Trickling Filter/Solids Contact System
Facility Location: (NAD83/WGS84 reference datum)	Latitude: 47.99283 Longitude: -122.17440
Discharge Locations:	Snohomish River Lagoon System (outfall 015) Latitude: 48.004167 Longitude: -122.177222
	Snohomish River Trickling Filter/Solids Contact System (outfall 025) Latitude: 47.991389 Longitude: -122.178889 Limited authorization for periodic flushing of diffusers only.
	Port Gardner Bay Trickling Filter/Solids Contact System (outfall 100) Latitude: 47.969444 Longitude: -122.246667
CSO Locations:	See table 3 on page 8 for CSO outfall locations. The City has a total of 6 CSO outfalls in the Snohomish River and 7 CSO outfalls in Port Gardner.
See Appendix D for maps showing the location of the facility, outfalls and service territory.	

A. Facility Description

History

Everett constructed its first sewers in 1890, three years before the City was incorporated. In 1897, after a sewer bond election passed, construction of the citywide system began in the north end of the City. The City constructed the original system as a combined sewer system that carries stormwater and sanitary sewage to the Water Pollution Control Facility (WPCF) for treatment. With population growth, the City expanded to the south and installed separate storm and sewer systems in the new areas. The current system serves 165,000 people (approximately 104,000 people in the City of Everett and 61,000 in nearby districts). The City manages a collection system of approximately 330 miles of sewer mains, interceptors and laterals, and 29 lift stations.

The City's sewer system originally discharged into the Snohomish River and Port Gardner Bay. The Snohomish County Health District constructed the WPCF in 1960 to provide wastewater treatment to the Everett area. The City took over operation of the facility in

1975. The original facility consisted of oxidation ponds and an outfall to the Snohomish River. Over time, the City added significant improvements to the plant, including aeration ponds and a chlorine contact channel in 1971, a new headworks in 1985, the trickling filter/solids contact system (TF/SC) in 1991, the South Effluent Pump Station (SEPS) for discharge to outfall 100 in Port Gardner Bay in 2005, and primary clarifiers in 2007. The City replaced surface aerators in the aeration ponds in 2010 to enhance treatment in the lagoon system. The City also started construction in 2014 to expand the TF/SC system to accommodate growth. The WPCF currently consists of two parallel treatment systems: a trickling filter/solids contact (TF/SC) system (outfalls 100 and 025) and an aeration/oxidation pond system (outfall 015).

Everett's sewer service area consists of two distinct systems: the combined system in the north end of the City and the separated system in the south. The older combined system is generally bordered by Possession Sound, the Snohomish River and Pigeon Creek Number 1. The separated system, which the City constructed after 1960, extends south from Pigeon Creek Number 1 to the southern city limits. In addition to serving the City of Everett, the WPCF provides wastewater treatment for the neighboring sewer districts, shown in Table 2 below. A map of the treatment area is included in Appendix D. Septic systems still serve a few hundred residential lots within the City and an unknown number in the larger service area.

Table 2. Tributary Sewer Agencies

Tributary Agency	Reserved Treatment Plant Capacity (Capacity Basis)
Silver Lake Water and Sewer District	6.6 MGD (maximum winter month flow)
Mukilteo Water and Wastewater District	1.6 MGD (maximum average daily flow)
Alderwood Water and Wastewater District	1.5 MGD (maximum average daily flow)

The WPCF is located on a 350-acre land parcel owned by the City on Smith Island, east of the Snohomish River. The WPCF is bordered by Interstate 5 to the west, the Snohomish River to the south, and Union Slough to the east. A dike system protects the plant, which is located within the Snohomish River flood plain.

Collection system status

The City relies on gravity flow for the majority of the collection system. Interceptors collect the sewage draining to the west and pump it to the east, toward the WPCF. The collection system is comprised of 22 drainage basins and consists of approximately 330 miles of pipe ranging in size from 3-inches to 72-inches in diameter. The system has 29 active lift stations and 35 major flow regulator structures. All lift stations include telemetry systems for continuous monitoring of operating conditions. The City's dispatch center receives all alarms from the lift stations and provides notice to operations and maintenance staff whenever problems arise. The City also uses a SCADA system to remotely track operations and performance of each lift station. All lift stations include redundant power supplies with either dedicated standby generators or a second utility power feed. City technicians visit all of the lift stations multiple times per week to conduct visual inspections and to perform routine preventive maintenance. Technicians also perform thorough inspections of each lift station twice per year.

Combined System and CSOs:

The combined system in the north end of the City serves an area of approximately 6,500 acres. Constructed between 1890 and 1963, the combined system requires a high maintenance effort due to its age. The City originally constructed its sewers with vitrified clay pipe, but since 1920 has used other pipe materials, such as concrete, ductile iron, polyvinyl chloride (PVC) and high-density polyethylene (HDPE). The combined system consists of approximately 2,785 manholes and 145 miles of 2- to 84-inch diameter pipelines, not including side sewers. During wet weather, stormwater and wastewater in excess of the capacity of the combined sewers can discharge through combined sewer overflow (CSOs) outfalls. Seven lift stations and 16 flow regulators in the combined collection system include overflows to either Port Gardner Bay or the Snohomish River. The City has 13 active CSO outfalls; six discharging to the Snohomish River and seven discharging to Port Gardner Bay. The City has abandoned two other CSO outfalls that used to discharge to the Snohomish River. Table 3 below shows the location of each discharge along with each outfall's current discharge rates.

Table 3. CSO Outfall Summary

Ecology Outfall ID	Everett CSO ID	Outfall Description	Receiving Water	Discharge Location		5-yr average (2009 - 2013)	
				Longitude	Latitude	Annual Average Discharge Volume (MG)	Annual No. of Events (24-hr Inter-event time)
005	PSO1	Lift Station #8	Port Gardner Bay	48.000415	-122.223469	1.39	4.0
013	PSO2	Lift Station #8	Port Gardner Bay	47.998904	-122.216061	0.03	0.8
012	PSO3	15th & Grand Street Outfall	Port Gardner Bay	47.997053	-122.214166	0.02	0.8
011	PSO4	Lift Station #5	Port Gardner Bay	47.984358	-122.219653	0.14	3.8
009	PSO5	Lift Station #3	Port Gardner Bay	47.982584	-122.218904	1.99	19.4
008	PSO6	West Hewitt & Bond Street Outfall	Port Gardner Bay	47.979464	-122.221072	13.91	49.0
007	PSO7	Lift Station #2	Port Gardner Bay	47.978237	-122.222371	6.73	16.6
016	SRO1	Lift Station #9	Snohomish River	47.995277	-122.18143	0.45	5.2
017	SRO2	Hayes Street Outfall	Snohomish River	47.995254	-122.181432	3.18	17.8
018	SRO3	Siphon Headworks Outfall	Snohomish River	47.994794	-122.181279	2.80	0.2
019	SRO4	Lift Station #32	Snohomish River	47.979755	-122.181949	9.18	20.0
026	SRO7	East Pacific Avenue Outfall	Snohomish River	47.976652	-122.187303	0.63	1.8
028	SRO8	East 36th Street & Lift Station #33 Outfall	Snohomish River	47.970098	-122.188762	3.44	1.4
Outfalls highlighted in blue meet the WAC 173-245 standard for "controlled"					*System Total*	*43.90*	*140.8*

The City completed a CSO Control Plan in November 1987 to comply with chapter 90.48.480 RCW, which required development of "reasonable plans and compliance schedules for the greatest reasonable reduction of combined sewer overflows". Ecology defined "reasonable minimum" in chapter 173-245 WAC as an average of no more than one untreated CSO discharge per outfall, per year, on average. The City's original plan identified a series of projects to be implemented over 30 years that would reduce overflows to the reasonable minimum threshold. As shown in Table 3, three of the City's outfalls currently comply with the standard of no more than one untreated discharge per year based on a 5-year average.

As required by chapter 173-245 WAC, the City submitted an update to their CSO Control Plan in October 2013 along with their NPDES permit application. The City submitted an amended control plan update in July 2014 to revise the proposed projects. The 2014 update identified projects that would bring all Snohomish River outfalls and three Port Gardner outfalls into compliance by 2017. The plan also proposes a 10-year extension for four Port

Gardner outfalls to allow for the construction of a wet weather facility that would ensure storage and treatment of most of the combined sewer flow generated from the western portion of the combined service area. Section F of the "Other Permit Conditions" portion of this fact sheet provides additional information on compliance schedules and other CSO control conditions in the proposed permit.

Separated System:

The sanitary system in the south end of the City serves an area of 11,500 acres within the city and a total of 25,000 acres, including the contribution received from the Alderwood, Silver Lake, and Mukilteo districts. The system was constructed after 1963 originally using concrete pipe. Since 1982, Everett has used new materials including PVC and ductile iron and typically used rubber gaskets to seal the pipe joints. The separate system in the south end is where the main growth within Everett is expected to occur. The collection system consists of approximately 4,379 manholes and 200 miles (not including laterals) of 6- to 48-inch diameter pipelines.

The City had significant problems with two portions of the separated collection system during the past permit term. The pressure main conveying flow from lift station 24, located south of the Everett city limits along Silver Way in unincorporated Snohomish County, ruptured in April 2012. This sewer line break caused sewage to flow into a nearby home and resulted in the discharge of approximately 1.0 million gallons of raw sewage to North Creek. Ecology and the City negotiated the terms of an administrative order and penalty (Agreed Order and Penalty No. 9484) designed to minimize the risk of future sewer line breaks and to improve emergency response to future breaks. In addition to paying a penalty of $4,000 for the discharge, the City agreed to replace the entire pressure main from lift station 24 to the intersection of 108th Street SE and 3rd Avenue SE; conduct a risk assessment of other pressure mains to identify sections with an elevated risk of failure; review existing collection system O&M practices and identify areas for improvement; and develop an emergency response plan with a focus on inter-jurisdictional communication and coordination for sewer emergencies. The City completed all tasks required by the order and Ecology issued a Notice of Compliance in early 2014 to terminate the order.

The City also had a series of overflows from lift station 1, located near the south end of the Port of Everett along Pigeon Creek and above Pigeon Creek Park. Lift station 1 is the City's largest lift station, serving a sewer shed of nearly 3,400 acres in the southwest portion of the City. Although the lift station was originally constructed with an overflow outfall to Port Gardner, the NPDES permit does not authorize discharges from this outfall since the lift station does not serve a combined sewer system. The City reported five discharges, ranging in size from 8,000 to 50,000 gallons, from this lift station between 2012 and 2014. Although the lift station receives utility power feed from two separate Snohomish PUD power feeds, power reliability contributed to multiple overflows during this time. The overflows generally resulted from power outages or other electrical equipment malfunctions and high flows from inflow and infiltration (I/I) that exceeded the lift station's capacity. The City submitted a plan in July 2014 that outlined strategies to eliminate the unpermitted overflows. The plan includes working with Snohomish PUD to improve the reliability of their redundant power feed; upgrading outdated electrical components; and converting an adjacent unused pump station structure to a storage tank that will provide up to 57,000 gallons of additional sewage storage at the site.

Industrial discharges

In addition to domestic sewage from residential and light commercial activities located within the service area, the treatment plant also receives pretreated industrial wastewater from permitted pretreatment facilities (11 Significant Industrial Users (SIUs) and 10 Categorical Industrial Users (CIUs). The City of Everett received approval of its pretreatment program on November 25, 1986.

The following table lists permitted pretreatment industries discharging to the WPCF.

Table 4. Pretreatment Industries

Name	Industrial Process	Categorical Pretreatment Standards	Process Wastewater Flow (gallons per day)	Non-Process Wastewater Flow (gallons per day)
Achilles USA	Extrusion, calendering, and lamination of PVC films	40 CFR 463.25	16,000	7,000
Airport Road Transfer Station (Snohomish County)	Solid waste transfer station; rubbish collection, compaction, and washdown	N/A	5,000	0
Ametech	Metal finishing of sheet metal parts and enclosures	40 CFR 433.17	400	140
Aramark/Overall Laundry Service	Industrial Laundry	N/A	90,000	0
Bluestreak Finishers, LTD	Anodizing, plating, and NDT penetrant testing of aluminum parts	40 CFR 433.17	2,800	600
Boeing Commercial Airplane Company	Aircraft assembly, metal finishing, painting, NDT	40 CFR 433.17	50,000	600,000
Cathcart Sanitary Landfill	Closed sanitary landfill (leachate pretreatment; aerated lagoon and secondary clarification)	N/A	87,000	400
Cintas Corporation	Industrial laundry	N/A	55,000	6,500
Community Transit, Kasch Park Operations Base	Transit bus service and maintenance	N/A	1,000	0
Community Transit, Merrill Creek Operations Base	Transit bus service and maintenance	N/A	5,800	0
Dura Coatings	Metal finishing, powder coating	40 CFR 433.17	Zero discharge	700
Everett Landfill and Transfer Station	Closed municipal landfill, leachate	N/A	20,000	0
Fluke Corporation	Metal finishing (electroplating and electroless plating), board washers	40 CFR 433.17	2,000	0
Jamco America, Inc.	Anodizing and water jet cutting	40 CFR 433.17	150	700
Naval Station Everett	Pretreatment of fuel and/or oil contaminated bilge and ballast water	N/A	12,000	0

Name	Industrial Process	Categorical Pretreatment Standards	Process Wastewater Flow (gallons per day)	Non-Process Wastewater Flow (gallons per day)
Port Chatham - Trident Everett	Fish thawing, skinning, boning, curing, smoking, canning, and packaging	N/A	35,000	130,000
The Railmakers NW	Electro-polishing	40 CFR 433.17	40	500
SNBL USA	Animal cage cleaning, habitat cleaning, necropsy, analytical lab	N/A	8,000	30,000
Stockpot, Inc.	Food manufacturer; thawing and cooking food products	N/A	180,000	150,000
Tyee Aircraft	Aircraft part machining	40 CFR 433.17	Zero discharge	0
Umbra Cuscinetti, Inc.	Metal finishing of airplane parts and dye testing	40 CFR 433.17	1,000	0
Total			**571,190**	**926,540**

Treatment processes

The following paragraphs describe the general treatment process at the WPCF. Appendix D contains a process flow schematic that illustrates the general process flow and a water balance for individual process components or treatment trains. Treatment at the WPCF consists of the following three general systems: common preliminary and biological pretreatment system, south trickling filter/solids contact system, and north lagoon system.

Preliminary and biological pretreatment

The City's collection system conveys flow under the Snohomish River to the WPCF through three distinct interceptor lines. The Siphon Headworks conveys combined sewage flow from the northeast and western portions of the combined system, the Snohomish River CSO Interceptor coveys combined sewage from the southeast portion of the combined system, and the South End Interceptor conveys raw sanitary sewage from the separated system (including tributary agencies). The north combined sewer interceptor from the Siphon Headworks includes a diversion structure (DS-0) near the plant entrance that bypasses a portion of the influent flow during heavy rain events. This bypass routes excess combined flow directly to the oxidation pond for treatment.

Primary influent from the three interceptor lines enters the plant at the headworks structure, which consists of archimedes screw pumps, parshall flumes for flow measurement, influent composite sampler for compliance sampling, bar screens, and grit tanks. Because of high variability of influent flow from the combined collection system, the plant's control systems automatically increase the number of online screw pumps and bar screens as primary influent flow increases. From the headworks, primary influent flows through Distribution Structure 1 (DS-1) to the primary clarifiers. The structure regulates flow to the primary clarifiers, which have a nominal peak-day hydraulic capacity of 50 MGD, by routing peak flows in excess of 50 MGD to Aeration [lagoon] Cell 1 (AC-1). In addition, during high wet weather flow periods, a bypass allows a portion of the primary influent to divert past the headworks screens and grit tanks and flow directly to AC-1.

Primary effluent flows from the clarifiers through Distribution Structure 2 (DS-2) to the aerated lagoons for the initial stages of secondary biological treatment. The aerated lagoons consist of two facultative lagoon cells (AC-1 and AC-2), each with an approximate volume of 33.5 million gallons. The lagoons use surface aerators to provide dissolved oxygen necessary to support microorganisms in the lagoons. Effluent from the aerated lagoons may flow to either the south plant or the north plant.

South TF/SC Plant

The main treatment path for the WPCF routes aerated lagoon effluent (ALE) from the lagoons to the Trickling Filter/Solids Contact (TF/SC) system of the south plant. Staff can feed ALE to the TF/SC system from either AC-1 or AC-2, or can feed from both aerated cells simultaneously. In addition to ALE, staff typically diverts 3-6 MGD of flow from DS-2 directly to the TF/SC system without pretreatment through the aerated lagoons. Staff blends ALE from either or both lagoons and primary effluent from DS-2 in varying proportions depending on the season and pond conditions to limit the organic strength sent to the TF/SC system. An expansion project scheduled for completion the summer of 2015 will increase the hydraulic capacity of the TF/SC system to 25 MGD from 21 MGD.

Blended aerated lagoon effluent and primary effluent flows to the trickling filter pump station. Pumps distribute flow to two trickling filter structures; the 2015 expansion will add a third trickling filter. Each structure contains approximately 91,000 cubic feet of a rigid plastic, crossflow media that provides 30 square feet of treatment surface area per cubic foot of media. Trickling filter effluent (TFE) drains from the bottom of each structure and flows to the solids contact basins; a portion of TFE recycles back to the trickling filters.

The solids contact basins consists of four pass (channel) aeration basin (AB) fitted with fine-bubble diffusers. The 2015 expansion project will construct two additional passes for a total of six. Staff may change the AB flow configuration from series to parallel and may use various treatment modes such as step feed, re-aeration, or plug flow depending on desired operating conditions and influent strength. Unlike conventional activated sludge basins that use biological activity within the basins to consume organic material, the treatment strategy for the solids contact basins at the WPCF focus on enhancing flocculation of solids sloughed from the trickling filters. Because of this goal, the solids contact basins provide a much shorter solids detention time than a typical activated sludge system.

Mixed liquor from the solids contact basins flows to the clarifier control structure, which distributes flow to the plant's two secondary clarifiers. The 2015 expansion will add a third clarifier. Once clarified, most of the secondary effluent flows to the South Effluent Pump Station (SEPS) for disinfection and discharge to Port Gardner via outfall 100. The City also has the ability to route a portion of the secondary effluent back through the WPCF to provide additional flow through the lagoon system during dry weather.

Sodium hypochlorite disinfects the effluent prior to discharge. Operators have the ability to add hypochlorite at the secondary clarifiers, at the entrance to the SEPS, or at both locations. A contact chamber within the SEPS structure provides detention time necessary for proper disinfection. Since secondary effluent from the WPCF combines with effluent from the City of Marysville's WWTP at the SEPS prior to discharge during dry weather months, the City collects composite and grab samples of secondary effluent prior to the SEPS for NPDES permit compliance monitoring of all parameters except fecal coliform and chlorine residual, which they collect at the SEPS wet well.

North Lagoon Plant

Aerated lagoon effluent not treated through the South Plant passes from cell AC-2 into the 130 acre oxidation pond. The 215 million gallon lagoon provides approximately 14 days of detention time during winter months and approximately 72 days of detention during the summer. A pump station located at the south end of the oxidation pond circulates water within the pond. Following the oxidation pond, lagoon system flow travels from the oxidation pond to the 25 acre polishing pond, then onto a 0.60 acre chlorine contact channel prior to discharge to the Snohomish River via outfall 015. The City adds sodium hypochlorite for disinfection at the point water enters the chlorine contact channel. Sodium bisulfite added at the effluent end of the channel dechlorinates the effluent prior to discharge. Pumps at the end of the contact channel convey effluent from the north plant to the Snohomish River.

Operator certification

Washington State law requires operators of municipal wastewater treatment plants to be certified at a level appropriate for the type and size of the facility. Guidance in Ecology's *Permit Writer's Manual* and WAC 173-230 classify the treatment system at the WPCF as a Group IV facility. As such, the operator in responsible charge of the day-to-day operations at the WPCF must, at a minimum, be rated as a Group IV operator. An operator certified for at least a Group III facility must be in charge of each scheduled shift at the facility.

The WPCF employs nine certified operators at various levels between Group IV and Group I. In addition to the certified operators at the treatment facility, the City employs five lab analysts and one lab aid in the environmental lab at the facility.

Facility Power Reliability

The TF/SC facility can receive power from two separate transmission grids that are owned and operated by Snohomish PUD. Power feeds enter the facility either from the south through a grid that supplies power to the City of Everett or from the north through a grid that supplies power to the City of Marysville. The facility does not have automatic switching capability. If one grid loses power, Snohomish PUD must manually switch power to the other grid. The City also owns portable generators that they can use at the TF/SC facility in emergency situations.

The Snohomish PUD transmission grid from Marysville is the main source of power for the North Lagoon Plant. During a power outage, an emergency generator at outfall 015 provides sufficient power to close a valve to stop gravity flow of effluent and to prevent the discharge of uncholinated effluent.

Discharge outfalls

Trickling Filter/Solids Contact System, Port Gardner Bay Outfall (outfall 100)

Kimberly-Clark Worldwide, Inc. (Kimberly-Clark) constructed outfall 100 in Port Gardner Bay in 2004 as a replacement of an outfall from the industrial wastewater treatment facility located at their Everett paper mill site. The City entered into an agreement with Kimberly-Clark to purchase capacity in the outfall for discharges from the TF/SC treatment system at the WPCF. The City of Marysville also purchased capacity in the outfall. With the closure of the Everett paper mill in 2012, the City agreed to purchase the outfall infrastructure from Kimberly-Clark and assume ownership and operation.

Outfall 100 discharges to Port Gardner Bay at a depth of about 350 feet and over 1,300 feet from the nearest shoreline. The outfall pipe is 63-inch diameter HDPE, which is buried in the intertidal and shallow subtidal area and then rests on the seabed with concrete anchors. The diffuser section is 1,556 feet in length and it is laid along a gradual curve that starts at -340 feet and ends at -348 feet below mean lower low water (MLLW). The diffuser has 80 vertical risers with 90° elbows, and these terminate with 5-inch round ports on each diffuser orifice plate. The riser elbows are oriented so that the diffuser port openings alternate discharge directions along the length of the diffuser.

Trickling Filter/Solids Contact, Snohomish River Outfall (outfall 025)

The City originally constructed the TF/SC treatment system with an outfall to the Snohomish River. In support of Ecology's 1999 Snohomish River Estuary Water Quality Improvement Project, the City agreed to divert all TF/SC flow from the Snohomish River outfall 025 to a new outfall located in Port Gardner Bay (outfall 100). As part of the agreement, the City would retain authority to discharge from outfall 025 under emergency conditions or if maintenance required shutdown of outfall 100.

Outfall 025 is located in a 450 foot wide section of the river approximately 500 feet east of the I-5 bridge over the Snohomish River and one mile upriver from outfall 015. The outfall consists of a 48-inch diameter pipe connected to a 35-foot long diffuser that extends approximately 200 feet into the river at a depth of -16 feet below mean lower low water datum. The diffuser has twelve 10-inch risers spaced 2.5 feet apart. The original design intended for effluent to discharge horizontally about 1-2 feet above the river bottom through pinch check valves. Sediment accumulations around the diffusers forced the City to take the outfall out of service in 2009. Although the City has evaluated alternatives to repair or replace the diffuser, budget constraints have delayed repairs. The City plans to continue efforts to restore the use of this outfall for emergency purposes.

North Lagoon Outfall (outfall 015)

Effluent from the North Lagoon Plant enters the Snohomish River about 900 feet west of the polishing pond and about one mile downstream of the TF/SC facility. The river is approximately 350 feet wide at the location of the outfall. The outfall pipe is 48 inches in diameter. The diffuser is located at approximately -8 feet below mean lower low water datum. The diffuser is approximately 36 feet long and has sixteen 10-inch risers spaced 2.5 feet apart. Effluent discharges horizontally through pinch check valves.

Solid wastes

The treatment of wastewater at the Everett Water Pollution Control Facility produces a variety of solids. Grit and screenings are collected from the headworks and scum is removed from the inlet area of the aerated lagoons. Dewatered grit material and screenings are collected and transported to the Roosevelt Landfill in Klickitat County for disposal. Waste secondary sludge collected from the secondary clarifiers in the TF/SC facility is routed to aerated lagoon AC-2 for digestion/stabilization. Sheet piling added to the effluent end of AC-2 in 2010 improved solids retention within the cell. The City removes digested sludge collected from the bottom of the aerated lagoons every 1-2 years. Digested biosolids are processed in a 5 acre area at the south end of the oxidation pond prior to transportation off site for land application in forest lands.

B. Description of the receiving water

The WPCF and associated combined sewer overflow outfalls discharge to the Snohomish River Estuary and Port Gardner Bay. Other nearby point source discharges include wastewater treatment plant outfalls from the cities of Marysville and Snohomish and from the Lake Stevens Sewer District WWTP. Other point source discharges include industrial discharges from dry docks at the Everett Shipyard and Hansen Boat Company. Significant nearby non-point sources of pollutants include sand and gravel mining operations; industrial stormwater from lumber mills, transportation facilities, and the Cedar Grove composting facility. Non-point municipal stormwater discharges in the vicinity are regulated under the City of Everett's Phase II Municipal Stormwater Permit and Snohomish County's Phase I Municipal Stormwater Permit (for areas outside of the Everett City Limits). Section III.E of this fact sheet describes any receiving waterbody impairments.

Ecology conducts long-term water quality monitoring of the Snohomish River at the Avenue D Bridge in Snohomish, located approximately 10 miles upriver of outfall 015 (monitoring station #07A090). Table 5 summarizes ambient conditions for conventional parameters measured between January 2005 and September 2013. The table also includes results from ambient metals monitoring conducted between October 2008 and August 2009 (bimonthly monitoring, 6 total samples).

Table 5. Ambient Data, Snohomish River

Parameter	Average Value	90th Percentile Value	Geometric Mean Value
Temperature, 1-DADMax	9.2° C	16.7° C	--
Dissolved Oxygen	11.3 mg/L	9.4 mg/L (10th percentile)	--
Suspended Solids	16.5 mg/L	30.2 mg/L	--
pH (min/max range: 7.3-7.9)[1]	7.6	--	--
Fecal Coliform	--	57/100 mL	17/100 mL
Total Ammonia-N	0.014 mg/L	0.021 mg/L	--
Nitrate + Nitrite N	0.225 mg/L	0.384 mg/L	0.196 mg/L
Total Phosphorus-P	0.024 mg/L	0.044 mg/L	--
Salinity at EWPCF outfalls[1]	8.0 psu	--	--
Hardness (as CaCO3)	17.9 mg/L	23.4 mg/L	--
Arsenic	0.66 µg/L	0.8 µg/L	--
Chromium	0.28 µg/L	0.35 µg/L	--
Copper	0.87 µg/L	1.18 µg/L	0.83 µg/L
Lead	0.099 µg/L	0.191 µg/L	--
Mercury	0.0021 µg/L	0.0022 µg/L	0.002 µg/L
Nickel	0.38 µg/L	0.54 µg/L	0.36 µg/L
Zinc	3.2 µg/L	5.45 µg/L	--
[1]*Data for ambient pH and salinity taken from 1993 TMDL study*			

Table 6 lists the Port Gardner ambient data used for this permit. Ecology used data from its marine water sampling station PSS019, located off of Hat Island, and the *Effluent Mixing Study Outfall 100* (CH2MHill, 2004).

Table 6. Ambient Data, Port Gardner Bay

Parameter	Value Used
Temperature (highest annual 1-DADMax)	9.96 C
pH (average)	7.74 standard units
Dissolved Oxygen	6.88 mg/L
Fecal Coliform	1 /100 mL dry weather
Salinity	29.3 Practical Salinity Units (PSU)

C. WPCF influent loading summary

The WPCF monitors influent flow and waste loading to verify actual loadings do not exceed approved design capacities. Table 7 summarizes loading to the facility from the period of October 2009 through December 2014. Appendix E contains complete data for all influent monitoring reported by the facility.

Table 7. Influent Loading Summary

Parameter	Average Value	Maximum Value
Monthly Average Daily Flow	19.3 MGD	34.6 MGD
Monthly Maximum Daily Flow	44.3 MGD	104.9 MGD
Monthly Average 5-day Biochemical Oxygen Demand (BOD_5)	294 mg/L 43,403 lbs/day	454 mg/L 62,668 lbs/day
Monthly Average 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	247 mg/L 36,305 lbs/day	396 mg/L 54,980 lbs/day
Monthly Average Total Suspended Solids (TSS)	238 mg/L 35,517 lbs/day	435 mg/L 51,790 lbs/day

D. Wastewater effluent characterization

The Everett WPCF reported in the permit application and discharge monitoring reports (DMRs) concentrations of pollutants discharged to Port Gardner Bay via outfall 100 and to the Snohomish River via outfall 015. Tables 8 and 9 summarize effluent data for routinely monitored parameters, as reported in DMRs between October 2009 and December 2014. Total residual chlorine concentrations from outfall 015 are typically at or below the detection limit of 0.008 mg/L.

Table 8. Outfall 100 Monitoring Data, Common Parameters

Parameter	Average Value	95th Percentile Value
Monthly Average Flow	9.9 MGD	14.5 MGD
Monthly Average $CBOD_5$	12.4 mg/L 1,007 lbs/day 94.8% removal	20.0 mg/L 1,675 lbs/day
Monthly Average TSS	15.5 mg/L 1,249 lbs/day 93.1% removal	24.0 mg/L 2,125 lbs/day
Monthly Geometric Mean of Fecal Coliform Bacteria	16 cfu/100 mL	48 cfu/100 mL
Average pH Range	6.7-7.4	—
Monthly Average Residual Chlorine	0.45 mg/L	0.47 mg/L
Monthly Average Ammonia	17.3 mg/L-N	29.4 mg/L-N
Monthly Average Nitrate+Nitrite	6.0 mg/L-N	14.7 mg/L-N

Parameter	Average Value	95th Percentile Value
Monthly Average Total Nitrogen	27.2 mg/L-N	38.1 mg/L-N
Monthly Average Total Phosphorous	3.2 mg/L-P	4.9 mg/L-P
Monthly Average Ortho-phosphate	2.5 mg/L-P	3.8 mg/L-P
Temperature, Daily Maximum	17.0 °C	23.7 °C

Table 9. Outfall 015 Monitoring Data, Common Parameters

Parameter	Average Value	95th Percentile Value
Monthly Average Flow	11.3 MGD	19.1 MGD
Monthly Average $CBOD_5$	11.2 mg/L 1,381 lbs/day 95.3% removal	18.0 mg/L 2,495 lbs/day
Monthly Average Equiv. $CBOD_5$ (Low River Season)	2,494 lbs/day	2,957 lbs/day
Monthly Average TSS	28.6 mg/L 2,792 lbs/day 87.8% removal	43.8 mg/L 5,058 lbs/day
Monthly Geometric Mean of Fecal Coliform Bacteria	7 cfu/100 mL	22 cfu/100 mL
Average pH Range	7.0-7.9	—
Monthly Average Residual Chlorine	<0.008 mg/L	—
Monthly Average Ammonia (mass is for low river season only)	24.9 mg/L-N 1,022 lbs/day	40.2 mg/L-N 1,250 lbs/day
Monthly Average Nitrate+Nitrite	0.7 mg/L-N	4.4 mg/L-N
Monthly Average Total Nitrogen	30.5 mg/L-N	43.6 mg/L-N
Monthly Average Total Phosphorous	5.1 mg/L-P	7.3 mg/L-P
Monthly Average Ortho-phosphate	4.0 mg/L-P	6.3 mg/L-P
Temperature, Daily Maximum	13.8 °C	24.4 °C
Temperature, 7DADMax	13.8 °C	24.5 °C

Table 10 and 11 summarize expanded testing for conventional, non-conventional, and priority pollutants, as reported by the Everett WPCF in the permit application and supplemental monitoring reports. Appendix E includes complete priority pollutant monitoring data collected by the WPCF between October 2009 and March 2014.

Table 10. Expanded Effluent Characterization – Outfall 100

Parameter	Units	# of Samples	Average	95th Percentile	Maximum
Dissolved Oxygen	mg/L	949	6.7	—	—
Total Kjeldahl Nitrogen	mg/L	38	22.4	—	36.4
Oil and Grease	mg/L	12	<5.3	—	<6.4
Total Dissolved Solids	mg/L	3	217	—	280
Hardness	mg/L	12	65.45	82.76	84.30
Antimony	µg/L	18	0.68	0.80	0.80
Arsenic	µg/L	69	1.07	1.40	1.40
Chromium	µg/L	70	0.74	1.17	1.40
Cobalt	µg/L	54	0.54	0.60	0.60
Copper	µg/L	69	6.96	9.86	14.00
Lead	µg/L	70	0.80	1.20	1.30
Manganese	µg/L	17	70.09	115.60	122.00
Mercury	µg/L	17	0.0135	0.0293	0.0479
Molybdenum	µg/L	69	2.21	3.56	4.70

Parameter	Units	# of Samples	Average	95th Percentile	Maximum
Nickel	µg/L	69	2.49	3.20	3.30
Tin	µg/L	9	1.13	1.50	1.60
Titanium	µg/L	1	1.70	—	1.70
Zinc	µg/L	69	28.77	36.60	50.00
Cyanide (detected in 4 of 18 samples)	mg/L	18	0.006	—	0.007
Phenolics (detected in 2 of 18 samples)	mg/L	18	0.24	—	0.42
trans Chlordane (detected in 1 of 3 samples)	µg/L	3	0.11	—	0.11
Acetone (detected in 1 of 3 samples)	µg/L	3	10.00	—	10.00
Benzyl Alcohol (detected in 1 of 4 samples)	µg/L	4	5.80	—	5.80
bis(2-Ethylhexyl)phthalate	µg/L	5	12.34	31.92	38.00

Table 11. Expanded Effluent Characterization – Outfall 015

Parameter	Units	# of Samples	Average	95th Percentile	Maximum
Dissolved Oxygen	mg/L	1075	5.7	—	—
Total Kjeldahl Nitrogen	mg/L	39	30.7	—	45.1
Oil and Grease	mg/L	11	<5.1	—	<5.5
Total Dissolved Solids	mg/L	3	280	—	330
Hardness	mg/L	12	69.04	84.55	84.60
Antimony	µg/L	18	0.75	1.02	1.30
Arsenic	µg/L	70	1.68	2.81	3.00
Cadmium (detected in 5 of 71 samples)	µg/L	71	0.20	0.20	0.20
Chromium	µg/L	71	1.25	2.28	2.80
Cobalt	µg/L	55	0.63	0.80	0.90
Copper	µg/L	70	6.90	12.80	14.20
Lead	µg/L	71	2.93	5.80	9.50
Manganese	µg/L	17	109.06	130.00	130.00
Mercury	µg/L	18	0.0159	0.0309	0.0363
Molybdenum	µg/L	70	2.61	4.21	5.50
Nickel	µg/L	70	2.92	3.96	4.40
Silver	µg/L	71	0.63	0.80	0.80
Tin	µg/L	9	1.18	1.60	1.60
Titanium	µg/L	1	9.00	—	9.00
Zinc	µg/L	70	15.77	27.55	33.00
Cyanide (detected in 1 of 19 samples)	mg/L	19	0.005	—	0.005
Phenolics (detected in 1 of 18 samples)	mg/L	18	0.036	—	0.036
Chloroform (detected in 1 of 4 samples)	µg/L	4	0.50	—	0.50
Toluene (detected in 1 of 4 samples)	µg/L	4	0.60	—	0.60
bis(2-Ethylhexyl)phthalate	µg/L	5	10.36	22.60	25.00

The WPCF did not discharge through outfall 025 during the previous permit term. Ecology considers monitoring data from outfall 100 to represent effluent quality expected to be discharged through outfall 025 and used that data in analyzing potential water quality impacts from discharges from outfall 025.

E. Permit status and compliance summary

Ecology issued the previous permit for this facility on September 1, 2009. The previous permit placed effluent limits on: $CBOD_5$, TSS, fecal coliform bacteria, pH, total residual chlorine, and seasonal equivalent $CBOD_5$. The Everett WPCF has generally complied with the effluent limits and permit conditions throughout the duration of the previous permit. Ecology assessed compliance based on its review of the facility's information in the Ecology Permitting and Reporting Information System (PARIS), discharge monitoring reports (DMRs) and on inspections.

As shown in table 12, the facility reported one effluent limit violation for discharges from outfall 100 and ten effluent limit violations for discharges from outfall 015. Staff attributed TSS and $CBOD_5$ violations in May and June 2013 as well as September 2014 to impacts that algae and duckweed had on lagoon effluent quality. Equivalent $CBOD_5$ violations on October 2012 and 2014 were attributed to increased flows from heavy rain at the end for the regulatory low-river flow season.

Table 12. Summary of Effluent Violations

Outfall	Monitoring Month	Parameter	Units	Reported Value	Maximum Limit
100	October-11	Monthly Average TSS	mg/L	31	30
015	February-12	Monthly Average $CBOD_5$	Lbs/Day	5,291	5,100
015	October-12	Daily Maximum Equiv. $CBOD_5$	Lbs/Day	23,064	5,402
015	October-12	Monthly Average Equiv. $CBOD_5$	Lbs/Day	3,859	3,043
015	May-13	Monthly Average $CBOD_5$	mg/L	33	25
015	May-13	Weekly Average $CBOD_5$	mg/L	41	40
015	May-13	Weekly Average $CBOD_5$	Lbs/Day	6,377	5,100
015	May-13	Monthly Average $CBOD_5$	Lbs/Day	4,311	3,190
015	June-13	Monthly Average $CBOD_5$	mg/L	28	25
015	September-14	Monthly Average TSS	mg/L	69	66
015	October-14	Daily Maximum Equiv. $CBOD_5$	Lbs/Day	12,235	5,402

In addition to the reported effluent violations, the Everett WPCF reported influent flows and loading that was at or near design capacities during several months between October 2009 and December 2014. Monthly average loading of BOD_5 exceeded the design capacity of 48,900 lbs/day during 13 months and was within 85% of that capacity during 23 months. Monthly average flow was also within 85% of the rated capacity of 36.3 MGD in December 2012. Ecology approved an engineering report in June 2010 that outlined alternatives to expand the treatment capacity of the WPCF. Final design documents for the expansion were approved in April 2014 and the City started construction in the summer of 2014. The City anticipates construction to be complete during August 2015.

Ecology staff last conducted a non-sampling compliance inspection on January 20, 2015. The inspection concluded that the facility was operating well during construction and that the expansion project was on pace for completion by August 2015. Ecology staff also completed annual pretreatment program audits during the previous permit term. The Everett WPCF has complied with all report submittal requirements in the past permit.

The City of Everett submitted an application for permit renewal on October 1, 2013 and Ecology accepted it as complete on January 30, 2014. The previous permit was administratively extended on September 18, 2014.

F. State environmental policy act (SEPA) compliance

State law exempts the issuance, reissuance or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions that are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, not to new discharges.

III. Proposed Permit Limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

A. Design criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Table 13 summarizes the design criteria found in the Water Pollution Control Facility Phase C1 Improvements design documents, dated February 2014 and prepared by Carollo Engineers. Ecology approved the document in April 2014. The design document shows that each treatment system at the WPCF has independent hydraulic constraints, however, each system does not have separate waste loading capacities for BOD_5 and TSS.

Table 13. Design Criteria for Everett WPCF (Phase C)

Parameter	Design Quantity
Total Maximum Month Design Flow (MMDF)	40.3 MGD
MMDF through North Plant (Lagoon System)	15.3 MGD
MMDF through South Plant (TF/SC System)	25.0 MGD
BOD_5 Loading for Maximum Month	83,000 lb/day
TSS Loading for Maximum Month	89,000 lb/day

B. Technology-based effluent limits

Federal and state regulations define technology-based effluent limits for domestic wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available, and reasonable methods of prevention, control, and treatment (AKART) for domestic wastewater. In addition, the federal CSO Control Policy (59 FR 18688) requires entities with Combined Sewer Overflows to implement "Nine Minimum Controls" as technology-based performance standards for CSO discharges. Nine Minimum Controls are discussed in more detail in Section V of this fact sheet.

Federal and state regulations allow alternate limits for waste stabilization ponds (lagoons) and trickling filters. Chapter 173-221-050 WAC outlines conditions under which Ecology may apply alternative limits in NPDES permits for domestic wastewater facilities. The rule allows alternate limits for waste stabilization ponds with a design capacity below 2 million gallons per day or those that have received, prior to November 1987, Ecology's approval under chapter 173-240 WAC for a greater design capacity. Trickling filters constructed and/or expanded prior to November 1984 are also allowed alternate limits. The lagoon system at the Everett WPCF qualifies for alternative limits since design criteria for that system was approved prior to 1987. The trickling filters/solids contact system does not qualify for alternative limits since Ecology first approved design criteria for that system after 1984.

Qualified lagoons may receive alternative limits for BOD_5 or $CBOD_5$ and TSS concentrations, calculated mass discharge and percent removal. Ecology uses past performance data when considering alternative limits for an existing facility and sets limits at levels consistently achievable at a 95% confidence level. The DMR data analysis shown in Appendix E shows that outfall 015 can consistently achieve standard technology based limits for $CBOD_5$ concentration and percent removal. Therefore, the proposed permit will not apply alternative limits for this parameter.

To establish appropriate TSS limits, Ecology reviewed monthly average effluent data reported over the past 15 ½ years, between January 2000 and June 2015. Review of this lengthy record is necessary since weather patterns that can fluctuate over periods of several years may skew the lagoon effluent data. For example, in years with cool, wet spring weather effluent TSS concentrations for the lagoons can be low and fairly stable. On the other hand, in years with warmer spring and summer periods, effluent TSS concentrations from the lagoons can be high and fairly variable due to increased algae growth. Analyzing data over a long period minimizes the weather-related impacts. As shown in Appendix E, the long-term data set demonstrates that the lagoons can consistently achieve a monthly average TSS concentration of 59 mg/L and a TSS removal efficiency of 78%, based on the calculated 95^{th} percentile of each data set. Ecology calculates the weekly average concentration limit as 1.5 times the monthly average limit.

Facilities that receive flows from combined sewers also quality for reduced percent removal limits during wet weather seasons. Ecology determines such reduced limits on a case-by-case basis and must base the limits on past performance. Monitoring data from October 2009 through December 2014 show that influent $CBOD_5$ and TSS concentrations during wet weather months of November through April are often approximately 20% less than the average long term influent concentrations. Despite the dilution during wet weather, both facilities consistently achieve 85% removal of $CBOD_5$ during the wet weather season and the TF/SC facility consistently achieves 85% removal of TSS. The data also shows no reduction in TSS removal efficiency for the lagoon system during wet weather months. Therefore, the proposed permit will not include alternate percent removal limits for the wet weather season.

Table 14 below identifies standard and alternative technology-based limits that apply to the proposed permit for $CBOD_5$, TSS, pH, and fecal coliform, as listed in chapter 173-221 WAC. Section III.F of this fact sheet evaluates the need for numeric water quality-based limits.

Table 14. Technology-based Limits

Parameter	Average Monthly Limit	Average Weekly Limit
$CBOD_5$ (concentration)	25 mg/L	40 mg/L
	In addition, the $CBOD_5$ effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
TSS from TF/SC (concentration)	30 mg/L	45 mg/L
	In addition, the TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration unless.	
TSS from Lagoon (concentration)	59 mg/L	88.5 mg/L
	In addition, the TSS effluent concentration must not exceed twenty-one percent (22%) of the average influent concentration.	
Chlorine from TF/SC	0.5 mg/L	0.75 mg/L
Chlorine from Lagoon	See discussion below on performance-based chlorine limits	
Parameter	**Monthly Geometric Mean Limit**	**Weekly Geometric Mean Limit**
Fecal Coliform Bacteria	200 organisms/100 mL	400 organisms/100 mL
Parameter	**Daily Minimum**	**Daily Maximum**
pH	6.0 standard units	9.0 standard units

Ecology derived the technology-based monthly average limit for chlorine from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, *Wastewater Engineering, Treatment, Disposal and Reuse*, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/L.

The existing permit used the technology-based limits described above for discharges to Port Gardner via outfall 100. The permit also has a water quality-based monthly average chlorine limit of 0.016 mg/L (16 μg/L) and a daily maximum limit of 0.083 mg/L (83 μg/L) for discharges from outfall 015 to the Snohomish River and the facility is able to comply with these limits. To prevent backsliding, the proposed permit will retain the lower limits for outfall 015 as performance-based limits.

Technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b). Ecology calculated the monthly and weekly average mass limits for $CBOD_5$ and Total Suspended Solids as follows:

Mass Limit = CL x DF x CF
where:
CL = Technology-based concentration limits listed in the above table
DF = Maximum Monthly Average Design flow (MGD)
CF = Conversion factor of 8.34

Table 15. Technology-based Mass Limits

	Outfall 100 - TF/SC Facility (25 MGD design flow)		Outfall 015 - Lagoon Facility (15.3 MGD design flow)	
Parameter	**Concentration Limit (mg/L)**	**Mass Limit (lbs/day)**	**Concentration Limit (mg/L)**	**Mass Limit (lbs/day)**
$CBOD_5$ Monthly Average	25	5,213	25	3,190
$CBOD_5$ Weekly Average	40	8,340	40	5,100
TSS Monthly Average	30	6,255	59	7,529
TSS Weekly Average	45	9,383	88.5	11,293

The proposed permit authorizes only intermittent discharges from outfall 025 to the Snohomish River for the purpose of diffuser maintenance and prohibits discharges from outfall 015 during the time period the facility discharges from outfall 025. Discharges from outfall 025 must meet technology-based concentration limits applicable to the TF/SC system. However, since this outfall has limited authorization for discharges, Ecology will not calculate specific technology-based mass limits for the outfall. The Everett WPCF must instead demonstrate that combined mass discharge from outfalls 015 and 025 do not exceed the mass limits for outfall 015 during any monitoring period when both outfalls are in service.

C. Surface water quality-based effluent limits

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

Numerical criteria for the protection of aquatic life and recreation

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical criteria for the protection of human health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA, 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the state of Washington.

Antidegradation

Description--The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

Facility Specific Requirements--This facility must meet Tier I requirements for discharges from outfall 015 and outfall 025. Although the City is expanding treatment capacity at the WPCF, the expansion project will not result in increased discharges from either outfall. The project does not increase the amount of flow that can pass through the lagoon system to outfall 015 and the proposed permit retains specific flow and duration limits on discharges from outfall 025. Therefore the project does not represent a new or expanded action for these outfalls. Under Tier I:

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.
- For waters that do not meet assigned criteria, or protect existing or designated uses, Ecology will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards. Ecology accomplishes this for this discharger by implementing TMDL-based limits identified in the 1999 *Snohomish River Estuary Total Maximum Daily Load Submittal Report*.

Expansion of the TF/SC system at the WPCF qualifies as a new or expanded action with respect to outfall 100 since it increases the authorized discharge volume and loading to Port Gardner. Therefore, discharges from the TF/SC system must meet Tier II requirements. A Tier II analysis focuses on evaluating feasible alternatives that would eliminate or significantly reduce the level of degradation. The analysis also includes a review of the benefits and costs associated with the lowering of water quality. New discharges and facility expansions are prohibited from lowering water quality without providing overriding public benefits.

As part of a Tier II analysis, Ecology must first determine whether the proposed action results in a measurable change in water quality. Chapter 173-201A-320(3) defines "measurable change" as follows:

- Temperature increase of 0.3°C or greater;
- Dissolved oxygen decrease of 0.2 mg/L or greater;
- Bacteria level increase of 2 cfu/100 mL or greater;
- pH change of 0.1 units or greater;
- Turbidity increase of 0.5 NTU or greater; or
- Any detectable increase in the concentration of a toxic or radioactive substance.

Ecology evaluates the above changes at the edge of the authorized chronic mixing zone for the outfall in question. Based on dilution calculations presented in *the Outfall 100 Effluent Mixing Study*, prepared by CH2M Hill in 2004, the 4 MGD increase in design flow that results from this expansion will not result in a significant decrease in allowable dilution and dilution factors will remain higher than 600:1. The large amount of dilution provided by outfall 100 assures that the expanded discharges will not result in any measureable change at the edge of the chronic mixing zone. Since the increased discharges will not likely result in a measureable decline in water quality in Port Gardner, Ecology concludes that the proposed permit complies with Tier II antidegradation.

Combined sewer overflows

Chapter 173-245 WAC requires that "All CSO sites shall achieve and at least maintain the greatest reasonable reduction, and neither cause violations of applicable water quality standards, nor restrictions to the characteristic uses of the receiving water, nor accumulation of deposits which: (a) Exceed sediment criteria or standards; or (b) have an adverse biological effect." "The greatest reasonable reduction" means control of each CSO outfall such that an average of no more than one untreated discharge may occur per year. Ecology includes specific conditions in the proposed permit to ensure that the City of Everett continues to make progress towards meeting water quality goals for each CSO outfall in its system. Section V of this fact sheet contains more detailed information on these CSO requirements.

Mixing zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution [WAC 173-201A-400 (7)(a)(ii-iii)].

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 4 means the effluent is 25% and the receiving water is 75% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute

and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Most aquatic life *acute* criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Most aquatic life *chronic* criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two liters/day for drinking water.
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. **Ecology must specify both the allowed size and location in a permit.**

   The proposed permit specifies the size and location of the allowed mixing zones (as specified below).

2. **The facility must fully apply "all known, available, and reasonable methods of prevention, control and treatment" (AKART) to its discharge.**

   Ecology has determined that the treatment provided at Everett WPCF meets the requirements of AKART for both outfalls (see "Technology-based Limits").

3. **Ecology must consider critical discharge conditions.**

   Surface water quality-based limits are derived for the water body's critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

   Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there

is little or no stratification. Ecology uses the water depth at mean lower low water (MLLW) for marine waters and tidally influenced river segments. Ecology's *Permit Writer's Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology's website at: https://fortress.wa.gov/ecy/publications/SummaryPages/92109.html.

Cosmopolitan Engineering prepared a supplemental mixing zone study in 1996 that used dye studies and computer modeling to determine dilution for discharges to the Snohomish River from outfalls 015 and 025. Table 16 summarizes the critical conditions used in that study. Critical conditions listed in Table 17 for Port Gardner are from the Effluent Mixing Study Outfall 100, prepared by CH2M Hill for Kimberly-Clark in 2004. The modeling for outfall 100 used the combined flow rates for discharges from Kimberly-Clark, the Everett WPCF and the Marysville WWTP and assigned the same dilution factor to all discharges.

Table 16. Conditions Used to Model Snohomish River Discharges (outfall 015 and 025)

Critical Condition	Value
The seven-day-average low river flow with a recurrence interval of twenty years (7Q20, used in TMDL study)	1051 cfs
River depth at MLLW and the 7Q20 period at outfall 015	8 feet
River depth at MLLW and the 7Q20 period at outfall 025	16 feet
Channel width near outfall 015	350 feet
Channel width near outfall 025	450 feet
Design flow rate used for outfall 015 dilution modeling	16 MGD
Design flow rate used for outfall 025 dilution modeling	8 MGD
Reflux factor due to tide reversal (expressed as steady-state percent of effluent concentration remaining in mixing zone due to build-up)	3.9%

Table 17. Conditions Used to Model Port Gardner Discharges (outfall 100)

Critical Condition	Value
Average Water depth at MLLW	344 feet
Minimum ambient density stratification profile with a range of 1.021 g/cm^3 at the surface and 1.023 g/cm^3 at a depth of 105 meters (344 feet)	
Maximum ambient density stratification profile with a range of 1.014 g/cm^3 at the surface and 1.023 g/cm^3 at a depth of 105 meters (344 feet)	
10th percentile current speeds for acute mixing zone	1.2 cm/sec
90th percentile current speeds for acute mixing zone	11.1 cm/sec
50th percentile current speeds for chronic and human health mixing zones	5.3 cm/sec
Maximum average monthly effluent flow for chronic and human health non-carcinogen	58.5 MGD
Maximum daily flow for acute mixing zone	69.9 MGD
Average effluent density of 0.996 g/cm^3	

4. Supporting information must clearly indicate the mixing zone would not:

- Have a reasonable potential to cause the loss of sensitive or important habitat.
- Substantially interfere with the existing or characteristic uses.
- Result in damage to the ecosystem.
- Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of discharge.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Because the Everett WPCF discharges treated domestic wastewater, the effluent contains fecal coliform bacteria, an organism used to indicate the possible presence of other bacteria and viruses that cause gastro enteric illness. Outfalls 015 and 025 discharge into a reach of the Snohomish River that the water quality standards designate for primary contact recreation, such as swimming. Ecology developed freshwater water quality criteria for fecal coliforms to assure that people swimming in water meeting the criteria would not develop gastro enteric illnesses. As discussed in the "Designated Uses and Surface Water Quality Criteria" section of this fact sheet, the standard that is applicable to this reach of the river is 200 colony forming units/100mL. Ecology has authorized mixing zones for outfalls 015 and 025; however, the discharges are subject to a technology-based effluent limit of 200 colony forming units/100mL. This means the effluent meets the water quality criteria at the point of discharge and doesn't need dilution to comply with the applicable standard.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics, and the discharge locations. Based on this review, Ecology concluded that the discharges do not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem, or adversely affect public health if the permit limits are met.

5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis for each outfall, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will not violate applicable water quality criteria outside the designated mixing zone boundaries if permit limits are met.

6. The size of the mixing zone and the concentrations of the pollutants must be minimized.

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. Because tidal currents change direction, the plume orientation within the mixing zone for outfall 100 changes. Plume orientation within the mixing zones for outfalls 015 and 025 may also change due to tidally-influenced flow reversal of the Snohomish River. Each plume mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis. In addition, the dilution factor authorized for outfall 100 is based on the combined design flows for the Everett WPCF TF/SC system, the Marysville WWTP and the Kimberly-Clark mill's treatment plant, which is approximately 2.3 times larger than the design flow for just the Everett's TF/SC system. This will result in a more conservative dilution factor for effluent discharged from the City of Everett.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zones authorized in the proposed permit.

7. Maximum size of chronic mixing zone.

The authorized chronic mixing zone does not exceed the maximum size restriction.

8. Acute mixing zone.

- **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**

  Ecology determined the acute criteria will be met at 10% of the distance of the chronic mixing zone.

- **The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**

  As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).

- **Comply with size restrictions.**

  The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

9. Overlap of mixing zones.

These mixing zones do not overlap any other mixing zones.

D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). The following tables summarize the criteria applicable to the designated uses for the Snohomish River and Port Gardner in the vicinity of the outfalls from the Everett WPCF.

Aquatic life uses are designated based on the presence of, or the intent to provide protection for the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The state water quality standards (WAC 173-201A-602) designate the Snohomish River in the vicinity of outfalls 015 and 025 for freshwater aquatic life uses of salmonid spawning, rearing, and migration. Although the standards assume a freshwater environment for the designated use, the standards also acknowledge that freshwater criteria may not be appropriate in brackish estuaries. The standards include the following allowances in WAC 173-201A-260(3)(e):

> *In brackish waters of estuaries, where different criteria for the same use occurs for fresh and marine waters, the decision to use the fresh water or the marine water criteria must be selected and applied on the basis of vertically averaged daily maximum salinity, referred to below as "salinity." The fresh water criteria must be applied at any point where ninety-five percent of the salinity values are less than or equal to one part per thousand, except that the fresh water criteria for bacteria applies when the salinity is less than ten parts per thousand; and The marine water criteria must apply at all other locations where the salinity values are greater than one part per thousand, except that the marine criteria for bacteria applies when the salinity is ten parts per thousand or greater.*

Based on ambient data collected during the development of the Snohomish Estuary TMDL and in support of the 1995 Mixing Zone Study for outfalls 015 and 025, the average salinity in the reach near the Everett WPCF is 8.0 parts per thousand (ppt). Since this salinity level is above the 1.0 ppt threshold listed above, Ecology will use marine numeric criteria associated with Possession Sound in evaluating the impacts of discharges from outfalls 015 and 025.

Table 612 of the water quality standards (WAC 173-201A-612) identifies Possession Sound, which includes Port Gardner, as “Excellent quality” for salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning. Table 18 lists the numeric criteria that Ecology will apply to Port Gardner and the Snohomish River Estuary.

Table 18. Marine Aquatic Life Uses and Associated Criteria

Excellent Quality	
Temperature Criteria – Highest 1D MAX	16°C (60.8°F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	6.0 mg/L
Turbidity Criteria	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
pH Criteria	pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

Fecal coliform numeric standards

Ecology sets fecal coliform standards to protect human health from enteric diseases that can result from recreational contact with contaminated waters or the consumption of shellfish recreationally harvested in contaminated areas. The following provides the basis for numeric fecal coliform standards that apply to the Snohomish River and Port Gardner.

- The *recreational use* for the Snohomish River is designated for "Primary Contact Recreation". Chapter 173-201A-602 includes a modified fecal coliform standard for the Snohomish River from mouth to latitude 47.942, longitude -122.1719 (southern tip of Ebey Island at river mile 8.1). Outfalls 015 and 025 discharge into this segment. The applicable standard for this segment is: "Fecal coliform organism levels shall both not exceed a geometric mean value of 200 colonies/100 mL and not have more than 10 percent of the samples obtained for calculating the mean value exceeding 400 colonies/100 mL."
- The *recreational use* for Port Gardner is "Primary Contact Recreation". To protect this designated use, the marine standards specify that fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL. Ecology will apply this standard for discharges from outfall 100.
- To protect shellfish harvesting in Port Gardner, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL. Ecology will apply this standard for discharges from outfall 100.

Additional designated uses

- The Snohomish River is designated for *water supply uses*, which include domestic, agricultural, industrial, and stock watering.
- The *miscellaneous freshwater uses* that apply to the Snohomish River include wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.
- The *miscellaneous marine water uses* that apply to Port Gardner include wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

E. Water quality impairments

Snohomish River

Ecology listed the Snohomish River Estuary as an impaired water body for dissolved oxygen in 1996. In response to that impairment, Ecology submitted a water quality improvement plan for the basin in 1999. The plan, which EPA approved in 2002, placed waste load allocations on $CBOD_5$ and ammonia from several point sources, including the Everett WPCF outfalls. The proposed permit incorporates these waste load allocations as water quality based limits for $CBOD_5$ and ammonia-nitrogen in the form of a combined parameter NBOD+CBOD. Since the facility does not routinely use outfall 025, the proposed permit applies the waste load allocation only to outfall 015. The proposed permit also prohibits discharges from outfall 015 whenever the facility discharges from outfall 025 and applies mass-based limits on outfall 015 to outfall 025.

Port Gardner

Ecology has not documented any water quality impairments in Port Gardner near outfall 100. However Ecology has documented near-shore sediment impairments in portions of Port Gardner near the City's CSO outfalls. Ecology's Toxic Cleanup Program is working with the Port of Everett to clean up existing sediment contamination in the near-shore environment. The proposed permit does not allow the City's CSO discharges to impair water or sediment quality near the outfalls. The permit will also require the City to develop and implement a monitoring plan that demonstrates that controlled CSO discharges do not impair water or sediment quality.

F. Evaluation of surface water quality-based effluent limits for narrative criteria

Ecology must consider the narrative criteria described in WAC 173-201A-260 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable methods of treatment and prevention (AKART) as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

In addition, Ecology considers the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing when there is a reasonable potential for the discharge to contain toxics. Ecology's analysis of the need for WET testing for this discharge is described later in the fact sheet.

G. Evaluation of surface water quality-based effluent limits for numeric criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biochemical oxygen

demand (BOD_5) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

The three outfalls associated with the WPCF use diffusers to help disperse treated effluent into the receiving water. The following summarizes the characteristic of each diffuser.

Outfall 015: 36-ft long diffuser with sixteen 10-inch ports spaced 2.5 feet apart. Depth of the diffuser is 8 feet at MLLW. Effluent discharges horizontally through pinch check valves.

Outfall 025: 35-ft long diffuser with twelve 10-inch ports spaced 3 feet apart. Depth of the diffuser is 16 feet at MLLW. Effluent discharges horizontally through pinch check valves.

Outfall 100: The diffuser section is 1,556 feet in length and is laid along a gradual curve that starts at a depth of 340 feet and ends at a depth of 348 feet MLLW. The section has 80 risers with 90° elbows oriented in alternating directions that terminate in 5-inch round ports.

For the purpose of establishing mixing zone size restrictions, the water quality standards categorize all marine waters in Puget Sound as "estuarine". In addition, although the water quality standards assign freshwater designated uses for the Snohomish River, the reach in the vicinity of outfalls 015 and 025 is considered and "estuary" due to significant tidal variations and tidally-influenced flow reversal. Ecology limits the size of mixing zones for outfalls in estuaries according to the following restrictions.

Chronic Mixing Zone--WAC 173-201A-400(7)(b) specifies that mixing zones must not extend in any horizontal direction from the discharge ports for a distance greater than 200 feet plus the depth of water over the discharge ports and may not occupy more than 25% of the width of the water body as measured during MLLW.

Acute Mixing Zone--WAC 173-201A-400(8)(b) specifies that in estuarine waters a zone where acute criteria may be exceeded must not extend beyond 10% of the distance established for the chronic zone.

Table 19 lists the horizontal maximum size restrictions for each outfall's chronic and acute mixing zones. Appendix D contains illustrations showing the approximate size and orientation of the authorized zones.

Table 19. Mixing Zone Size Restrictions

Outfall	Chronic Mixing Zone Size	Acute Mixing Zone Size
015	The chronic mixing zone extends 208 feet downstream and 208 feet upstream of each diffuser port. The width of the mixing zone is 87.5 feet (25% of 350 feet) and is centered on the middle of the multi-port diffuser at a location 180 feet from the east bank of the river at MLLW.	The acute mixing zone extends 20.8 feet upstream and 20.8 feet downstream from each diffuser port. The width of the mixing zone is 77.6 feet (36-foot diffuser length plus 20.8 feet on each end) and is centered on the middle of the multi-port diffuser.
025	The chronic mixing zone extends 216 feet downstream and 216 feet upstream of each diffuser port. The width of the mixing zone is 112.5 feet (25% of 450 feet) and is centered on the middle of the multi-port diffuser at a location 222.5 feet from the east bank of the river at MLLW.	The acute mixing zone extends 21.6 feet upstream and 21.6 feet downstream from each diffuser port. The width of the mixing zone is 78.2 feet (35-foot diffuser length plus 21.6 feet on each end) and is centered on the middle of the multi-port diffuser.
100	The chronic mixing zone extends 540 feet (based on minimum depth of 340 feet) in any horizontal direction from each discharge port of the multi-port diffuser section.	The acute mixing zone extends 54.0 feet in any horizontal direction from each discharge port of the multi-port diffuser section.

The Everett Water Pollution Control Facility, Re-rating and Effluent Mixing Zone Study (Brown and Caldwell, April 1996) presented mixing zone analyses for outfalls 015 and 025 that were based on modeling calibrated by dye studies. The Effluent Mixing Study Outfall 100, prepared by CH2M Hill in 2004 for Kimberly-Clark Worldwide, provided a mixing zone analysis for the Port Gardner outfall that was based on computer modeling of the combined effluent flow from the Kimberly-Clark treatment facility, the Everett WPCF, and the Marysville WWTP under various ambient conditions. The proposed permit uses the dilution factors from these studies as the maximum allowable dilution from each outfall. Table 20 summarizes the authorized dilution factors for each outfall.

Table 20. Authorized Dilution Factors

Criteria	Outfall 015		Outfall 025		Outfall 100	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Aquatic Life	6.4	14.2	7.3	15.6	156	696
Human Health, Carcinogen		14.2		15.6		696
Human Health, Non-carcinogen		14.2		15.6		696
Seasonal Temperature		26.7				

For each outfall, Ecology determined the impacts of dissolved oxygen deficiency, pH, fecal coliform, chlorine, ammonia, metals, other toxics, and temperature as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

Dissolved Oxygen--$CBOD_5$ and Ammonia Effects--Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) of an effluent sample indicates the amount of carbon-based biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of the oxygen demand (nitrogenous biochemical oxygen demand, or NBOD) potential in the receiving water. In issuing a permit, Ecology must consider whether technology-based limits on $CBOD_5$ and ammonia have a reasonable potential to decrease dissolved oxygen below the applicable water quality criteria for the receiving water.

Port Gardner, Outfall 100

With technology-based limits, discharges from outfall 100 results in a small amount of $CBOD_5$ and NBOD relative to the large amount of dilution in the receiving water at critical conditions. Technology-based limits will ensure that dissolved oxygen criteria are met in the receiving water.

Snohomish River, Outfalls 015 and 025

As noted under the Water Quality Impairments section of this fact sheet, the Snohomish river estuary was listed as an impaired water body for dissolved oxygen in 1996. The 1999 *Snohomish River Estuary Dissolved Oxygen TMDL* established waste load allocations (WLAs) for carbonaceous biochemical oxygen demand ($CBOD_5$) and ammonia for discharges occurring during the July-October critical season from wastewater treatment plants in the basin, including from the Everett WPCF. The TMDL established the following waste load allocations for the Everett WPCF. Allocations were based on discharges that were occurring in 1999, which included continuous discharges from both Snohomish River outfalls from the WPCF.

Table 21. TMDL-based Waste Load Allocations for Everett WPCF

Outfall	Ammonia-Nitrogen (lbs/day)	$CBOD_5$ (lbs/day)
015 from Lagoon System	867	1,668
025 from TF/SC System	667	494
Everett WPCF's WLA to Snohomish River Estuary	1,534	2,162

Part of the City's response to the TMDL was to partner with Kimberly-Clark and the City of Marysville to construct the deep water outfall (outfall 100) in Port Gardner and to redirect flow from outfall 025 to that new outfall. Because of this transfer, the City now discharges TF/SC effluent through outfall 100 and does not discharge into the Snohomish River from the TF/SC system, except for occasional flushing. Therefore, Ecology applies the total load allocations for ammonia and $CBOD_5$ to the maximum daily limits for the lagoon system which discharges to the Snohomish River, via Outfall 015.

Effluent mass loading limits for $CBOD_5$ and ammonia are related because both represent an oxygen demand that affects dissolved oxygen levels in the river. Ecology allows an exchange of waste load allocations between $CBOD_5$ and ammonia if the overall daily load remains constant. Based on river modeling studies, Ecology established a WLA exchange

rate for Snohomish Estuary Dischargers of 2.1 pounds of $CBOD_5$ for each pound of ammonia. Using this exchange, the total WLA can be expressed as a combined parameter, that Ecology calls "NBOD+CBOD", which is calculated as follows:

NBOD+CBOD lbs/day = (2.1*ammonia lbs/day) + $CBOD_5$ lbs/day

WLA = (2.1 * 1,543) + 2,162 = 5,402 lbs/day NBOD+CBOD

The WLA above is the maximum daily limit (MDL) for this parameter. According to federal NPDES regulations, all permit limits must be expressed as both average monthly and maximum daily limits. The average monthly limit (AML) is calculated according to the method in EPA's Technical Support Document for Water Quality-based Toxics Control (1991). See Appendix F for detailed calculations. The AML calculation is affected by effluent variability and number of samples per month. Ecology calculated the average monthly limit based on 16 sampling events per month (4 per week) and a calculated coefficient of variation (CV) of 0.27, which is based on a statistical analysis of monitoring data over the last permit term. Average monthly limit calculated based on current performance resulted in a numeric limit of 3,366 lbs/day. Since this calculated limit is higher than the existing permit limit, Ecology will retain the existing average monthly limit to prevent backsliding. Therefore the average monthly and daily maximum limits for the proposed permit are:

MDL = WLA = 5,402 lbs/day NBOD+CBOD

AML = 3,043 lbs/day NBOD+CBOD

The proposed permit will continue to enforce technology-based limits for $CBOD_5$ concentration during the critical season.

pH – Due to the high buffering capacity of marine water and the large amount of dilution provided by outfall 100, compliance with the technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards in Port Gardner. Therefore Ecology will retain technology-based pH limits for outfall 100.

Since the average salinity levels in the Snohomish River are generally low and outfalls 015 and 025 have low dilution, Ecology used modeling to determine whether technology-based limits have a potential to violate the numeric pH standards with respect to the resultant mixed pH and the amount of pH change in the river. The modeling estimates the pH of a saltwater mixture from two sources based on the mixed temperature, alkalinity and salinity. The results of the modeling from outfalls 015 and 025 are in Appendix F.

The modeling predicts that discharges from outfall 015 with a pH of 6.0 have a potential to reduce pH below the numeric criteria of 7.0 and will result in a pH change greater than 0.5 standard units at the edge of the chronic mixing zone. Ecology determined that a pH limit of 6.4 is necessary for outfall 015 to ensure compliance with the water quality standard. Effluent monitoring from October 2009 through December 2014 demonstrates that the lagoon facility can comply with a limit of 6.4 and only reported a lower pH of 6.3 once in October 2009. Discharges with a pH of 9.0 will not adversely impact water quality.

The modeling also predicted that a pH of 6.0 will result in more than a 0.5 standard unit change in pH at the edge of the chronic mixing zone for outfall 025. Ecology determined that a limit of 6.1 is necessary to ensure discharges from outfall 025 do not cause more than a 0.5 standard unit change. Discharges with a pH of 9.0 will not adversely impact water quality. Table 22 summarizes the proposed pH limits for the three outfalls.

Table 22. pH Limit Summary

Outfall	Minimum Daily pH Limit	Maximum Daily pH Limit
015 from Lagoon System	6.4	9.0
025 from TF/SC System	6.1	9.0
100 from TF/SC	6.0	9.0

Fecal Coliform – Ecology modeled the numbers of fecal coliform by simple mixing analysis using the technology-based weekly geometric mean limit of 400 organisms per 100 ml and the chronic dilution factors listed in Table 18 for each outfall. Under critical conditions, modeling predicts no violation of the water quality criterion for fecal coliform. Therefore, the proposed permit includes the technology-based effluent limit for fecal coliform bacteria. In addition, the technology-based effluent limits are equivalent to the listed water quality criteria for fecal coliform organisms for the Snohomish River Estuary, which ensure that discharges from outfalls 015 and 025 can meet the water quality standard without mixing.

Turbidity--Ecology evaluated the impact of turbidity based on the range of total suspended solids in the effluent and turbidity of the receiving water. Ecology expects no violations of the turbidity criteria outside the designated mixing zone provided the facility meets its technology-based total suspended solids permit limits.

Temperature – The state temperature standards for marine waters (WAC 173-201A-210) include multiple elements:

- Annual 1-Day maximum criteria
- Incremental warming restrictions
- Protections against acute effects

Ecology evaluates each criterion independently to determine reasonable potential and to derive permit limits.

Annual 1-Day maximum criteria

Each marine water body has an annual maximum temperature criterion [WAC 173-201A-210(1)(c), and Table 612]. These threshold criteria (e.g., 13, 16, 19, 22°C) protect specific categories of aquatic life by controlling the effect of human actions on water column temperatures. The threshold criteria apply at the edge of the chronic mixing zone. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax). Ecology concludes that there is no reasonable potential to exceed the temperature standard when the mixture of ambient water and effluent at the edge of the chronic mixing zone is less than the criteria of 16°C.

Incremental warming criteria

The water quality standards also limit the amount of warming human sources can cause under specific situations [WAC 173-201A-210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone. At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment (T_i), calculated as:

$$T_i = \frac{12}{(T_{amb} - 2)}$$

This increment is permitted only to the extent doing so does not cause temperatures to exceed the annual maximum criteria.

At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition. When Ecology has not yet completed a TMDL to address documented temperature impairments, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25% or less of the critical flow. This is because the fully mixed effect on temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less) for all human sources combined.

Temperature Acute Effects

1. Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C; unless a dilution analysis indicates ambient temperatures will not exceed 33°C 2-seconds after discharge.
2. General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.
3. Lethality to incubating fish: Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

Outfall 100

Ecology calculated the reasonable potential for discharges from outfall 100 to exceed the annual 1-Day maximum temperature and incremental warming criteria at the edge of the chronic mixing zone during critical conditions. As shown in Appendix F, Ecology predicts that the outfall 100 discharge will increase temperature in the vicinity of the outfall by 0.02° C to a temperature of 9.98° C.

Based on the maximum ambient temperature (T_{amb}) of 9.96°C for the region around the outfall 100 and the incremental warming equation above, the maximum allowable incremental temperature change is 1.51°C. As noted above, Ecology predicts the discharge from outfall 100 to cause an incremental temperature increase of 0.02°C, which is well within the allowable incremental change. Based on the predicted temperature and incremental change at the edge of the chronic mixing zone, there is no reasonable potential for discharges from outfall 100 to exceed water quality standards and no temperature limit is needed.

Ecology also considered the acute effects the discharge may have in the receiving water. Outfall 100 discharges treated domestic wastewater that traditionally does not approach temperatures near 33°C. Therefore, no reasonable potential exists for instantaneous lethality. Furthermore, ambient records do not indicate that receiving water temperatures approach 17.5°C or 23°C. Based on this analysis, the proposed permit does not include any temperature limits for discharges from outfall100.

Outfall 015

Based on ambient data presented in Table 5, temperature in the Snohomish River Estuary in the vicinity of outfall 015 is warmer than the marine criteria of 16°C. Since ambient conditions exceed the criteria, discharges from outfall 015 are only allowed to warm the water by 0.3°C at the edge of the chronic mixing zone. Ecology calculated the reasonable potential for discharges from outfall 015 to exceed this incremental limit during critical conditions. As shown in Appendix F, there is a reasonable potential for the discharge to exceed the criteria and, therefore, Ecology must establish a limit to the amount of heat discharged from this outfall.

Ecology's calculations use the 90th percentile of ambient data collected between January 2005 and September 2013 (16.7° C), the 95th percentile of daily maximum effluent data collected between October 2009 and December 2014 (24.4° C, from table 8), and the authorized chronic dilution factor of 14.2. The analysis determined that a temperature limit of 20.0° C would be needed for the lagoon effluent to meet the applicable temperature standards.

Based on past performance, the lagoon facility cannot comply with a temperature limit of 20° C during the months of May through October. Given the likelihood of violating a temperature limit, Ecology evaluated alternatives for limiting the amount of heat discharged through outfall 015. One alternative considered modifies the allowed mixing zone for temperature. Ecology's 2010 Water Quality Guidance Manual entitled "*Procedures to Implement the State's Temperature Standards through NPDES Permits*" identifies a provision in the water quality standards that allows Ecology to exceed the numeric size criteria of a mixing zone in certain conditions. Based on this allowance, Ecology evaluated the impacts of modifying the authorized dilution factor applied to temperature by limiting the flow from outfall 015.

Ecology's analysis first looked at the record of 90th percentile ambient temperature and 95th percentile effluent temperature for each month. This examination revealed that the discharge would only have a potential to exceed the temperature standard during the months of July through September. As such, Ecology determined that any limit should apply only during the months of July through September when river flow is low.

During the low river flow period established in the *Snohomish River Estuary TMDL* (July through October), plant staff generally must limit flow through the lagoon system and outfall 015 to ensure compliance with the NBOD+CBOD mass limit required to protect the river from dissolved oxygen depletion. Flow records for the lagoon facility show that the average flow from outfall 015 during the period range between 3.0 MGD to 5.0 MGD and does not typically exceed 7.8 MGD on any given day (September 2014 was an outlier that had at least one day of flow at 14.3 MGD). As discussed in the mixing zone section of this fact sheet, the authorized dilution factor for outfall 015 was calculated based on a design flow rate of 16 MGD and the 7Q20 river flow of 1,051 cfs. Since typical plant practice is to limit flow during the critical period, modifying the dilution factor for temperature is justified as long as actual discharge rates remain below the modeled design flow rate. To ensure this occurs, Ecology decided to apply a flow limit as a way to manage temperature from the outfall.

Ecology used an iterative approach to examine the impacts altering the amount of flow from outfall 015 would have on the reasonable potential for the discharge to exceed the temperature criteria. When calculating dilution based on a percentage of ambient flow, as described in WAC 173-201A-400, reducing the effluent flow rate while keeping the ambient flow rate constant at the 7Q20 flow of 1,051 cfs results in an increase in the calculated dilution factor for the outfall. To determine the minimum dilution needed to ensure no more than a 0.3°C increase at the edge of the chronic mixing zone, Ecology recalculated the temperature impacts based on the seasonal (July-September) 95th percentile of effluent temperature (26.3°C), the seasonal 90th percentile of ambient temperature (18.3°C), and a variety of dilution factors. This iterative exercise revealed that a dilution factor of 26.7, which corresponds to an effluent flow rate of 10.2 MGD, is needed to ensure temperature does not exceed the water quality criteria at the edge of the chronic mixing zone during the season. Since this flow rate is consistent with the typical maximum flow rates reported during the last permit term, Ecology proposes including a seasonal maximum daily flow limit of 10.2 MGD in the permit for outfall 015 in lieu of a numeric temperature limit. To avoid backsliding, Ecology will only use this modified dilution for purposes of temperature compliance and will not use this higher dilution for other parameters.

With respect to acute effects, data indicates that lagoon effluent temperature does not approach 33°C and ambient temperature does not approach 23°C. Therefore, a temperature limit is not needed for these factors. Data does indicate that ambient temperature may exceed 17.5° C during July and August. However compliance with the flow limit proposed above is sufficient to protect against lethality to incubating fish that may be present in the vicinity of the outfall.

Outfall 025

The proposed permit limits the frequency and duration of discharges from outfall 025 to no more than once per week and for no more than three hours for each discharge. The proposed permit also prohibits simultaneous discharge from outfall 025 and 015. Given these restrictions, Ecology believes there is minimal risk for outfall 025 to cause violations of the chronic and acute temperature standards.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria for aquatic life protection. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

Monitoring conducted by the Everett WPCF between 2009 and 2014 revealed detectable concentrations of the following toxic pollutants:

TF/SC System (outfalls 100 and 025): ammonia, arsenic, chlordane, residual chlorine, chromium, copper, cyanide, lead, mercury, nickel, and zinc.

Lagoon System (outfall 015): ammonia, arsenic, cadmium, residual chlorine, chromium, copper, cyanide, lead, mercury, nickel, silver, and zinc.

Ecology conducted a reasonable potential analysis that uses protocols established in EPA's *Technical Support Document for Water Quality-based Toxics Control* (See Appendix F) to determine whether the proposed permit would require effluent limits on any of the above

pollutants. The analyses for outfalls 015 and 025 used ambient ammonia and metals data shown in Table 5. Ecology used a background concentration of zero for the parameters that did not appear in past Snohomish River monitoring. In addition, past ambient monitoring of Port Gardner did not include the toxic parameters listed above for outfall 100. Because of this, Ecology used an ambient concentration of zero for all parameters in analyzing discharges to Port Gardner.

The reasonable potential analysis predicted that the TF/SC effluent will not violate water quality standards for aquatic life at the edges of the acute and chronic mixing zones for outfall 100. As such, the proposed permit will not include water quality-based limits on the pollutants listed above when discharged to Port Gardner through outfall 100.

The analysis predicts that chlorine and chlordane present in the TF/SC effluent have a reasonable potential to exceed aquatic life criteria in the Snohomish River when discharge from outfall 025. Therefore the proposed permit will include a maximum daily chlorine limit of 95 μg/L for discharges from outfall 025. Since the proposed permit only authorizes limited duration discharges from outfall 025 for the purposes of flushing, an average monthly chlorine limit is not appropriate.

With respect to chlordane, the analysis shows that the discharge will meet the acute water quality criteria at the edge of the acute mixing zone for outfall 025, but will not meet the chronic criteria at the edge of the chronic mixing zone. The water quality standards state that the numeric chronic chlordane standard is based on a 24-hour average. Since the proposed permit limits the discharge duration from outfall 025 to three hours, Ecology believes that the chlordane present in a limited duration discharge through outfall 025 will comply with the chronic standard when averaged over a 24-hour period. Therefore, the permit will not include a limit on chlordane discharge through outfall 025.

The reasonable potential analysis also predicts that ammonia present in the lagoon effluent may violate water quality criteria for ammonia toxicity. Because of this, the proposed permit includes the following water quality-based limits on ammonia discharged from outfall 015: maximum daily limit of 47.1 mg/L and average monthly limit of 31.4 mg/L. Ecology also reevaluated whether the existing chlorine limits on outfall 015 sufficiently protect aquatic life. The analysis determined that the existing limit remains protective of aquatic life and no change to the chlorine limit is needed.

H. Human health

Washington's water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

Monitoring conducted by the Everett WPCF during the past permit term identified the following chemicals of concern for human health:

TF/SC System (outfalls 100 and 025): antimony, bis(2-Ethylhexyl)phthalate, chlordane, cyanide, manganese, mercury, nickel, and phenolic compounds.

Lagoon System (outfall 015): antimony, bis(2-Ethylhexyl)phthalate, chloroform, cyanide, manganese, mercury, nickel, phenolic compounds, and toluene.

Ecology evaluated the potential discharges from each outfall have to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001) and Ecology's *Permit Writer's Manual* to make a reasonable potential determination. The evaluation showed that discharges from outfalls 015 and 100 have no reasonable potential to cause violations of water quality standards for the above pollutants and effluent limits are not needed to protect human health.

The reasonable potential analysis suggested that the chlordane detected in the TF/SC effluent may have a potential to exceed human health criteria when discharged to the Snohomish River via outfall 025. However this determination was based on a single detection of one form of the pollutant (trans-chlordane) out of three samples. Since the proposed permit does not authorize continuous discharges from outfall 025, Ecology will not include a human health-based limit on chlordane for outfall 025. The proposed permit will require the Everett WPCF to conduct additional monitor of the TF/SC effluent to determine whether detectable levels of chlordane are present in the effluent and Ecology will reevaluate the impact of this discharge in the next permit.

I. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. http://www.ecy.wa.gov/programs/tcp/smu/sediment.html

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards for the following reasons.

Snohomish River (Outfalls 015 and 025): The 1995 mixing zone study determined that average river velocity at low flow periods was in the range of 1.5 ft/sec to 2.0 ft/sec. Flow velocities in this range are sufficient to keep small particles onto which pollutants would adsorb, such as clays and silts, in suspension. Although the study revealed that tidal changes caused flow reversal in the river, the length of time flows would slow to a velocity where deposition may occur was generally short (approximately 1 hour per tide cycle). This data indicates a low potential for sediment deposition in the vicinity of the outfalls.

Ecology's Toxic Cleanup Program contracted with SAIC to conduct a comprehensive study of sediments in Port Gardner and the Snohomish River Estuary in 2008. This study included sampling locations near outfalls 015 and 025. Data from this study showed that the predominant grain size of sediments near the outfalls is medium to coarse sand and that the sediments contained very little silt or clay. This is consistent with the expectation of low deposition due to high river currents. In addition, the study found that the sediments contained some metals (copper, zinc, arsenic, lead, and chromium), but concentrations of these metals were approximately one order of magnitude lower than the numeric sediment quality standards for marine waters. Since past testing has not revealed any contamination at or near the sediment management standards and ambient conditions do not favor sediment deposition near the outfalls, Ecology will not require the Everett WPCF to conduct sediment monitoring near outfalls 015 and 025.

Port Gardner (Outfall 100): Kimberly-Clark conducted a sediment survey of the region surrounding outfall 100 in June 2004 and again in December 2012. Both sediment sampling events did not reveal any concentrations of pollutants in excess of the marine sediment quality standards. Since past testing has not shown exceedances of the sediment management standards, Ecology will not require the Everett WPCF to conduct sediment monitoring near outfall 100 during this permit term.

CSO Outfalls: Chapter 173-245-015 WAC states, in part, that CSO sites may not cause accumulations of deposits that exceed sediment criteria or standards. The proposed permit will require the City of Everett to develop and implement a monitoring plan to demonstrate that controlled CSO outfalls do not adversely impact sediments near the outfalls. See Part V of this fact sheet for more information on this requirement.

J. Whole effluent toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- *Acute toxicity tests measure mortality as the significant response* to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
- *Chronic toxicity tests measure various sublethal toxic responses*, such as reduced growth or reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Laboratories accredited by Ecology for WET testing know how to use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know about WET testing and how to calculate an NOEC, LC50, EC50, IC25, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (https://fortress.wa.gov/ecy/publications/SummaryPages/9580.html), which is referenced in the permit. Ecology recommends that the Everett WPCF send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

Acute Toxicity

WET testing conducted during the previous permit term showed the facility's effluent has a reasonable potential to cause acute toxicity in the receiving water. The proposed permit will include an acute toxicity limit. **The effluent limit for acute toxicity is: No acute toxicity detected in a test sample representing the acute critical effluent concentration (ACEC).** The acute critical effluent concentration (ACEC) is the concentration of effluent

at the boundary of the acute mixing zone during critical conditions. The ACEC for each outfall is:

- 15.6% effluent from the lagoon treatment system for outfall 015
- 13.7% effluent from the TF/SC treatment system for outfall 025
- 0.64% effluent from the TF/SC treatment system for outfall 100

Compliance with an acute toxicity limit is measured by an acute toxicity test comparing test organism survival in the ACEC (using a sample of effluent diluted to equal the ACEC) to survival in nontoxic control water. The Everett WPCF is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC sample and the control sample. Due to the limited discharge authorization for outfall 025, the proposed permit does not apply the acute toxicity limit to that outfall. However the permit applies a limit to outfall 100 and requires testing done on the TF/SC effluent to include dilutions at the ACEC concentrations for both outfall 100 and outfall 025.

Chronic toxicity

Chronic WET testing of effluent from both treatment systems, conducted by the Everett WPCF prior to submitting a permit renewal application, showed no reasonable potential for effluent discharges to cause receiving water chronic toxicity. The proposed permit will not include a chronic WET limit. The Everett WPCF must retest the effluent before submitting an application for permit renewal.

- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization
- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased. The Everett WPCF may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing after the process or material changes have been made.

K. Groundwater quality limits

The groundwater quality standards (chapter 173-200 WAC) protect beneficial uses of groundwater. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100). The Everett WPCF does not discharge wastewater to the ground. No permit limits are required to protect groundwater.

L. Comparison of effluent limits with the permit issued on September 1, 2009

The following tables compare the limits from the existing permit and the proposed permit.

Table 23. Comparison of Previous and Proposed Effluent Limits, Outfall 100

		Previous Effluent Limits:		Proposed Effluent Limits:	
Parameter	**Basis of Limit**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
$CBOD_5$	Technology	25 mg/L 4,380 lbs/day 85% Removal	40 mg/L 7,010 lbs/day	25 mg/L 5,513 lbs/day[1] 85% Removal	40 mg/L 8,340 lbs/day
TSS	Technology	30 mg/L 5,250 lbs/day 85% Removal	45 mg/L 7,880 lbs/day	30 mg/L 6,255 lbs/day 85% Removal	45 mg/L 9,383 lbs/day
Fecal Coliform Bacteria	Technology	200/100 mL	400/100 mL	200/100 mL	400/100 mL
Total Residual Chlorine	Technology	0.5 mg/L	0.75 mg/L	0.5 mg/L	0.75 mg/L
Parameter		**Daily Limit (min-max)**		**Daily Limit (min-max)**	
pH	Technology	6.0-9.0		6.0-9.0	
Parameter		**Limit**		**Limit**	
Whole Effluent Toxicity	Water Quality	No toxicity at the ACEC of 0.64% Effluent		No toxicity at the ACEC of 0.64% Effluent	
[1] CBOD5 and TSS mass limits increased due to increase in design flow rate for the TF/SC system.					

Table 24. Comparison of Previous and Proposed Effluent Limits, Outfall 015

		Previous Effluent Limits:		Proposed Effluent Limits:	
Parameter	**Basis of Limit**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
$CBOD_5$	Technology	25 mg/L 3,190 lbs/day (Nov-Jun) 65% Removal (Jul-Oct)	40 mg/L 5,100 lbs/day (Nov-Jun)	25 mg/L 3,190 lbs/day (Nov-Jun) 85% Removal[1]	40 mg/L 5,100 lbs/day (Nov-Jun)
TSS	Technology	66 mg/L 8,420 lbs/day	99 mg/L 12,630 lbs/day	59 mg/L[2] 7,529 lbs/day 79% Removal	88.5 mg/L 11,293 lbs/day
Fecal Coliform Bacteria[3]	Technology	200/100 mL	400/100 mL	200/100 mL	400/100 mL
Parameter		**Daily Limit (min-max)**		**Daily Limit (min-max)**	
pH[4]	Tech/WQ	6.0-9.0		6.4-9.0	
Parameter		**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
NBOD+CBOD (Equiv. $CBOD_5$)	TMDL	3,043 lbs/day (Jul-Oct)	5,402 lbs/day (Jul-Oct)	3,043 lbs/day (Jul-Oct)	5,402 lbs/day (Jul-Oct)
Total Residual Chlorine[5]	WQ	0.016 mg/L	0.083 mg/L	16 µg/L	83 µg/L
Ammonia	WQ	N/A	N/A	31.4 mg/L	47.1 mg/L
Flow [6]	WQ	N/A	N/A	N/A	10.2 MGD (Jul-Sep)
Parameter		**Limit**		**Limit**	
Whole Effluent Toxicity	Water Quality	No toxicity at the ACEC of 15.6% Effluent		No toxicity at the ACEC of 15.6% Effluent	

1	WAC 173-221-050(2) allows alternative $CBOD_5$ concentration and percent removal limits for lagoon facilities. The previous permit applied technology-based concentration limits based on a demonstrated capability for the lagoon system to meet technology-based limits. Since monitoring data from 2009-2014 demonstrates the lagoons capability to consistently achieve 85% removal of $CBOD_5$, the proposed permit extends the application of technology-based limits to the percent removal limit as well.
2	TSS limits are performance based according to WAC 173-221-050(2). Ecology's *Permit Writers Manual* allows for lagoon TSS limits of up to 75 mg/l monthly average. TSS levels from Everett WPCF's lagoon have consistently achieved the limits set in the existing permit. Ecology calculated new concentration and percent removal limits based on levels that the 2009-2014 monitoring data demonstrated achievable at a 95% confidence level.
3	Fecal coliform limits are calculated as geometric means rather than arithmetic averages.
4	The previous permit applied technology-based limits for pH. The proposed permit applies a water quality-based limit for the daily minimum pH and technology-based limit for the daily maximum pH.
5	The Total Residual Chlorine limit does not change, only the reporting unit has changed for consistency with other facilities with water quality-based chlorine limits.
6	Seasonal flow limit is added in lieu of a temperature limit.

IV. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, detection level (DL), and quantitation level (QL) on the discharge monitoring report or in the required report.

A. Wastewater monitoring

The monitoring schedule is detailed in the proposed permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (Publication Number 92-09). The proposed permit retains the monitoring frequencies for routine parameters that were specified in the previous permit.

Ecology has included some additional monitoring of nutrients in the proposed permit to establish a baseline for this discharger. It will use this data in the future as it develops TMDLs for dissolved oxygen and establishes WLAs for nutrients for Puget Sound. The previous permit included similar nutrient characterization; however the proposed permit replaces "Total Nitrogen" with "Total Kjeldahl Nitrogen" as one of the parameters. The monitoring frequency will remain once per month.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Biosolids monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

As a pretreatment publicly owned treatment works (POTW), the City of Everett is required to sample influent, final effluent, and sludge for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass-through the plant to the sludge or the receiving water. The City will use the monitoring data to verify the effectiveness of existing local limits that commercial and industrial users must meet and to develop new local limits, if needed.

B. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). The City of Everett operates an environmental lab at the Water Pollution Control Facility that is accredited for testing drinking water, non-potable water, and solids for general chemistry, microbiology, and most metals. A complete list of accredited parameters and methods is available through Ecology's searchable Lab Accreditation database:
https://fortress.wa.gov/ecy/laboratorysearch/SearchLabName.aspx?CompanyID=667

C. Effluent limits which are near detection or quantitation levels

The water quality-based effluent concentration limits for residual chlorine discharged through outfalls 015 and 025 are near the limits of current analytical methods to detect or accurately quantify. The method detection level (MDL) also known as detection level (DL) is the minimum concentration of a pollutant that a laboratory can measure and report with a 99 percent confidence that its concentration is greater than zero (as determined by a specific laboratory method). The quantitation level (QL) is the level at which a laboratory can reliably report concentrations with a specified level of error. Estimated concentrations are the values between the DL and the QL. Ecology requires permitted facilities to report estimated concentrations. When reporting maximum daily effluent concentrations, Ecology requires the facility to report "less than X" where X is the required detection level if the measured effluent concentration falls below the detection level.

V. Other Permit Conditions

A. Reporting and record keeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

B. Prevention of facility overloading

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the City to:

- Take the actions detailed in proposed permit Special Condition S.4.
- Design and construct expansions or modifications before the treatment plant reaches existing capacity.
- Report and correct conditions that could result in new or increased discharges of pollutants.

Special Condition S.4 restricts the amount of flow.

C. Operation and maintenance

The proposed permit contains Special Condition S.5 as authorized under RCW 90.48.110, chapters 173-220-150, 173-230, and 173-240-080 WAC. Ecology included it to ensure proper operation and regular maintenance of equipment, and to ensure that the Everett WPCF takes adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment.

O&M manual

The Everett WPCF will complete an expansion of the TF/SC treatment system in 2015 that adds a new trickling filter, two new solids contact basins, a new clarifier and modifies or upgrades other existing plant components. Chapter 173-240-080 WAC requires Ecology to review and approve changes to the facility operations and maintenance (O&M) manual whenever the facility is expanded or modified. The proposed permit requires the City to submit an updated O&M manual that incorporates the changes.

Inflow & infiltration

The City completed an I/I evaluation in 2012 as part of their compressive sewer plan development. That analysis determined that wet season dry weather infiltration was not excessive and has decreased from the baseline flows recorded in 2003. Given the status of I/I in the collection system, the proposed permit will not require an I/I assessment. However Ecology encourages the City to continue monitoring I/I as part of their comprehensive collection system operations and maintenance program.

D. Pretreatment

Duty to enforce discharge prohibitions

This provision prohibits the publicly owned treatment works (POTW) from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer.

- The first section of the pretreatment requirements prohibits the POTW from accepting pollutants which causes “pass-through” or “interference”. This general prohibition is from 40 CFR §403.5(a). Appendix C of this fact sheet defines these terms.
- The second section reinforces a number of specific state and federal pretreatment prohibitions found in WAC 173-216-060 and 40 CFR §403.5(b). These reinforce that the POTW may not accept certain wastes, which:
    a. Are prohibited due to dangerous waste rules.
    b. Are explosive or flammable.
    c. Have too high or low of a pH (too corrosive, acidic or basic).
    d. May cause a blockage such as grease, sand, rocks, or viscous materials.
    e. Are hot enough to cause a problem.
    f. Are of sufficient strength or volume to interfere with treatment.
    g. Contain too much petroleum-based oils, mineral oil, or cutting fluid.
    h. Create noxious or toxic gases at any point.

40 CFR Part 403 contains the regulatory basis for these prohibitions, with the exception of the pH provisions which are based on WAC 173-216-060.

- The third section of pretreatment conditions reflects state prohibitions on the POTW accepting certain types of discharges unless the discharge has received prior written authorization from Ecology. These discharges include:
  a. Cooling water in significant volumes.
  b. Stormwater and other direct inflow sources.
  c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Ecology delegated authority to the City of Everett for permitting, monitoring, and enforcement over industrial users discharging to their treatment system to provide more direct and effective control of pollutants. Ecology oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (chapter 90.48 RCW and chapter 173-216 WAC).

E. Solid wastes

To prevent water quality problems the facility is required in permit Special Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under chapter 70.95J RCW, chapter 173-308 WAC "Biosolids Management," and chapter 173-350 WAC "Solid Waste Handling Standards." The disposal of other solid waste is under the jurisdiction of the Snohomish County Health District.

Requirements for monitoring sewage sludge and record keeping are included in this permit. Ecology will use this information, required under 40 CFR 503, to develop or update local limits.

F. Combined sewer overflows

Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same piping system. Most of the time, combined sewer systems transport all wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the combined sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water bodies. Chapter 173-245 WAC and EPA's CSO control policy (59 FR 18688) identify the required measures for control of overflows from combined sewer systems.

CSO Reduction Plan/Long-Term Control Plan and CSO Reduction Plan Amendments

Ecology requires municipalities to initially develop combined sewer overflow (CSO) reduction plans per chapter 173-245 WAC requirements. These plans are substantially equivalent to the long-term control plan (LTCP) as defined by EPA in its CSO control policy.

Chapter 173-245 WAC requires that "All CSO sites shall achieve and at least maintain the greatest reasonable reduction, and neither cause violations of applicable water quality standards, nor restrictions to the characteristic uses of the receiving water, nor accumulation of deposits which: (a) Exceed sediment criteria or standards; or (b) have an adverse biological effect." "The greatest reasonable reduction" means control of each CSO outfall such that an average of no more than one untreated discharge may occur per year.

Ecology originally approved the CSO reduction plan for the City of Everett in 1987. The original plan proposed a 30-year timeline to achieve full compliance with the "controlled" standard of no more than one untreated discharge per year, on average, for each outfall. To date, the City has implemented controls that have reduced overflows from three outfalls to an average of one per year or less. The City's 2014 CSO Control Plan Update presented a series of projects that are designed to control overflows from an additional six outfalls by the 2017 deadline proposed in the original plan. The City has requested an additional 10 years to complete control projects for the remaining four outfalls. The proposed permit includes compliance schedules for projects identified in the 2014 CSO Control Plan Update that are identified with projected completion dates that fall within the term of the permit.

The proposed permit requires the City to submit an amendment of its CSO reduction plan in conjunction with its application for permit renewal. The amendment must include an assessment of the effectiveness of the CSO reduction plan, a re-evaluation of CSO project priorities, and a list of projects to be completed in the next five years. In addition, the City must identify newly corrected or controlled CSOs that meet the state's one untreated discharge per year per CSO standard in the CSO Reduction Plan Amendment.

Nine minimum controls

Municipalities with combined sewer overflow outfalls must implement nine minimum controls as technology-based standards for CSO discharges. The nine minimum controls are largely programmatic policies and practices designed to minimize the impacts untreated CSOs have on human health and the environment. It is not possible with current knowledge and technology to calculate numeric water quality-based effluent limits for CSOs. Ecology may include numeric water quality-based effluent limits in the future permits only after the long-term control plan is in place and after collection of sufficient water quality data.

The nine minimum controls include:

1. Use proper operations and maintenance practices within the combined collection system to reduce the magnitude, frequency and duration of CSOs.
2. Implement procedures that maximize storage capacity of the combined collection system.
3. Minimize pollution from non-domestic wastewater sources through close management of a pretreatment program.
4. Maximize treatable flow to the wastewater treatment plant during wet weather.
5. Prevent CSO discharges during dry weather and properly report any dry weather CSO discharges immediately to Ecology.
6. Implement procedures to control solid and floatable materials in CSOs.
7. Implement and maintain a pollution prevention program designed to keep pollutants from entering the combined sewer system.

8. Establish a process to notify the public when and where CSOs occur.
9. Monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls, including event-based monitoring of all CSO flow quantity, frequency and duration.

CSO monitoring and annual CSO report

The proposed permit requires the City to monitor the volume, duration and precipitation associated with each CSO discharge event at each identified outfall. The City must report results of this monitoring in annual CSO reports. Ecology includes submittal annual reports as part of the NPDES permit according to the requirements of WAC 173-245-090(1). This report: (a) details the past year's frequency and volume of combined sewage discharge from each CSO site, (b) explains the previous year's CSO reduction accomplishments, and (c) lists the projects planned for the next year. The report must indicate whether a CSO site has increased over the baseline annual condition. If an increase has occurred, the Permittee must propose a project and/or schedule to reduce that site below its baseline conditions. The report must document implementation of the nine minimum controls, and wet weather operation (flow blending) at the treatment plant.

The City must also assess in its annual reports and CSO reduction plan amendment whether identified outfalls meet the state standard of one untreated discharge per year per CSO. Assessment may be based on a long-term average which is currently defined as 20 years.

Post-construction monitoring program

Under EPA's CSO Control Policy's presumption approach, CSO controls are presumed to attain WQS if certain performance criteria are met. Ecology presumes that a program that meets the criteria specified in WAC 173-245 and EPA's CSO control policy provides an adequate level of control to meet the water quality-based requirements of the Clean Water Act. This presumption must be verified via a post-construction monitoring program by characterization, monitoring, and modeling of the system, including consideration of sensitive areas.

The federal CSO control policy (59 FR 18688) requires post-construction monitoring to verify implemented CSO control strategies comply with water quality standards. Post-construction monitoring applies to any CSO outfall that is controlled to meet the "greatest reasonable reduction" of combined sewer overflows, as defined in chapter 173-245 WAC. Implementation requires development of a monitoring plan and completion of a data report that documents compliance. The proposed permit requires the City to develop a post-construction monitoring plan by June 30, 2017. The permit also requires the City to implement the monitoring plan and to report monitoring data by April 1, 2019. EPA published guidance on post-construction monitoring plans in May 2012. Copies of the guidance document titled "CSO Post Construction Compliance Monitoring Guidance" (publication # EPA-833-K-11-001) is available through EPA's CSO website: http://water.epa.gov/polwaste/npdes/cso/

G. Outfall evaluation

Kimberly-Clark hired Advanced American Construction to inspect the exposed pipe sections and diffuser of outfall 100 in June 2010. This inspection did not identify any problems. Given the depth of the diffusers and lack of previous damage, the proposed permit will not require additional inspection of outfall 100. Ecology may add an inspection requirement in future permits.

The previous permit did not require an evaluation of outfall 015. The proposed permit requires an inspection of this outfall and submittal of a report detailing the findings of that inspection (Special Condition S.9). The inspection must evaluate the physical condition of the discharge pipe and diffusers, and evaluate the extent of sediment accumulations in the vicinity of the outfall.

H. Reuse for single-pass non-contact cooling water

The previous permit authorized the use of treated effluent from the TF/SC system as Class C Reclaimed Water for the purposes of non-contact cooling water at the Kimberly-Clark mill bleach plant. With the closure and decommissioning of the Kimberly-Clark mill, there is no longer an authorized end user for this reclaimed water. As a result, the proposed permit does not authorize this use. If the City contemplates developing other beneficial uses of reclaimed water, as authorized by RCW 90.46, they must provide appropriate documents to Ecology and the Department of Health for approval of the new reclaimed water proposal.

I. General conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual domestic wastewater NPDES permits issued by Ecology.

VI. Permit Issuance Procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwaters, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

B. Proposed permit issuance

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

VII. References for Text and Appendices

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September 2004. *Effluent Mixing Study Outfall 100* (for combined effluent discharge from Kimberly-Clark, Everett, and Marysville).

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June 1997. *Snohomish River Estuary Dry Season TMDL Study – Phase II, Water Quality Model Confirmation and Pollutant Loading Capacity Recommendations*.

January 1998. *Snohomish River Estuary Dry Season TMDL Study – Phase II, Technical Addendum Number 1*.

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Appendix A – Public Involvement Information

Ecology proposes to reissue a permit to City of Everett Water Pollution Control Facility. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Application on February 1, 2014, and February 8, 2014 in the *Everett Daily Herald* to inform the public about the submitted application and to invite comment on the reissuance of this permit.

Ecology placed a Public Notice of Draft on July 30, 2015, in the *Everett Daily Herald* to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Told where copies of the draft permit and fact sheet were available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offered to provide the documents in an alternate format to accommodate special needs.
- Asked people to tell us how well the proposed permit would protect the receiving water.
- Invited people to suggest fairer conditions, limits, and requirements for the permit.
- Invited comments on Ecology's determination of compliance with antidegradation rules.
- Urged people to submit their comments, in writing, before the end of the comment period.
- Told how to request a public hearing about the proposed NPDES permit.
- Explained the next step(s) in the permitting process.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting,* which is available on our website at https://fortress.wa.gov/ecy/publications/SummaryPages/0307023.html.

You may obtain further information from Ecology by telephone, (425) 649-7037, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

The primary author of this permit and fact sheet is Shawn McKone, PE.

Appendix B – Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Appendix C – Glossary

1-DMax or 1-day maximum temperature -- The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures -- The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity -- The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART -- The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An "early warning value" must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality -- The existing environmental condition of the water in a receiving water body.

Ammonia -- Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual average design flow (AADF) -- The average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly (intermittent) discharge limit -- The average of the measured values obtained over a calendar month's time taking into account zero discharge days.

Average monthly discharge limit -- The average of the measured values obtained over a calendar month's time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Best management practices (BMPs) -- Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD5 -- Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass -- The intentional diversion of waste streams from any portion of a treatment facility.

Categorical pretreatment standards -- National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Chlorine -- A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic toxicity -- The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean water act (CWA) -- The federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance inspection-without sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance inspection-with sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite sample -- A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction activity -- Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous monitoring -- Uninterrupted, unless otherwise noted in the permit.

Critical condition -- The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Date of receipt -- This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection limit -- The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Dilution factor (DF) -- A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Distribution uniformity -- The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Early warning value -- The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit -- The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded and that background water quality will be protected.

Engineering report -- A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal coliform bacteria -- Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample -- A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Groundwater -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Industrial user -- A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial wastewater -- Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local limits -- Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Major facility -- A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum daily discharge limit -- The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum day design flow (MDDF) -- The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) -- The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method detection level (MDL) -- See Detection Limit.

Minor facility -- A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing zone -- An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

National pollutant discharge elimination system (NPDES) -- The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

pH -- The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Pass-through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

Peak hour design flow (PHDF) -- The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) -- The maximum anticipated instantaneous flow.

Point of compliance -- The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Potential significant industrial user (PSIU) --A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day; or

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the

result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer (64 FR 30417).
ALSO GIVEN AS:
The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency, December 2007).

Reasonable potential -- A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Responsible corporate officer -- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sample Maximum -- No sample may exceed this value.

Significant industrial user (SIU) --

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

   Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

   *The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

Slug discharge -- Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

Soil scientist -- An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility

are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 year(s), respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste -- All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

Soluble BOD_5 -- Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD_5 test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD_5 test is sufficient to remove the particulate organic fraction.

State waters -- Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater -- That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria -- A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids -- That portion of total solids in water or wastewater that passes through a specific filter.

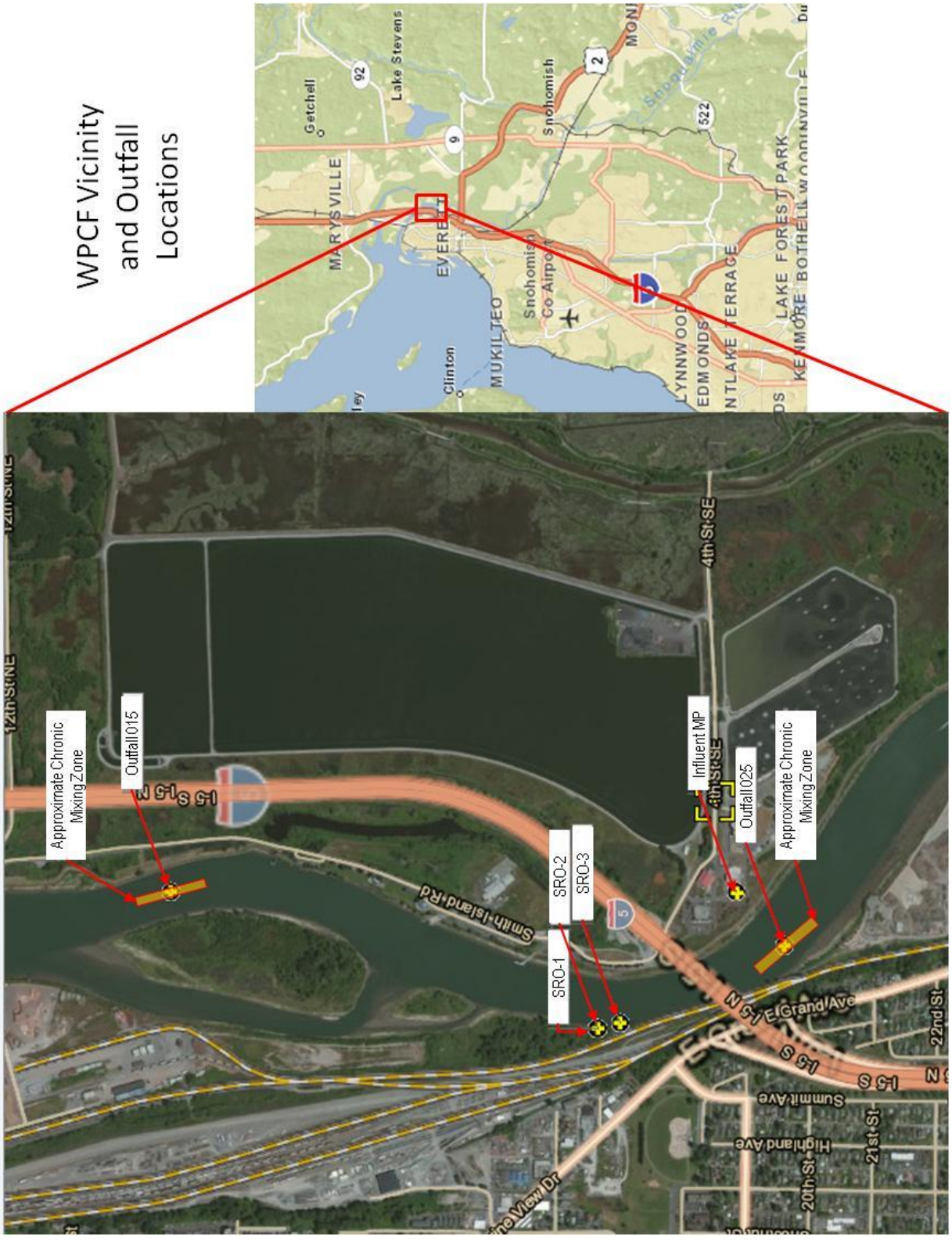
Total maximum daily load (TMDL) -- A determination of the amount of pollutant that a water body can receive and still meet water quality standards.

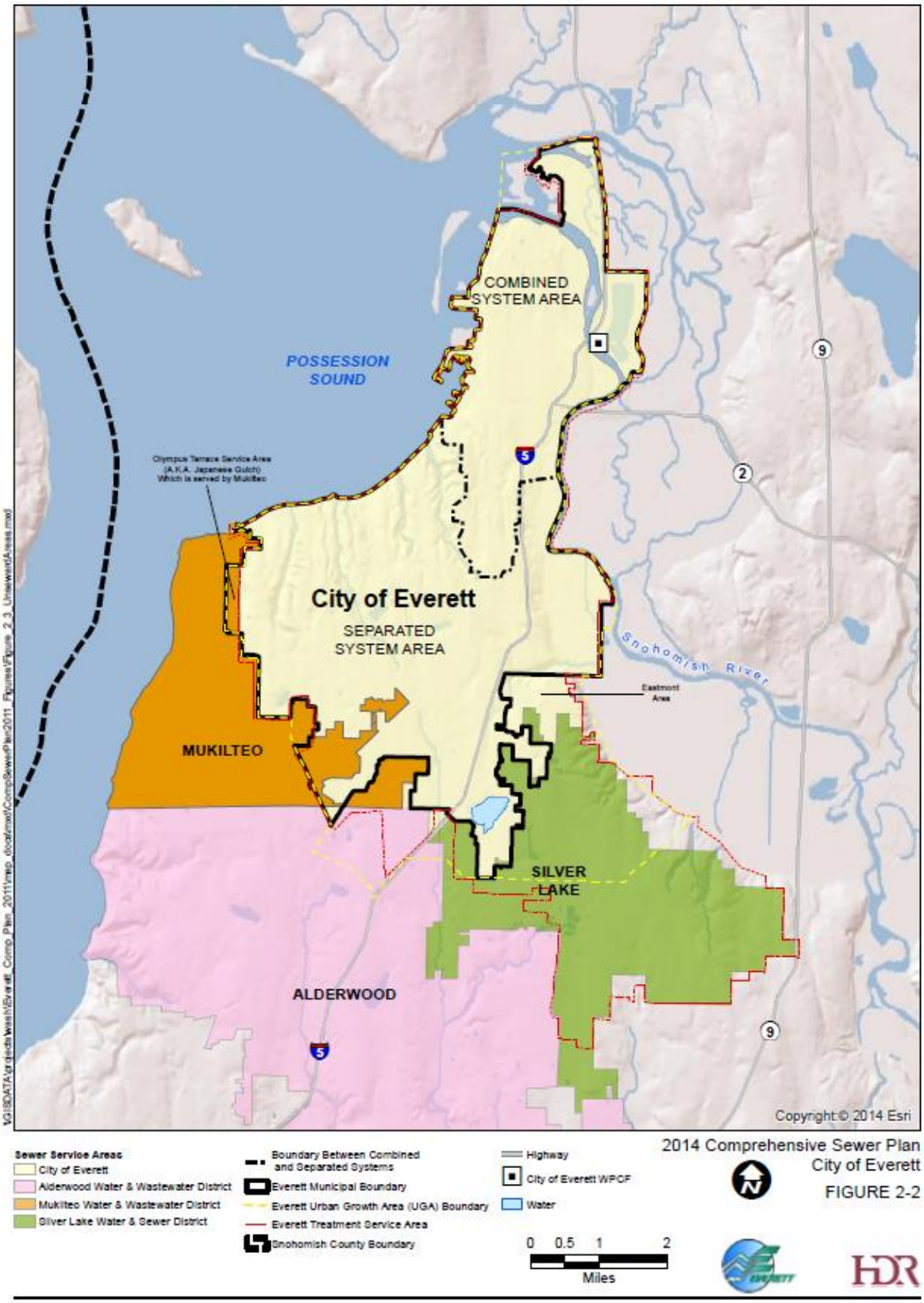
Total suspended solids (TSS) -- Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit -- A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D – Maps and Facility Overview

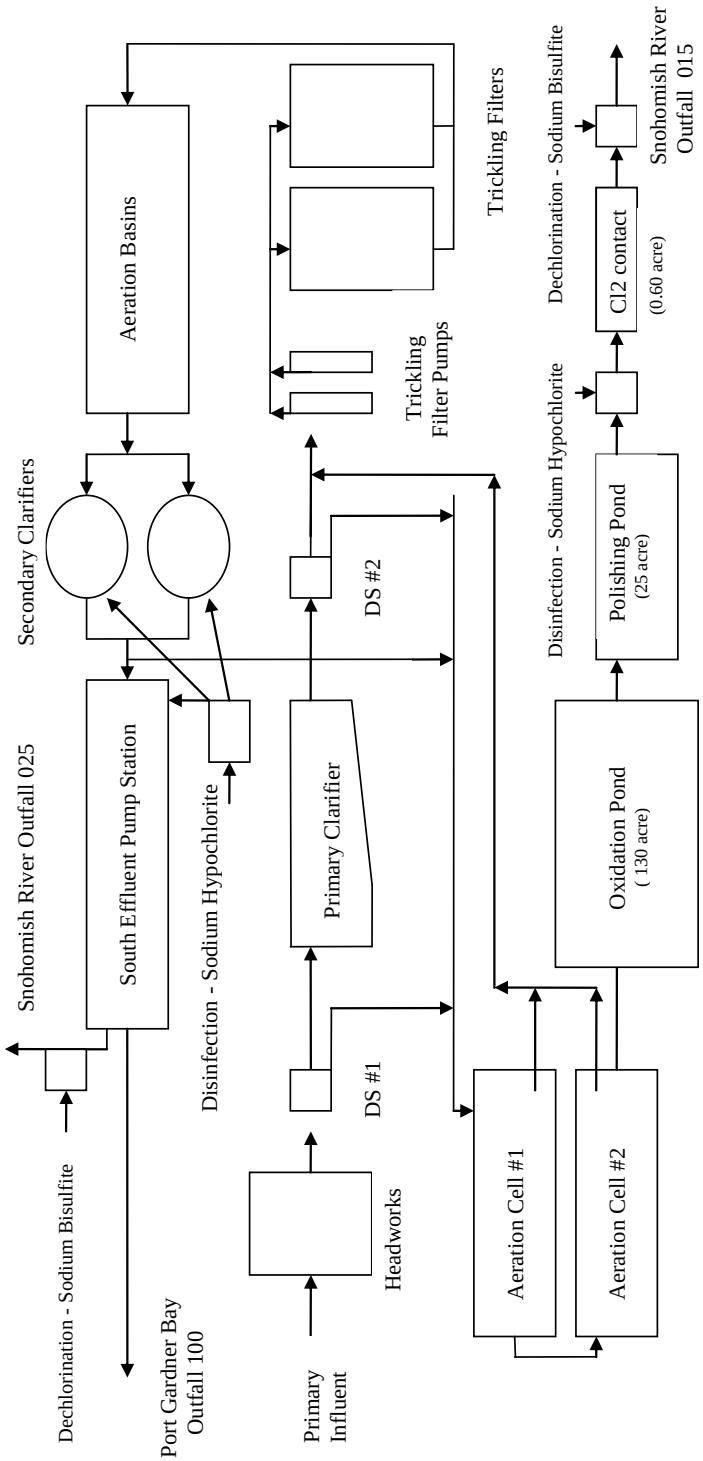



COMBINED SYSTEM AREA
POSSESSION SOUND
Olympus Terrace Service Area (A.K.A. Japanese Gulch) Which is served by Mukilteo
City of Everett
SEPARATED SYSTEM AREA
Snohomish River
Eastmont Area
MUKILTEO
SILVER LAKE
ALDERWOOD
Copyright © 2014 Esri
Sewer Service Areas
City of Everett
Alderwood Water & Wastewater District
Mukilteo Water & Wastewater District
Silver Lake Water & Sewer District
Boundary Between Combined and Separated Systems
Everett Municipal Boundary
Everett Urban Growth Area (UGA) Boundary
Everett Treatment Service Area
Snohomish County Boundary
Highway
City of Everett WPCF
Water
0 0.5 1 2
Miles
2014 Comprehensive Sewer Plan
City of Everett
FIGURE 2-2
HDR


City of Everett Water Pollution Control Facility, NPDES Permit No. WA-002449-0, G.1.a - CSO Discharge Points
N
W
E
S
Sewer Outfall
Site Location Map
Legend
CSO Outfall (Eliminated)
CSO Outfall (Active)
City of Everett WPCF
Outfall Main
Sewer Interceptor
Gravity Main
Force Main
Outfall 100 (DWO)
Combined / Sanitary Boundary
PSO1
PSO2
PSO3
PSO4
PSO5
PSO6
PSO7
PSO8
SRO1
SRO2
SRO3
SRO4
SRO7
SRO8
WPCF
Outfall 100
10TH ST
19TH ST
23RD ST
EVERETT AVE
HEWITT AVE
PACIFIC AVE
41ST
32ND ST SE
N BROADWAY
E MARINE VIEW DR
W MARINE VIEW DR
COLBY AVE
BROADWAY AVE
WALNUT ST
ROCKER AVE
S 3RD AVE
S 2ND AVE
BEVERLY LANE
GLENWOOD AVE
RESERVOIR #1
RESERVOIR #4
RESERVOIR #2
RESERVOIR #3
CITY OF EVERETT SEWAGE LAGOON
Port Gardner Bay
SNOHOMISH RIVER
529
5
City of Everett Public Works Utility Mapping
Date: 9/23/2013
Document Path: G:\Basemaps\Vicinity\Sewer\Combined_CSO_Locations.mxd

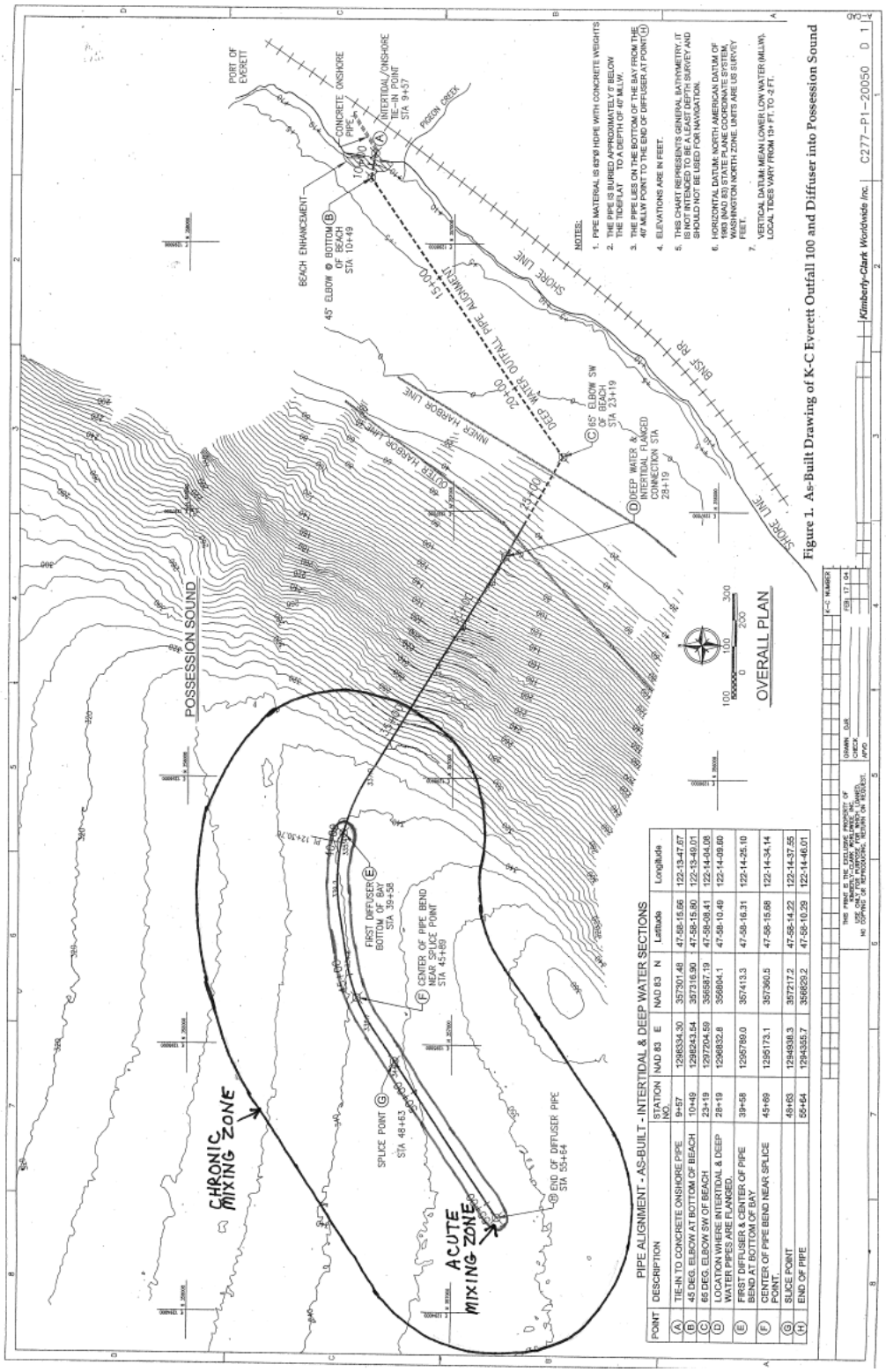
Everett Water Pollution Control Facility Process Flow Diagram

Annual Water Water Pollution Control Facility, Balance for the based on flows for the annual average through 6/30/13 year 7/1/12



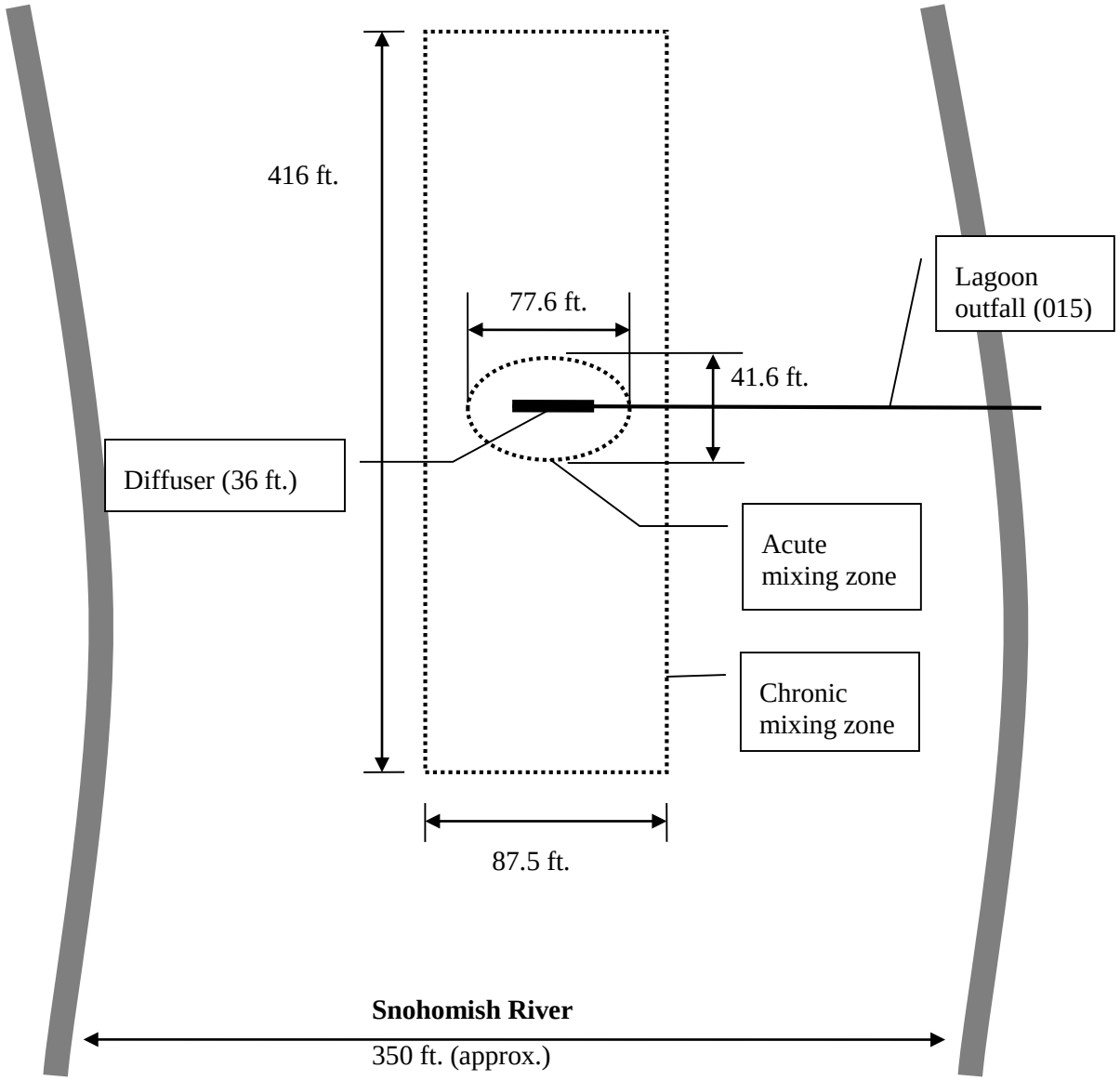
Process Description	WPCF label	Flow, MGD
Primary Influent	PI	20.2
Primary Clarifier to TFI	PCT	6.4
Aerated Lagoon to TFI	ALE-1, ALE-2	9.4
Trickling Filter Influent	TFI	15.8
TF/SC recirculation to AC-1	BP	5.2
Aeration Cell 1 to AC-2	AC-1	Unknown[1]
Aeration Cell 2 to Oxidation pond	AC-2	12.2
Outfall 100 effluent	SCE	10.6
Outfall 015 effluent	FEN	12.2
Outfall 025 effluent	FES	No discharge[2]
[1] Aerated lagoon flow to TFI may be from port ALE-1, ALE-2, or both ports. There is no ALE flow measurement and it is not possible to calculate the amount of water entering AC-1 that is not pulled into ALE-1 that then passes to AC-2.		
[2] Outfall O25 has been inoperable since December 2009 due to silt over the diffusers. Prior to that time, when the FES diffuser was flushed a maximum of 2.25 MG per week could be discharged. (flushing is allowed once per week at maximum flow of 18 MGD for no more than 3 hours)		

Outfall 100 and mixing zones



Outfall 015 and mixing zones

(plan view, not to scale – Outfall 025 mixing zone is similar)



Appendix E – Monitoring Data Summary

The following appendix contains monitoring data reported by the Everett WPCF on monthly Discharge Monitoring Reports and in Whole Effluent Toxicity monitoring reports for the period between October 2009 and December 2014.

Influent Monitoring Data, 2009-2014

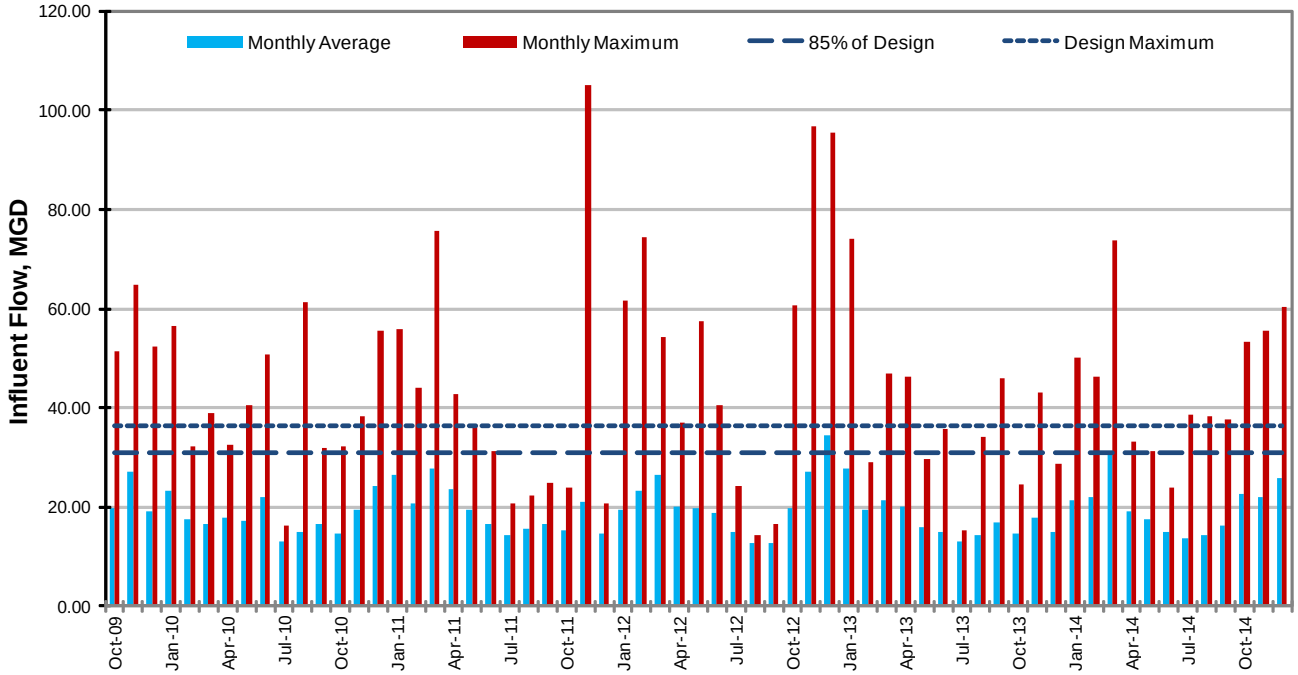
Facility: Everett WPCF
Permit No: WA0024490

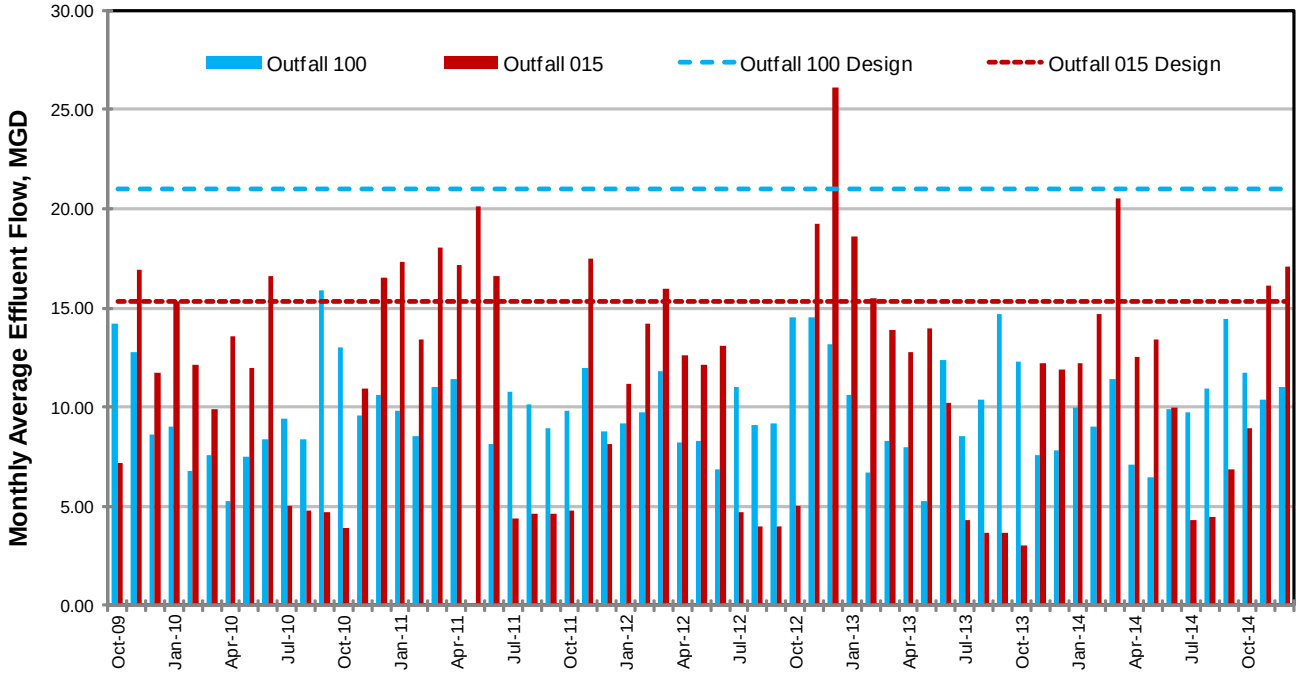
	Influent													
Date	Flow, MGD	Flow, MGD	BOD, mg/L	BOD, mg/L	BOD, ppd	BOD, ppd	CBOD, mg/L	CBOD, mg/L	CBOD, ppd	CBOD, ppd	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd
	Monthly Average	Monthly Maximum	Monthly Average	Monthly Maximum	Monthly Average	Monthly Maximum	Monthly Average	Monthly Maximum	Monthly Average	Monthly Maximum	Monthly Average	Monthly Maximum	Monthly Average	Monthly Maximum
October-09	19.7	51.5	308	396	47982	66,128	247	287	39,547	53,546	244	280	39,269	53,085
November-09	27.0	64.9	284	413	**55742**	74,435	197	310	38,999	56,481	186	227	39,039	49,711
December-09	19.1	52.3	278	345	41360	52,698	196	234	28,997	35,984	222	249	34,105	36,916
January-10	23.3	56.6	235	271	41213	48,830	177	198	31,239	35,647	191	214	35,583	47,839
February-10	17.5	32.1	265	280	37896	40,451	195	217	27,762	31,527	225	238	32,356	35,277
March-10	16.6	38.8	273	300	36469	40,731	199	224	26,507	28,906	249	267	32,606	34,774
April-10	17.8	32.6	281	313	41352	49,250	200	237	29,425	37,495	224	246	33,048	36,337
May-10	17.3	40.4	279	326	36936	40,812	193	223	25,550	27,756	249	284	33,409	36,965
June-10	21.9	50.7	227	294	38137	40,744	144	187	24,673	27,232	211	271	36,815	46,203
July-10	13.1	16.2	322	368	35155	37,213	222	240	24,306	25,117	274	299	29,887	31,832
August-10	15.0	61.4	288	310	35005	35,288	215	250	25,978	26,261	296	325	36,105	35,679
September-10	16.5	31.9	257	284	34016	42,121	190	219	24,818	32,485	250	264	33,308	41,005
October-10	14.8	32.1	307	322	36921	39,541	246	260	29,486	31,366	285	302	34,678	38,134
November-10	19.4	38.2	258	294	40010	42,296	213	243	32,524	34,952	236	251	36,719	39,395
December-10	24.3	55.4	217	236	40235	46,700	181	197	33,464	38,696	192	207	37,521	48,998
January-11	26.5	55.8	205	233	41162	47,241	164	197	33,344	37,559	188	213	40,229	48,710
February-11	20.8	44.2	250	290	41609	46,198	209	234	34,211	36,875	222	257	37,673	40,110
March-11	27.8	75.6	204	273	41216	43,745	162	219	32,584	34,927	189	228	39,341	43,448
April-11	23.7	42.7	225	276	42378	45,601	189	236	34,825	36,209	196	216	37,795	40,204
May-11	19.4	36.7	256	274	40242	43,756	212	224	33,213	36,227	228	257	35,974	38,863
June-11	16.6	31.2	311	344	42688	48,053	262	273	35,967	37,705	245	252	33,901	37,230
July-11	14.3	20.8	421	641	**50512**	76,604	371	636	44,472	76,104	435	722	51,790	85,353
August-11	15.7	22.2	371	547	48355	63,890	320	463	41,774	54,053	295	628	38,607	73,600
September-11	16.7	25.0	454	499	**62668**	70,602	396	454	54,980	64,639	369	420	51,626	66,368
October-11	15.4	23.9	409	484	**52391**	64,667	372	444	47,575	59,164	302	330	38,725	44,803
November-11	21.2	104.9	302	349	46015	61,519	278	333	41,606	53,880	233	280	38,027	56,958
December-11	14.7	20.6	359	381	43762	47,600	338	360	41,354	45,596	260	280	31,717	36,163
January-12	19.3	61.5	328	364	**49571**	64,500	296	341	45,250	62,339	234	260	35,992	43,798
February-12	23.2	74.3	280	314	**49448**	59,172	250	290	44,155	48,782	201	240	36,421	39,401
March-12	26.4	54.4	245	314	**51143**	60,123	212	270	44,191	51,561	176	195	37,383	44,245
April-12	20.0	36.9	272	307	43579	46,250	234	269	37,276	39,986	226	264	37,050	40,282
May-12	19.8	57.6	264	310	40228	45,628	229	287	34,551	37,737	215	258	33,445	42,816
June-12	18.9	40.4	287	327	44132	47,428	237	264	36,171	39,259	225	244	34,981	41,579
July-12	15.0	24.4	303	323	37633	43,777	253	306	30,687	34,449	245	255	30,851	34,412
August-12	12.7	14.4	372	394	39263	41,866	319	339	33,692	35,756	281	290	29,609	30,830
September-12	12.8	16.5	378	390	40529	44,100	327	354	35,137	40,773	310	321	33,203	34,827
October-12	19.7	60.6	317	403	45072	48,187	279	353	39,952	43,378	255	331	37,311	41,291
November-12	27.0	96.7	245	314	45348	49,966	214	266	38,815	42,642	183	212	36,257	45,244
December-12	34.6	95.4	175	199	46217	57,347	150	159	39,343	55,610	144	151	38,353	47,818
January-13	27.9	74.0	232	279	47250	55,057	201	241	41,225	49,597	183	221	38,327	46,358
February-13	19.6	29.1	261	288	42202	44,941	240	249	38,832	39,598	202	217	32,961	35,896
March-13	21.5	47.0	257	304	44152	52,322	238	279	41,115	50,462	206	221	35,417	42,103
April-13	20.2	46.3	279	331	44486	48,297	248	301	39,563	42,215	216	244	34,984	38,716
May-13	16.0	29.7	335	374	44027	48,775	302	334	39,404	42,787	261	289	34,668	38,940
June-13	14.9	35.8	323	367	40242	42,523	302	343	36,892	39,198	261	284	31,751	34,028
July-13	13.2	15.3	357	371	39311	42,980	319	337	35,172	39,464	279	304	30,715	35,911
August-13	14.3	34.1	355	370	41924	43,069	314	337	37,125	37,776	301	317	36,390	44,314
September-13	17.0	46.0	387	476	**56501**	69,865	319	410	46,493	60,588	277	313	39,089	45,952
October-13	14.8	24.7	362	490	44387	80,741	304	406	37,228	66,186	280	326	34,778	48,409
November-13	17.8	43.2	316	374	44605	46,011	262	329	36,777	37,493	251	307	35,688	36,485
December-13	15.1	28.6	330	366	40729	45,231	290	321	35,603	38,852	253	281	31,019	35,946
January-14	21.4	50.1	278	327	45580	50,325	247	289	40,618	46,124	219	257	36,395	45,093
February-14	22.1	46.2	267	334	44718	48,088	240	299	40,767	46,114	200	243	34,190	40,586
March-14	30.6	73.8	208	247	**49200**	60,090	175	207	41,133	53,088	163	199	38,474	47,384
April-14	19.1	33.2	263	287	40935	43,141	206	224	31,989	33,566	204	221	32,085	34,595
May-14	17.5	31.3	293	300	41921	53,636	240	271	33,780	36,835	219	242	31,168	35,317
June-14	15.0	24.0	323	410	40152	60,048	285	410	35,350	50,374	256	344	32,134	68,855
July-14	13.8	38.6	330	610	37357	77,262	290	500	32,642	60,048	267	384	30,485	73,399
August-14	14.2	38.4	325	440	37388	60,849	304	400	34,797	54,444	263	352	30,569	63,411
September-14	16.1	37.7	307	400	39680	95,810	261	380	32,961	56,887	260	384	33,604	77,846
October-14	22.6	53.3	295	510	**49429**	97,053	248	460	40,653	82,674	216	344	36,307	83,393
November-14	21.9	55.6	261	360	44226	80,373	220	400	35,521	65,052	192	296	32,263	77,022
December-14	25.8	60.2	259	620	**50392**	88,938	221	600	43,205	86,069	166	228	33,405	62,256
AVE:	19.3	44.3	294	358	43,403	53,976	247	308	36,305	45,145	238	283	35,517	46,075
MIN:	12.7	14.4	175	199	34,016	35,288	144	159	24,306	25,117	144	151	29,609	30,830
MAX:	34.6	104.9	454	641	62,668	97,053	396	636	54,980	86,069	435	722	51,790	85,353
Median	19.1	40.4	284	331	42,202	48,187	240	287	35,967	39,986	233	264	35,417	41,579
95th Percentile	27.7	75.5	386	543	52,266	80,704	337	463	45,172	66,073	302	384	39,334	76,680
85% DESIGN:	30.9				41,565								57,545	
DESIGN:	36.3				48,900								67,700	

approaching design limits (85%)
exceeds design limits

Discharge Monitoring Data, Influent and Effluent Flow, 2009-2014

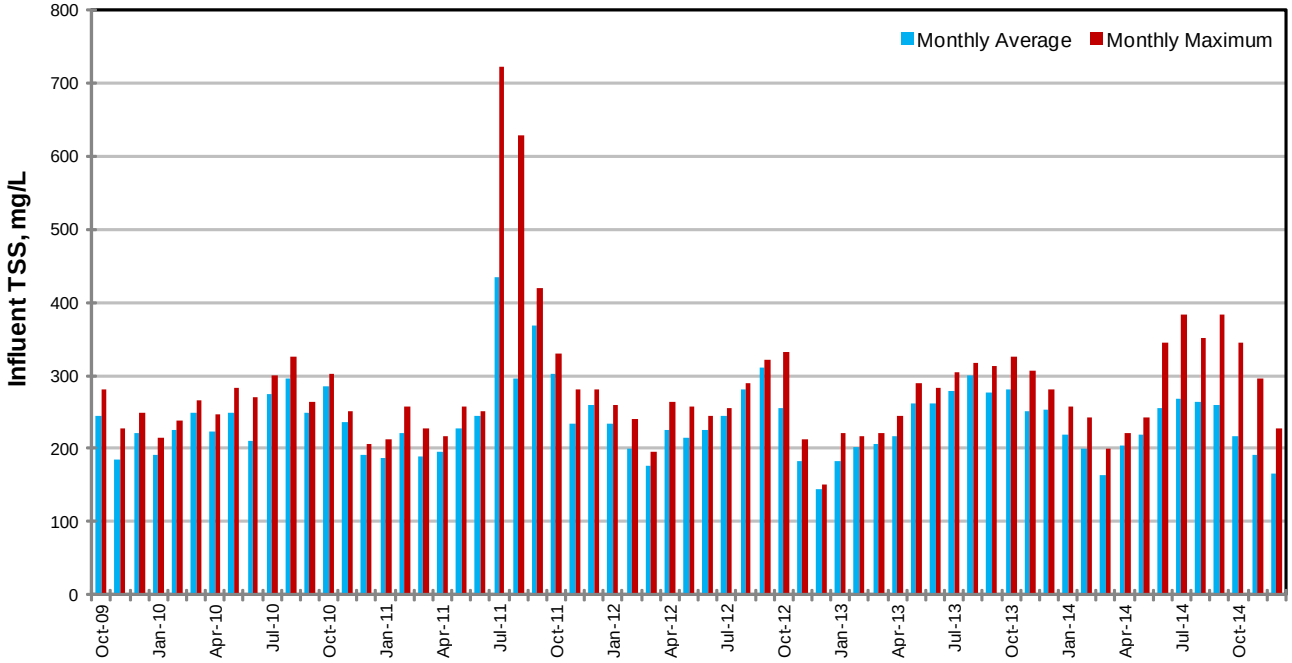
Everett WPCF
Permit #WA0024490

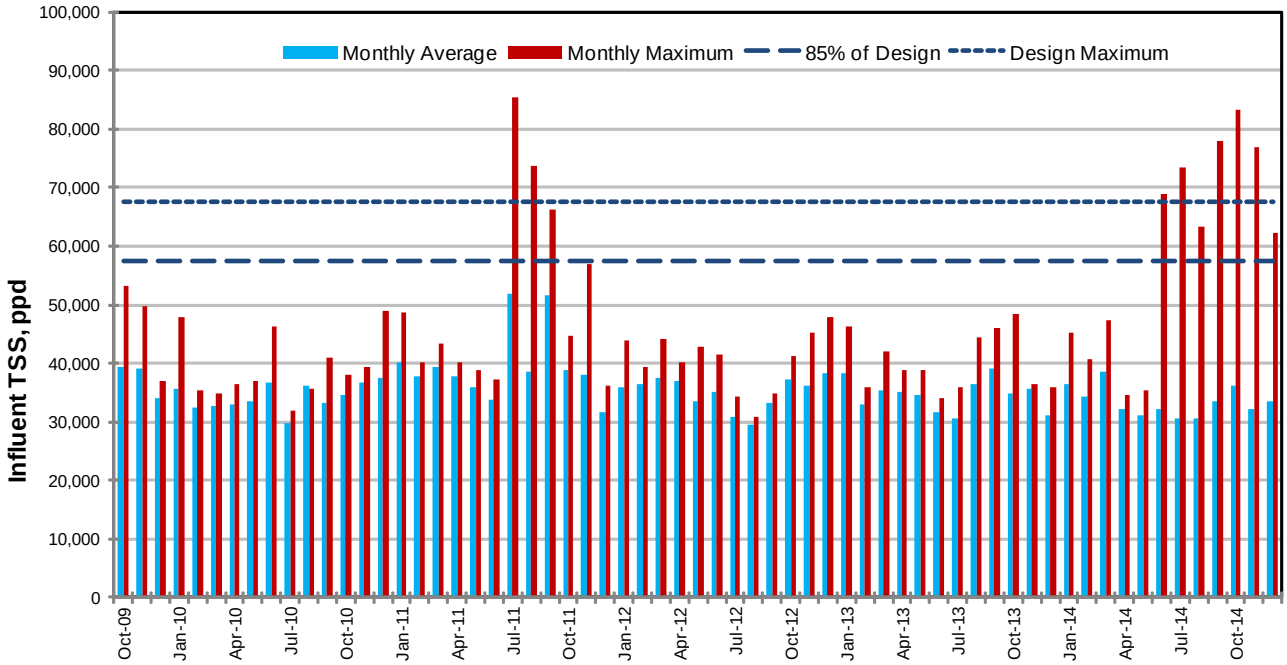




Discharge Monitoring Data, Influent TSS, 2009-2014

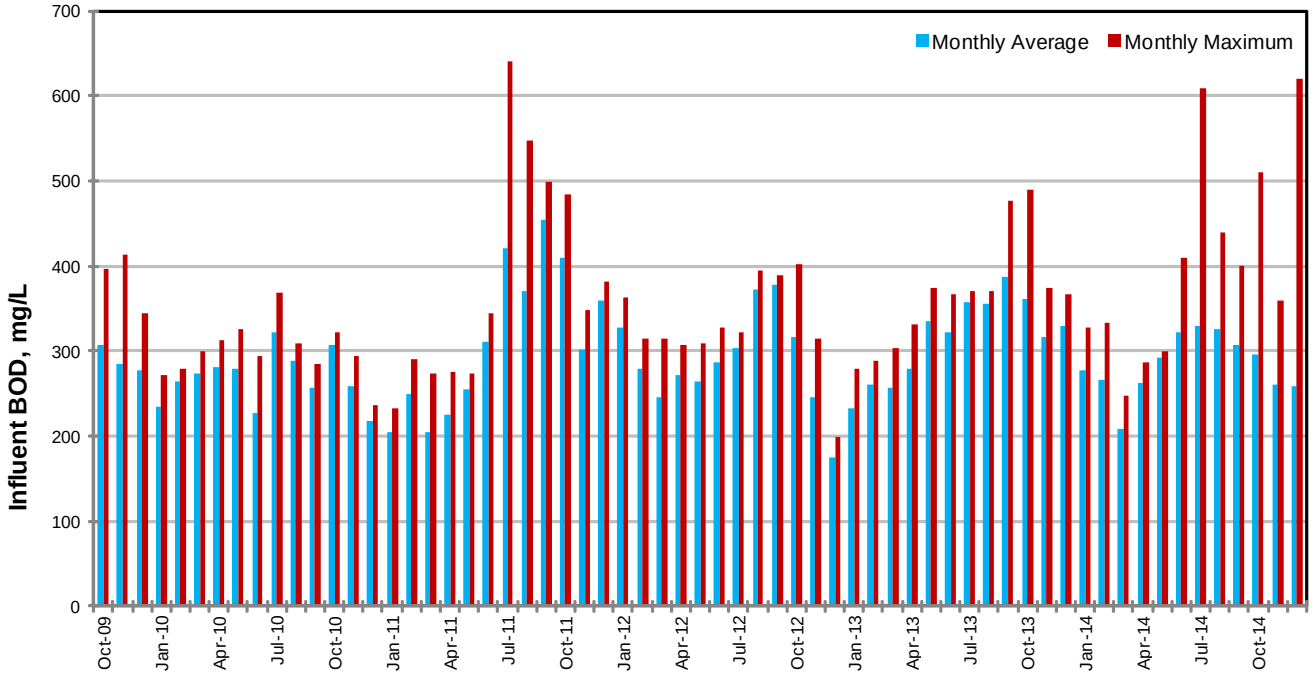
Everett WPCF
Permit #WA0024490

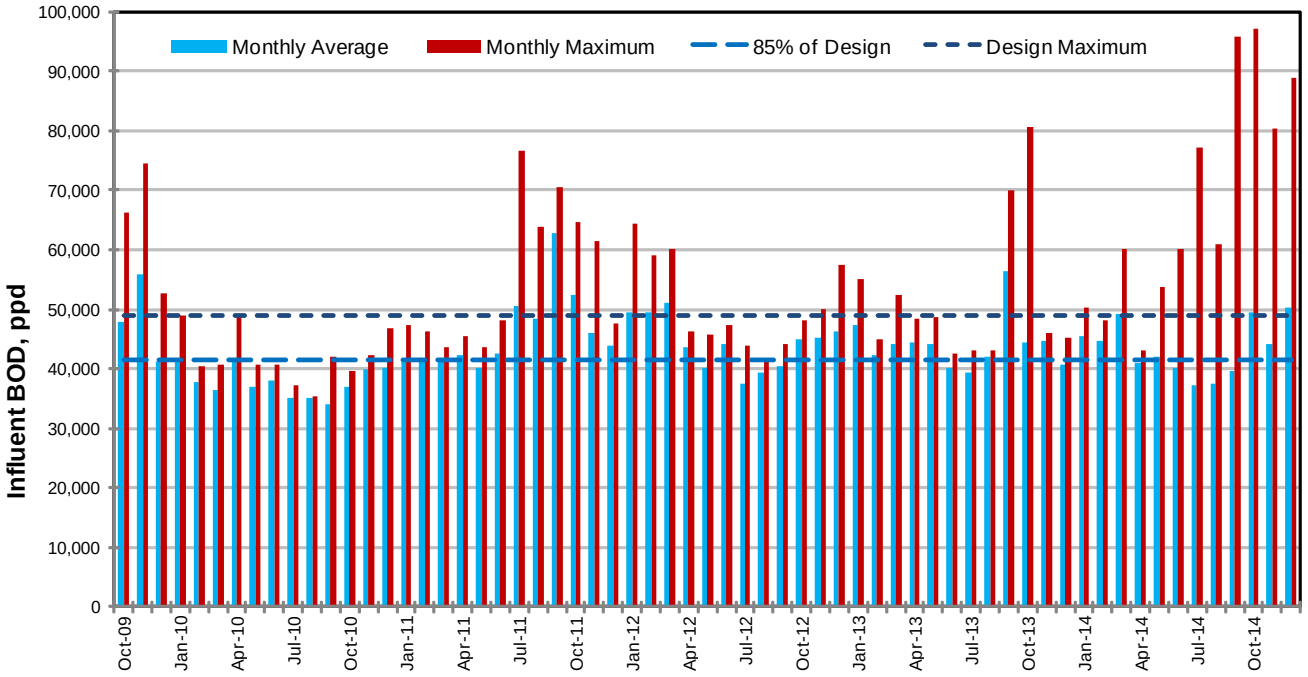




Discharge Monitoring Data, Influent BOD, 2009-2014

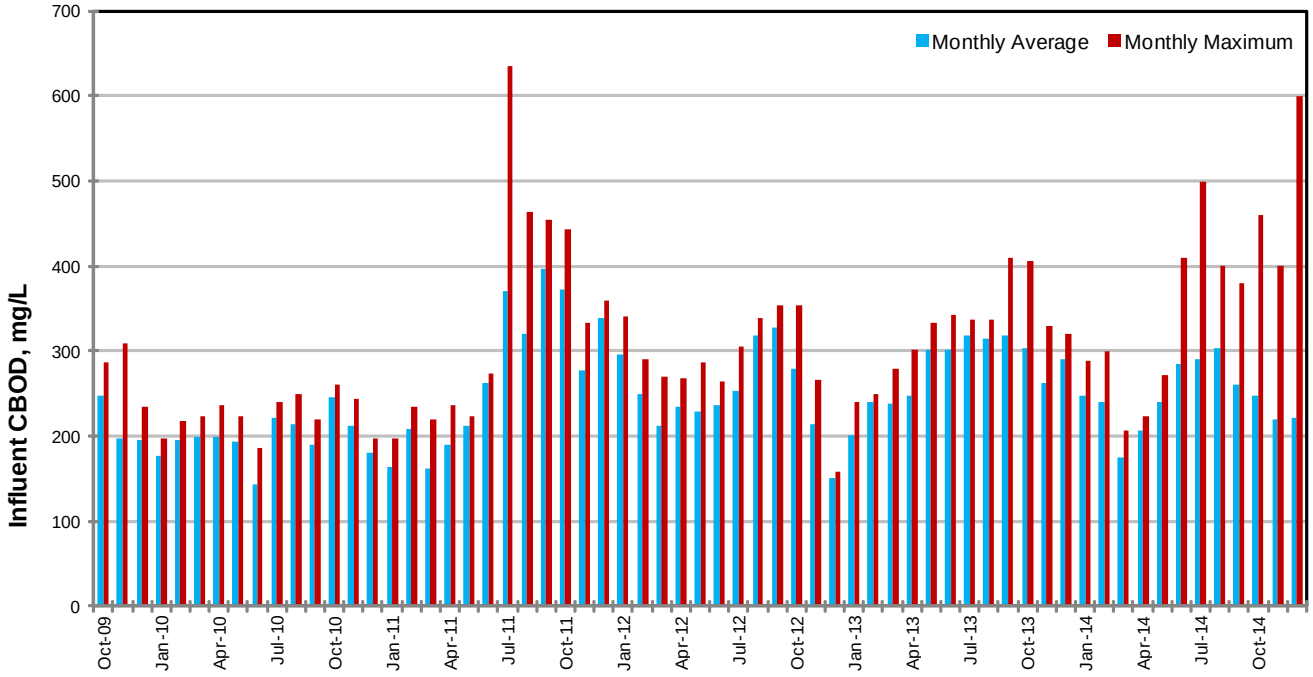
Everett WPCF
Permit #WA0024490

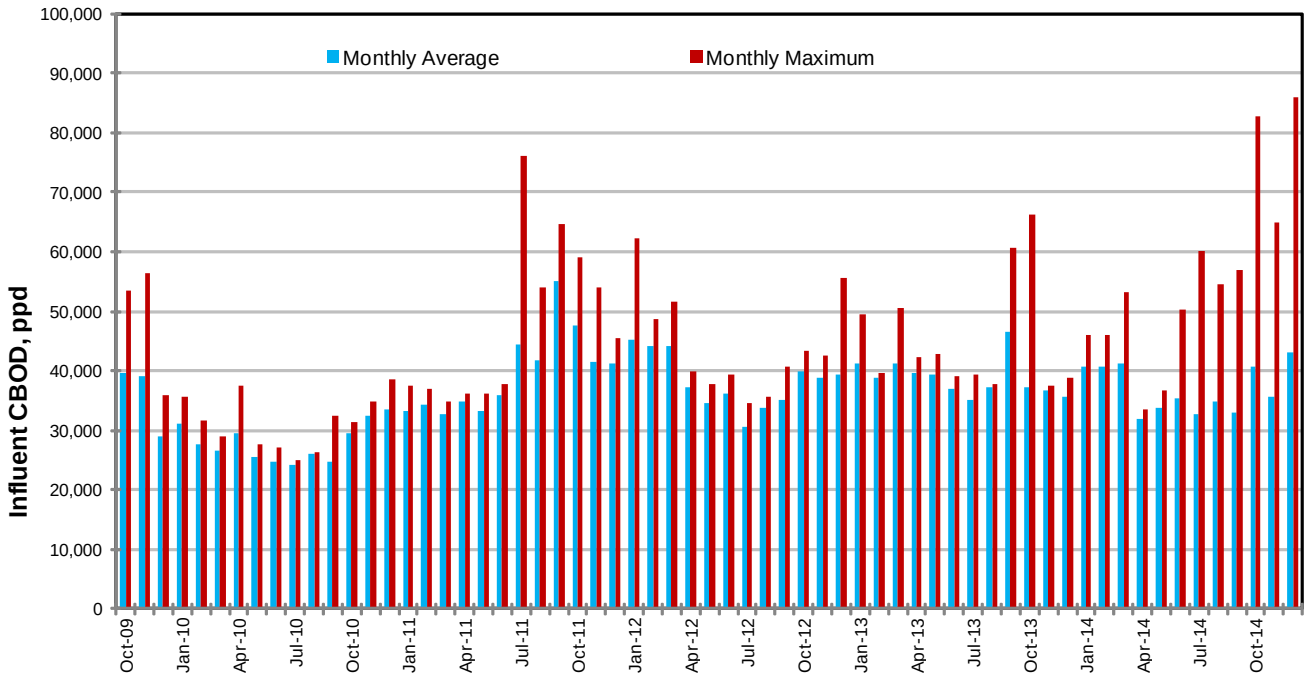




Discharge Monitoring Data, Influent CBOD, 2009-2014

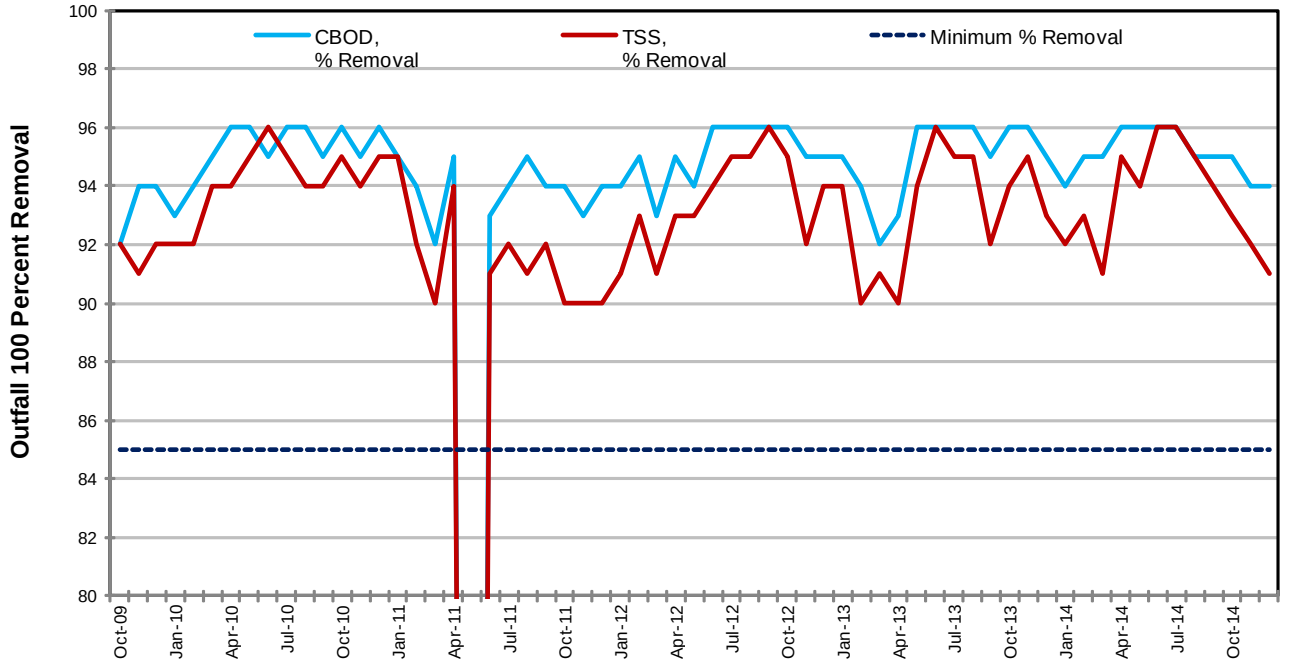
Everett WPCF
Permit #WA0024490

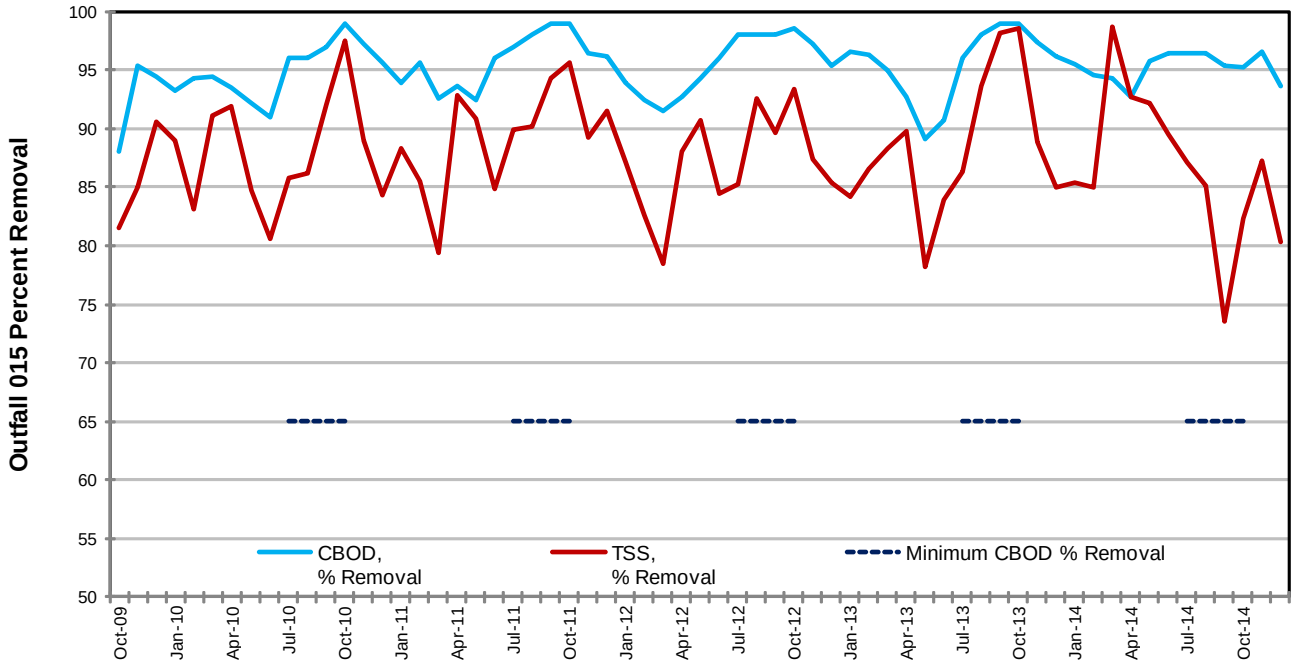




Discharge Monitoring Data, CBOD and TSS % Removal, 2009-2014

Everett WPCF
Permit #WA0024490





Discharge Monitoring Data, 2009-2014
Outfall 100

Facility: Everett WPCF
Permit No: WA0024490

	Effluent											
Date	Flow, MGD	Flow, MGD	CBOD, mg/L	CBOD, mg/L	CBOD, ppd	CBOD, ppd	CBOD, % Removal	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd	TSS, % Removal
	Monthly Average	Monthly Maximum	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Monthly Average	Monthly Average	Weekly Average	Monthly Average	Weekly Average	Monthly Average
October-09	14.2	20.2	20.0	26.0	2,193	2,479	92.0	19.0	21.0	2,073	2,383	92.0
November-09	12.8	18.7	11.0	17.0	1,190	2,279	94.0	16.0	23.0	1,765	3,118	91.0
December-09	8.6	13.1	13.0	19.0	842	1,190	94.0	17.0	26.0	1,155	1,564	92.0
January-10	9.0	15.2	13.0	17.0	853	1,080	93.0	16.0	21.0	1,082	1,394	92.0
February-10	6.8	13.1	11.0	13.0	591	884	94.0	18.0	22.0	985	1,460	92.0
March-10	7.6	9.2	10.0	11.0	594	759	95.0	16.0	19.0	1,021	1,248	94.0
April-10	5.3	9.0	8.0	9.0	358	459	96.0	14.0	15.0	629	999	94.0
May-10	7.5	14.1	7.0	9.0	440	502	96.0	11.0	15.0	672	681	95.0
June-10	8.4	14.0	6.0	8.0	411	766	95.0	8.0	13.0	595	1,109	96.0
July-10	9.4	12.1	9.0	10.0	684	865	96.0	15.0	17.0	1,134	1,368	95.0
August-10	8.4	10.7	8.0	10.0	552	666	96.0	16.0	18.0	1,064	1,216	94.0
September-10	15.9	18.2	10.0	11.0	1,244	1,436	95.0	15.0	16.0	2,016	2,341	94.0
October-10	13.0	18.1	11.0	14.0	1,188	1,956	96.0	13.0	14.0	1,390	1,794	95.0
November-10	9.6	17.0	12.0	15.0	894	1,121	95.0	15.0	23.0	1,125	1,264	94.0
December-10	10.6	16.1	8.0	9.0	639	1,204	96.0	10.0	15.0	861	1,592	95.0
January-11	9.8	16.1	8.0	10.0	608	679	95.0	10.0	12.0	761	876	95.0
February-11	8.5	16.0	14.0	20.0	943	1,345	94.0	17.0	21.0	1,159	1,403	92.0
March-11	11.0	16.0	11.0	19.0	939	1,180	92.0	18.0	29.0	1,463	1,711	90.0
April-11	11.4	16.0	9.0	10.0	846	1,147	95.0	12.0	16.0	1,087	1,188	94.0
May-11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
June-11	8.1	11.2	19.0	19.0	1,297	1,400	93.0	23.0	22.0	1,553	1,547	91.0
July-11	10.8	13.7	18.0	19.0	1,550	1,914	94.0	24.0	28.0	2,128	2,827	92.0
August-11	10.1	14.0	17.0	19.0	1,381	1,657	95.0	26.0	36.0	2,192	3,211	91.0
September-11	8.9	13.7	22.0	25.0	1,561	1,794	94.0	28.0	32.0	2,059	2,647	92.0
October-11	9.8	13.6	23.0	24.0	1,846	2,129	94.0	**31.0**	35.0	2,472	2,770	90.0
November-11	12.0	20.9	13.0	24.0	1,374	2,222	93.0	18.0	33.0	1,785	2,437	90.0
December-11	8.8	16.0	21.0	25.0	1,578	2,274	94.0	24.0	29.0	1,736	2,428	90.0
January-12	9.2	6.1	19.0	32.0	1,488	2,682	94.0	20.0	34.0	1,441	2,506	91.0
February-12	9.7	16.2	13.0	16.0	1,000	1,193	95.0	15.0	18.0	1,119	1,220	93.0
March-12	11.8	16.1	14.0	17.0	1,302	1,575	93.0	15.0	17.0	1,443	1,748	91.0
April-12	8.2	16.1	12.0	14.0	793	895	95.0	14.0	16.0	981	1,278	93.0
May-12	8.3	15.9	13.0	15.0	862	971	94.0	15.0	19.0	954	1,219	93.0
June-12	6.9	10.7	10.0	11.0	541	573	96.0	12.0	18.0	686	963	94.0
July-12	11.0	15.4	10.0	11.0	901	1,038	96.0	12.0	12.0	1,056	1,320	95.0
August-12	9.1	10.6	12.0	14.0	932	1,052	96.0	14.0	19.0	1,050	1,462	95.0
September-12	9.2	10.7	12.0	13.0	933	998	96.0	13.0	16.0	985	1,190	96.0
October-12	14.5	18.2	11.0	14.0	1,302	1,567	96.0	13.0	16.0	1,519	1,884	95.0
November-12	14.5	18.0	9.0	11.0	1,052	1,455	95.0	13.0	17.0	1,576	2,378	92.0
December-12	13.2	18.0	7.0	8.0	788	1,000	95.0	8.0	9.0	865	1,182	94.0
January-13	10.6	18.0	10.0	14.0	815	1,131	95.0	11.0	17.0	905	1,072	94.0
February-13	6.7	8.0	13.0	16.0	721	946	94.0	20.0	30.0	1,100	1,811	90.0
March-13	8.3	15.9	18.0	20.0	1,302	1,657	92.0	19.0	22.0	1,281	1,436	91.0
April-13	8.0	16.4	17.0	26.0	1,110	1,555	93.0	22.0	33.0	1,471	1,980	90.0
May-13	5.3	6.2	13.0	12.0	626	620	96.0	14.0	15.0	624	832	94.0
June-13	12.4	15.8	9.0	9.0	885	971	96.0	9.0	9.0	862	927	96.0
July-13	8.5	13.6	13.0	17.0	908	1,111	96.0	15.0	17.0	1,018	1,285	95.0
August-13	10.4	17.6	13.0	14.0	1,170	1,335	96.0	16.0	20.0	1,367	1,592	95.0
September-13	14.7	18.1	14.0	16.0	1,780	2,208	95.0	20.0	25.0	2,471	2,706	92.0
October-13	12.3	18.1	13.0	14.0	1,333	1,808	96.0	15.0	18.0	1,589	2,357	94.0
November-13	7.6	15.8	10.0	12.0	626	711	96.0	11.0	13.0	688	767	95.0
December-13	7.8	16.0	14.0	17.0	909	1,289	95.0	18.0	20.0	1,175	1,367	93.0
January-14	10.0	16.1	14.0	15.0	1,139	1,630	94.0	16.0	19.0	1,306	1,651	92.0
February-14	9.0	16.0	11.0	13.0	768	1,080	95.0	14.0	15.0	1,057	1,504	93.0
March-14	11.4	16.2	9.0	10.0	808	976	95.0	15.0	18.0	1,383	1,698	91.0
April-14	7.1	8.1	9.0	10.0	534	599	96.0	10.0	11.0	597	655	95.0
May-14	6.5	13.2	11.0	13.0	536	842	96.0	13.0	16.0	707	1,298	94.0
June-14	9.9	15.9	12.0	14.0	946	1,124	96.0	11.0	11.0	806	893	96.0
July-14	9.7	15.6	12.0	13.0	1,032	1,164	96.0	11.0	15.0	891	1,319	96.0
August-14	10.9	15.7	13.9	16.0	1,292	1,659	95.0	11.7	13.0	1,065	1,308	95.0
September-14	14.4	16.0	13.8	17.0	1,680	2,165	95.0	14.9	19.0	1,798	2,440	94.0
October-14	11.7	16.1	10.2	12.0	1,010	1,369	95.0	13.2	15.0	1,278	1,674	93.0
November-14	10.4	16.0	12.0	15.0	988	1,177	94.0	14.0	21.0	1,081	1,422	92.0
December-14	11.0	16.0	12.0	18.0	1,019	1,183	94.0	15.0	20.0	1,282	1,454	91.0
AVE:	9.9	14.8	12.4	15.2	1,007	1,302	94.8	15.5	19.6	1249.0	1618.9	93.1
MIN:	5.3	6.1	6.0	8.0	358	459	92.0	8.0	9.0	595.0	655.0	90.0
MAX:	15.9	20.9	23.0	32.0	2,193	2,682	96.0	31.0	36.0	2472.0	3211.0	96.0
Median	9.7	16.0	12.0	14.0	936	1,179	95.0	15.0	18.0	1122.0	1445.0	93.5
Std. Dev	2.4	3.2	3.7	5.1	379.8	524.3	1.1	4.6	6.6	462.6	620.9	1.8
CV		0.2	0.3	0.3	0.4	0.4	0.0	0.3	0.3	0.4	0.4	0.0
95th Percentile	14.5	18.2	20.0	25.0	1,675	2,271	96.0	24.0	33.0	2125.3	2766.8	96.0
Limits	21.0		25	40	4,380	7,010	85	30	45	5,250	7,880	85

ND = No Discharge

Reported Values Exceed Permit Limits

Discharge Monitoring Data, 2009-2014
Outfall 100

Facility: Everett WPCF
Permit No: WA0024490

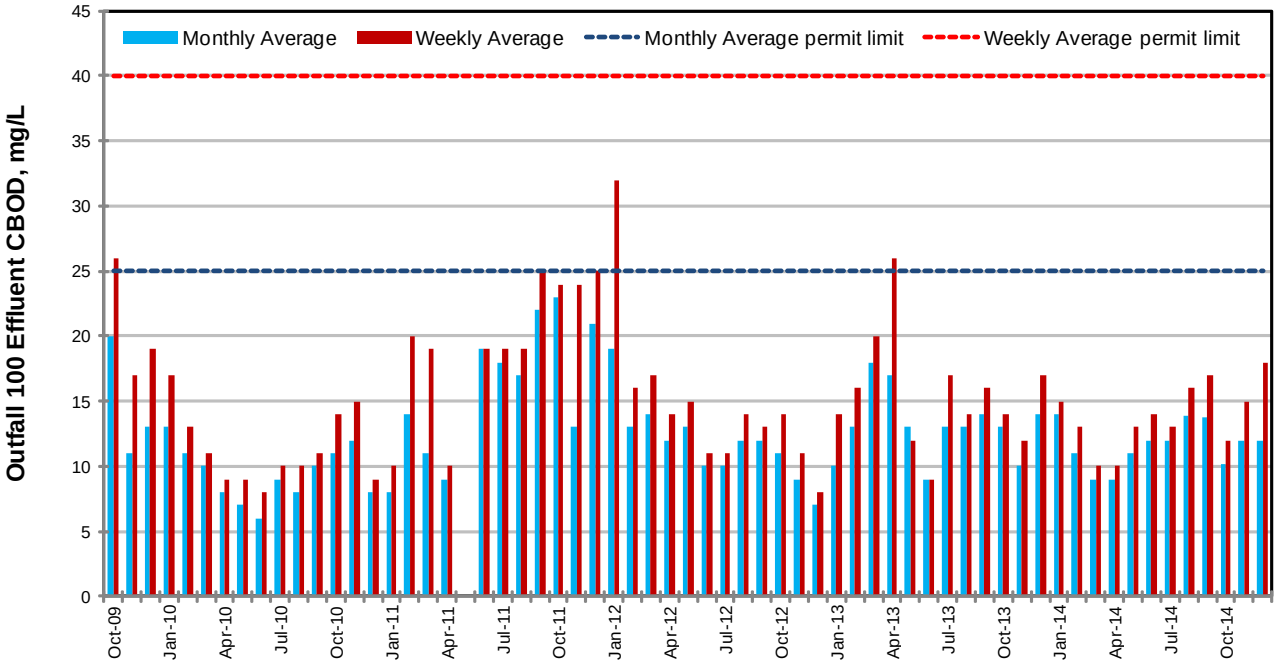
	Effluent											
Date	Fecal Coliform, #/100 ml	Fecal Coliform, #/100 ml	PH	PH	Chlorine, mg/L	Chlorine, mg/L	Temperature	Ammonia, mg/l (as N)	Phosphorous, mg/l (as P)	Orthophosphorous, mg/L (as P)	Nitrate + Nitrite, mg/L (as N)	Total Nitrogen, mg/L (as N)
	GEM	GM7	Monthly Minimum	Monthly Maximum	Monthly Ave	Weekly Average	Monthly Maximum	Monthly Average	Monthly Average	Monthly Average	Monthly Average	Monthly Average
October-09	31	55	6.6	7.7	0.44	0.46	17.2	19.7	2.44	1.69	2.38	21.10
November-09	9	17	6.2	7.8	0.46	0.49	14.2	4.9	1.49	1.20	6.50	12.10
December-09	7	17	6.7	7.4	0.47	0.49	12.4	5.2	1.52	1.32	6.90	13.40
January-10	7	22	6.7	7.3	0.44	0.46	11.4	12.8	2.31	1.82	4.70	21.10
February-10	4	8	6.9	7.3	0.44	0.46	12.8	19.1	3.63	2.89	6.90	32.40
March-10	21	6	6.9	7.5	0.46	0.51	14.4	20.8	4.78	3.36	5.30	32.20
April-10	7	11	6.6	7.4	0.45	0.45	17.5	19.2	3.93	3.52	7.00	30.50
May-10	7	9	6.4	7.3	0.42	0.48	18.5	24.5	5.17	4.71	7.30	36.90
June-10	6	10	6.0	7.0	0.46	0.47	9.1	4.2	2.77	2.48	14.70	21.80
July-10	36	187	6.6	7.4	0.45	0.51	24.0	14.4	4.37	3.62	12.30	33.90
August-10	23	39	6.4	7.3	0.45	0.54	24.5	17.2	4.43	3.50	10.04	38.10
September-10	31	59	6.3	7.4	0.43	0.48	19.9	15.9	2.48	1.79	8.83	23.30
October-10	51	84	6.3	7.5	0.45	0.49	19.4	22.7	3.79	2.94	3.63	32.10
November-10	13	42	6.4	7.4	0.46	0.49	16.3	15.7	2.56	2.02	2.86	22.70
December-10	5	22	6.1	7.5	0.44	0.51	12.8	12.4	2.27	1.94	5.35	21.30
January-11	5	7	6.6	7.2	0.42	0.43	12.1	7.6	1.51	1.30	4.30	16.00
February-11	7	12	7.0	7.3	0.43	0.46	11.9	16.8	1.96	1.57	0.95	21.50
March-11	6	10	7.0	7.4	0.45	0.48	12.8	14.9	1.91	1.49	1.40	18.80
April-11	12	12	6.7	7.2	0.45	0.48	13.4	17.8	2.46	2.17	2.15	23.80
May-11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
June-11	25	30	7.1	7.3	0.43	0.43	18.0	23.2	3.45	2.21	0.08	28.50
July-11	42	60	6.9	7.4	0.44	0.49	21.2	22.1	4.54	2.95	6.48	34.10
August-11	10	73	6.7	7.3	0.46	0.48	23.0	13.3	4.73	2.93	13.90	32.20
September-11	4	5	6.5	7.1	0.45	0.51	21.5	6.1	5.24	3.07	15.10	31.50
October-11	7	25	6.7	7.2	0.47	0.49	16.7	10.8	4.78	3.00	15.40	37.00
November-11	18	54	6.5	7.4	0.45	0.54	15.1	14.8	2.46	1.79	2.15	20.70
December-11	9	63	7.1	7.6	0.48	0.51	12.8	29.5	3.90	2.79	0.06	34.30
January-12	6	25	6.8	7.3	0.47	0.49	11.9	17.2	2.93	1.30	0.64	33.20
February-12	4	9	6.2	7.2	0.47	0.50	11.7	2.4	1.17	0.92	5.60	10.70
March-12	5	118	6.6	7.2	0.45	0.47	12.6	10.8	1.65	1.19	2.40	16.40
April-12	3	10	6.6	7.2	0.45	0.47	15.1	15.9	3.28	2.46	7.56	27.60
May-12	9	32	6.2	7.3	0.45	0.47	17.6	11.4	3.15	2.29	11.50	25.90
June-12	21	41	6.6	7.2	0.46	0.50	18.9	11.1	2.42	1.97	9.90	22.50
July-12	30	127	7.0	7.3	0.47	0.49	23.4	24.0	3.37	2.74	5.27	31.50
August-12	36	81	7.1	7.4	0.47	0.49	24.1	27.3	4.48	3.68	4.83	37.30
September-12	26	46	7.2	7.4	0.46	0.48	21.2	30.4	4.93	4.01	4.29	39.00
October-12	58	162	6.8	7.5	0.47	0.49	18.7	24.4	2.76	2.17	3.57	26.10
November-12	10	14	6.7	7.3	0.47	0.48	17.7	21.3	2.93	2.55	2.50	27.20
December-12	8	16	6.4	7.0	0.46	0.50	12.8	4.9	1.43	1.16	7.05	13.20
January-13	7	28	6.6	7.3	0.46	0.49	12.0	10.0	1.71	1.51	1.98	13.50
February-13	4	11	7.0	7.4	0.44	0.48	12.1	19.6	2.69	2.01	1.20	23.40
March-13	4	6	6.9	7.3	0.45	0.48	14.6	26.2	3.11	2.49	0.41	29.10
April-13	4	7	7.0	7.4	0.45	0.48	16.4	28.4	3.78	2.79	0.05	33.90
May-13	4	5	7.1	7.4	0.43	0.45	17.9	29.6	4.67	3.73	4.74	41.10
June-13	21	28	7.0	7.4	0.49	0.50	22.9	25.7	3.97	3.57	2.45	30.80
July-13	24	29	6.4	7.5	0.44	0.48	23.0	30.2	4.45	3.31	3.36	39.40
August-13	33	41	6.6	7.5	0.45	0.46	22.4	25.0	4.87	3.74	9.38	37.70
September-13	45	75	6.8	7.6	0.47	0.48	22.3	22.7	4.03	2.84	6.63	33.40
October-13	48	71	6.6	7.9	0.47	0.48	16.6	27.4	3.61	2.91	3.65	32.90
November-13	15	20	7.0	7.4	0.44	0.46	16.2	22.9	3.11	2.61	3.57	29.90
December-13	15	21	6.8	7.6	0.46	0.49	14.2	18.0	2.93	2.22	6.83	28.60
January-14	6	19	6.8	7.2	0.46	0.47	12.8	15.8	2.65	1.84	4.52	24.50
February-14	3	5	6.8	7.3	0.45	0.47	12.2	22.7	3.26	2.59	4.78	28.00
March-14	2	5	6.2	7.8	0.44	0.46	13.2	10.4	1.72	1.39	5.22	18.00
April-14	2	2	6.6	7.1	0.45	0.47	16.3	19.2	3.01	2.45	5.36	26.70
May-14	9	29	6.5	7.2	0.41	0.44	18.7	9.8	3.91	3.32	20.10	30.70
June-14	9	11	6.7	7.1	0.43	0.44	21.9	14.5	2.85	2.60	8.22	25.80
July-14	13	37	6.6	7.9	0.45	0.46	23.6	16.8	4.76	4.03	12.77	32.40
August-14	30	130	6.5	7.2	0.46	0.49	23.7	16.8	4.51	3.85	10.69	31.58
September-14	68	135	6.7	7.5	0.47	0.50	21.8	24.9	4.39	3.53	5.53	36.42
October-14	15	42	6.7	7.2	0.46	0.49	19.5	13.9	3.11	2.28	8.28	25.75
November-14	7	18	6.2	7.7	0.45	0.46	16.8	2.1	1.55	1.14	9.70	13.80
December-14	7	19	6.4	9.0	0.45	0.47	14.4	12.7	2.11	1.58	2.60	18.20
AVE:	16	39	6.7	7.4	0.45	0.48	17.0	17.3	3.2	2.5	6.0	27.2
MIN:	2	2	6.0	7.0	0.41	0.43	9.1	2.1	1.2	0.9	0.1	10.7
MAX:	68	187	7.2	9.0	0.49	0.54	24.5	30.4	5.2	4.7	20.1	41.1
Median	9	24	6.7	7.4	0.45	0.48	16.7	17.0	3.1	2.5	5.3	28.3
Std. Dev	15.2	41.0	0.3	0.3	0.0	0.0	4.2	7.4	1.1	0.9	4.3	7.7
CV	0.9	1.1	0.04	0.04	0.03	0.05	0.2	0.4	0.3	0.4	0.7	0.3
95th Percentile	48	130	6.2	7.8	0.47	0.51	23.7	29.4	4.9	3.8	14.7	38.1
Limits	200	400	6.0	9.0	0.50	0.75						

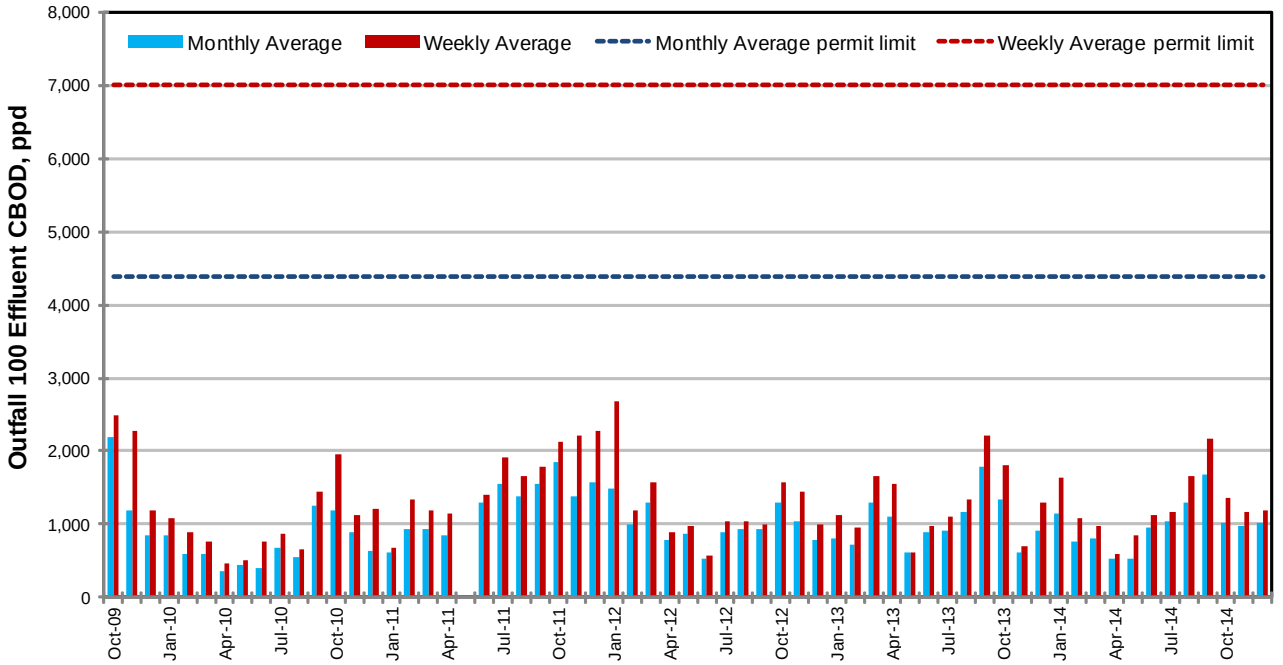
ND = No Discharge

Reported Values Exceed Permit Limits

Discharge Monitoring Data, Outfall 100 CBOD, 2009-2014

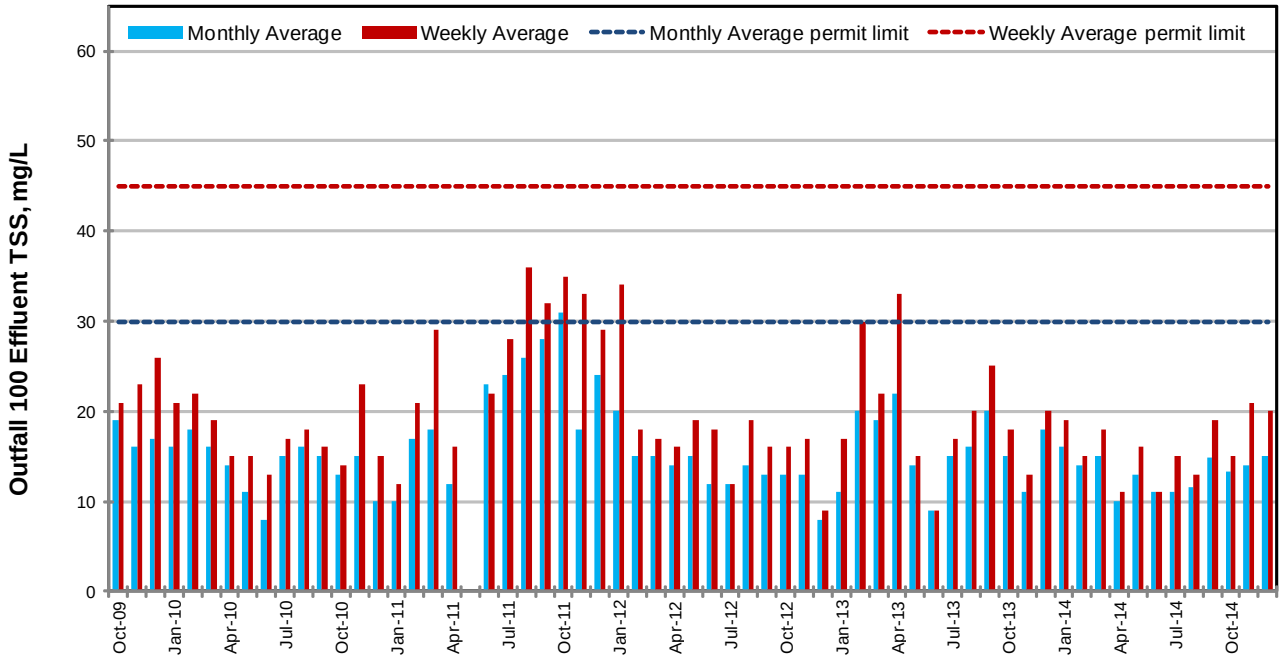
Everett WPCF
Permit #WA0024490

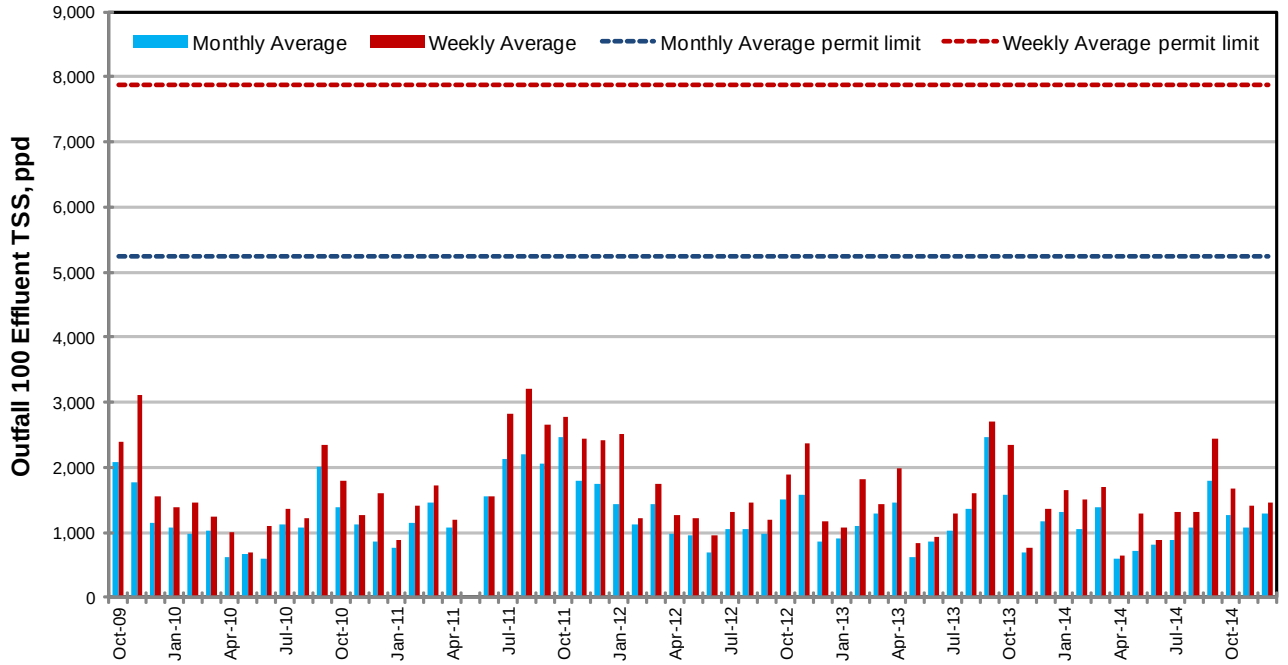




Discharge Monitoring Data, Outfall 100 TSS, 2009-2014

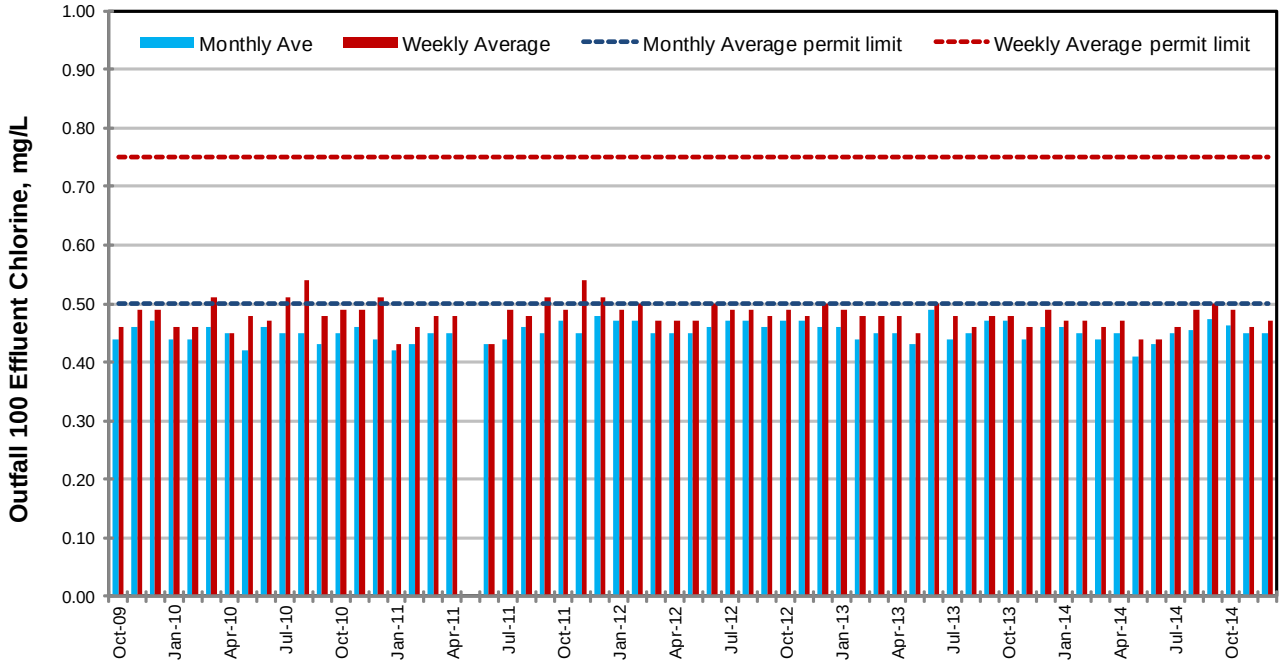
Everett WPCF
Permit #WA0024490

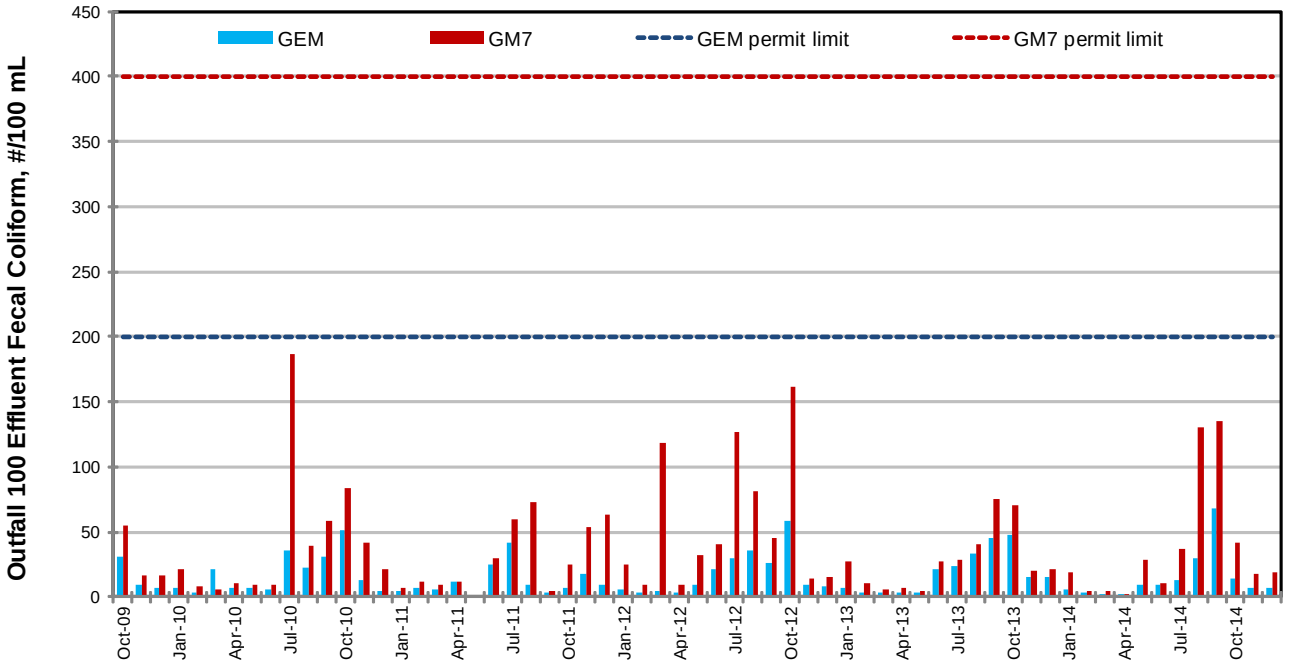




Discharge Monitoring Data,Outfall 100 Residual Chlorine and Fecal Coliform, 2009-2014

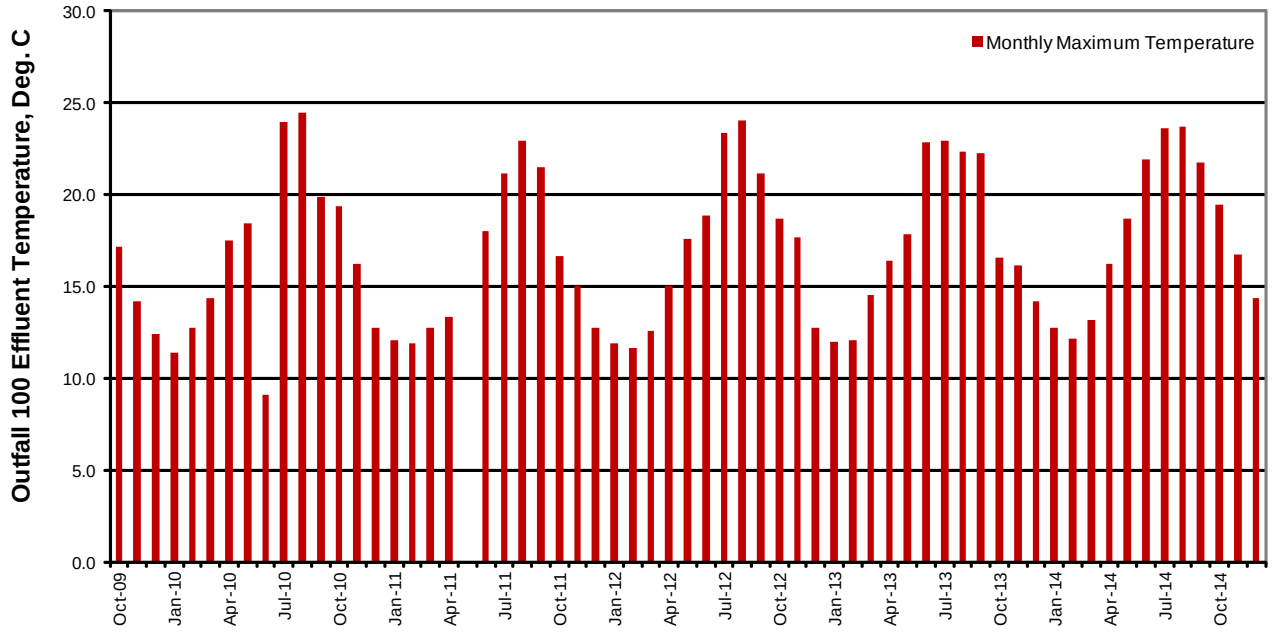
Everett WPCF
Permit #WA0024490

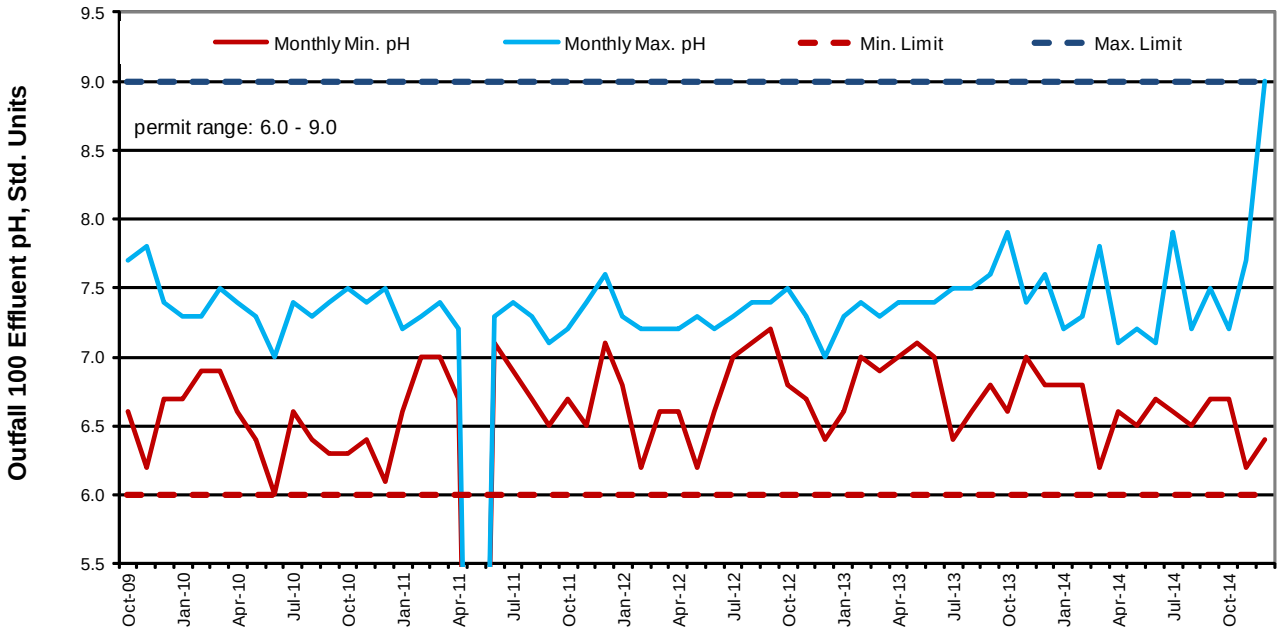




Discharge Monitoring Data, Outfall 100 Temperature and pH, 2009-2014

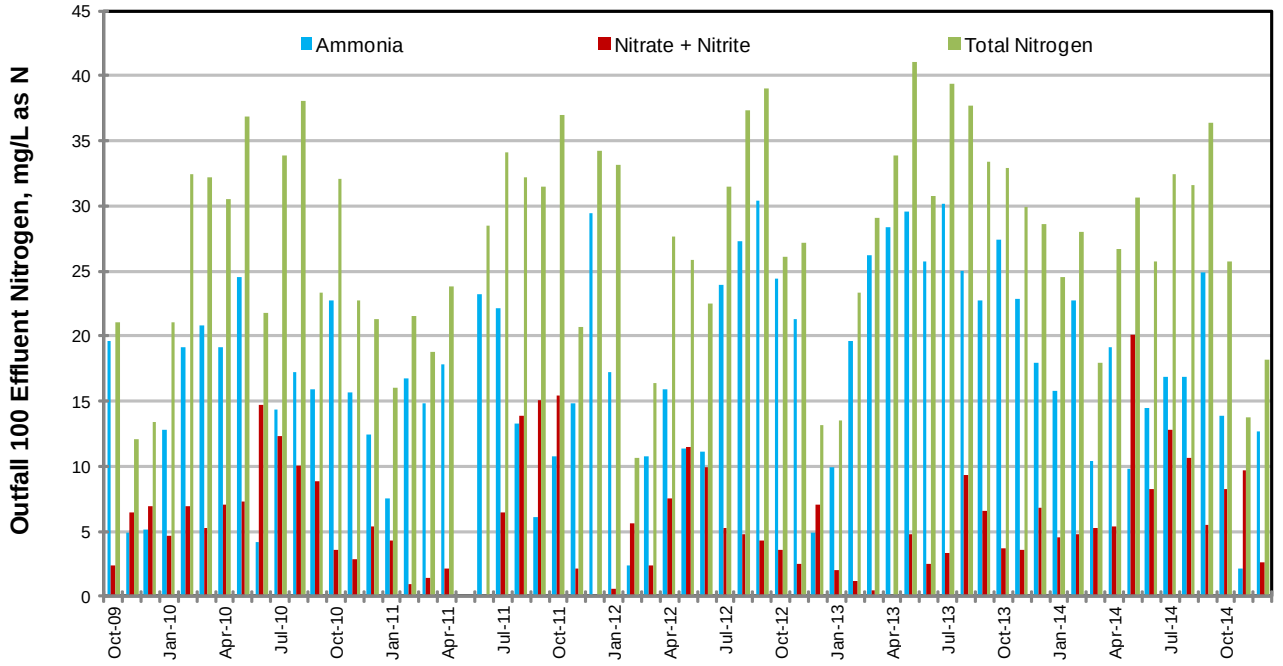
Everett WPCF
Permit #WA0024490

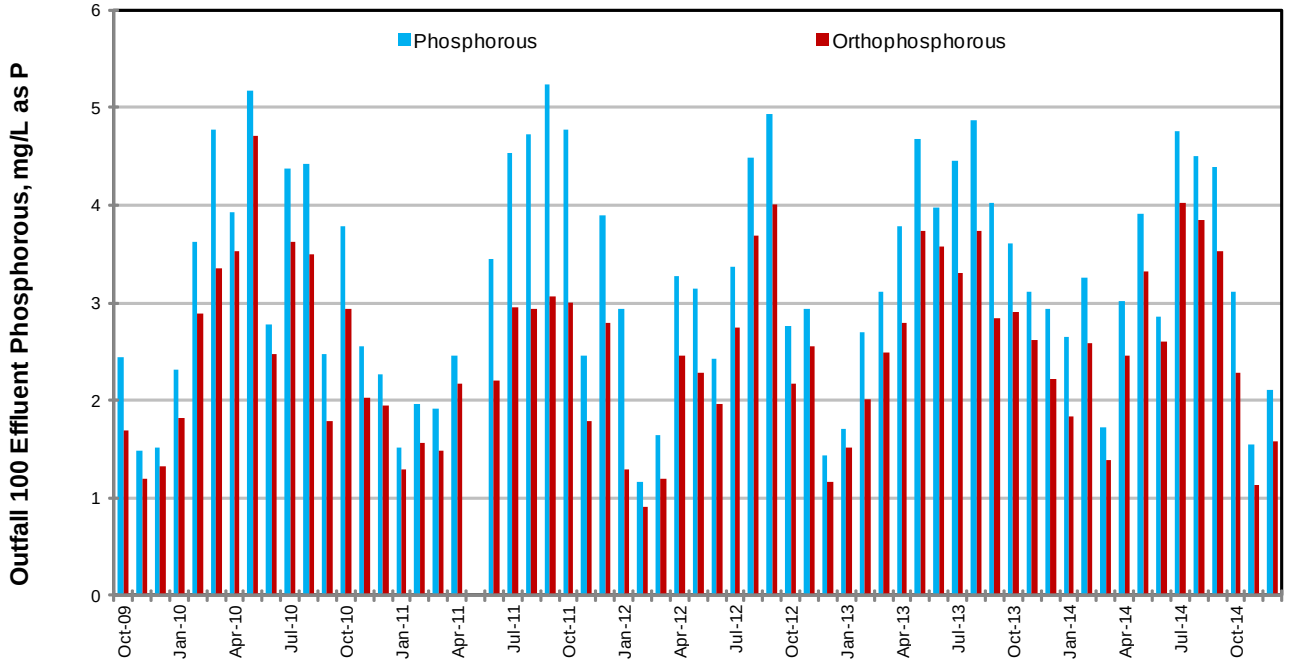




Discharge Monitoring Data, Outfall 100 Nitrogen and Phosphorous, 2009-2014

Everett WPCF
Permit #WA0024490





Discharge Monitoring Data, 2009-2014
Outfall 015

Facility: Everett WPCF
Permit No: WA0024490

	Effluent													
Date	Flow, MGD	Flow, MGD	CBOD, mg/L	CBOD, mg/L	CBOD, ppd	CBOD, ppd	CBOD, % Removal	Equiv. CBOD, ppd	Equiv. CBOD, ppd	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd	TSS, % Removal
	Monthly Ave	Monthly Max	Monthly Ave	Wkly Ave	Monthly Ave	Wkly Ave	Ave	Monthly Ave	Monthly Max	Monthly Ave	Wkly Ave	Monthly Ave	Wkly Ave	Ave
October-09	7.2	22.6	16.0	17.0			88.0	2,857	4,012	45.0	55.0	2,746	3,168	81.6
November-09	16.9	34.7	9.0	13.0	1,207	1,501	95.4			28.0	34.0	3,994	5,419	84.9
December-09	11.7	29.5	11.0	16.0	1,123	1,744	94.4			21.0	22.0	2,078	2,982	90.5
January-10	15.3	28.9	12.0	15.0	1,487	2,375	93.2			21.0	22.0	2,726	3,838	89.0
February-10	12.1	15.3	11.0	12.0	1,156	1,285	94.4			38.0	51.0	3,825	5,288	83.1
March-10	9.9	26.2	11.0	12.0	882	1,400	94.5			22.0	49.0	1,790	3,595	91.2
April-10	13.6	30.2	13.0	17.0	1,630	2,250	93.5			18.0	26.0	2,114	3,211	92.0
May-10	12.0	29.9	15.0	17.0	1,482	2,043	92.2			38.0	50.0	3,954	6,586	84.7
June-10	16.6	31.9	13.0	14.0	1,802	2,674	91.0			41.0	45.0	5,764	8,001	80.6
July-10	5.0	7.8	10.0	11.0			96.0	2,142	3,675	39.0	49.0	1,621	2,231	85.8
August-10	4.8	7.0	8.0	9.0			96.0	2,405	3,894	41.0	45.0	1,646	2,344	86.1
September-10	4.7	7.3	7.0	8.0			97.0	2,661	4,035	20.0	36.0	892	1,964	92.0
October-10	3.9	4.0	3.0	4.0			99.0	2,416	2,601	7.0	10.0	218	309	97.5
November-10	10.9	26.6	6.0	7.0	574	969	97.2			26.0	31.0	2,659	4,283	89.0
December-10	16.5	31.0	8.0	9.0	1,118	1,666	95.6			30.0	39.0	4,440	6,536	84.4
January-11	17.3	35.5	10.0	12.0	1,647	2,557	93.9			22.0	25.0	3,366	4,987	88.3
February-11	13.4	22.5	9.0	9.0	969	1,106	95.7			32.0	37.0	3,625	5,047	85.6
March-11	18.0	31.6	12.0	15.0	1,821	2,791	92.6			39.0	54.0	6,063	10,605	79.4
April-11	17.2	30.1	12.0	16.0	1,889	3,338	93.7			14.0	18.0	2,087	3,473	92.9
May-11	20.1	31.7	16.0	18.0	2,720	3,647	92.5			21.0	27.0	3,623	5,614	90.8
June-11	16.6	25.8	15.0	18.0	2,134	3,030	96.0			37.0	51.0	4,861	7,663	84.9
July-11	4.4	5.1	13.0	16.0			97.0	2,279	2,986	44.0	50.0	1,623	2,099	89.9
August-11	4.6	5.7	8.0	11.0			98.0	2,593	3,565	29.0	42.0	1,084	1,387	90.2
September-11	4.6	5.1	6.0	8.0			99.0	2,718	3,096	21.0	24.0	793	859	94.3
October-11	4.8	5.1	4.0	5.0			98.9	2,797	3,035	13.0	15.0	536	595	95.7
November-11	17.5	43.4	10.0	13.0	1,622	3,008	96.4			25.0	28.0	3,732	6,266	89.3
December-11	8.1	18.1	13.0	21.0	972	2,091	96.2			22.0	33.0	1,650	3,728	91.5
January-12	11.2	31.2	18.0	25.0	1,655	2,700	93.9			30.0	40.0	3,055	4,916	87.2
February-12	14.2	38.3	19.0	22.0	2,504	**5,291**	92.4			35.0	39.0	4,390	8,725	82.6
March-12	16.0	27.0	18.0	20.0	2,396	3,459	91.5			38.0	52.0	5,074	7,068	78.4
April-12	12.6	24.3	17.0	22.0	1,895	2,643	92.7			27.0	48.0	3,026	5,798	88.1
May-12	12.1	25.0	13.0	17.0	1,457	2,815	94.3			20.0	34.0	2,086	3,860	90.7
June-12	13.1	24.7	11.0	12.0	1,191	1,306	96.0			35.0	38.0	3,813	4,933	84.4
July-12	4.7	5.1	9.0	11.0			98.0	2,227	2,554	36.0	44.0	1,411	1,833	85.3
August-12	4.0	4.1	7.0	9.0			98.0	2,340	2,598	21.0	30.0	692	995	92.5
September-12	4.0	4.4	8.0	9.0			98.0	2,712	2,925	32.0	38.0	1,079	1,268	89.7
October-12	5.0	34.2	4.0	6.0			98.6	3,859	**23,064**	17.0	22.0	733	3,107	93.3
November-12	19.2	42.8	6.0	7.0	1,049	1,845	97.2			23.0	31.0	4,218	8,300	87.4
December-12	26.1	44.5	7.0	8.0	1,525	2,565	95.3			21.0	23.0	4,563	6,601	85.4
January-13	18.6	42.3	7.0	9.0	1,259	2,696	96.5			29.0	31.0	4,752	8,412	84.2
February-13	15.5	26.7	9.0	11.0	1,129	1,335	96.3			27.0	33.0	3,421	4,231	86.6
March-13	13.9	30.3	12.0	14.0	1,621	2,951	95.0			24.0	31.0	3,158	5,306	88.3
April-13	12.8	33.3	18.0	22.0	1,977	2,438	92.7			22.0	29.0	2,403	3,187	89.8
May-13	14.0	26.4	**33.0**	**41.0**	**4,311**	**6,377**	89.1			57.0	74.0	7,279	10,324	78.2
June-13	10.2	16.9	**28.0**	40.0	2,485	4,209	90.7			42.0	57.0	3,772	6,188	83.9
July-13	4.3	5.1	12.0	15.0	416		96.0	2,510	2,923	38.0	43.0	1,353	1,505	86.4
August-13	3.7	4.9	6.0	8.0	178		98.0	2,474	3,639	19.0	28.0	586	945	93.7
September-13	3.7	4.9	4.0	4.0	107		99.0	2,706	3,761	5.0	9.0	167	346	98.2
October-13	3.0	3.2	3.0	3.0	76		99.0	2,206	2,361	4.0	5.0	94	138	98.6
November-13	12.2	23.6	7.0	9.0	767	865	97.3			28.0	35.0	2,945	3,541	88.8
December-13	11.9	22.5	11.0	11.0	1,051	1,067	96.2			38.0	46.0	3,896	4,943	85.0
January-14	12.2	30.4	11.0	16.0	1,213	2,016	95.5			32.0	51.0	3,337	6,184	85.4
February-14	14.7	26.3	13.0	13.0	1,492	2,063	94.6			30.0	40.0	3,995	6,159	85.0
March-14	20.5	41.9	10.0	12.0	1,877	2,933	94.3			21.0	30.0	3,806	6,738	98.7
April-14	12.5	25.7	15.0	19.0	1,689	2,493	92.7			15.0	17.0	1,663	2,137	92.6
May-14	13.4	28.4	10.0	11.0	1,036	1,847	95.8			17.0	24.0	1,880	3,109	92.2
June-14	10.0	25.0	10.0	11.0	916	1,181	96.5			27.0	33.0	2,334	3,458	89.5
July-14	4.3	5.4	10.2	14.0	365	10	96.5	2,335	2,935	34.4	42.0	1,261	1,528	87.1
August-14	4.5	5.3	11.0	13.0	436	11	96.4	2,232	2,703	39.0	44.0	1,503	1,829	85.2
September-14	6.9	14.3	12.0	14.0	702	12	95.4	941	2,930	**69.0**	83.0	3,865	4,297	73.5
October-14	8.9	30.0	11.8	14.0	877	12	95.2	2,957	**12,235**	38.1	50.0	2,753	3,623	82.4
November-14	16.1	38.0	7.6	8.0	982	1,388	96.6			24.4	27.0	3,129	4,905	87.3
December-14	17.1	37.0	14.0	20.0	2,169	4,098	93.7			32.7	42.0	4,912	8,892	80.3
AVE:	11.3	23.0	11.2	13.7	1,381	2219.6	95.3	2493.6	4548.9	28.6	36.7	2792.3	4308.0	87.8
MIN:	3.0	3.2	3.0	3.0	76	10.2	88.0	941.0	2361.0	4.0	5.0	94.0	138.0	73.5
MAX:	26.1	44.5	33.0	41.0	4,311	6377.0	99.0	3859.0	23064.0	69.0	83.0	7279.0	10605.0	98.7
Median	12.1	26.2	11.0	13.0	1,236	2170.5	95.7	2474.0	3035.0	28.0	36.0	2753.3	3860.0	87.4
Standard Deviation	5.5	12.5	5.2	6.9	757	1291.9	2.4	517.2	4707.3	11.5	14.3	1575.9	2555.9	5.1
CV	0.48	0.54	0.47	0.50	1	0.58	0.03	0.21	1.03	0.40	0.39	0.56	0.59	0.06
95th Percentile	19.1	42.3	18.0	22.0	2,495	4181.3	91.0	2956.6	12235.0	43.8	54.9	5057.8	8693.7	79.5
Low River 95th %	7.2	30.0	13.0	16.0	816	12.0	95.2	2956.6	12235.0	45.0	55.0	2753.3	3623.0	81.6
High River 95th %	20.1	42.8	19.5	25.8	2,515	4263.1	91.0			41.1	54.2	5779.0	8805.0	79.3
Limit, Low River	15.3		25	40			65	3,043	5,402	66	99	8,420	12,630	
Limit, High River	15.3		25	40	3,190	5,100				66	99	8,420	12,630	

Reported Values Exceed Permit Limits

Discharge Monitoring Data, 2009-2014
Outfall 015

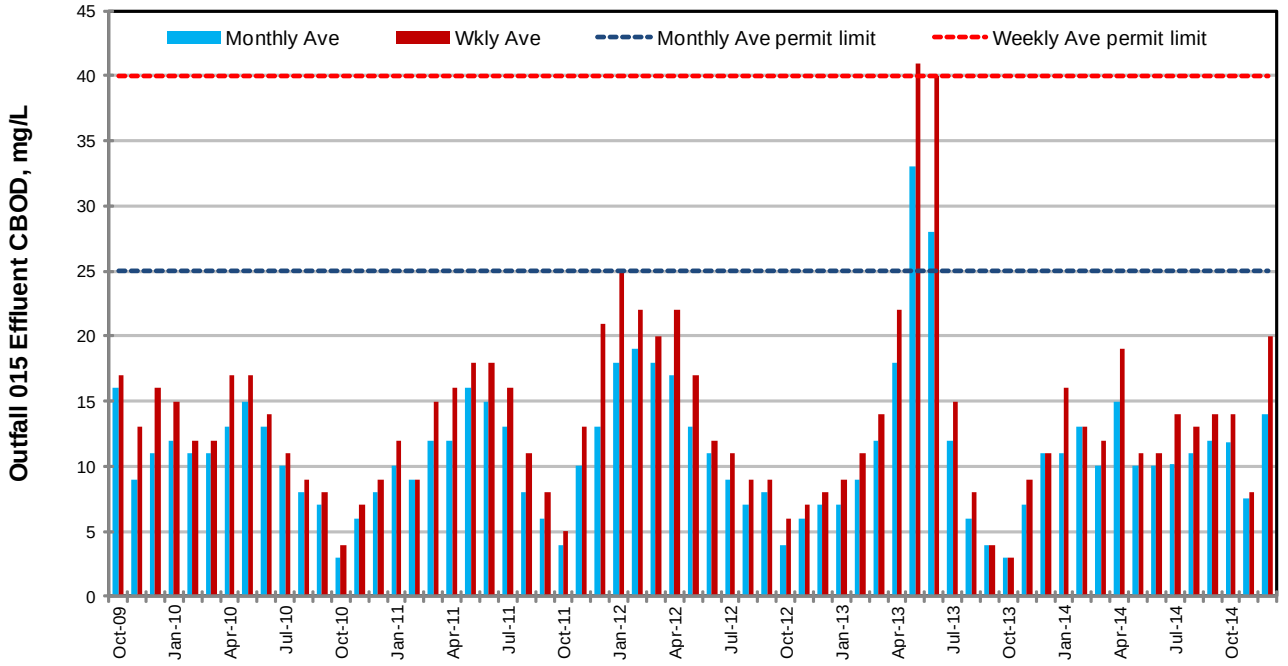
Facility: Everett WPCF
Permit No: WA0024490

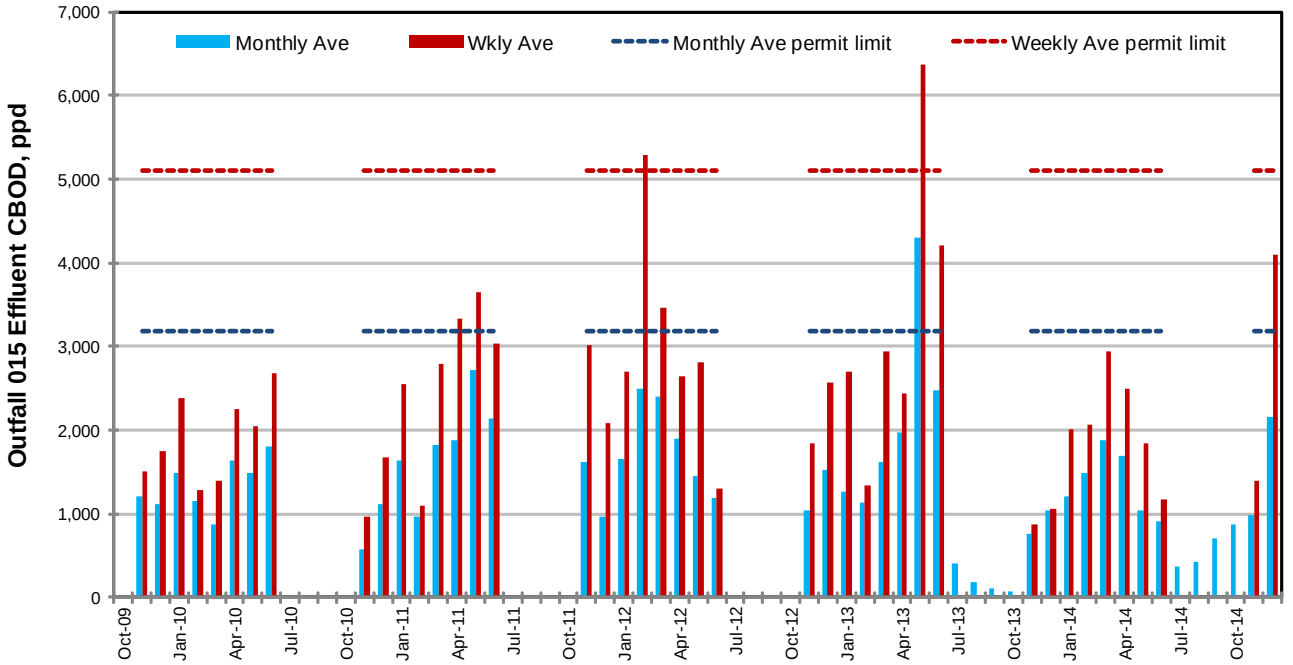
	Effluent													
Date	Fecal Coliform, #/100 ml	Fecal Coliform, #/100 ml	PH	PH	Chlorine, mg/L	Chlorine, mg/L	Temperature	Temperature, 7-DADMax	Ammonia, mg/l (as N)	Ammonia, ppd (as N)	Phosphorous, mg/l (as P)	Orthophosphorous, mg/L (as P)	Nitrate + Nitrite, mg/L (as N)	Total Nitrogen, mg/L (as N)
					Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly		Monthly
	GEM	GM7	Min	Max	Ave	Max	Max	Max	Ave	Average	Ave	Ave	Monthly Ave	Ave
October-09	3	4	6.3	7.7	0.008	0.008	16.2	15.7	17.1	945.0	5.39	4.48	6.50	29.90
November-09	23	84	6.4	7.7	0.008	0.027	11.8	10.6	21.3		4.00	3.29	0.52	21.70
December-09	22	97	6.7	7.5	0.008	0.064	8.4	8.8	22.1		3.67	2.84	0.01	25.60
January-10	22	87	6.7	7.6	0.008	0.022	8.8	8.4	19.3		3.03	2.51	0.01	22.90
February-10	8	47	6.9	8.0	0.008	0.044	10.7	10.1	22.1		4.06	3.14	0.06	29.10
March-10	4	12	7.0	8.2	0.008	0.025	14.4	13.6	28.9		4.06	4.28	0.02	32.70
April-10	4	12	7.3	7.9	0.008	0.013	18.6	16.4	29.1		4.84	4.41	0.05	34.70
May-10	10	19	7.1	8.3	0.008	0.020	21.7	19.9	24.0		4.84	4.05	0.10	30.70
June-10	11	19	7.1	8.3	0.008	0.014	22.7	21.9	17.5		3.56	3.02	0.42	22.70
July-10	14	30	7.2	7.9	0.008	0.014	27.3	25.9	20.8	833.0	5.31	4.79	0.26	28.80
August-10	11	19	7.6	8.3	0.008	0.008	26.9	23.3	24.8	990.0	6.29	5.52	0.82	33.20
September-10	5	12	6.8	7.8	0.008	0.022	21.1	20.4	29.3	1,142.0	5.79	5.45	0.26	33.80
October-10	3	4	6.8	7.7	0.008	0.015	19.5	19.2	33.7	1,098.0	5.84	5.27	0.12	38.20
November-10	5	10	6.6	7.6	0.008	0.028	13.5	12.2	32.6		5.40	4.17	0.03	39.10
December-10	9	62	6.4	7.4	0.008	0.048	9.4	8.2	17.8		2.96	1.94	0.15	22.50
January-11	15	59	6.4	7.3	0.008	0.054	9.2	8.4	17.4		2.95	1.93	0.01	29.10
February-11	5	17	7.1	8.1	0.008	0.019	7.5	7.9	20.6		3.18	2.18	0.09	26.20
March-11	13	64	7.3	8.1	0.009	0.072	11.2	10.7	14.7		2.28	1.66	0.28	20.10
April-11	10	65	7.1	7.4	0.008	0.043	18.7	14.1	19.5		3.12	2.63	0.03	24.40
May-11	24	108	7.2	7.7	0.008	0.020	19.0	17.9	25.0		4.32	2.98	0.01	31.20
June-11	5	19	7.1	8.1	0.008	0.074	22.6	21.0	26.0		4.83	3.55	0.04	31.00
July-11	13	24	7.4	8.1	0.008	0.011	23.9	22.6	24.1	859.0	5.36	4.63	1.12	26.90
August-11	3	5	7.4	7.7	0.008	0.010	24.4	23.3	28.4	1,088.0	6.16	5.59	0.89	33.00
September-11	2	4	7.1	7.7	0.008	0.061	22.6	22.9	30.6	1,182.0	6.50	5.87	0.25	33.20
October-11	1	1	7.1	7.6	0.008	0.008	16.9	17.6	31.5	1,250.0	5.45	5.32	0.11	33.80
November-11	13	124	7.3	7.7	0.008	0.051	10.6	11.1	26.2		4.04	3.39	0.82	31.30
December-11	4	65	6.9	7.7	0.008	0.008	7.2	6.6	24.1		3.73	3.04	0.17	27.90
January-12	12	37	7.0	7.4	0.008	0.010	6.4	6.3	27.9		5.27	3.15	0.01	33.10
February-12	4	45	7.0	7.3	0.008	0.014	7.9	7.6	21.6		4.27	2.42	0.01	37.10
March-12	3	10	6.9	8.0	0.008	0.027	11.5	11.0	16.2		2.82	2.01	0.04	20.90
April-12	4	16	7.1	8.2	0.008	0.034	17.3	16.0	20.7		3.84	3.34	0.02	25.00
May-12	8	22	7.0	7.9	0.008	0.024	21.3	20.7	28.1		5.00	4.17	0.01	31.40
June-12	5	9	7.4	8.1	0.008	0.023	21.8	19.8	30.4		5.39	4.34	0.09	45.20
July-12	13	29	7.4	8.6	0.008	0.026	24.5	23.9	22.9	895.0	3.43	3.80	0.52	27.50
August-12	4	8	7.4	8.2	0.008	0.044	26.6	25.4	30.4	1,008.0	6.38	5.75	0.49	35.30
September-12	3	3	7.5	8.1	0.008	0.026	23.2	22.3	34.8	1,165.0	7.29	6.19	0.76	38.80
October-12	1	12	7.6	8.1	0.008	0.017	19.3	18.1	40.6	1,754.0	7.15	6.49	0.18	44.50
November-12	4	12	7.3	7.7	<0.008	0.010	14.0	13.6	32.5		4.63	4.01	0.15	34.90
December-12	10	60	6.9	7.4	0.008	0.008	9.4	8.5	17.1		2.75	1.99	0.41	19.90
January-13	3	16	7.0	7.3	<0.008	0.067	6.5	5.4	16.3		2.62	1.76	0.75	19.50
February-13	2	3	6.9	7.7	<0.008	<.008	8.2	7.4	16.2		2.56	1.84	0.10	18.40
March-13	2	4	6.9	7.8	<0.008	<.008	15.9	13.3	24.8		3.29	2.75	0.10	28.50
April-13	8	62	7.0	8.4	<0.008	<.008	19.6	18.1	23.7		4.06	3.21	0.02	28.30
May-13	4	8	6.6	8.5	<0.008	0.016	23.1	21.3	26.4		5.86	4.18	0.29	38.20
June-13	3	21	6.9	8.5	<0.008	0.029	25.5	22.2	25.4		5.30	4.06	1.08	33.90
July-13	8	26	6.9	8.1	<0.008	0.023	27.4	25.6	27.7	997.0	7.04	6.12	0.24	32.80
August-13	4	5	7.1	7.7	<0.008	0.014	26.1	25.4	36.5	1,095.0	8.01	7.17	0.30	40.10
September-13	1	2	6.9	7.9	<0.008	0.011	23.8	23.1	41.0	1,238.0	8.01	7.32	0.23	43.70
October-13	1	1	7.1	7.8	<0.008	0.034	16.1	14.9	40.8	1,015.0	7.00	6.32	0.34	42.70
November-13	3	11	7.3	7.8	<0.008	0.020	11.3	11.6	42.3		6.42	5.21	0.08	44.50
December-13	2	3	6.9	7.7	<0.008	0.031	6.3	5.6	30.1		4.31	3.45	0.19	34.80
January-14	2	12	7.2	7.5	<0.008	0.012	7.1	6.5	27.0		5.20	3.44	0.03	33.00
February-14	2	3	6.8	7.5	<0.008	<.008	8.8	7.0	26.1		4.54	3.15	0.01	28.90
March-14	2	2	6.9	7.6	<0.008	0.044	13.0	11.6	21.4		3.64	2.49	0.07	25.60
April-14	5	11	7.0	8.2	<0.008	0.020	18.1	15.0	21.4		3.69	3.06	0.46	25.00
May-14	4	11	7.1	8.4	<0.008	0.022	22.7	21.7	24.5		24.50	4.60	3.81	28.50
June-14	3	10	7.4	8.3	<0.008	0.024	22.7	22.2	29.8		5.69	5.03	0.47	32.80
July-14	18	27	7.5	8.2	<0.008	0.013	28.8	27.7	25.8	938.1	6.51	5.78	0.77	30.60
August-14	8	9	6.8	7.9	<0.008	0.010	26.8	26.0	21.4	854.9	7.06	6.07	4.44	31.90
September-14	3	7	6.9	7.5	<0.008	0.018	21.4	24.1	1.4	114.0	6.05	4.75	10.29	22.93
October-14	2	3	6.8	7.9	<0.008	0.038	19.0	18.4	11.2	990.3	5.29	4.47	6.23	22.90
November-14	4	8	6.8	7.8	<0.008	0.013	13.2	13.5	18.5		4.25	3.29	0.29	23.10
December-14	12	147	6.8	7.4	<0.008	0.058	9.1	8.6	17.1		3.55	2.09	0.01	23.30
AVE:	7.0	27.7	7.0	7.9	0.008	0.027	17.0	16.0	24.9	1021.5	5.1	4.0	0.7	30.5
MIN:	1.0	1.0	6.3	7.3	0.008	0.008	6.3	5.4	1.4	114.0	2.3	1.7	0.0	18.4
MAX:	24.0	147.0	7.6	8.6	0.009	0.074	28.8	27.7	42.3	1754.0	24.5	7.3	10.3	45.2
Median	4.0	12.0	7.0	7.8	0.008	0.022	18.1	16.0	24.8	1008.0	4.8	4.0	0.2	30.7
Standard Deviation	5.8	32.6	0.3	0.3	0.000	0.018	6.8	6.6	7.4	287.8	2.9	1.5	1.8	6.7
CV	0.84	1.18	0.04	0.04	0.020	0.661	0.40	0.41	0.30	0.28	0.56	0.36	2.41	0.22
95th Percentile	21.6	96.0	6.4	8.4	0.008	0.064	26.9	25.6	40.2	1250.0	7.3	6.3	4.4	43.6
Low River 95th %	14.0	29.0	6.8	8.3	0.008	0.044	27.4	26.0	40.8	1250.0	8.0	7.2	6.5	43.7
High River 95th %	22.1	97.6	6.4	8.4	0.008	0.068	22.7	21.9	32.5		5.9	4.6	0.8	39.4
Limit, Low River	200	400	6.0	9.0	0.016	0.083								
Limit, High River	200	400	6.0	9.0	0.016	0.083								

Reported Values Exceed Permit Limits

Discharge Monitoring Data, Outfall 015 CBOD, 2009-2014

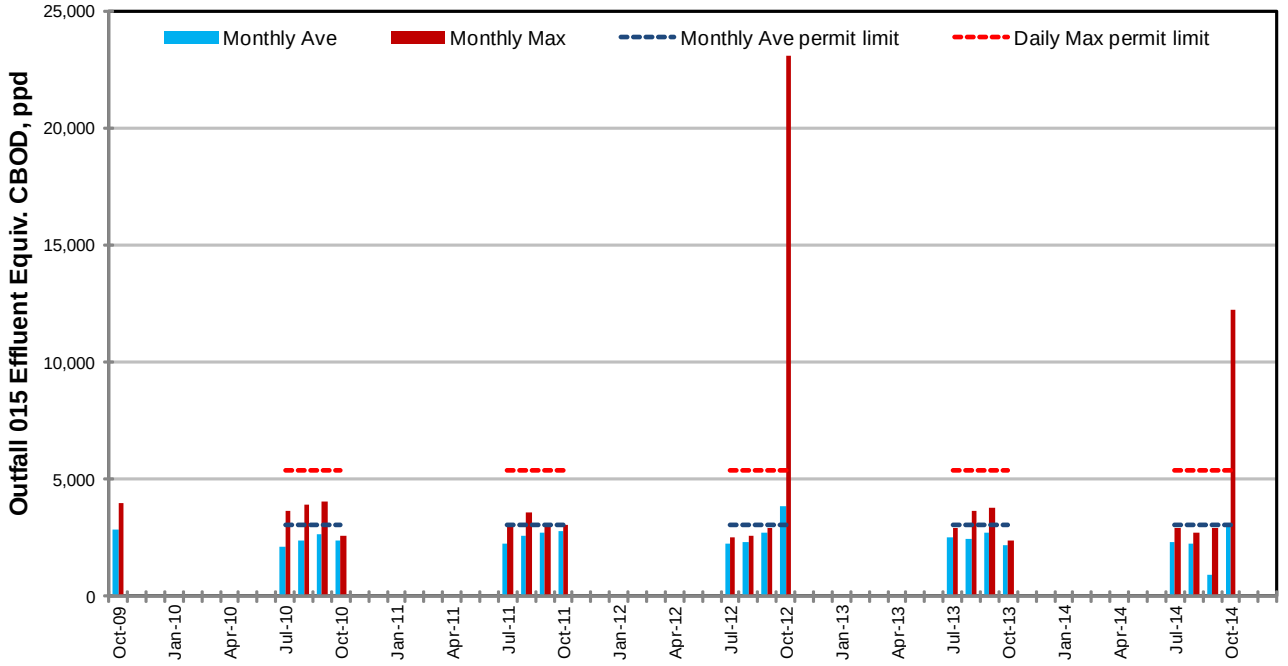
Everett WPCF
Permit #WA0024490

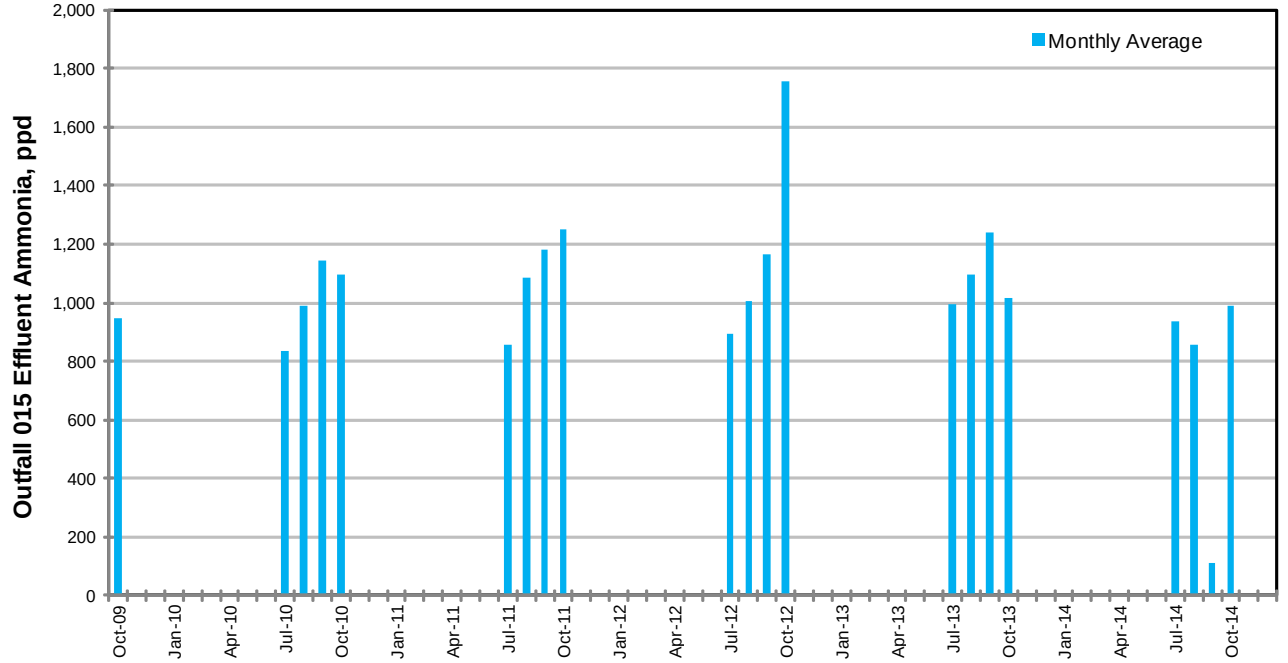




Discharge Monitoring Data, Outfall 015 Equiv. CBOD and Ammonia Mass, 2009-2014

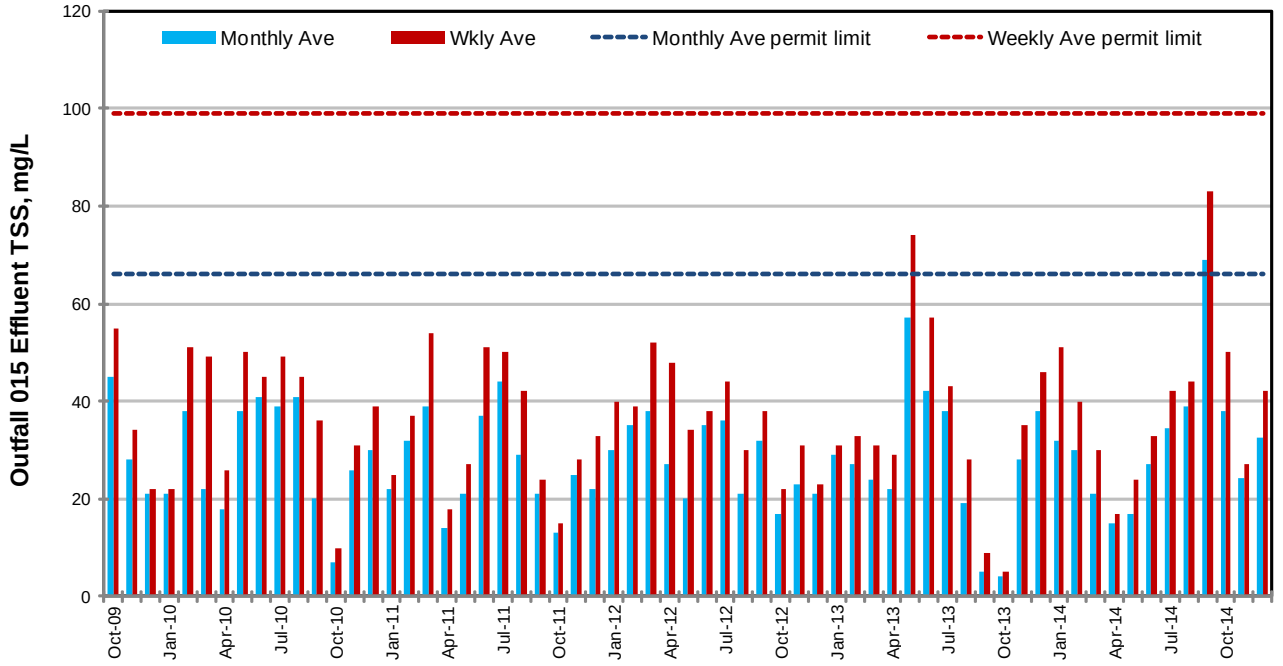
Everett WPCF
Permit #WA0024490

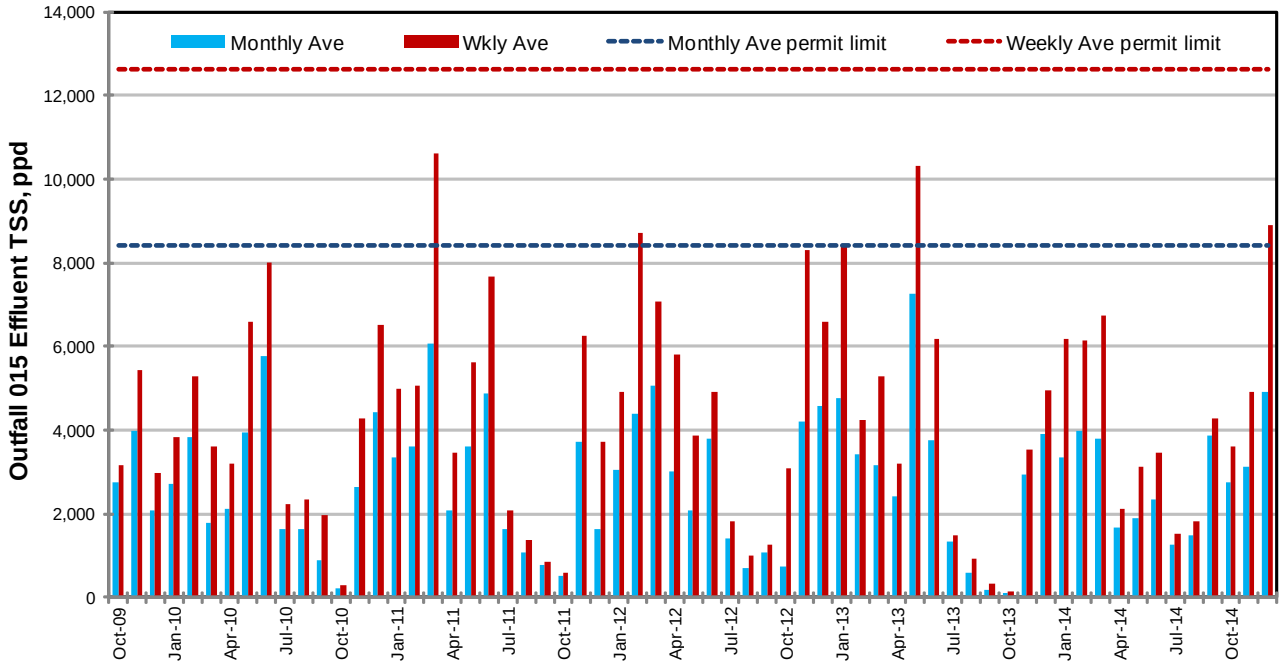




Discharge Monitoring Data, Outfall 015 TSS, 2009-2014

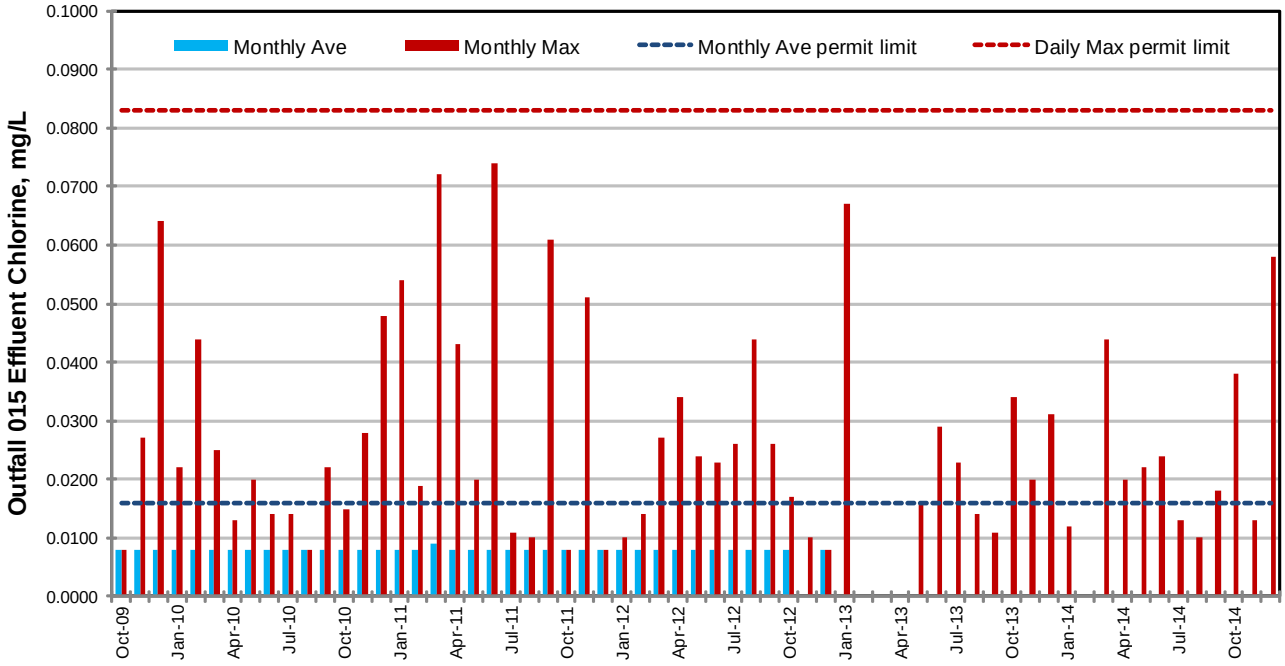
Everett WPCF
Permit #WA0024490

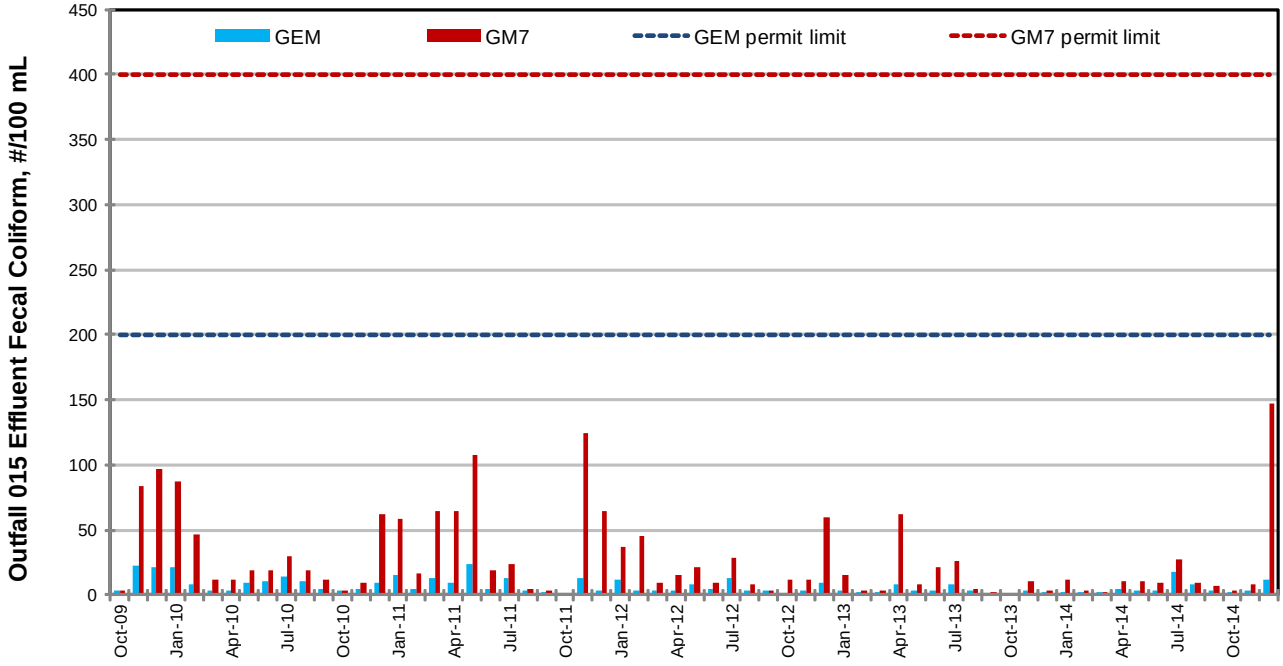




Discharge Monitoring Data, Outfall 015 Residual Chlorine and Fecal Coliform, 2009-2014

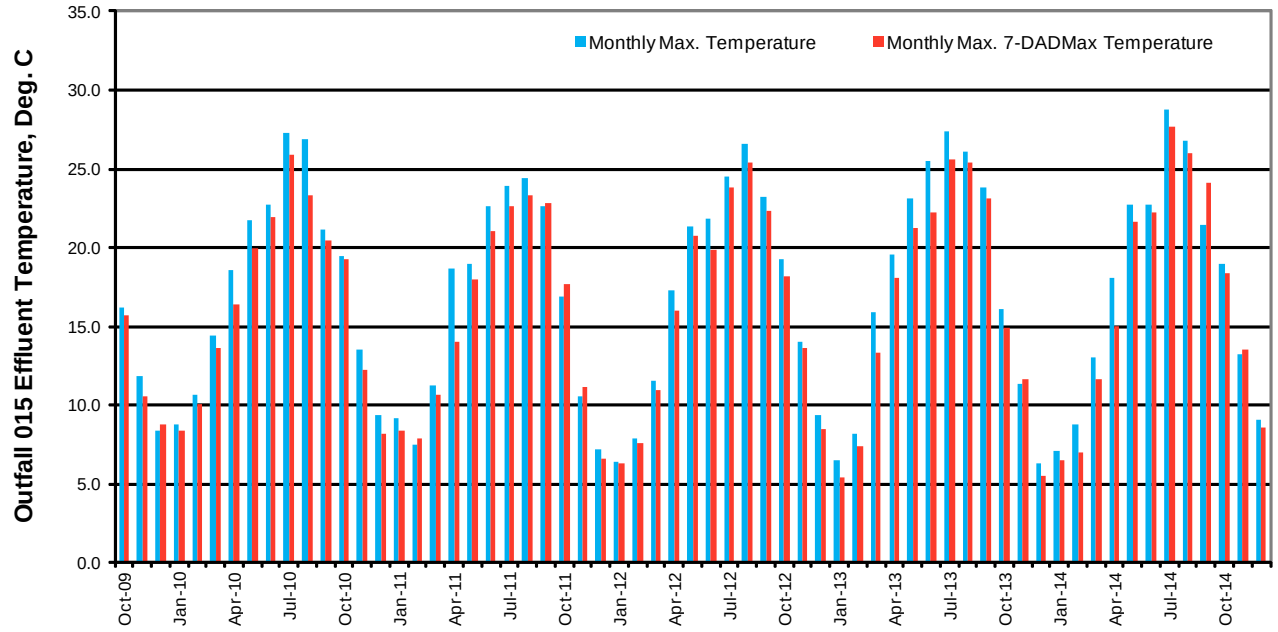
Everett WPCF
Permit #WA0024490

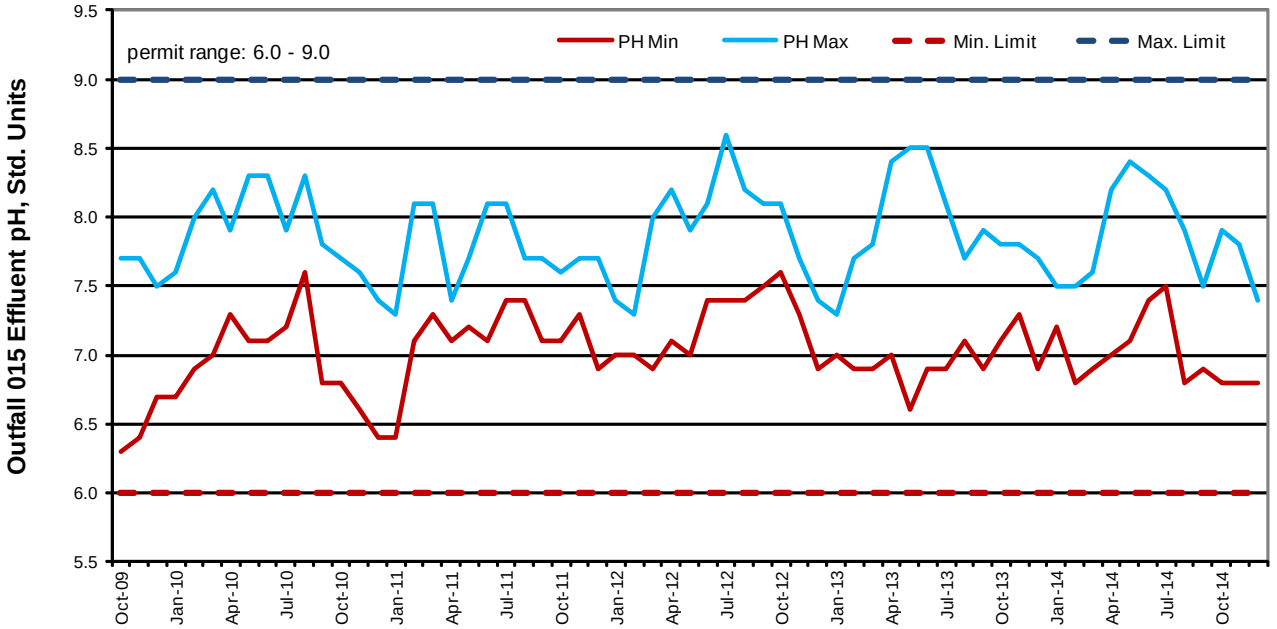




Discharge Monitoring Data,Outfall 015 Temperature and pH, 2009-2014

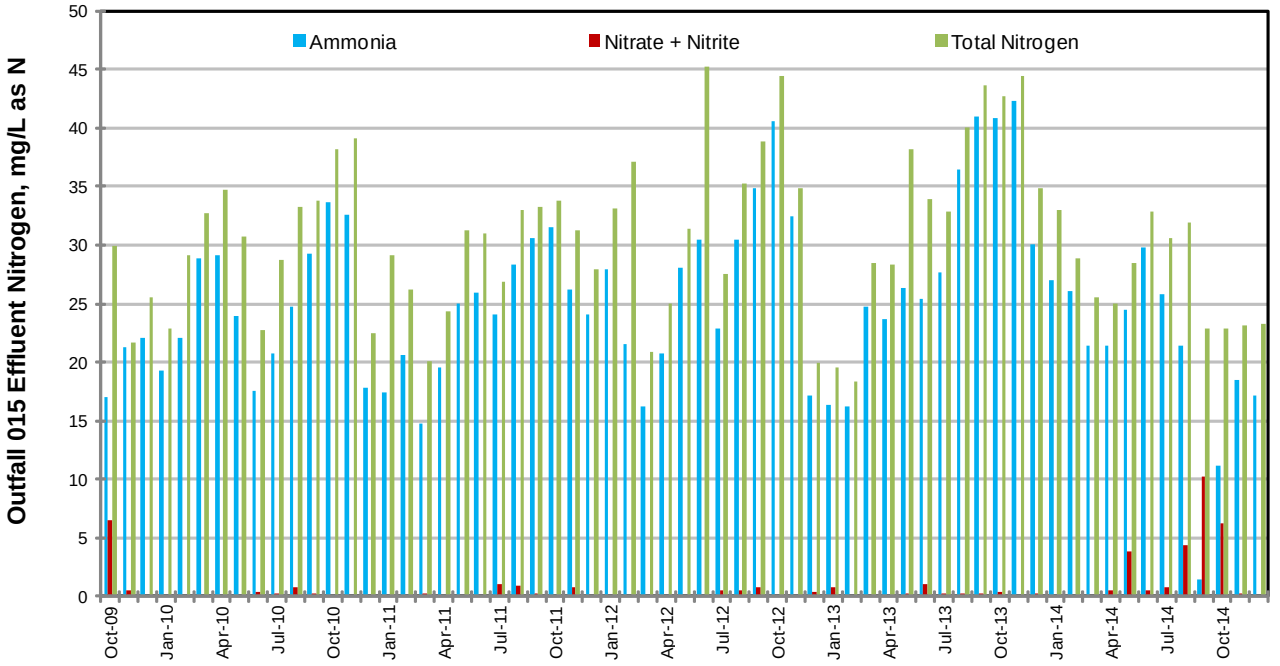
Everett WPCF
Permit #WA0024490

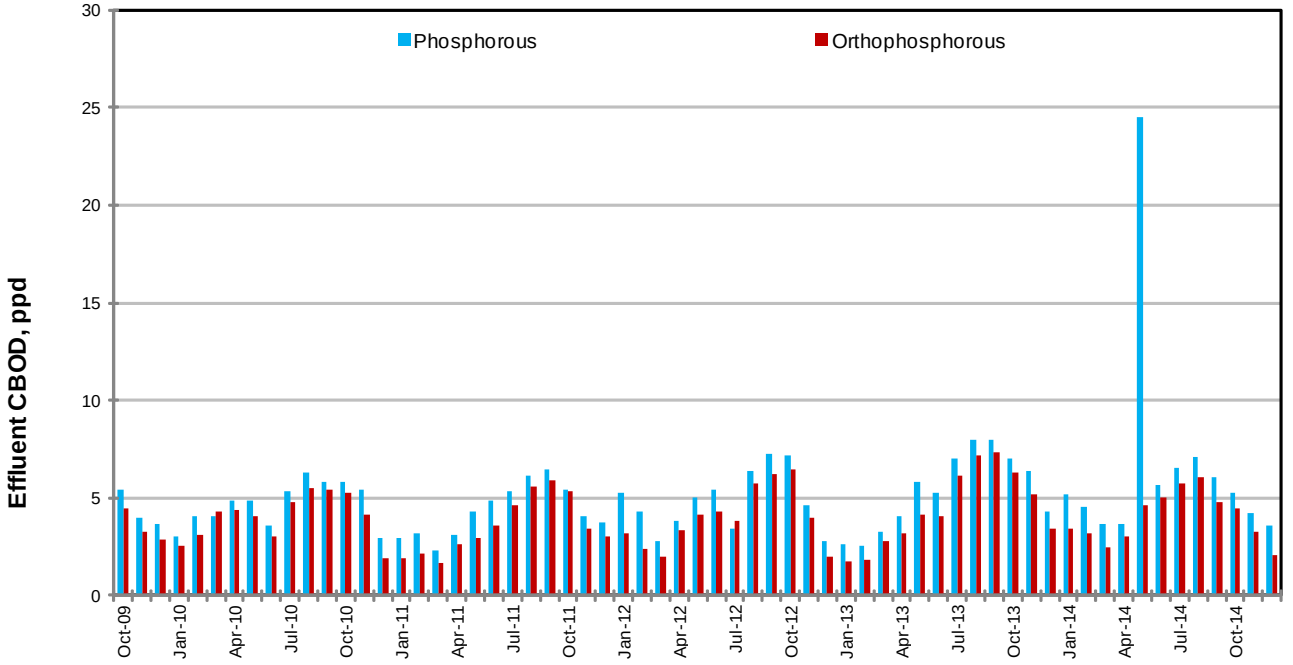




Discharge Monitoring Data, Outfall 015 Nitrogen and Phosphorous, 2009-2014

Everett WPCF
Permit #WA0024490





	Outfall 015 Monthly Average TSS Concentrations (mg/L)															
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
January	30	24	13	24	33	34	22	26	32	21	21	22	30	29	32	27
February	20	24	24	12	31	57	29	30	30	30	38	32	35	27	30	36
March	14	16	33	15	36	32	39	41	26	46	22	39	38	24	21	25
April	33	35	28	21	28	23	36	40	25	20	18	14	27	22	15	27
May	29	34	31	45	21	41	64	40	31	32	38	21	20	57	17	31
June	36	36	44	56	43	41	53	49	46	57	41	37	35	42	27	54
July	34	31	56	68	60	73	61	40	32	59	39	44	36	38	34	
August	29	26	55	30	46	26	64	59	51	46	41	29	21	19	39	
September	15	10	55	23	40	9		66	52	45	20	21	32	5	69	
October	18	25	48	21	25	25	45	54	41	45	7	13	17	4	38	
November	19	22	31	27	24	23	31	69	38	28	26	25	23	28	24	
December	20	15	28	28	23	18	33	31	25	21	30	22	21	38	33	
95th Percentile	***59***															

	Outfall 015 Monthly Average TSS percent removal (%)															
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
January	90.0	87.5	92.1	86.6	81.7		89.0	86.9	86.0	90.8	89.0	88.3	87.2	84.2	85.4	85.6
February	91.0	87.5	86.1	94.1	84.0		84.1	86.3	89.7	89.4	83.1	85.6	82.6	86.6	85.0	80.9
March	93.0	90.8	81.3	92.2	83.6		81.3	77.8	90.0	82.2	91.2	79.4	78.4	88.3	98.7	87.6
April	81.8	81.4	87.3	90.3	87.5		82.4	82.7	88.9	91.7	92.0	92.9	88.1	89.8	92.6	88.4
May	85.2	82.7	86.6	82.8	90.7	86.3	71.7	86.3	86.8	86.9	84.7	90.8	90.7	78.2	92.2	88.7
June	81.8	80.0	84.7	79.6	82.9		77.7	81.9	83.7	80.2	80.6	84.9	84.4	83.9	89.5	81.7
July	84.7	79.5	80.2	74.7	78.4	71.5	78.1	83.4	89.3	78.1	85.8	89.9	85.3	86.4	87.1	
August	88.7	91.8	81.4	89.3	83.1	91.3	78.7	82.8	84.0	82.6	86.1	90.2	92.5	93.7	85.2	
September	93.4	96.0	78.9	91.9	86.3	96.7		78.9	85.9	83.8	92.0	94.3	89.7	98.2	73.5	
October	92.0	89.1	85.5	90.9	91.3	90.1	81.0	80.4	86.1	81.6	97.5	95.7	93.3	98.6	82.4	
November	90.6	87.2	91.1	87.1		89.4	81.7	73.8	84.5	84.9	89.0	89.3	87.4	88.8	87.3	
December	89.9	89.9	87.0	86.1		93.1	80.9	87.2	89.5	90.5	84.4	91.5	85.4	85.0	80.3	
95th Percentile	***78.2***															

Outfall 015 Daily Temperature, Degrees C

Year	2009			2010											
Month/Day	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
1	15.3	10.3	8.4	6	8.6	11.1	11.4	15.1	16.6	20.8	22.7	18.9	19.5	11.1	4.9
2	15.3	10.6	7.4	6.5	8.8	12.2	10.5	14.1	16.5	22.4	23.5	19.3	19.3	12.7	5
3	15.8	10.8	6.8	6.6	8.8	11.2	9.6	13.8	17.4	22	24.5	20.3	17.8	12.2	5.2
4	16.2	11	5.7	8.1	9.5	12	10.2	14.2	17.2	19.4	24.4	20.2	18.3	13.5	5
5	15.2	10.2	5	6.8	10.6	11	10.9	13.2	18.7	20	25.9	20.1	17.7	11.8	4.6
6	15.9	9.8	4.7	7.4	10.4	11	10.5	14.3	18.5	21.8	23.8	19.1	17.9	11.7	4.5
7	15.1	8.8	4.1	6.7	9.5	10.5	9.7	15.3	18.7	24.1	21.8	18.7	16.5	12.1	5.2
8	16.1	8.5	3.8	6.6	10.2	10.6	10.2	16.1	19.4	26.2	21.5	19.3	16.5	11.5	6.6
9	15.4	8.4	4.1	7.2	10.4	9.5	11.4	17.3	19.1	26.6	20.9	18.7	16	10.5	7.3
10	15.7	11.8	3.8	7.1	9.1	9.6	11.4	16.9	19	27.3	22.7	17.8	16.1	10.7	7.7
11	14.3	9	3.8	7.6	8.7	8.5	12.3	17.9	18.9	27.3	23.3	19.5	15.9	9	7.6
12	12.2	9.8	3.9	8.3	9	8.6	12.6	18.1	20.5	24.4	24.1	18.6	15.9	10.1	8.8
13	11.9	8.3	3.6	8.7	8.6	8.7	12.3	18.3	20.3	24.7	24.7	20.7	15.8	9.2	9.4
14	11.9	7.6	3.6	8.3	9	9.5	13.4	19.3	19.7	24.9	26.4	21.1	15.1	9.9	8.6
15	12.7	7.9	3.5	8.3	10.3	10.7	14.6	19.7	20	24.1	26.3	19.9	15.3	9.7	7.9
16	13.1	8.7	3.8	8.1	9.4	10.9	15.4	20.5	19.7	24.1	26.9	20	14.8	9.5	7.4
17	13.7	9.2	4.2	8.2	10.5	11.1	15.9	21.7	18.1	23.1	26.8	19.8	14.2	8.9	6.8
18	13.9	8.3	4.9	8.7	10.3	11.3	17.6	19.8	19.5	23.7	24.9	20.8	13.1	8.1	5.8
19	13.5	8.3	5.8	8.3	9.5	12.1	18.6	20.2	18.8	23.4	23.5	20.7	13.9	8	5.5
20	13.4	8.5	6.5	8.8	10.3	12.9	16.9	17.3	17.9	23.7	23.6	19.4	13.7	7.5	4.9
21	13.3	8	6.6	8.5	10.3	12.3	15.2	17.9	18.7	24.2	22.3	19.8	13	6.6	5.1
22	13	8	6.9	8	10.2	13.7	15.4	19.5	19.8	23.7	22.6	19.6	13	5.5	5.6
23	12.5	8	6.8	7.9	8.8	13.8	15.5	16.8	22.7	24.4	21.3	18.8	13	3.7	5.4
24	12.7	8.3	6.2	7	8.7	14.3	13.9	18.3	21.9	24	21.8	17.3	12.2	2.4	5.9
25	11.4	8.9	5.7	7.6	9.3	13.1	15.6	17.7	21.6	25.7	22.5	18.7	11.2	2.5	6.4
26	11.2	9.1	5.3	8	9.1	13.1	15	17.3	21.9	24.7	21.1	18.6	10.6	2.4	6.4
27	10.7	9.1	4.6	7.8	9.8	14.4	14.9	16.5	21.9	25.8	20.4	19.7	12.1	2.8	6.1
28	9.8	8.4	4.4	7.7	10.7	12.7	15.2	15.6	21.6	25.2	20.1	19.6	11	2.7	6.2
29	9.3	8.8	3.8	7.7		11.4	15.5	14.6	21.7	25.2	19	19	12	3.7	5.7
30	10.6	8.7	4.1	8		10.9	15.6	15	21.4	24.8	19.7	19	10.8	4.3	4.7
31	10.5		4.6	8.3		11.7		16		23	19.1		11.4		3.7

Year	2011											
Month/Day	January	February	March	April	May	June	July	August	September	October	November	December
1	3.8	6.8	3.5	10.5	16.2	15.4	21.6	22.2	21.6	16.3	10.6	5.9
2	3.4	7	5	10.9	14.8	16.7	22.8	22.2	21.6	16.9	10.1	5.8
3	3.1	6.4	5.7	10.8	14.6	18.1	22.2	22.9	21.4	16.3	9.9	5.2
4	3.4	6.9	5.4	9.5	14.2	19.8	22.5	23.5	21.2	15.8	9.6	5.4
5	3.4	7.2	6.2	9	14.7	21	22.6	22.5	21.5	15.1	8	4.7
6	4.6	7.2	6.9	9.5	13.7	22.6	23.9	23.2	21.5	14.8	8.7	4.5
7	5.3	7.4	7.6	9.1	13.1	20.8	21.7	23.5	21.9	14.8	7.8	4.6
8	5.1	7.5	7.3	11	13.9	19.6	22.6	22.7	22.6	15.8	8.5	4.8
9	4.7	7.3	8.4	11.3	13.9	20.3	22.2	22.5	21.9	15.9	8.8	4.3
10	4.3	6.9	8.8	10.1	15.3	19.1	22.4	21.8	22.4	14.9	9.8	3.3
11	3.3	5.9	8.3	10.8	14.6	22.1	22.5	20.5	22.3	14.4	8.2	3.6
12	3.9	6.4	8.1	12.1	15.5	22.5	20.7	23.2	22.4	14.2	7.4	3.1
13	6.1	6.9	8	11.2	15.9	19.3	ND	22.1	21.1	14.4	7.4	2.7
14	7.6	7	8.5	9.8	16.2	18.7	ND	22.6	20.6	13.9	7.4	2.9
15	8.3	6.7	8.8	10.3	15.5	18.4	ND	22.3	18.5	13.9	7.2	3.3
16	9	6.8	8.5	9.8	14.3	20.3	ND	23	20.2	12.8	6.4	4
17	9.2	6.6	8.9	11.3	15	20.5	ND	22.9	18.2	13	6.5	3.9
18	8.8	7.4	8.4	11.2	16.8	19.5	ND	22.6	17.1	13.2	6.9	4.2
19	8.3	6.8	9.1	13	17.6	17.9	ND	22.4	18.2	13.1	5.7	4.5
20	7.7	6.6	9.3	12.4	18.5	20.2	ND	22.3	19	12.9	5.5	4.9
21	7.5	5.8	9.3	12.1	17.5	20.2	ND	23.9	18.5	12.8	5.4	4.9
22	7.8	5.3	9	18.7	17.7	19.8	ND	22.3	18.2	13.1	6.6	4.3
23	8	4.8	10	14.5	18.5	19.9	ND	22.3	20.7	13.6	6.9	4.3
24	7.8	4.4	10.5	14	19	20.8	22	22.6	21.3	13.4	6.6	4.7
25	8.3	4.2	11.2	12.9	16.5	19.7	21.4	23.6	19.9	13.2	6.5	5.1
26	8.7	2.6	10.8	13.8	16.2	21.2	21.3	24.1	18	11.9	6.6	5.1
27	8.1	2.8	11.1	12.4	15.7	20.8	21.1	24.4	17.1	11.8	6.9	6.3
28	7.9	4.3	11	11.6	16.2	21	21.4	23	17.6	10.4	7.2	7.2
29	8.1		10.1	13	18.3	20.1	21.7	22.8	17.2	11.9	6.5	7.2
30	8		9.9	13.8	17.7	20.5	22	22.2	17.4	10.7	6.4	6.8
31	7.5		10.4		17.1		23.1	22		10.7		5.7

Year	2012											
Month/Day	January	February	March	April	May	June	July	August	September	October	November	December
1	5.5	6.5	5.4	10.3	13.8	18.2	19.7	24	22.4	19.3	13.6	8.7
2	5.5	7.4	5.2	11.8	14.6	19.7	20.4	23.4	22	17.1	13.6	8.3
3	5.6	7.9	6.4	10.4	12.6	19.1	19.1	24.2	21.7	17.7	13.3	8.6
4	6.3	6.2	6.8	11.2	14.1	17.6	20.4	24.3	21.9	ND	14	9.4
5	6.3	6	6.7	11.9	14.6	16.7	20.3	25.4	22.5	15	13.9	8.2
6	5.9	5.9	6.8	11.8	15.6	18.6	22.5	26.4	22	15.3	ND	8.9
7	5.6	6.6	7.6	11.8	17.8	16.2	22.3	21.6	22.3	14.9	ND	7.4
8	6.2	6.4	8.4	13	17.8	16.4	23.7	23.3	23.2	15.8	ND	6.5
9	6.3	6.7	7.4	14.1	17.2	17.4	23.4	23.6	21.2	14.4	ND	5.9
10	6.4	7.9	7.6	16.2	16.8	20.2	23.4	23.9	20.9	13.8	ND	6
11	5.3	7.7	7.9	14.4	17.3	21.3	23.6	24.1	19.9	13.5	ND	5.9
12	4.4	7.9	6.1	15	18.2	20.8	24	25.1	20.4	12.6	ND	6.2
13	3.8	7.8	6.9	14.7	19.8	19	24.4	24.7	19	13	ND	6.7
14	3.3	7.6	6.4	16	20.7	18.5	24.5	26.6	19.5	13.3	8.7	6.3
15	2.7	7.6	7.6	16.7	21.3	19.7	23.2	25.3	20	13.7	8.8	5.3
16	2.4	6.7	8.4	15.1	21.2	19.4	23.3	25.2	19.7	13.5	7.4	5.4
17	2.1	7.1	8.6	13.6	20.7	18.4	24	25.7	20.3	14	7.6	6
18	1.6	6.4	8.5	14.4	20.5	17.9	22.4	25.5	20.5	13.8	7.2	5.3
19	0.6	6.3	8.2	13.6	20.9	18.8	23.6	21.8	20.7	13.4	8.1	5
20	1.1	6.3	8.6	14.2	19.4	19.3	22.3	23.8	19.9	12.8	8.3	5.1
21	2.3	7.1	9.4	15	18.1	19.9	22.2	23.7	18.6	12.1	8.2	4.9
22	2.8	7.8	8.3	17.3	16.5	19.3	22.1	23.4	19.2	11	7.8	4.7
23	3.4	7.6	10.9	16.3	15.8	18.4	21	23	19.2	10.8	7.7	5.1
24	3.8	6.7	10.4	16.6	17.2	19.3	ND	22.3	18.9	10.8	8.3	5.1
25	4.2	6.6	11	15.9	18.9	19.4	ND	22.1	18.5	11.3	7.5	5
26	4.8	6.9	11	14.9	19.8	18.1	23.3	22.8	17.9	10.3	7.1	5
27	4.9	7.1	11.4	14.8	19.4	19.7	22.6	22.6	17.4	10.7	6.7	5.4
28	4.1	5.9	11.5	16.4	18.5	21.8	23.6	22.5	18	11.4	6.1	5.7
29	5.1	5.1	10.5	16.3	18.8	20.3	24.4	21.6	18.2	12.6	6.4	5.4
30	5.3		11	15	18.8	20.2	23	22.4	17.6	12.8	7.4	5.3
31	6		10.3		18.6		20	22		13.1		5

Summary of Daily Data, 2009-2014	
Days Sampled	1873
Average	13.8
Minimum	0.6
Maximum	28.8
95th Percentile	24.4
95th Percentile of data for each month	
January	8.4
February	10.3
March	13.3
April	17.5
May	21.3
June	22.6
July	27.3
August	26.1
September	22.5
October	18.0
November	13.0
December	8.6
July through September	26.3

Year	2013											
Month/Day	January	February	March	April	May	June	July	August	September	October	November	December
1	4.5	7.3	8.1	15.8	17.8	18.3	27.4	21.1	23.3	13.1	11.3	6.3
2	3.1	7.3	8.8	14.3	18	18.9	26.7	20.3	23.5	12.8	11.2	5.9
3	3.5	7	8.7	15.3	18.8	20.1	25.4	22.4	22.5	13.9	9.4	5.3
4	3.7	7.4	8.2	14.9	19.8	20.6	25.3	22.4	21.7	14.6	9.3	4.4
5	3.9	7.5	8	16.1	21.6	21.1	24.4	23.3	21.5	15	9.1	3.4
6	4.6	7.2	7.8	15	21.4	21.5	24.6	23.8	21.4	16.1	9.3	2.2
7	6	7.1	7.6	13.8	21.2	21.4	24.6	25.6	21.3	14.5	9.6	1.7
8	6.1	6.5	10.3	14.7	20.4	20.5	26.2	26.1	21.8	14.4	10.7	1.9
9	6	6	9.3	13.8	20	20.2	26	24.6	21.9	14.6	10	1.8
10	5.8	6.9	9.7	13.7	21.2	20.2	25.7	26	22.5	14.1	9.8	2.1
11	4.9	6.3	10.5	14.3	23.1	19.5	24.6	24.9	22.7	14.1	9.8	2.4
12	4.2	6.5	9.9	13.4	20.6	18.6	22.5	25.5	23.8	14.4	10.1	2.4
13	3.1	7	10.3	12.5	19.8	19.1	22.9	25.2	22	13.8	10.8	3
14	2.9	7.2	10.5	13.5	19.3	19.1	23.7	24.9	21.5	13.6	10.4	2.8
15	3.3	8.2	11.4	14.3	19.6	19.7	23.3	23.3	20.5	13.6	10	3.1
16	3	7.6	10.8	15.7	19.9	20.6	23.9	24.5	19.4	13.1	9.3	3.4
17	2.7	7.1	10.3	16.3	19	21.3	22.5	24	18.8	13.2	9	3.7
18	2.5	7	9.8	14.7	17.8	21.7	24	24.9	20.7	13.1	9.3	3.8
19	2.5	7.7	10	14.3	18.4	22.9	24.4	25.8	22.1	12.5	9.4	3.1
20	2.6	6.8	10	15.5	18.9	20.3	23.8	24.5	20.9	12.2	8.2	2.2
21	2.6	6.3	9.6	14.9	17.6	21	24	24.5	20.2	12	6.5	2.7
22	2.5	6	9.5	15.7	16	21.5	24.3	24.9	18.2	12.4	5.5	3.7
23	2.7	5.9	10.4	16	16.2	22.1	24.8	23.2	16.8	12.3	5	4.9
24	3.3	5.8	10.6	17.4	17	20.9	26.1	23.6	17.9	12	5.1	4.7
25	4.1	6.4	10.8	19	16.7	21.6	24.2	22.8	16.3	12.1	4.6	4.5
26	4.1	5.9	11.7	19.6	17.2	21.2	24.8	22.7	17.4	12.1	4.6	4.4
27	4.4	6.6	11.8	18.6	16.6	21.3	24.2	22.4	15.3	12.4	5.8	3.9
28	4.7	7.1	13.9	17.7	16.2	21.9	23.4	23.8	14.8	12.4	4.8	4.9
29	5.3		14.5	17	16.1	23.3	24.1	22.6	13.9	11.6	4.9	4.5
30	5.9		14.7	17.3	16.5	25.5	24.4	23.2	13.3	10.8	5.9	4.5
31	6.5		15.9		17.3		23.7	23		10.8		5.1

Year	2014											
Month/Day	January	February	March	April	May	June	July	August	September	October	November	December
1	5.1	5.9	7.9	12.7	20.1	21	23.7	25.1	ND	18.2	13.1	4.9
2	5.1	5.6	6.3	13.2	20.4	21.8	25.7	24.7	ND	17.8	12.6	4.2
3	5.3	5.4	7.7	11.6	18.3	21.2	23.7	25.4	ND	17.7	12.7	3.3
4	4.9	4.7	7.6	12.2	16.6	21.3	24.6	26.4	ND	17.9	12.9	3.7
5	4.4	2.8	9	10.7	16.5	21.6	23.9	26	ND	18	12.9	4.4
6	3.6	1.6	9.6	13.5	16.3	22.1	26.7	26.8	ND	19	13.2	5.5
7	4	1.8	10	14.4	18.3	21.8	22.1	26.3	ND	18.5	13.1	6.2
8	4.6	1.8	9.5	14.1	17.7	22.3	25.3	25.8	ND	18.6	12.7	7.1
9	4.9	2	10.1	13.7	16.3	22.1	25.2	25.6	ND	18.8	12	8.1
10	5.7	2.2	10.7	14.5	16.5	21.4	25.7	25.3	ND	17.6	12.2	9
11	6	3.3	11.9	14.8	17.4	21	26.5	26.4	ND	17.6	10.6	9.1
12	6	4.6	12	14.5	20.2	21.2	27.5	25.4	ND	17.6	7.9	9
13	6.6	5.8	13	14.9	20.5	19.5	27.1	24.2	ND	17.2	5.9	9
14	7	6.8	11.9	15.5	21.8	18.5	28.8	23.3	ND	16.6	5	8.4
15	7.1	6.5	11.2	16.2	22.7	17.5	27.7	22.9	ND	15.9	4.3	7.3
16	6.6	6.5	10.8	13.8	21.1	19.1	28.3	23.7	21.4	17	3.8	7.2
17	6.3	6.4	10.5	13	20.5	19.3	27.9	23.7	21.1	16	3.8	6.9
18	6	6.3	10.3	14.2	21.9	18.3	25.4	24.6	20	16.7	3.8	6.9
19	5.6	6.7	9.7	12.3	22.4	20.5	25.2	26.2	21	17.4	4	7.4
20	5.8	6.7	9.8	13.2	21.2	21.1	24.2	24.5	21.3	17	5	7.7
21	5.5	6.7	10.5	13.3	20.7	21.2	25.6	24	21.1	16.2	5.7	8.1
22	5.2	6.1	10.4	14	21.1	22	23.9	24.7	20.6	15.3	6.3	7.9
23	5.3	5.8	10.6	12.7	9.6	22.2	22.6	23.5	19.8	14.6	7.6	7.5
24	5.2	5.8	12.2	13.2	20.3	22.5	19.9	ND	19.1	14.5	7.1	7.3
25	5.5	6.7	11.9	13.7	19.8	22.7	21.9	ND	19.4	16.1	7.6	7.4
26	4.5	7.5	11.1	14.6	19	22.6	23.2	ND	18.5	13.7	8.8	7.2
27	4.6	8.2	11.1	13.7	19.9	22.1	23.8	ND	19.2	13.6	10.1	6.9
28	4.9	8.8	10.6	14.9	21.1	20.8	24.8	ND	18.3	13.2	10.1	6.7
29	5.3		10.5	17	19.1	21.6	25.3	ND	17.3	13.9	8.5	6.3
30	5.6		10.5	18.1	19.2	22.6	25.9	ND	17.4	13.4	6.2	6
31	5.9		11.3		20		26.2	ND		13.5		4.3

Outfall 015 Acute WET Test Results as NOEC/LOEC in Percent Effluent

Collected	Start Date	Organism	Station	Endpoint	NOEC	LOEC	PMSD
1/14/2014	1/14/2014	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	14.8%
10/22/2013	10/23/2013	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	50	100	5.0%
7/10/2013	7/10/2013	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	5.6%
4/2/2013	4/2/2013	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100	> 100	9.2%
1/14/2013	1/15/2013	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	5.6%
10/2/2012	10/2/2012	*Ceriodaphnia dubia*	FEN (Lagoon)	48-hour Survival	25	50	26.1%
7/9/2012	7/9/2012	fathead minnow	FEN (Lagoon)	96-hour Survival	50	100	9.6%
4/3/2012	4/3/2012	*Ceriodaphnia dubia*	FEN (Lagoon)	48-hour Survival	100	> 100	12.9%
1/10/2012	1/11/2012	fathead minnow	FEN (Lagoon)	96-hour Survival	50	100	6.4%
10/26/2011	10/26/2011	*Ceriodaphnia dubia*	FEN (Lagoon)	48-hour Survival	100	> 100	10.9%
7/12/2011	7/13/2011	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	4.6%
4/5/2011	4/5/2011	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100	> 100	9.2%
1/11/2011	1/11/2011	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	8.4%
10/13/2010	10/13/2010	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	50	100	16.9%
7/7/2010	7/7/2010	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	9.0%
4/6/2010	4/7/2010	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100	> 100	5.0%
1/5/2010	1/5/2010	fathead minnow	FEN (Lagoon)	96-hour Survival	100	> 100	8.1%
10/21/2009	10/21/2009	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100	> 100	5.0%

Outfall 015 ACEC: 15.6%

Outfall 100 Acute WET Test Results as NOEC/LOEC in Percent Effluent

Collected	Start Date	Organism	Station	Endpoint	NOEC	LOEC	PMSD
1/14/2014	1/14/2014	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	9.9%
10/22/2013	10/23/2013	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100	> 100	32.4%
7/10/2013	7/10/2013	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	16.3%
4/2/2013	4/2/2013	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100	> 100	5.0%
1/14/2013	1/15/2013	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	6.3%
10/2/2012	10/2/2012	*Ceriodaphnia dubia*	SCE (Port Gardner)	48-hour Survival	30	100	16.9%
7/9/2012	7/9/2012	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	8.9%
4/3/2012	4/3/2012	*Ceriodaphnia dubia*	SCE (Port Gardner)	48-hour Survival	100	> 100	16.1%
1/10/2012	1/11/2012	fathead minnow	SCE (Port Gardner)	96-hour Survival	30	100	6.3%
10/26/2011	10/26/2011	*Ceriodaphnia dubia*	SCE (Port Gardner)	48-hour Survival	100	> 100	5.0%
7/12/2011	7/13/2011	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	5.6%
4/5/2011	4/5/2011	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100	> 100	5.0%
1/11/2011	1/11/2011	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	7.2%
10/13/2010	10/13/2010	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100	> 100	5.0%
7/7/2010	7/7/2010	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	7.5%
4/6/2010	4/7/2010	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100	> 100	9.2%
1/5/2010	1/5/2010	fathead minnow	SCE (Port Gardner)	96-hour Survival	100	> 100	4.6%
10/21/2009	10/21/2009	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100	> 100	5.0%

Outfall 100 ACEC: 0.64%
Outfall 025 ACEC: 13.7%

NOEC = Concentration at which testing showed no observable effects

LOEC = Lowest concentration at which test showed an observable effect

PMSD = Percent minimum significant difference calculated for all tests in sampling event

Outfall 015 Acute WET Test Results as % Survival in 100% Effluent

Collected	Start Date	Organism	Station	Endpoint	% Survival
1/14/2014	1/14/2014	fathead minnow	FEN (Lagoon)	96-hour Survival	95.0%
10/22/2013	10/23/2013	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	**0.0%**
7/10/2013	7/10/2013	fathead minnow	FEN (Lagoon)	96-hour Survival	100.0%
4/2/2013	4/2/2013	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100.0%
1/14/2013	1/15/2013	fathead minnow	FEN (Lagoon)	96-hour Survival	100.0%
10/2/2012	10/2/2012	*Ceriodaphnia dubia*	FEN (Lagoon)	48-hour Survival	**0.0%**
7/9/2012	7/9/2012	fathead minnow	FEN (Lagoon)	96-hour Survival	**5.0%**
4/3/2012	4/3/2012	*Ceriodaphnia dubia*	FEN (Lagoon)	48-hour Survival	100.0%
1/10/2012	1/11/2012	fathead minnow	FEN (Lagoon)	96-hour Survival	**0.0%**
10/26/2011	10/26/2011	*Ceriodaphnia dubia*	FEN (Lagoon)	48-hour Survival	100.0%
7/12/2011	7/13/2011	fathead minnow	FEN (Lagoon)	96-hour Survival	100.0%
4/5/2011	4/5/2011	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	95.0%
1/11/2011	1/11/2011	fathead minnow	FEN (Lagoon)	96-hour Survival	95.0%
10/13/2010	10/13/2010	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	**30.0%**
7/7/2010	7/7/2010	fathead minnow	FEN (Lagoon)	96-hour Survival	97.5%
4/6/2010	4/7/2010	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100.0%
1/5/2010	1/5/2010	fathead minnow	FEN (Lagoon)	96-hour Survival	97.5%
10/21/2009	10/21/2009	*Daphnia pulex*	FEN (Lagoon)	48-hour Survival	100.0%

Median	**98%**

Outfall 100 Acute WET Test Results as % Survival in 100% Effluent

Collected	Start Date	Organism	Station	Endpoint	% Survival
1/14/2014	1/14/2014	fathead minnow	SCE (Port Gardner)	96-hour Survival	100.0%
10/22/2013	10/23/2013	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	**60.0%**
7/10/2013	7/10/2013	fathead minnow	SCE (Port Gardner)	96-hour Survival	90.0%
4/2/2013	4/2/2013	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100.0%
1/14/2013	1/15/2013	fathead minnow	SCE (Port Gardner)	96-hour Survival	100.0%
10/2/2012	10/2/2012	*Ceriodaphnia dubia*	SCE (Port Gardner)	48-hour Survival	**10.0%**
7/9/2012	7/9/2012	fathead minnow	SCE (Port Gardner)	96-hour Survival	97.5%
4/3/2012	4/3/2012	*Ceriodaphnia dubia*	SCE (Port Gardner)	48-hour Survival	100.0%
1/10/2012	1/11/2012	fathead minnow	SCE (Port Gardner)	96-hour Survival	**15.0%**
10/26/2011	10/26/2011	*Ceriodaphnia dubia*	SCE (Port Gardner)	48-hour Survival	100.0%
7/12/2011	7/13/2011	fathead minnow	SCE (Port Gardner)	96-hour Survival	100.0%
4/5/2011	4/5/2011	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100.0%
1/11/2011	1/11/2011	fathead minnow	SCE (Port Gardner)	96-hour Survival	92.5%
10/13/2010	10/13/2010	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100.0%
7/7/2010	7/7/2010	fathead minnow	SCE (Port Gardner)	96-hour Survival	100.0%
4/6/2010	4/7/2010	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100.0%
1/5/2010	1/5/2010	fathead minnow	SCE (Port Gardner)	96-hour Survival	100.0%
10/21/2009	10/21/2009	*Daphnia pulex*	SCE (Port Gardner)	48-hour Survival	100.0%

Median	**100%**

The effluent demonstrates reasonable potential for Acute Toxicity when median survival in 100% effluent is less than 80% for a series of tests or if any single test results in less than 65% survival. WAC 173-205-050

Outfall 015 Chronic WET Test Results as NOEC/LOEC in Percent Effluent

Collected	Start Date	Organism	Station	Endpoint	NOEC	LOEC	PMSD
1/14/2013	1/15/2013	topsmelt	FEN (Lagoon)	7-day Survival	100	> 100	12.8%
				Biomass	50	100	14.4%
				Weight	50	100	11.8%
1/14/2013	1/15/2013	Atlantic mysid	FEN (Lagoon)	7-day Survival	50	100	11.0%
				Biomass	15.6	25	10.3%
				Weight	15.6	25	8.4%
7/9/2012	7/9/2012	topsmelt	FEN (Lagoon)	7-day Survival	25	50	17.0%
				Biomass	50	100	23.5%
				Weight	50	> 50	35.1%
7/9/2012	7/9/2012	Atlantic mysid	FEN (Lagoon)	7-day Survival	100	> 100	12.7%
				Biomass	15.6	25	15.3%
				Weight	15.6	25	16.3%

Outfall 100 Chronic WET Test Results as NOEC/LOEC in Percent Effluent

Collected	Start Date	Organism	Station	Endpoint	NOEC	LOEC	PMSD
1/14/2013	1/15/2013	topsmelt	SCE (Port Gardner)	7-day Survival	100	> 100	9.0%
				Biomass	10	100	12.7%
				Weight	10	100	11.7%
1/14/2013	1/15/2013	Atlantic mysid	SCE (Port Gardner)	7-day Survival	100	> 100	13.6%
				Biomass	10	100	12.4%
				Weight	10	100	7.9%
7/9/2012	7/9/2012	topsmelt	SCE (Port Gardner)	7-day Survival	100	> 100	22.4%
				Biomass	100	> 100	24.8%
				Weight	100	> 100	25.1%
7/9/2012	7/9/2012	Atlantic mysid	SCE (Port Gardner)	7-day Survival	100	> 100	12.8%
				Biomass	30	100	12.1%
				Weight	30	100	12.5%

NOEC = Concentration at which testing showed no observable effects

LOEC = Lowest concentration at which test showed an observable effect

PMSD = Percent minimum significant difference calculated for all tests in sampling event

Appendix F – Technical Calculations

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found in the PermitCalc workbook on Ecology's webpage at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html.

Simple Mixing:

Ecology uses simple mixing calculations to assess the impacts of certain conservative pollutants, such as the expected increase in fecal coliform bacteria at the edge of the chronic mixing zone boundary. Simple mixing uses a mass balance approach to proportionally distribute a pollutant load from a discharge into the authorized mixing zone. The approach assumes no decay or generation of the pollutant of concern within the mixing zone. The predicted concentration at the edge of a mixing zone (C_{mz}) is based on the following calculation:

$$C_{mz} = Ca + \frac{(Ce - Ca)}{DF}$$

where: Ce = Effluent Concentration
Ca = Ambient Concentration
DF = Dilution Factor

The following tables summarize the simple mixing analysis for fecal coliform discharged from each outfall.

Outfall 015

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	14.2
Receiving Water Fecal Coliform, #/100 ml	35
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*200*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**61**
Difference between mixed and ambient, #/100 ml	26

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.

Outfall 025

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	15.6
Receiving Water Fecal Coliform, #/100 ml	35
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*200*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**58**
Difference between mixed and ambient, #/100 ml	23

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.

Outfall 100

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	696.0
Receiving Water Fecal Coliform, #/100 ml	1
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*14*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**2**
Difference between mixed and ambient, #/100 ml	0.57

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.

Reasonable Potential Analysis:

The spreadsheets Input 2 – Reasonable Potential, and LimitCalc in Ecology's PermitCalc Workbook determine reasonable potential (to violate the aquatic life and human health water quality standards) and calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets are taken directly from the *Technical Support Document for Water Quality-based Toxics Control*, (EPA 505/2-90-001). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b).

Ammonia Criteria Calculation

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature, pH, and salinity of the receiving marine water. To evaluate ammonia toxicity, Ecology uses available ambient data for the critical season. Ecology calculates water quality criteria for the unionized form of ammonia in saltwater using the method specified in EPA 440/5-88-004 (Ambient Water Quality Criteria for Ammonia (Saltwater)-1989).

Marine Un-ionized Ammonia Criteria Calculation

Calculation of seaw ater fraction of un-ionized ammonia from Hampson (1977). Un-ionized ammonia criteria for salt w ater are from EPA 440/5-88-004. Revised 19-Oct-93.

Snohomish River Estuary (outfalls 015 and 025)

INPUT	
1. Receiving Water Temperature, deg C (90th percentile):	16.7
2. Receiving Water pH, (90th percentile):	7.6
3. Receiving Water Salinity, g/kg (10th percentile):	8.0
4. Pressure, atm (EPA criteria assumes 1 atm):	1.0
5. Unionized ammonia criteria (mg un-ionized NH_3 per liter) from EPA 440/5-88-004:	
Acute:	0.233
Chronic:	0.035
OUTPUT	
Using mixed temp and pH at mixing zone boundaries?	No
1. Molal Ionic Strength (not valid if >0.85):	0.161
2. pKa8 at 25 deg C (Whitfield model "B"):	9.264
3. Percent of Total Ammonia Present as Unionized:	1.2%
4. Total Ammonia Criteria (mg/L as NH_3):	
Acute:	19.97
Chronic:	3.00
RESULTS	
Total Ammonia Criteria (mg/L as N)	
Acute:	**16.42**
Chronic:	**2.47**

Marine Un-ionized Ammonia Criteria Calculation

Calculation of seaw ater fraction of un-ionized ammonia from Hampson (1977). Un-ionized ammonia criteria for salt w ater are from EPA 440/5-88-004. Revised 19-Oct-93.

Port Gardner Bay (Outfall 100)

INPUT	
1. Receiving Water Temperature, deg C (90th percentile):	10.0
2. Receiving Water pH, (90th percentile):	7.7
3. Receiving Water Salinity, g/kg (10th percentile):	29.3
4. Pressure, atm (EPA criteria assumes 1 atm):	1.0
5. Unionized ammonia criteria (mg un-ionized NH_3 per liter) from EPA 440/5-88-004:	
Acute:	0.233
Chronic:	0.035
OUTPUT	
Using mixed temp and pH at mixing zone boundaries?	No
1. Molal Ionic Strength (not valid if >0.85):	0.602
2. pKa8 at 25 deg C (Whitfield model "B"):	9.315
3. Percent of Total Ammonia Present as Unionized:	0.9%
4. Total Ammonia Criteria (mg/L as NH_3):	
Acute:	26.82
Chronic:	4.03
RESULTS	
Total Ammonia Criteria (mg/L as N)	
Acute:	**22.06**
Chronic:	**3.31**

Calculation of Water Quality-based Effluent Limits:

Water quality-based effluent limits are calculated by the two-value waste load allocation process as described on page 100 of the TSD (EPA, 1991) and shown below.

1. Calculate the acute waste load allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic waste load allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

WLA_a = (acute criteria x DF_a) – [(background conc. x (DF_a - 1)]

WLA_c = (chronic criteria x DF_c) – [(background conc. x (DF_c -1)]

where: DF_a = Acute Dilution Factor

DF_c = Chronic Dilution Factor

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the waste load allocations WLA_a and WLA_c.

$LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$

where: $\sigma^2 = \ln[CV^2 + 1]$

$z = 2.326$

CV = coefficient of variation = std. dev/mean

$LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$

where: $\sigma^2 = \ln[(CV^2 \div 4) + 1]$

$z = 2.326$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit and the monthly average effluent limit.

MDL = Maximum Daily Limit

$MDL = LTA \times e^{(Z\sigma - 0.5\sigma^2)}$

where: $\sigma^2 = \ln[CV^2 + 1]$

$z = 2.326$ (99th percentile occurrence)

LTA = Limiting long term average

AML = Average Monthly Limit

$AML = LTA \times e^{(Z\sigma_n - 0.5\sigma_n^2)}$

where: $\sigma^2 = \ln[(CV^2 \div n) + 1]$

n = number of samples/month

$z = 1.645$ (95^{th} % occurrence probability)

LTA = Limiting long term average

The following tables present the results of the reasonable potential analysis conducted by Ecology to determine the need for water quality-based limits for toxic pollutants discharged from each outfall. The tables also present the calculated limits for each pollutant if one is needed.

Reasonable Potential Calculation

Facility	Everett WPCF, Outfall 015
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	6.4	14.2
Human Health Carcinogenic		14.2
Human Health Non-Carcinogenic		14.2

Pollutant, CAS No. & NPDES Application Ref. No.			AMMONIA, Criteria as Total NH3	ANTIMONY (INORGANIC) 7440360 1M	ARSENIC (dissolved) 7440382 2M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CADMIUM - 7440439 4M Hardness dependent	CHLORINE (Total Residual) 7782505	CHLOROFORM 67663 11V	CHROMIUM(HEX) 18540299	COPPER - 7440508 6M Hardness dependent	CYANIDE 57125 14M	LEAD - 7439921 7M Dependent on hardness
Effluent Data	# of Samples (n)		63	18	70	5	71	365	4	71	70	19	71
	Coeff of Variation (Cv)		0.3	0.265	0.335	0.6	0.6	0.1	0.6	0.421	0.401	0.6	0.62
	Effluent Concentration, ug/L (Max. or 95th Percentile)		40,200		2.81	25	0.2	74	0.5	2.28	12.8	0.005	5.8
	Calculated 50th percentile Effluent Conc. (when n>10)			0.7								0.005	
Receiving Water Data	90th Percentile Conc., ug/L		19		0		0	0		0	0.639	0	0.191
	Geo Mean, ug/L			0		0			0			0	
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	16,421	-	69	-	42	13	-	1100	4.8	1	210
		Chronic	2,467	-	36	-	9.3	7.5	-	50	3.1	1	8.1
	WQ Criteria for Protection of Human Health, ug/L		-	4300	-	5.9	-	-	470	-	-	220000	-
	Metal Criteria Translator, decimal	Acute	-	-	1	-	0.994	-	-	0.993	0.83	-	0.951
		Chronic	-	-	-	-	0.994	-	-	0.993	0.83	-	0.951
	Carcinogen?		N	N	Y	Y	N	N	Y	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value			0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
s	$s^2=\ln(CV^2+1)$		0.294	0.326	0.555	0.100	0.404	0.386	0.555	0.570	
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.954	0.958	0.959	0.992	0.959	0.958	0.854	0.959	
Multiplier			1.00	1.00	1.00	1.00	1.00	1.00	1.39	1.00	
Max concentration (ug/L) at edge of…		Acute	6,297	0.439	0.031	11.563	0.354	2.199	0.001	1.023	
		Chronic	2,849	0.198	0.014	5.211	0.159	1.342	0.000	0.566	
Reasonable Potential? Limit Required?			**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month			4					30			
LTA Coeff. Var. (CV), decimal			0.3					0.1			
Permit Limit Coeff. Var. (CV), decimal			0.3					0.1			
Waste Load Allocations, ug/L		Acute	104993					83.2			
		Chronic	34776					106.5			
Long Term Averages, ug/L		Acute	55377					66.301			
		Chronic	24856					94.932			
Limiting LTA, ug/L			24856					66.301			
Metal Translator or 1?			1.00					1.00			
Average Monthly Limit (AML), ug/L			**31417**					**68.3**			
Maximum Daily Limit (MDL), ug/L			**47127**					**83.2**			

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.2605	0.5545	0.5545	0.5545
Pn	Pn=(1-confidence level)1/n	0.847	0.549	0.473	0.854
Multiplier		0.7662	0.9336	1.0385	0.5573
Dilution Factor		14.2	14.2	14.2	14.2
Max Conc. at edge of Chronic Zone, ug/L		0.0493	1.6437	3.7E-02	0.0004
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**

Comments/Notes:

References: WAC 173-201A,
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation - Page 2

Facility	Everett WPCF, Outfall 015
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	6.4	14.2
Human Health Carcinogenic		14.2
Human Health Non-Carcinogenic		14.2

Pollutant, CAS No. & NPDES Application Ref. No.		MANGANESE 7439965	MERCURY 7439976 8M	NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	SILVER - 7740224 11M dependent on hardness.	TOLUENE 108883 25V	ZINC- 7440666 13M hardness dependent				
Effluent Data	# of Samples (n)	17	18	70	18	71	4	70				
	Coeff of Variation (Cv)	0.16	0.167	0.22	0.6	0.198	0.6	0.38	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		0.0363	3.955		0.8	0.6	27.6				
	Calculated 50th percentile Effluent Conc. (when n>10)	111	0.013	2.8	0.036							
Receiving Water Data	90th Percentile Conc., ug/L		0.0022	0.54		0		5.45				
	Geo Mean, ug/L	0	0.002	0.36	0		0					
Water Quality Criteria	Aquatic Life Criteria, ug/L Acute	-	1.8	74	-	1.9	-	90				
	Aquatic Life Criteria, ug/L Chronic	-	0.025	8.2	-	-	-	81				
	WQ Criteria for Protection of Human Health, ug/L	100	0.15	4600	5E+06	-	200000	-				
	Metal Criteria Translator, decimal Acute	-	0.85	0.99	-	0.85	-	0.946				
	Metal Criteria Translator, decimal Chronic	-	-	0.99	-	-	-	0.946				
	Carcinogen?	N	N	N	N	N	N	N				

Aquatic Life Reasonable Potential

Effluent percentile value			0.950	0.950		0.950		0.950				
s	$s^2=\ln(CV^2+1)$		0.166	0.217		0.196		0.367				
Pn	$Pn=(1-\text{confidence level})^{1/n}$		0.847	0.958		0.959		0.958				
Multiplier			1.11	1.00		1.00		1.00				
Max concentration (ug/L) at edge of…	Acute		0.007	1.067		0.106		8.678				
	Chronic		0.005	0.778		0.056		6.905				
Reasonable Potential? Limit Required?			**NO**	**NO**		**NO**		**NO**				

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month												
LTA Coeff. Var. (CV), decimal												
Permit Limit Coeff. Var. (CV), decimal												
Waste Load Allocations, ug/L	Acute											
	Chronic											
Long Term Averages, ug/L	Acute											
	Chronic											
Limiting LTA, ug/L												
Metal Translator or 1?												
Average Monthly Limit (AML), ug/L												
Maximum Daily Limit (MDL), ug/L												

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.159	0.1659	0.2174	0.5545	0.5545	
Pn	$Pn=(1-\text{confidence level})1/n$	0.838	0.847	0.958	0.847	0.473	
Multiplier		0.8546	0.844	0.6867	0.5673	1.0385	
Dilution Factor		14.2	14.2	14.2	14.2	14.2	
Max Conc. at edge of Chronic Zone, ug/L		7.8169	0.0028	0.5318	0.0025	4.4E-02	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**	

Comments/Notes:

References: WAC 173-201A,
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation

Facility	Everett WPCF, Outfall 025
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	7.3	15.6
Human Health Carcinogenic		15.6
Human Health Non-Carcinogenic		15.6

Pollutant, CAS No. & NPDES Application Ref. No.			AMMONIA, Criteria as Total NH3	ANTIMONY (INORGANIC) 7440360 1M	ARSENIC (dissolved) 7440382 2M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CHLORDANE 57749 6P	CHROMIUM(HEX) 18540299	COPPER - 7440508 6M Hardness dependent	CYANIDE 57125 14M	LEAD - 7439921 7M Dependent on hardness	MANGANESE 7439965	MERCURY 7439976 8M
Effluent Data	# of Samples (n)		63	18	69	5	3	70	69	18	70	17	17
	Coeff of Variation (Cv)		0.4	0.114	0.136	0.6	0.6	0.261	0.28	0.192	0.244	0.447	0.824
	Effluent Concentration, ug/L (Max. or 95th Percentile)		29,400		1.4	38	0.11	1.165	9.86	0.007	1.2		0.0479
	Calculated 50th percentile Effluent Conc. (when n>10)			0.7						0.006		75.2	0.0085
Receiving Water Data	90th Percentile Conc., ug/L		19		0		0	0	0.639	0	0.191		0.0022
	Geo Mean, ug/L			0		0	0			0		0	0.002
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	16,421	-	69	-	0.09	1100	4.8	1	210	-	1.8
		Chronic	2,467	-	36	-	0.004	50	3.1	1	8.1	-	0.025
	WQ Criteria for Protection of Human Health, ug/L		-	4300	-	5.9	0.0006	-	-	220000	-	100	0.15
	Metal Criteria Translator, decimal	Acute	-	-	1	-	-	0.993	0.83	-	0.951	-	0.85
		Chronic	-	-	-	-	-	0.993	0.83	-	0.951	-	-
	Carcinogen?		N	N	Y	Y	Y	N	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950	0.950		0.950
s	$s^2=\ln(CV^2+1)$	0.385	0.135	0.555	0.257	0.275	0.190	0.240		0.720
Pn	Pn=(1-confidence level)$^{1/n}$	0.954	0.958	0.368	0.958	0.958	0.847	0.958		0.838
Multiplier		1.00	1.00	3.00	1.00	1.00	1.13	1.00		1.60
Max concentration (ug/L) at edge of…	Acute	4,044	0.192	0.045	0.158	1.673	0.001	0.321		0.011
	Chronic	1,902	0.090	0.021	0.074	1.123	0.001	0.252		0.007
Reasonable Potential? Limit Required?		**NO**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**		**NO**

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month		4
LTA Coeff. Var. (CV), decimal		0.6
Permit Limit Coeff. Var. (CV), decimal		0.6
Waste Load Allocations, ug/L	Acute	0.657
	Chronic	0.0624
Long Term Averages, ug/L	Acute	0.211
	Chronic	0.0329
Limiting LTA, ug/L		0.0329
Metal Translator or 1?		1.00
Average Monthly Limit (AML), ug/L		**0.1**
Maximum Daily Limit (MDL), ug/L		**0.1**

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.1136	0.5545	0.5545	0.1903	0.4268	0.7199	
Pn	Pn=(1-confidence level)1/n	0.847	0.549	0.368	0.847	0.838	0.838	
Multiplier		0.8903	0.9336	1.2049	0.8232	0.6559	0.491	
Dilution Factor		15.6	15.6	15.6	15.6	15.6	15.6	
Max Conc. at edge of Chronic Zone, ug/L		0.0449	2.2742	0.0085	0.0004	4.8205	0.0024	
Reasonable Potential? Limit Required?		**NO**	**NO**	**YES**	**NO**	**NO**	**NO**	

Comments/Notes:

References: WAC 173-201A,

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation - Page 2

Facility	Everett WPCF, Outfall 025
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	7.3	15.6
Human Health Carcinogenic		15.6
Human Health Non-Carcinogenic		15.6

Pollutant, CAS No. & NPDES Application Ref. No.			NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	ZINC- 7440666 13M hardness dependent	CHLORINE (Total Residual) 7782505							
Effluent Data	# of Samples (n)		69	18	69	365							
	Coeff of Variation (Cv)		0.175	0.6	0.19	0.1	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		3.2		36.6	470							
	Calculated 50th percentile Effluent Conc. (when n>10)		2.5	0.2									
Receiving Water Data	90th Percentile Conc., ug/L		0.54		5.45	0							
	Geo Mean, ug/L		0.36	0									
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	74	-	90	13							
		Chronic	8.2	-	81	7.5							
	WQ Criteria for Protection of Human Health, ug/L		4600	5E+06	-	-							
	Metal Criteria Translator, decimal	Acute	0.99	-	0.946	-							
		Chronic	0.99	-	0.946	-							
	Carcinogen?		N	N	N	N							

Aquatic Life Reasonable Potential

Effluent percentile value			0.950		0.950	0.950							
s	$s^2=\ln(CV^2+1)$		0.174		0.188	0.100							
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.958		0.958	0.992							
Multiplier			1.00		1.00	1.00							
Max concentration (ug/L) at edge of…		Acute	0.900		9.446	64.384							
		Chronic	0.708		7.320	30.128							
Reasonable Potential? Limit Required?			**NO**		**NO**	**YES**							

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month						1							
LTA Coeff. Var. (CV), decimal						0.1							
Permit Limit Coeff. Var. (CV), decimal						0.1							
Waste Load Allocations, ug/L		Acute				94.9							
		Chronic				117							
Long Term Averages, ug/L		Acute				75.624							
		Chronic				104.29							
Limiting LTA, ug/L						75.624							
Metal Translator or 1?						1.00							
Average Monthly Limit (AML), ug/L						**88.7**							
Maximum Daily Limit (MDL), ug/L						**94.9**							

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$		0.1737	0.5545									
Pn	Pn=(1-confidence level)1/n		0.958	0.847									
Multiplier			0.7414	0.5673									
Dilution Factor			15.6	15.6									
Max Conc. at edge of Chronic Zone, ug/L			0.4972	0.0128									
Reasonable Potential? Limit Required?			**NO**	**NO**									

Comments/Notes:

References: WAC 173-201A,
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation

Facility	Everett WPCF, Outfall 100
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	156.0	696.0
Human Health Carcinogenic		696.0
Human Health Non-Carcinogenic		696.0

Pollutant, CAS No. & NPDES Application Ref. No.			AMMONIA, Criteria as Total NH3	ANTIMONY (INORGANIC) 7440361M	ARSENIC (dissolved) 7440382 2M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CHLORDANE 57749 6P	CHROMIUM(HEX) 18540299	COPPER - 7440508 6M Hardness dependent	CYANIDE 57125 14M	LEAD - 7439921 7M Dependent on hardness	MANGANESE 7439965	MERCURY 7439976 8M
Effluent Data	# of Samples (n)		63	18	69	5	3	70	69	18	70	17	17
	Coeff of Variation (Cv)		0.4	0.114	0.136	0.6	0.6	0.261	0.28	0.192	0.244	0.447	0.824
	Effluent Concentration, ug/L (Max. or 95th Percentile)		29,400		1.4	38	0.11	1.165	9.86	0.007	1.2		0.0479
	Calculated 50th percentile Effluent Conc. (when n>10)			0.7						0.006		75.2	0.0085
Receiving Water Data	90th Percentile Conc., ug/L		0		0		0	0	0	0	0		0
	Geo Mean, ug/L			0		0	0			0		0	0
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	22,061	-	69	-	0.09	1100	4.8	1	210	-	1.8
		Chronic	3,314	-	36	-	0.004	50	3.1	1	8.1	-	0.025
	WQ Criteria for Protection of Human Health, ug/L		-	4300	-	5.9	0.0006	-	-	220000	-	100	0.15
	Metal Criteria Translator, decimal	Acute	-	-	1	-	-	0.993	0.83	-	0.951	-	0.85
		Chronic	-	-	-	-	-	0.993	0.83	-	0.951	-	-
	Carcinogen?		N	N	Y	Y	Y	N	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value			0.950		0.950		0.950	0.950	0.950	0.950	0.950		0.950
s	$s^2=\ln(CV^2+1)$		0.385		0.135		0.555	0.257	0.275	0.190	0.240		0.720
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.954		0.958		0.368	0.958	0.958	0.847	0.958		0.838
Multiplier			1.00		1.00		3.00	1.00	1.00	1.13	1.00		1.60
Max concentration (ug/L) at edge of…		Acute	188		0.009		0.002	0.007	0.052	0.000	0.007		0.000
		Chronic	42		0.002		0.000	0.002	0.012	0.000	0.002		0.000
Reasonable Potential? Limit Required?			**NO**		**NO**		**NO**	**NO**	**NO**	**NO**	**NO**		**NO**

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.1136	0.5545	0.5545	0.1903	0.4268	0.7199
Pn	$Pn=(1\text{-confidence level})1/n$	0.847	0.549	0.368	0.847	0.838	0.838
Multiplier		0.8903	0.9336	1.2049	0.8232	0.6559	0.491
Dilution Factor		696	696	696	696	696	696
Max Conc. at edge of Chronic Zone, ug/L		0.001	0.051	0.0002	9E-06	0.108	1E-05
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Comments/Notes:

References: WAC 173-201A,

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation - Page 2

Facility	Everett WPCF, Outfall 100
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	156.0	696.0
Human Health Carcinogenic		696.0
Human Health Non-Carcinogenic		696.0

Pollutant, CAS No. & NPDES Application Ref. No.			NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	ZINC- 7440666 13M hardness dependent	CHLORINE (Total Residual) 7782505							
Effluent Data	# of Samples (n)		69	18	69	365							
	Coeff of Variation (Cv)		0.175	0.6	0.19	0.1	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		3.2		36.6	470							
	Calculated 50th percentile Effluent Conc. (when n>10)		2.5	0.2									
Receiving Water Data	90th Percentile Conc., ug/L		0		0	0							
	Geo Mean, ug/L		0	0									
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	74	-	90	13							
		Chronic	8.2	-	81	7.5							
	WQ Criteria for Protection of Human Health, ug/L		4600	5E+06	-	-							
	Metal Criteria Translator, decimal	Acute	0.99	-	0.946	-							
		Chronic	0.99	-	0.946	-							
	Carcinogen?		N	N	N	N							

Aquatic Life Reasonable Potential

Effluent percentile value			0.950		0.950	0.950							
s	$s^2=\ln(CV^2+1)$		0.174		0.188	0.100							
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.958		0.958	0.992							
Multiplier			1.00		1.00	1.00							
Max concentration (ug/L) at edge of…		Acute	0.020		0.222	3.013							
		Chronic	0.005		0.050	0.675							
Reasonable Potential? Limit Required?			**NO**		**NO**	**NO**							

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$		0.1737	0.5545									
Pn	$Pn=(1\text{-confidence level})1/n$		0.958	0.847									
Multiplier			0.7414	0.5673									
Dilution Factor			696	696									
Max Conc. at edge of Chronic Zone, ug/L			0.0036	0.0003									
Reasonable Potential? Limit Required?			**NO**	**NO**									

Comments/Notes:

References: WAC 173-201A,

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Ecology used the limit calculation procedure described above to calculate NBOD+CBOD limits for outfall 015. Since the Snohomish River Estuary TMDL establishes a Maximum Daily Limit

as the Waste Load Allocation, we used that limit to back calculate the Long Term Average used to determine an appropriate Average Monthly Limit as follows.

NBOD+CBOD Limit Calculations

1. Calculate Daily Maximum Limit based on TMDL Waste Load Allocations (WLAs)			
	Ammonia WLA	1543	lbs/day
	CBOD5 WLA, lbs/day	2162	lbs/day
	NBOD Exchange Rate	2.1	lbs NBOD per lb of ammonia
	Equivalent NBOD+CBOD WLA	5402.3	lbs/day
	(Maximum Daily Limit)		
2. Calculate Long Term Average (LTA) from Maximum Daily Limit (MDL)			
	σ^2	0.070365	
	z_{99}	2.326	
	CV	0.27	
	NBOD+CBOD LTA	3019	lbs/day
3. Calculate Average Monthly Limit (AML) from LTA			
	# of Samples	16	per month
	z_{95}	1.645	
	σ_n^2	0.004546	
	CV	0.27	
	NBOD+CBOD AML	3365.7	lbs/day

Ecology used the complete set of NBOD+CBOD data collected by the Everett WPCF during the previous permit term to calculate the coefficient of variation used in the above limit calculations. However two data points (one from October 2012 and one from October 2014) were eliminated as "outliers". Both data points were influenced by high flows through the lagoon system that were caused by heavy rain events. Since the average monthly limit calculated above is higher than the limit in the previous permit and the facility was capable of meeting the previous limit, Ecology will retain the previous limit in the proposed permit to prevent backsliding.

pH Reasonable Potential Analysis

Ecology uses a spreadsheet tool for calculating the pH of a saltwater mixture of two sources based on their mixed temperature, pH, alkalinity, and salinity. The tool is based on the CO2SYS program, developed at the Brookhaven National Lab by Lewis and Wallace (1998), which calculates equilibrium concentrations of parameters of the carbonate system in seawater. Equilibrium pH is one of the parameters calculated by the program. Ecology estimates the equilibrium pH at the edge of the chronic mixing zone for both the minimum and maximum limits in the proposed permit and evaluates whether the results have a reasonable potential to exceed water quality standards. Ecology used this method to evaluate the reasonable potential for effluent discharged to the Snohomish River from outfalls 015 and 025 to violate the water quality standards for pH.

Outfall 015

Calculation of pH of a Mixture in Marine Water

Based on the CO2SYS program (Lewis and Wallace, 1998), http://cdiac.esd.ornl.gov/oceans/co2rprt.html

INPUT	pH = 6.0	pH = 6.4	pH = 9.0
1. MIXING ZONE BOUNDARY CHARACTERISTICS			
Dilution factor at mixing zone boundary	14.2	14.2	14.2
Depth at plume trapping level (m)	0.000	0.000	0.000
2. BACKGROUND RECEIVING WATER CHARACTERISTICS			
Temperature (deg C):	16.70	16.70	16.70
pH:	7.60	7.60	7.60
Salinity (psu):	8.00	8.00	8.00
Total alkalinity (meq/L)	0.89	0.89	0.89
3. EFFLUENT CHARACTERISTICS			
Temperature (deg C):	27.30	27.30	27.30
pH:	6.00	6.40	9.00
Salinity (psu)	0.50	0.50	0.50
Total alkalinity (meq/L):	2.28	2.28	2.28
OUTPUT			
CONDITIONS AT THE MIXING ZONE BOUNDARY			
Temperature (deg C):	17.45	17.45	17.45
Salinity (psu)	7.47	7.47	7.47
Density (kg/m^3)	1004	1004	1004
Alkalinity (mmol/kg-SW):	0.99	0.99	0.99
Total Inorganic Carbon (mmol/kg-SW):	1	1	1
pH at Mixing Zone Boundary:	**6.78**	**7.12**	**7.95**
pH change at Mixing Zone Boundary:	**-0.82**	**-0.48**	**0.35**

Outfall 025

Calculation of pH of a Mixture in Marine Water

Based on the CO2SYS program (Lewis and Wallace, 1998), http://cdiac.esd.ornl.gov/oceans/co2rprt.html

INPUT	pH = 6.0	pH = 6.1	pH = 9.0
1. MIXING ZONE BOUNDARY CHARACTERISTICS			
Dilution factor at mixing zone boundary	15.6	15.6	15.6
Depth at plume trapping level (m)	0.000	0.000	0.000
2. BACKGROUND RECEIVING WATER CHARACTERISTICS			
Temperature (deg C):	16.70	16.70	16.70
pH:	7.60	7.60	7.60
Salinity (psu):	8.00	8.00	8.00
Total alkalinity (meq/L)	0.89	0.89	0.89
3. EFFLUENT CHARACTERISTICS			
Temperature (deg C):	27.30	27.30	27.30
pH:	6.00	6.10	9.00
Salinity (psu)	0.50	0.50	0.50
Total alkalinity (meq/L):	1.20	1.20	1.20
OUTPUT			
CONDITIONS AT THE MIXING ZONE BOUNDARY			
Temperature (deg C):	17.38	17.38	17.38
Salinity (psu)	7.52	7.52	7.52
Density (kg/m^3)	1004	1004	1004
Alkalinity (mmol/kg-SW):	0.91	0.91	0.91
Total Inorganic Carbon (mmol/kg-SW):	1	1	1
pH at Mixing Zone Boundary:	**7.02**	**7.10**	**7.79**
pH change at Mixing Zone Boundary:	**-0.58**	**-0.50**	**0.19**

Temperature Reasonable Potential Analysis

The following tables summarize the calculations Ecology used to determine the reasonable potential for the discharges to violate the temperature standards, as described in the **Evaluation of surface water quality-based effluent limits for numeric criteria** section of this fact sheet.

Outfall 100

Marine Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)--(ii) and Water Quality Program Guidance. All Data inputs must meet WQ guidelines. The Water Quality temperature guidance document may be found at: http://www.ecy.wa.gov/biblio/0610100.html

INPUT	May-Sep
1. Chronic Dilution Factor at Mixing Zone Boundary	696.0
2. Annual max 1DADMax Ambient Temperature (Background 90th percentile)	10.0 °C
3. 1DADMax Effluent Temperature (95th percentile)	23.7 °C
4. Aquatic Life Temperature WQ Criterion	16.0 °C
OUTPUT	
5. Temperature at Chronic Mixing Zone Boundary:	9.98 °C
6. Incremental Temperature Increase or decrease:	0.0197 °C
7. Incremental Temperature Increase 12/(T-2) if T≤ crit:	1.51 °C
8. Maximum Allowable Temperature at Mixing Zone Boundary:	11.47 °C
A. If ambient temp is warmer than WQ criterion	
9. Does temp fall within this warmer temp range?	NO
10. Temp increase allowed at mixing zone boundary, if required:	---
B. If ambient temp is cooler than WQ criterion but within 12/(T_{amb}-2) and within 0.3 °C of the criterion	
11. Does temp fall within this incremental temp. range?	NO
12. Temp increase allowed at mixing zone boundary, if required:	---
C. If ambient temp is cooler than (WQ criterion-0.3) but within 12/(T_{amb}-2) of the criterion	
13. Does temp fall within this Incremental temp. range?	NO
14. Temp increase allowed at mixing zone boundary, if required:	---
D. If ambient temp is cooler than (WQ criterion - 12/(T_{amb}-2))	
15. Does temp fall within this Incremental temp. range?	YES
16. Temp increase allowed at mixing zone boundary, if required:	NO LIMIT
RESULTS	
17. Do any of the above cells show a temp increase?	**NO**
18. Temperature Limit if Required?	**NO LIMIT**

Outfall 015

Marine Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)--(ii) and Water Quality Program Guidance. All Data inputs must meet WQ guidelines. The Water Quality temperature guidance document may be found at: http://www.ecy.wa.gov/biblio/0610100.html

INPUT	Jan	Feb	Mar	Apr	May	Jun	Jul
1. Chronic Dilution Factor at Mixing Zone Boundary	14.2	14.2	14.2	14.2	14.2	14.2	14.2
2. Annual max 1DADMax Ambient Temperature (Background 90th percentile)	6.0 °C	6.6 °C	6.7 °C	8.6 °C	10.6 °C	12.2 °C	18.3 °C
3. 1DADMax Effluent Temperature (95th percentile)	8.4 °C	10.3 °C	13.3 °C	17.5 °C	21.3 °C	22.6 °C	27.3 °C
4. Aquatic Life Temperature WQ Criterion	16.0 °C	16.0 °C	16.0 °C	16.0 °C	16.0 °C	16.0 °C	16.0 °C
OUTPUT							
5. Temperature at Chronic Mixing Zone Boundary:	6.15 °C	6.88 °C	7.14 °C	9.21 °C	11.36 °C	12.93 °C	18.93 °C
6. Incremental Temperature Increase or decrease:	0.17 °C	0.26 °C	0.46 °C	0.63 °C	0.76 °C	0.73 °C	0.63 °C
7. Incremental Temperature Increase 12/(T-2) if T≤ crit:	3.02 °C	2.60 °C	2.56 °C	1.82 °C	1.40 °C	1.18 °C	---
8. Maximum Allowable Temperature at Mixing Zone Boundary:	9.00 °C	9.22 °C	9.24 °C	10.40 °C	12.00 °C	13.38 °C	18.60 °C
A. If ambient temp is warmer than WQ criterion							
9. Does temp fall within this warmer temp range?	NO	NO	NO	NO	NO	NO	YES
10. Temp increase allowed at mixing zone boundary, if required:	---	---	---	---	---	---	0.3
B. If ambient temp is cooler than WQ criterion but within 12/(T_{amb}-2) and within 0.3 °C of the criterion							
11. Does temp fall within this incremental temp. range?	NO	NO	NO	NO	NO	NO	---
12. Temp increase allowed at mixing zone boundary, if required:	---	---	---	---	---	---	---
C. If ambient temp is cooler than (WQ criterion-0.3) but within 12/(T_{amb}-2) of the criterion							
13. Does temp fall within this Incremental temp. range?	NO	NO	NO	NO	NO	NO	---
14. Temp increase allowed at mixing zone boundary, if required:	---	---	---	---	---	---	---
D. If ambient temp is cooler than (WQ criterion - 12/(T_{amb}-2))							
15. Does temp fall within this Incremental temp. range?	YES	YES	YES	YES	YES	YES	---
16. Temp increase allowed at mixing zone boundary, if required:	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	---
RESULTS							
17. Do any of the above cells show a temp increase?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**
18. Temperature Limit if Required?	**NO LIMIT**	**NO LIMIT**	**NO LIMIT**	**NO LIMIT**	**NO LIMIT**	**NO LIMIT**	**20.0 °C**

Notes:

Although the calculations for September suggest no need for a limit, the predicted temperature at the edge of the chronic mixing zone for that month (line 5) is only 0.01 degree lower than the allowable temperature. Given the small difference, Ecology chose to include September in the months in which a limit is warranted.

Marine Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)--(ii) and Water Quality Program Guidance. All Data inputs must meet WQ guidelines. The Water Quality temperature guidance document may be found at: http://www.ecy.wa.gov/biblio/0610100.html

INPUT	Aug	Sep	Oct	Nov	Dec	Jul-Sep	Jul-Sep
1. Chronic Dilution Factor at Mixing Zone Boundary	14.2	14.2	14.2	14.2	14.2	14.2	26.7
2. Annual max 1DADMax Ambient Temperature (Background 90th percentile)	19.5 °C	15.5 °C	11.6 °C	7.9 °C	5.5 °C	18.3 °C	18.3 °C
3. 1DADMax Effluent Temperature (95th percentile)	26.1 °C	22.5 °C	18.0 °C	13.0 °C	8.6 °C	26.3 °C	26.3 °C
4. Aquatic Life Temperature WQ Criterion	16.0 °C	16.0 °C	16.0 °C	16.0 °C	16.0 °C	16.0 °C	16.0 °C
OUTPUT							
5. Temperature at Chronic Mixing Zone Boundary:	19.96 °C	15.99 °C	12.05 °C	8.28 °C	5.74 °C	18.86 °C	18.60 °C
6. Incremental Temperature Increase or decrease:	0.46 °C	0.49 °C	0.45 °C	0.36 °C	0.22 °C	0.56 °C	0.30 °C
7. Incremental Temperature Increase 12/(T-2) if T≤ crit:	---	0.89 °C	1.25 °C	2.03 °C	3.41 °C	---	---
8. Maximum Allowable Temperature at Mixing Zone Boundary:	19.80 °C	16.00 °C	12.85 °C	9.95 °C	8.93 °C	18.60 °C	18.60 °C
A. If ambient temp is warmer than WQ criterion							
9. Does temp fall within this warmer temp range?	YES	NO	NO	NO	NO	YES	YES
10. Temp increase allowed at mixing zone boundary, if required:	0.3	---	---	---	---	0.3	NO LIMIT
B. If ambient temp is cooler than WQ criterion but within 12/(T_{amb}-2) and within 0.3 °C of the criterion							
11. Does temp fall within this incremental temp. range?	---	NO	NO	NO	NO	---	---
12. Temp increase allowed at mixing zone boundary, if required:	---	---	---	---	---	---	---
C. If ambient temp is cooler than (WQ criterion-0.3) but within 12/(T_{amb}-2) of the criterion							
13. Does temp fall within this Incremental temp. range?	---	YES	NO	NO	NO	---	---
14. Temp increase allowed at mixing zone boundary, if required:	---	NO LIMIT	---	---	---	---	---
D. If ambient temp is cooler than (WQ criterion - 12/(T_{amb}-2))							
15. Does temp fall within this Incremental temp. range?	---	NO	YES	YES	YES	---	---
16. Temp increase allowed at mixing zone boundary, if required:	---	---	NO LIMIT	NO LIMIT	NO LIMIT	---	---
RESULTS							
17. Do any of the above cells show a temp increase?	**YES**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**
18. Temperature Limit if Required?	**20.0 °C**	**NO LIMIT**	**NO LIMIT**	**NO LIMIT**	**NO LIMIT**	**20.0 °C**	**NO LIMIT**

Notes:

Although the calculations for September suggest no need for a limit, the predicted temperature at the edge of the chronic mixing zone for that month (line 5) is only 0.01 degree lower than the allowable temperature. Given the small difference, Ecology chose to include September in the months in which a limit is warranted.

Appendix G – Response to Comments

The City of Everett reviewed the draft permit and fact sheet for factual accuracy prior to the public comment period. In addition identifying factual errors in the documents, the City provided substantive comments on some conditions in the proposed permit. The following discusses changes Ecology made to the draft permit and fact sheet as a result of the City's review and provides responses to the City's substantive comments. Ecology will add responses to any additional comments received during the public comment period to this appendix prior to issuing the final permit.

City of Everett comments on the draft fact sheet

1. Page 6, Table 1, CSO Locations

   Change "See table 3 on page 9" to table 3 on page 8

   Response: Page reference corrected.

2. Page 8, Table 3, CSO Outfall Summary

   Change Outfall Description of Ecology Outfall 013, PS02, from Lift Station #7 to Lift Station #8

   Response: Identification corrected in table 3.

3. Page 11, Treatment Processes

   Please add language to the Fact Sheet describing how Everett WPCF meets the NPDES permit section S5.D. electrical power failure requirement. The following is from the 2009 Fact Sheet pg 8 …

   > Power at FEN is from the Marysville power transmission grid to the north. There is an emergency generator at Outfall 015 that provides power to close the gravity valve in a power outage to prevent discharge of unchlorinated effluent.
   >
   > The TF/SC plant is fed power by transmission grids from Everett to the south and Marysville to the north. In the event one grid goes down, Snohomish PUD #1 is called to manually switch power over to the other grid. Portable generators are also available at the plant and the Public Works Service Center in downtown Everett (3200 Cedar Street) for emergency operations.

   Response: A new section on facility power reliability has been added to the fact sheet on page 14.

4. Page 18, Table 9

   Outfall 015 Monthly Average Residual Chlorine should be < 0.008 mg/L

   Response: Table corrected and sentence added to the Wastewater Effluent Characterization paragraph on page 17 explaining that reported concentrations are typically at or below the detection limit.

5. Page 18, Table 10

Are Cyanide values from a single result so footnote 1 applies? or are results less than detection limits and should be reported as <0.01?

Response: The City's data showed 4 of 18 tests between October 2009 and March 2014 that had detectable levels of cyanide. Table 10 originally listed values that were inappropriately rounded. The table has been corrected to show the correct values (average = 0.006 mg/L and maximum = 0.007 mg/L). The table has also been changed to more clearly identify parameters that had a small number of detections out of all samples analyzed.

Is the 95th percentile calculation valid for parameters with a single result or should it be removed for titanium, trans chlordane, acetone, benzyl alcohol? (cyanide?)

Response: Tables 10 and 11 have had calculated 95th percentile values deleted for parameters that have sample sizes of less than 5 samples with detected concentrations since the statistic is not generally valid for small sample sets. The 95th percentile values in the table are generally presented for information purposes only. The reasonable potential calculations for aquatic life toxicity use the 95th percentile value only when a parameter has more than 20 samples; parameters with less than 20 samples use the maximum detected concentration. The human health reasonable potential analysis uses the average concentration when the sample size is 10 or more and the maximum concentration when the sample size is less than 10.

6. Page 19, Table 11

Are cadmium, cyanide and phenolics values from a single result so footnote 1 applies? or are the results less than detection limits and should be reported as < ?

Is the 95th percentile calculation valid for parameters with a single result or should it be removed for titanium, chloroform and toluene? (cadmium, cyanide and phenolics ?)

Response: See responses for comment #5.

7. Page 22, paragraph 3.

The last sentence says that the [DMR] data shows that the lagoons can consistently achieve a monthly average TSS concentration of 45 mg/L and a removal efficiency of 79%. This in turn gets used as the basis for technology-based TSS effluent limits for outfall 015 in tables 14, 15 and 24.

The effluent data on page 90 show that the lagoons cannot consistently achieve this monthly average TSS concentration. In May 2013 the monthly average TSS was 57 mg/L and in September 2014 it was 69 mg/L. In addition, during this permit cycle outfall 015 would have had three effluent violations for weekly average TSS under the proposed limit of 67.5 mg/L with 74 and 70 mg/L weekly averages in May 2013 and an 83 mg/L weekly average in September 2014.

From 2004-2009 there were 22 months with outfall 015 monthly average TSS above 45 mg/L. There have been no major changes in operation and maintenance of the lagoon treatment system between 2004 and now. Weather, lagoon biology, and whether or not there is nitrification in the summer seem to be the factors having the most influence on FEN TSS

which consists almost entirely of algae and daphnia produced in the pond system. The years 2010-2013 were wet and cool springs with no discernible nitrification in the summer. TSS may have been lower in those years due to many factors that are beyond our control and we are concerned the years 2010-2013 that did not have major algae blooms may be the anomaly and not the "new normal" for the lagoon system.

Current operations substantiate that the proposed limits are not consistently achievable through proper operation and maintenance of the lagoon system. The WPCF would have two effluent violations for June 2015 under the proposed limits with a monthly average of 54 mg/L and a weekly average of 83 mg/L.

The data on page 90 also show that the lagoons cannot consistently achieve 79% TSS removal. There were three months where the % removals were 78.4, 78.2 and 73.5%. The Fact Sheet therefore is incorrect to say outfall 015 can consistently meet the proposed TSS limits.

Paragraph 3 also says that Ecology sets limits at levels consistently achievable at a 95% confidence level. The spreadsheet on page 90 presents the 95% values for the TSS concentration and percent removal data.

The regulation governing alternate limits for waste stabilization ponds (lagoons) is WAC 173-221-050(2). While the regulation does talk about setting concentration limits that are consistently achievable through proper operation and maintenance based on an analysis of past performance, there is no requirement in regulation to set TSS limits based on what is demonstrated achievable 95% of the time. There is also no water quality need for such limits. Setting limits on such a basis assures that non-compliance will occur 5% of the time, and the monthly average concentration and percent removal data on page 90 make that demonstration clear.

Response: WAC 173-221-030(11) defines "Effluent concentrations consistently achievable through proper operation and maintenance" as follows:

> *(a) For a given pollutant parameter, the 95th percentile value for the thirty-day average effluent quality achieved by a wastewater facility in a period of at least twenty-four consecutive months, excluding values attributable to equipment failures, operational errors, overloading, and other unusual conditions; and*
>
> *(b) A seven-day average value equal to 1.5 times the value derived under (a) of this subsection.*

Chapter 5, Section 3 of Ecology's Water Quality Program Permit Writer's Manual describes the procedures permit writers use in determining alternative limits for municipal wastewater treatment plants. The limits calculated in the proposed permit follow those procedures, with the exception that Ecology used TSS data for the full permit term rather than the past 24 months.

Ecology appreciates the City's concerns that the originally proposed monthly average limit of 45 mg/L is substantially lower than the limit in the previous permit and that a three year period of cool, wet springs between 2010 and 2013 may have contributed to a false impression of improving performance. A review of effluent data over a period of more than 15 years lends credence to this concern. Ecology analyzed average monthly lagoon effluent data from January 1, 2000 through June 30, 2015 to determine if there

was a discernible pattern to the data. The data shows evidence of cyclic periods in which TSS concentrations may be low and stable for 2-3 years followed by periods of unstable, higher concentrations for 5-7 years. The 45 mg/L limit was calculated based on data dominated by a period with stable, low concentrations. However the data also shows that variability is increasing in recent years, which is consistent with effluent patterns observed between 2002 and 2007. To compensate for this long term fluctuation in performance, Ecology has recalculated the TSS limit using the 95th percentile value of the longer 15 ½ year record. This calculation results in a monthly average limit of 59 mg/L and an average weekly limit of 88.5 mg/L. The corresponding monthly and weekly average TSS mass limits are 7,656 lbs/day and 11,484 lbs/day, respectively.

Comment 7 (continued).

Furthermore, WAC 173-221-050(2) specifically does not require a percent removal limit for TSS so there should be no percent removal requirement for TSS in this permit. There is no percent removal requirement in the current permit. Note that WAC 173-221-050(2) does require percent removal limits for BOD, but not for TSS.

Response: Ecology does not agree with the City's interpretation of WAC 173-220-050(2) with respect to the claim that the regulation "specifically does not require a percent removal limit for TSS". Part (a) of subsection 2 reads as follows:

> *(a) Up to a thirty-day average of 45 mg/L BOD, 45 mg/L TSS. Seven-day averages shall not exceed 65 mg/L BOD, 65 mg/L TSS. Additionally, the thirty-day average percent BOD removal shall not be less than sixty-five percent of influent concentrations.*

Ecology considers this regulation to be silent with respect to TSS percent removal. It neither specifically waives the percent removal limit for waste stabilization ponds, nor does it explicitly define any other alternative numeric limit. Given the lack of a specific alternate limit for TSS percent removal, one could interpret the language to imply that the default technology-based limit of 85% removal should apply. However such an interpretation is not necessary. Ecology must consider both state and federal regulations in writing NPDES permits and apply the most stringent of the two regulations. While the state rule is silent with respect to TSS percent removal, the federal rules are not. Federal alternative limits for waste stabilization ponds, promulgated in 40 CFR 133.103(c) and 40 CFR 133.105(b), specifies a <u>minimum</u> TSS percent removal of 65%. Like the state regulation, the federal regulation also specifies adjustment of alternative limits based on demonstrated performance. Following procedures outlined in the Permit Writer's Manual, Ecology calculated the alternative TSS percent removal limit at 78%, based on the 15 ½ years of record discussed previously.

Comment 7 (continued).

The proposed outfall 015 TSS permit limits needlessly put the City of Everett at a significant compliance risk. The Fact Sheet discussion, the referenced Fact Sheet tables, and the permit limits need to be changed to levels that are consistently achievable. Everett recommends that the TSS monthly average and weekly average limits from the current permit be continued in the new permit, and also that there be no TSS percent removal limit, as is the case in the current permit.

Response: The City's permit from 1992 through 2004 contained seasonal TSS percent removal limits for outfall 015 of 71% for the months of October – July and 72% for the months of August – September. A review of this historic data revealed that the City complied with this limit for the period between January 1, 2000 and June 30, 2004 (Ecology did not review data prior to 2000). In addition, the 95th percentile of TSS Percent Removal data for the 2000-2004 period justified increasing the limit to 79% in the 2004 permit.

The administrative record for the 2004 permit does not clearly explain why Ecology removed the limit, even though the City complied with the limits and the data justified an increase in the limit. The fact sheet for that permit included the statement "The Everett Water Pollution Control Facility receives storm water from combined sewers and can not meet the percentage removal requirements during wet weather", which suggests that the removal may have been related to an alternative limit allowance for facilities that treat combined sewage. However the data does not substantiate the claim that the facility "can not meet the percent removal requirements during wet weather". In addition, the procedures in the Permit Writer's Manual as well as the requirements in state and federal regulations on alternative limits specify that any relaxation of the percent removal limits for facilities treating combined sewage are only applied during the wet weather season and that the alternative limit must be at a "consistently achievable" level[1]. Based on an analysis of the 15 ½ year history of data for outfall 015 that was discussed earlier, a percent removal limit of 78% is consistently achievable for all months, including wet weather months.

8. Page 27, paragraph 1

   Change "5 MGD increase in design flow" to 4 MGD. The increase in design flow is from 21 to 25 MGD.

   Response: Correction made.

9. Page 34, last paragraph, and Page 38, third paragraph.

   Statement is made in both places that Ecology listed the Snohomish River Estuary as an impaired water body for ammonia and biochemical oxygen demand in 1996. The statement is incorrect. The listing was for dissolved oxygen. The subsequent TMDL established loads for ammonia and BOD to bring the estuary into compliance with the dissolved oxygen standard.

   Response: Correction made.

10. Page 43 - second paragraph. Page 44 - last paragraph, Page 107 - Reasonable Potential Analysis.

    The analysis of temperature concerns in the summer months and how the practice by Everett of limiting the flows for TMDL driven reasons, leads to a greater dilution factor (26.7 instead of 14.2), and therefore, with a flow limit, there is not a need for a temperature limit is a very thoughtful and well-reasoned approach. The last sentence however needs to be replaced. That sentence says that "To avoid backsliding, Ecology will only use this modified dilution

[1] See Chapter 5, section 3.4 of Ecology's *Permit Writer's Manual*, WAC 173-221-050(3), and 40 CFR 133.103(a).

for purposes of temperature compliance and will not use this higher dilution for other parameters."

Response: Pages 27-32 of the fact sheet provide a thorough discussion on the topic of the use of mixing zones for discharges. As discussed on page 29, Ecology used the 1996 mixing zone study, prepared for the City by Cosmopolitan Engineering, as the basis for dilution factors authorized in the proposed permit. These dilution factors are the same dilution factors authorized in each of the City's permits since 1996. Any relaxation of the previously authorized dilution factors is considered backsliding.

Ecology's approach to control temperature from this discharge is based on altering the authorized mixing zone used for temperature. The analysis presented in the fact sheet demonstrated that the discharge from outfall 015 requires a temperature limit and that a limit of 20°C is necessary to comply with the appropriate temperature standard. However, Ecology also recognized that the facility would have difficulty in complying with a numeric temperature limit of 20°C and instead chose to limit the heat discharged from the lagoon facility by limiting the amount of effluent the facility can discharge during the summer. Therefore, the flow limit in the proposed permit is, by proxy, a temperature limit because it limits the amount of heat discharged to the river during the critical summer period.

The original temperature analysis in the fact sheet did not clearly describe the use of mixing zone alterations in the implementation of temperature standards. This strategy generally relies on a provision in the state's water quality standards and in Ecology's Guidance Manual in implementing temperature standards through NPDES permits. The temperature guidance allows Ecology to consider an altered mixing zone for temperature if there is a reasonable expectation that the alteration would not adversely affect fish or other aquatic life. Limiting flow ensures that the proposed expanded mixing zone remains protective of aquatic life.

Comment 10 (continued).

Everett notes that the higher dilution factor should be applied during July through September for ammonia discharged from outfall 015, and that doing so removes the need for an ammonia limit during those months. The Reasonable Potential Analysis for October through June should also be re-done as the 7Q20 river flow based dilution should be based only on flow data from those months. This does not present a backsliding issue since it is not relaxing an existing water quality-based effluent limit. The current permit does not have a limit for ammonia. This recommendation calls for changes to the reasonable potential analysis on page 107 and the discussion in the last paragraph on page 44.

Response: Ecology cannot arbitrarily modify the approved mixing zone as requested by the City. Use of an alternative dilution factor for temperature is based on Ecology's published guidance on strategies for implementing temperature standards through the NPDES permit. For all other parameters, Ecology must use dilution factors established in the approved 1996 mixing zone study. If the City believes the information in the 1996 study is out of date or believes that there is a need for seasonal dilution factors, the City may hire a consultant to develop a new mixing zone model. Ecology will review any new mixing zone model presented by the City and consider its use for future permits. It should also be noted that, Ecology cannot approve a new model if the study does not

demonstrate that a) ambient and/or facility conditions have changed since 1996 and warrant reevaluation; and b) proposed dilution comply with Ecology's standards for mixing zone studies, including the use of dye studies to verify the model. If proposed dilution factors assume flow rates that are less than the design flow rate for the lagoon facility, Ecology may include those flow rates in future permits as enforceable flow limits.

11. Page 49, Table 24.

Change proposed effluent TSS concentration and pounds per day limits back to matching the previous effluent limits. Delete the proposed limits for Ammonia.

Response: As noted earlier, Ecology recalculated the TSS limits using a longer (15 ½ year) history of effluent data for outfall 015. Table 24 shows the recalculated concentration, mass and percent removal limits.

Ecology's response to comment #10 describes why we cannot alter the dilution factor used in the reasonable potential analysis for ammonia. Therefore the proposed limit for ammonia will remain. However, in reviewing that limit, Ecology discovered that the limit values in Table 24 and in Table S1A of the permit along with the monitoring frequency in table S2A of the permit were not correct. The limit calculation presented in Appendix F shows the correct limit, which is based on conducting weekly monitoring. The ammonia limit in the reasonable potential calculation spreadsheet was not transferred properly to the permit. The limits in the permit and fact sheet have been changed to a monthly average of 31.4 mg/L and a daily maximum of 47.1 mg/L. The monitoring frequency in the permit table S2A has been changed to weekly instead of monthly.

12. Page 107, Reasonable Potential sheet for 015.

Need to prepare one for the greater dilution factor for July-September due to flow restriction. Use to show no reasonable potential then for Ammonia.

Should probably also do this for October-June using 7Q20 river flow for those months to describe dilution factor.

Response: As discussed in other responses, Ecology cannot change the dilution factor as requested by the City. Therefore the reasonable potential analysis for outfall 015 will not change.

Ecology also needs to change this form so it does not say hardness dependent for metals standards for marine waters in the column headers for metals.

Response: The reasonable potential calculation worksheet is used in both marine and freshwater applications and uses common column headers for both applications. Although the column headers for some metals include "hardness dependent" in the label, the water quality standards for those parameters do not rely on hardness when the sheet is used in marine environments. Ecology will not change the headers since they do not have a functional impact on the reasonable potential calculations or any effluent limits.

City of Everett comments on the draft permit

13. Page 5, Discharge Limits table for Outfall 015, TSS and Ammonia.

Remove the percent removal requirement for TSS and restore the current permit TSS concentration limits. See our comments regarding TSS in the Fact Sheet on this topic.

Remove the ammonia limit. See our comments re Ammonia in the Fact Sheet on this topic.

Response: Ecology recalculated the TSS limits based on a 15 ½ year period of record. The limit table now includes the recalculated limits. As discussed in responses to the fact sheet comments, Ecology cannot change the dilution factor used in the reasonable potential analysis that was the basis for the ammonia limit for outfall 015. Therefore the ammonia limit remains in the permit. However, Ecology discovered an error in which the ammonia limit that appeared in the limit table was not the same limit calculated in the reasonable potential workbook. The limit in the table has been corrected.

14. Page 8, Available Dilution Factors Table.

For bottom line, change title to read "Seasonal Temperature and Ammonia – July-September". The logic of a higher dilution factor in July-September associated with an effluent flow limit applies just as well to ammonia as to temperature. Consider another dilution factor line for Ammonia – October-June which would be based on design effluent flows and river 7Q20 flows for October through June. See our comments re Ammonia in the Fact Sheet on this topic.

Response: See responses to comment #10 related to the dilution factor for temperature. Ecology cannot make the requested change.

15. Page 9 and 10, Monitoring Schedule, (2) Final Wastewater Effluent

"Final Wastewater Effluent means wastewater exiting the last treatment process or operation for each treatment system. Typically, this is after or at the exit from the chlorine contact chamber or other disinfection process."

Please add language here, under outfall 100 on pg. 10, or in a footnote that specifies the sampling point for outfall 100 fecal coliform, total residual chlorine, and temperature is exiting SEPS or at the K.C. sampling site while all other parameters are secondary clarifier effluent (SCE). The 2009 permit specifies the SCE sampling location as "above SEPS".

Change temperature sample type for all 3 outfalls from "grab" to "grab or continuous"

Response: Ecology added a footnote to the monitoring table to clarify the monitoring locations for outfall 100. The permit considers monitoring at the SEPS the official monitoring location for pH, temperature, chlorine and fecal coliform. However the footnote also states that the City may collect samples at the KC sampling site during high flow periods, which Ecology will consider if sampling at the SEPS results in violations of chlorine or fecal coliform limits.

The monitoring frequency for temperature has been changed to "continuous" and the sample type has been changed to "metered/recorded" for all outfalls.

16. Page 11, Monitoring Schedule, (4) Pretreatment: WPCF influent, effluent and biosolids

"The Permittee must monitor WPCF influent, lagoon facility effluent (outfall 015), TF/SC system effluent (outfall 100 and 025), and biosolids from the treatment systems for parameters noted below according to the indicated schedule."

Please remove "and 025". Outfall 100 monitoring results are used to characterize potential outfall 025 discharge. There is no routine discharge from outfall 025 and will not be for the foreseeable future.

Response: Reference to outfall 025 deleted for clarity. Although the monitoring is based on the TF/SC treatment system, which can discharge out of outfall 025, the City will report the results on discharge monitoring reports for 100. Ecology will continue to use priority pollutant results reported for outfall 100 as representative of effluent quality that may discharge from outfall 025.

17. Page 11, (5) Permit renewal application requirements – final wastewater effluent

"The Permittee must record and report the wastewater treatment plant flow discharged on the day it collects the sample for priority pollutant testing with the discharge monitoring report."

Is this sentence necessary? We already report all daily influent and effluent flows on the dmr and the wording is somewhat confusing.

Response: The sentence is not relevant for the parameters listed and has been deleted. The sentence generally applies to priority pollutants that require reporting of mass discharges in the NPDES application.

18. Page 11, Monitoring Schedule Table.

Because Mercury monitoring requirements vary from other metals, both in standard units and type of sample, the Mercury monitoring should be a separate line from the other metals. Furthermore, the sampling for Mercury should use clean metals sample techniques, EPA Method 1669.

Response: For clarity, mercury has been moved to a separate line in the monitoring table with a footnote stating that the results are reported with the other priority pollutant metals. EPA method 1669 is fundamentally a grab sample with special restrictions to ensure clean sampling. The sample collection method has not changed, but the footnote clarifies that clean sampling according to 1669 is required.

19. Page 12, Footnotes for monitoring table, 7

"If measuring temperature continuously, the Permittee must determine and report a daily maximum from half-hour measurements in a 24-hour period"

Does this mean report a daily maximum from **no greater than** half-hour measurements?

Response: Footnote has been edited to remove references to grab sampling and to clarify that the daily maximum is to be determined from continuously measured data that is assessed over time intervals of no longer than 30 minutes.

20. Page 13

The numbering is off. S2.B. should be S2.C., S2.C should be S2.D, etc…

Response: Section numbering corrected.

"S2.C" (should be S2.D.) Flow measurement and continuous monitoring devices – items number 3&4 seem to conflict. Should we "Calibrate weekly" or "to the frequency recommended by the manufacturer". Does this section also apply to CSO monitoring, or just the WPCF?

Please specify what continuous monitoring devices would require a weekly calibration or perhaps remove "weekly" and let frequency be determined by manufacturer recommendations and the monitoring records for each device.

Response: S2.D.3 has been edited to clarify that it applies to water quality parameters, such as pH or DO. As stated in S2.D.5, the minimum calibration for flow monitoring devices is once per year. Weekly calibration does not apply to CSO monitoring unless the City installs instruments to monitor water quality parameters of a CSO discharge. The annual calibration of flow meters, however, does apply to CSO monitoring.

21. Page 31, S8.A. Authorized combined sewer overflow (CSO) discharge locations

Change Ecology Outfall ID 013, Everett CSO ID PS02, from Lift Station #7 to Lift Station #8

Response: Identification corrected in Special Conditions S8.A and S8.G.

22. Page 35, S8.F. Compliance Schedule

The City requests edits to the CSO compliance schedule to read:

In order to achieve the greatest reasonable reduction of combined sewer overflows at the earliest possible date, the Permittee must complete the following elements of the approved CSO reduction plan. The Permittee must:

1. Complete construction of the "East Grand Stormwater Separation and Sewer Replacement" project by December 31, 2015.
2. Submit an Engineering Report for the Hayes Street CSO Improvements Project by June 30, 2016.
3. Submit an Engineering Report for the WPCF Structure Zero Improvements Project by June 30, 2016.
4. Submit modeling data for operations and maintenance improvements to outfalls SRO-7 and SRO-8 by December 31, 2016.
5. Complete construction of the "Sewer M" project by December 31, 2017.
6. Complete construction of the "Hayes Street CSO Improvements" project by December 31, 2017.
7. Complete "SRO-1 CSO Improvements" by December 31, 2017.
8. Complete "Regulator Weirs R4 and R39 Revision" project by December 31, 2017.
9. Submit design documents (plans and specifications) before the start of construction on all CSO related projects.
10. Provide a status update to Ecology on selection of site for a facility to control overflows from outfall PSO-4, PSO-5, PSO-6, and PSO-7 by March 1, 2020. The update must discuss progress in selecting the ultimate facility location and provide a timeline for any necessary property acquisition.

Response: This comment requests removal of specific dates for the submittal of design documents for the Hayes Street CSO Improvements and for the Structure Zero Improvements and replaces the dates with a requirement to "Submit design documents before construction (milestone #9). Ecology cannot make the requested change because permit compliance schedules must include enforceable dates for each milestone. After consulting with the City, Ecology changed the due date for the design documents to December 31, 2016.

Ecology received comments from the Puget Soundkeeper Alliance and the City of Everett during the 30-day public notice period. Each comment and Ecology's responses can be found on the following pages.

Puget Soundkeeper Alliance's comments (via Smith & Lowney, P.L.L.C.):

These comments on the August 2015 draft NPDES permit no. WA0024490 for the City of Everett Water Pollution Control Facility are submitted on behalf of Puget Soundkeeper Alliance.

Comment #1: The Everett Facility is one of the larger wastewater discharges to Puget Sound, adding up to 40 million gallons per day of treated municipal wastewater to the Sound. The contamination of Puget Sound by toxic pollutants is widespread and well-documented. Waste streams comprising the Everett Facility's influent are heterogeneous and include not only domestic wastewater but also industrial discharges from a wide variety of industrial facilities, as well as stormwater from urban streets and facilities. Consequently, a wide spectrum of toxic pollutants is introduced to the Everett Facility and many of these can be expected to pass through because they are not susceptible to efficient or effective removal by the treatment works. These pollutants are likely to include persistent bioaccumulative toxics ("PBTs"), such as PCBs, flame retardants, and pharmaceuticals. The permit should include rigorous effluent monitoring to determine whether toxic pollutants are being discharged at levels of concern, which would warrant the addition of effluent limitations or implementation of other measures to reduce or eliminate these discharges. The Everett Facility is an excellent place to start enhanced efforts to detect and control discharges of the numerous toxic pollutants that threaten the Sound.

While the draft permit does include a monitoring requirement for the EPA list of priority pollutants, this is inadequate to the task. First, the priority pollutant list excludes numerous toxic pollutants that are likely to be found in the discharge and that ought to be subject to NPDES regulatory controls in fulfillment of federal objectives to eliminate toxic discharges, 33 U.S.C. § 1251(a)(3), and the mandates of state law, RCW 90.48.010 and .520. A recent report by the EPA Office of the Inspector General (Report No 14-P-0363, Sept. 29,

2014, "More Action Is Needed to Protect Water Resources From Unmonitored Hazardous Chemicals") describes an aspect of this problem. Consistent with the findings of this report, a review of the toxic release inventory ("TRI") reports submitted by the Significant Industrial Users listed in the draft fact sheet at pp. 10 - 11 reveals that the following facilities have reported discharges of toxic pollutants that are not among those on the priority pollutants list:

<u>Boeing Commercial Airplane Company</u>
- Methyl Isobutyl Ketone
- Certain glycol ethers
- N-methyl-2-Pyrrolidone
- Xylene
- Methanol
- 1,2,4-trimethylbenzene
- Cyclohexane
- Diethanolamine
- Tetrabromobisphenol A

<u>Stockpot Inc.</u>
- Nitric acid

<u>Bluestreak finishers</u>
- Nitric acid

The permit should require screening monitoring for these and other toxic pollutants that are likely to be present in the discharge.

Ecology's Response to Comment #1: *Ecology appreciates the comments concerning the potential for toxicity in the Everett WPCF discharge. In developing this permit, Ecology used priority pollutant data that the City of Everett collected from the WPCF effluent during the period of October 2009 through March 2014. Table 10 on page 18 of the fact sheet lists the priority pollutants detected in effluent from the facility's trickling filter/solids contact (TF/SC) treatment system. Table 11 on page 19 provides information on priority pollutants detected in effluent from the facility's lagoon treatment system. The tables show that during the 2009-2014 period, the City conducted up to 71 separate tests for priority pollutant metals and 4 to 5 tests for organics. The City's testing included xylene, Methyl Isobutyl Ketone (also known as 4-Methyl-2-Pentanone or MIBK), and PCB arochlors. The testing did not detect the presence of any of the above pollutants in the effluent from either treatment system.*

The pretreatment conditions in the 2009 permit required the Everett WPCF to conduct priority pollutant testing of the influent to the treatment plant. Influent testing between 2009 and 2014 detected concentrations of MIBK and Xylene, but did not detect the presence of any PCB arachlors. Testing done on samples collected on September 9, 2010, detected 9.9 µg/L of MIBK and 7.9 µg/L of xylene (as a combination of m,p-xylene and o-xylene). No other samples during the 2009-2014 period detected MIBK or any form of xylene in the influent. The fact that effluent samples collected at the same time did not detect MIBK or xylene indicates that these chemicals do not pass through the Everett WPCF.

Ecology has established criteria for approximately 160 pollutants based on the National Toxics Rule (40 CFR 131.36) and the EPA National Recommended WQ Criteria (2004, 69 FR 342) (see WAC 173-201A). Ecology performed a reasonable potential analysis for each pollutant detected in the effluent for which a water quality criteria have been established to determine the potential for a violation of water quality criteria (see Appendix F of the fact sheet). Ecology set limits on chlorine and total ammonia in effluent discharged from the lagoon system through outfall 015 based on this analysis and determined that all other parameters in the WPCF effluent have to reasonable potential to cause violations of water quality criteria.

Ecology does not require monitoring for some of the pollutants discharged by industrial users because (1) Washington State has not promulgated surface water criteria for the parameter, (2) pretreatment activities remove or greatly reduce the pollutant at the source, and/or (3)the pollutant is diluted or converted and is therefore not detectable in the effluent. For example, methanol, which is a simple alcohol, is amenable to biological breakdown during biological treatment at the sewage treatment plant and is commonly used as a supplemental food source for the bacteria at some wastewater treatment plants. Nitric acid quickly breaks down to its molecular components of hydrogen, nitrogen, and oxygen. Individual chemicals from industrial processes are often undetectable after mixing with the other sewerage flows in the system.

In many cases, the appropriate control method is to prevent the pollutant from entering the collection system through a reliable pretreatment program. This approach is supported by federal regulations. The City of Everett is responsible for regulating permitted and authorized discharges from significant industrial users. Ecology delegated pretreatment authority to the City of Everett and inspects their program annually. The City screens each industrial user individually and sets case-by-case local limits with the aim to ensure industrial discharges do

not contribute pollutants that will cause detectable levels in the biosolids or exceed safe employee exposure levels. Occasionally the City sets limits for pollutants that do not have water quality criteria in order to minimize employee exposure.

Another method Ecology uses to assess effluent toxicity is whole effluent toxicity (WET) testing. WET testing is a regulatory tool under the Clean Water Act that captures the effects of additive toxicity and other possible toxicity interactions specific to a given effluent. WET testing involves exposing living organisms (vertebrates, invertebrates) to set concentrations of the permittee's effluent over a period of time and recording the results. WET testing is performed to determine both the acute (short term) and the chronic (longer term) effects of the effluent on sensitive species. The permittee must meet specific WET performance standards. For acute toxicity, the effluent must achieve a median of at least 80% survival in 100% effluent with no single test showing less than 65% survival in 100% effluent. For chronic toxicity, the effluent must show no toxicity in a concentration of effluent representing the edge of the acute mixing zone. More information regarding WET testing can be found at Ecology's WET testing website (http://www.ecy.wa.gov/programs/wq/wet/index.html).

WET testing results for the Everett WPCF are presented in Appendix D for 2009-2014. Both treatment systems at the Everett WPCF passed all acute WET limit tests conducted during the permit term. The lagoon treatment system had a median survival rate of 98% in 100% effluent during the period and the TF/SC system had a median survival of 100% in 100% effluent. Chronic WET testing conducted in July 2012 and January 2013 as part of the reapplication process demonstrated that both treatment systems continue to show no reasonable potential for chronic toxicity. The proposed permit retains the requirements from the previous permit for quarterly WET limit testing on both treatment systems and requires chronic testing during the final year of the permit for the next renewal application.

The proposed Everett WPCF NPDES permit requires quarterly priority pollutant metals monitoring of the effluent from both treatment systems, influent to the WPCF and of the biosolids. The permit also requires annual monitoring of the organic priority pollutants listed in Appendix A of the permit (acid compounds, volatile compounds, and base neutral compounds including several persistent bioaccumulative toxics). Ecology believes this level of monitoring provides adequate data to reassess compliance with the State's water quality standards at the next permit issuance.

In general, this comment relates to Ecology's agency-wide policies, the State's WQ standards, and the sufficiency of EPA's National Toxics Rule, rather than to how Ecology applied these standards and policies to this individual permit. Ecology developed this permit consistent with the State's water quality standards, the methods described in its Permit Writers' Manual, and relevant Federal laws and rules.

Comment #2: Second, screening monitoring is ineffective if the laboratory analytical methods used have detection and quantitation levels far in excess of pollutant concentrations of concern. Rather than default to the EPA-approved analytical methods for toxics screening, Ecology should evaluate the availability of newer and superior analytical methods and require their use for toxic pollutant screening wherever appropriate.

Ecology's Response to Comment #2: *Ecology agrees that analytic detection and quantitation levels must be low enough to ensure compliance with water quality criteria. Ecology added Appendix A to its permit for this very reason to ensure permittees meet the detection and quantitation levels necessary for adequate assessment. Consistent with WAC 173-201A-260(3)(h), Ecology developed Appendix A in accordance with the "Guidelines Establishing Test Procedures for the Analysis of Pollutants" (40 C.F.R. Part 136). Use of Part 136 test methods is required by 40 CFR Part 122.41(j)(4).*

In general, this comment relates to Ecology's agency-wide policies, the State's WQ standards, and EPA required testing methods, rather than to how Ecology applied these standards and policies to this individual permit. Ecology developed this permit consistent with the State's water quality standards, the methods described in its Permit Writers' Manual, and relevant Federal laws and rules. Furthermore, through its appeal of NPDES permit WA0031968 (PCHB 13-137), Puget Soundkeeper Alliance had a full and fair opportunity to raise this same issue before the PCHB. The PCHB's ruling in that case concluded that "the state Surface Water Quality Standards require the use of EPA-approved analytical test methods published in [40 CFR 136] the Code of Federal Regulations" (emphasis added). In light of that ruling, Ecology will continue to follow the required testing methodologies set out in federal regulations and affirmed by the PCHB.

Comment #3: Appendix A to the draft permit identifies detection limits ("DLs") and quantitation levels ("QLs") for the individual pollutant analyses required by the permit. Where do these DLs and QLs come from? Many of them are different from those given in the federal regulations. Where do the QLs come from? A QL is typically calculated as the DL multiplied by 3.18, but that does not fit most of the given figures. It is also puzzling that closely related pollutants to be analyzed with the same lab method have apparently inconsistent numbers; for instance, on p. 55, the QLs for PCB-1248 and PCB-1260 are both identified as 0.5 ug/L while the DL for PCB-1248 is 0.25 ug/L and that for PCB-1260 is 0.13 ug/L. How, when, and by whom were the QLs and DLs in these tables developed?

Ecology's Response to Comment #3: *Ecology compiled the list of Appendix A methods, detection levels (DLs), and quantitation levels (QLs) over several years, beginning in 1993. Early efforts relied on input on the DLs and QLs from Ecology staff, EPA Region 10, and several public and private laboratories. In January 2008, EPA Region 10 published a document titled "Table of Limits" that included a list of methods with known detection limits, instrument detection limits, and method detection limits. Also in early 2008, Ecology conducted a survey of all labs accredited in Washington for organics analysis. After comparing the results from Ecology's survey and the Region 10 Table of Limits, Ecology's Water Quality program staff assembled Appendix A in consultation with Ecology's Manchester Laboratory staff, Ecology's Environmental Assessment Program (EAP) staff, and the agency's Quality Assurance (QA) Officer. The version of Appendix A included in the proposed permit is a product of the efforts described above.*

Ecology recognizes that many older EPA Part 136 methods lack method detection levels (e.g. EPA Method 608.2). Even when a method includes detection levels, Appendix A values for DLs and QLs may be lower than those published with the method. This reflects advances in laboratory analysis procedures allowing lower DLs and QLs. As noted above, the actual values included in Appendix A by Ecology were influenced by a survey of laboratories and input from experienced chemists at

Ecology's Manchester lab. Ecology's Water Quality Program maintains Appendix A and updates the appendix on a regular basis, primarily to add newly approved EPA Part 136 methods. Consideration of edits to DLs and QLs occurs in consultation with appropriate staff at the Manchester Laboratory and Ecology's QA Officer. Ecology last updated the appendix in August 2014.

Comment #4: Relatedly, the fact sheet appendix F seems to indicate that a dilution factors of 14.2, 15.6, and 696 were used for the three outfalls to determine reasonable potential for human health criteria. Soundkeeper objects to the use of mixing zones or dilution factors for PBTs, including those assigned criteria under the NTR. EPA has repeatedly cautioned that mixing zones are inappropriate to PBTs, and has even banned them from the Great Lakes. Mixing zones should be disallowed "because [bioaccumulative chemicals of concern, "BCCs," also known as PBTs], due to their persistent and bioaccumulative nature, are incompatible with mixing zones. By definition, BCCs are chemicals that do not degrade over time. These chemicals accumulate in organisms living in the water and become more concentrated as they move up the food chain – from biota to fish and wildlife to humans. Because the effects of these chemicals are not mitigated by dilution, using a mixing zone to 'dilute' BCC discharges is not appropriate." 65 Fed.Reg. 67638, 67640-641 (Nov. 13, 2000). PBTs detected in the Everett Facility's discharges include lead and mercury. Soundkeeper is confident that additional PBTs would be detected if appropriately sensitive laboratory analysis methods were used.

Soundkeeper notes that there are fish consumption advisories in place for Puget Sound in the vicinity of the discharge based on PBT fish tissue contamination, that there are 303(d)listings for PBTs in the Sound, and that the Sound has a well-documented PCB contamination problem. Given these factors, Soundkeeper asserts that, with respect to the PBTs present in the Everett Facility discharge, Ecology has not and cannot identify "supporting information that clearly indicates that the [outfall 001] mixing zone would not have a reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health," which means that no mixing zone may be authorized under WAC 173-201A400(4). Accordingly, the reasonable potential analysis for NTR human health criteria for PBTs should be redone without consideration of dilution.

Ecology's Response to Comment #4: *The NPDES permit for the Everett WPCF does not authorize discharges from an outfall identified as "outfall 001". The outfalls authorized by this permit are designated as outfall 100, outfall 015, and outfall 025. Ecology assumes that the above comment was directed at these outfalls. The above comment also identifies "lead and mercury" as "PBT's detected in the Everett Facility's discharge". While the state's Persistent Bioaccumulative Toxins rule (WAC 173-333) identifies lead on the list of "Metals of Concern" (WAC 173-333-315), the rule does not include total mercury (CAS Number 7439-97-6) on the PBT list (WAC 173-333-310). The state's PBT list includes methyl mercury (CAS Number 22967-92-6), which is an organometallic compound that is most commonly recognized as the form of mercury that bioaccumulates in the environment. Analytical results reported by the City of Everett determined the concentrations of total mercury in the discharges. Analytical methods for total mercury will include methyl mercury as part of the total mercury detected in the sample, however the analytical methods will not differentiate methyl mercury from other forms of mercury that do not have the same risk for bioaccumulation.*

Ecology understands and appreciates the concern over PBTs in aquatic species in the Puget Sound. As documented in the Chemical Action Plans (CAPs) for lead, mercury and PCBs that Ecology's Waste2Resources Program developed under the state's PBT Initiative, the best approach for PBT reduction is through source control. The CAPs also identify wastewater pretreatment programs, such as the City of Everett's pretreatment program, as important contributors to source control by regulating the discharge of industrial wastes to the City's sewage system. Ecology approved the City's pretreatment program and delegated pretreatment authority to them in 1986. Ecology's delegation included approval of local limits developed by the City for any chemical that could pass through the treatment facility at levels that violate WQ standards, interfere with the treatment process, or accumulate in sewage sludge. Special Condition S6.D of the draft permit requires the City to routinely assess the adequacy of their local limits and to modify the limits whenever necessary to ensure that the limits remain adequate to protect water quality, sludge quality, and treatment plant operations. The City last revised their local limits in 2008.

As required by Chapter 173-201A-400(4) WAC, Ecology considered whether authorizing the mixing zones would result in a reasonable potential to cause a loss of sensitive or important habitat; substantially interfere with the existing or characteristic uses of the water body; result in damage to the ecosystem; or adversely affect public health. Pages 29 and 30 of the fact sheet document Ecology's approach to assessing this potential. Ecology's evaluation considers the numeric criteria for pollutants listed in the WQ standards along with results of toxicity testing. The evaluation also considers ambient concentrations of pollutants when they are detected in the environment along with any water quality impairment listing for the receiving water.

With respect to PBTs, the comment noted that the effluent contains "lead and mercury". Table 5 of the fact sheet lists ambient concentrations for lead and mercury in the Snohomish River that Ecology used in its reasonable potential assessment for outfalls 015 and 025. Although the permit authorizes a mixing zone for mercury and lead, the combined effluent and ambient concentrations for both pollutants remain below applicable WQ standards. Ecology was unable to obtain ambient water column data from mercury and lead in Port Gardner. However the 2012 Water Quality Assessment (303(d)) list demonstrates that both mercury and lead in fish tissue and sediment samples from Port Gardner comply with the standards. While the 2012 list does include an impairment listing for PCBs in fish tissue in some locations of Port Gardner, priority pollutant testing of influent to and effluent from the Everett WPCF did not detect any PCBs. Therefore, Ecology determined that the mixing zone authorization for outfall 100 complies with the limitations included in Chapter 173-201A-400(4) WAC

In general, this comment relates to Ecology's agency-wide policies and the State's WQ standards rather than to how Ecology applied these standards and policies to this individual permit. Ecology developed this permit consistent with the State's water quality standards and the methods described in its Permit Writers' Manual. The human health criteria in the water quality standards incorporate bioaccumulation factors. The standards allow mixing zones for those human health parameters and those standards were implemented in the draft NPDES permit for the Everett WPCF.

Ecology also considered the narrative criteria described in Chapter 173-201A-260 WAC when it determined permit limits and conditions. Ecology considered the narrative criteria when it evaluated the characteristics of the wastewater and implementation of all known, available, and reasonable methods of treatment and prevention (AKART) as described in the technology-based limits section of the fact sheet. When Ecology determined that the facility is meeting AKART it

considered the pollutants in the wastewater and the adequacy of treatment to prevent the violation of narrative criteria.

Comment #5: Also with regard to mixing zones, Soundkeeper questions reliance on old mixing zone studies as the basis for dilution factors. The outfall 100 mixing zone study was completed in 2004 and considered the flow with the Kimberly-Clark discharge, which no longer exists. The mixing zone studies for outfalls 015 and 025 date back to 1996. Have there not been significant changes in the receiving waters or the discharges or the modeling techniques to warrant a new mixing zone study?

Ecology's Response to Comment #5: *The age of a mixing zone study does not render the study invalid for use in a NPDES permit. During the permit drafting process, Ecology reviews the ambient receiving water and effluent characteristics used in a mixing zone study to determine whether current conditions remain consistent with the study. If conditions change and if the change has the potential to decrease dilution compared to the existing mixing zone study, Ecology may recalculate dilution using appropriate models or may require the permittee to complete a new mixing zone study. With respect to the proposed permit for the Everett WPCF, Ecology is not aware of any factors that may cause mixing to decrease.*

The 2004 mixing zone study for outfall 100 evaluated dilution at various flow rates and determined acute and chronic dilution factors appropriate for the different flows. The following table compares dilution factors for the outfall at flows ranging between 37 MGD and 73 MGD. As the data in this table demonstrates, an inverse relationship exists between flow and dilution. Soundkeeper is correct that the loss of flow from the Kimberly-Clark Mill will change the amount of dilution provided by outfall 100. However that change would result in a significant increase in dilution. Continuing to use the dilution factors from the 2004 study minimizes the authorized mixing zone by setting dilution factors that are more conservative than actual dilution.

Table 2
Comparison of Critical Condition Dilution Factors for Design and As-Built Diffusers

Discharge Flow (see text)	Critical Discharge Condition	Dilution Design Diffuser (1,555-foot with 80, 4.5-inch ports)	Dilution As-Built Diffuser (1,550-foot with 80, 5-inch ports)	Dilution for K-C Effluent with As-Built Diffuser & Current Flows[1]
41 mgd (K-C only)	Acute	219:1		
44.9 mgd (K-C only)	Acute		200:1	**200:1**
65 mgd (Combined)	Acute	167:1	161:1	
69.9 mgd (Combined)	Acute		156:1	**203:1**
73 mgd (Combined)	Acute	157:1	153:1	
37 mgd (K-C only)	Chronic	1018:1		
40.5 mgd (K-C only)	Chronic		911:1	**911:1**
58.5 mgd (Combined)	Chronic		696:1	**905:1**
61 mgd	Chronic	689:1	672:1	
69 mgd	Chronic	634:1	618:1	

1. This column shows the dilution factors (shown in bold) for the currently projected startup & combined flows for the As-Built Diffuser. The K-C effluent dilution factors for combined flows include the dilution increase due to mixing with municipal effluent flows (see prior section).

Ecology is not aware of any substantial changes to the physical condition of outfall 015 or of the characteristics of the Snohomish River in the vicinity of outfall 015. The outfall evaluation required by Special Condition S9 of the draft permit could reveal changes that would warrant a new mixing zone study. Ecology will assess this need after the evaluation is complete. As noted on page 43 of the fact sheet, Ecology is aware that the Everett WPCF operators often limit flow through outfall 015 during the critical summer season to ensure discharges comply with TMDL-based limits derived from the 1999 Snohomish River Estuary Dissolved Oxygen TMDL. In addition, the draft permit limits summer flow through outfall 015 to a daily maximum of 10.2 MGD as a strategy to ensure the discharge complies with temperature standards. The temperature-based flow limit and the operating strategy to limit flow to comply with the dissolved oxygen TMDL are factors that will cause actual dilution to be higher than the dilution authorized in the permit. Although the draft permit does not authorize changes in outfall 015 dilution due to actual flows being lower than modeled flow, the City of Everett may request adjustment of the dilution in future permits, including use of seasonal dilution rates, if they choose to update the mixing zone study based on new conditions.

Ecology is also aware that the physical conditions of outfall 025 and of the river in the vicinity of the outfall are no longer consistent with the conditions modeled in the 1996 mixing zone study. As discussed on page 15 of the fact sheet, sediment has accumulated around the outfall. The accumulation forced the City to take the outfall out of service in 2009. The City plans to repair or replace the diffuser on this outfall as funding becomes available. Ecology will require the City to update the mixing zone study for this outfall as part of the project planning and design process.

Comment #6: Further, the descriptions of the mixing zones authorized by the permit are inadequate in violation of WAC 173-201A-400(1) and WAC 173-220-130(3)(c) (requiring that permits specify the "dimensions" of a mixing zone). None of the descriptions state the depth through the water column included in the mixing zones.

***Ecology's Response to Comment #6**: The WQ standards do not limit the vertical extent of a mixing zone. Therefore, the height of the mixing zones authorized by in the draft permit extend from the discharge ports to the water surface. Ecology will add this statement to the mixing zone authorizations found in Special Condition S1.C of the draft permit.*

Comment #7: Soundkeeper questions whether the mixing zones for outfall 100 comports with regulatory size restrictions. These are described as extending 540 (and 54 for chronic) feet "in any horizontal direction from each port in the diffuser." This seems to describe a series of neighboring or overlapping circular zones rather than a simple circular shape. How do these mixing zones comport with the WAC 173-201A-400 size restrictions?

***Ecology's Response to Comment #7:** WAC 173-201A-400(7)(b)(i) states that mixing zones in in estuarine waters shall "[n]ot extend in <u>any horizontal direction from the discharge port(s)</u> for a distance greater than two hundred feet plus the depth of water over the discharge port(s) as measured during mean lower low water" (emphasis added). WAC 173-201A-400(8)(b) states: "[i]n oceanic and estuarine waters a zone where acute criteria may be exceeded shall not extend*

beyond ten percent of the distance established in subsection (7)(b) of this section as measured independently from the discharge port(s)"(emphasis added). The plain language of the WQ standard clearly establishes that the distance for the horizontal limit of a mixing zone extends from each port in a diffuser. As such, the complete mixing zone for discharges through multi-port diffusers is accurately described as a series of circular regions extending from each port. The WQ standards do not require mixing zones to be described as "a simple circular shape" as the comment implies.

The Outfall 100 diffuser section is described in multiple locations of the fact sheet as follows: a line that is 1,556 feet in length and laid along a gradual curve that starts at -340 feet and ends at -348 feet below mean lower low water (MLLW); has 80 vertical risers with 90° elbows that terminate with 5-inch round ports on each diffuser orifice plate; each riser is oriented so that the diffuser port openings alternate discharge directions along the length of the diffuser. When a diffuser section is installed on a slope so that one end of the diffuser is deeper than the other, Ecology uses the depth of the shallowest diffuser port as the outfall depth used to establish the mixing zone size. This is done to minimize the size of the mixing zone. Given the outfall depth of 340 feet and the limit of 200 feet plus depth for the size of the mixing zone, the complete chronic mixing zone for the outfall is made up of circular regions that extend 540 feet from each of the 80 ports. With the acute mixing zone limited to 10% of the distance established for the chronic mixing zone, the complete acute mixing zone for outfall 100 is made up of circular regions that extend 54 feet from each of the 80 ports. Appendix D of the fact sheet (page 75) includes a figure that illustrates the approximate region encompassed by the complete mixing zone.

Comment #8: It appears that reasonable potential and numeric effluent limitation calculations for parameters related to dissolved oxygen, for which the Snohomish River does not meet criteria and has a TMDL, include consideration of mixing zones and dilution factors. Soundkeeper contends that it is inappropriate to assign mixing zones and dilution factors to these pollutants given the state of the river. The river has no assimilative capacity for pollutants that could degrade the river's condition with regard to dissolved oxygen.

Ecology's Response to Comment #8: *The Snohomish River was listed on the 1996 and 1998 303(d) lists for failing to meet dissolved oxygen standards; the TMDL study was completed in 1999. Because the TMDL is being implemented (primarily through NPDES permits), the river is no longer listed as impaired for dissolved oxygen. As stated on page 38 of the fact sheet, the 1999 Snohomish River Estuary Dissolved Oxygen TMDL established waste load allocations (WLAs) for $CBOD_5$ and Ammonia that Ecology used to calculate numeric permit limits on discharges to the Snohomish River. Ecology used EPA-supported models (WASP5 and DYNHYD5) to simulate oxygen depletion in the estuary and to establish the load allocations necessary to limit the dissolved oxygen deficit caused by point sources to no more than 0.2 mg/L. The WLAs for the Everett WPCF shown in Table 21 of the fact sheet were derived from this TMDL modeling. By definition, the TMDL-based WLAs in Table 21 are "Maximum Daily Limits". Ecology calculated an appropriate average monthly limit based on the TMDL-based maximum daily limits using equations from EPA's Technical Support Document for Water Quality-based Toxics Control (1991). The limit calculations use statistical methods to establish limits and do not consider mixing.*

The fact sheet documents on page 39 how Ecology calculated the seasonal permit limit on "Equivalent Oxygen Demand" (expressed as NBOD+CBOD) that is included in Special Condition S1.A of the draft permit. Ecology first established "Equivalent Oxygen Demand" as a TMDL-based limit in the Everett WPCF permit issued on July 1, 2004. The City proposed the use of "Equivalent Oxygen Demand" in their comments on the draft 2004 permit (see page 55 of fact sheet for the 2004 permit). The City noted that the TMDL model provided a technical basis to express the limit based on a single "Equivalent Oxygen Demand" and provided an equation for converting the WLAs for $CBOD_5$ and Ammonia into a single parameter. The equation uses a conversion factor based on the mass of oxygen needed to oxidize one pound of ammonia-nitrogen; it does not consider mixing or dilution in the receiving water. Ecology responded to the City's comment by accepting the equivalency equation and replacing separate TMDL-based $CBOD_5$ and ammonia limits with a single "Equivalent Oxygen Demand" limit. The TDML-based limits in the draft permit remain the same as the limits implemented in the 2004 and 2009 permits for the Everett WPCF and have been calculated using the same equations.

Ecology considered mixing while assessing whether ammonia present in effluent discharged through outfall 015 would have a reasonable potential to exceed water quality standards for aquatic toxicity. As discussed on pages 44-45 of the fact sheet, this analysis demonstrated a reasonable potential for ammonia to exceed the aquatic life toxicity standard outside of the mixing zones established for that outfall. Due to this potential, we calculated water quality-based effluent limits for outfall 015 at concentrations necessary to protect aquatic life from the toxic effects of ammonia. Inclusion of this aquatic life toxicity-based effluent limit on ammonia does not alter the TMDL-based "Equivalent Oxygen Demand" limit. The Everett WPCF must comply with both limits. The combined mass discharge (expressed in pounds per day) of $CBOD_5$ and ammonia must not exceed the "Equivalent Oxygen Demand" limit in Special condition S1.A and the ammonia concentration (expressed in mg/L) must not exceed the Total Ammonia limit in the same condition. In addition, the TMDL-based limit applies to discharges only during the months of July through October while the Total Ammonia concentration limit applies during all months.

Comment #9[a]: Soundkeeper questions the propriety of the numeric effluent limitations for NH3-N and NBOD+CBOD for outfalls 015 and 025 to the Snohomish River, which are given in S1.A and S1.B. Under 40 CFR 122.44(d)(vii)(B), "Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7." The 1999 Snohomish River TMDL for dissolved oxygen gives WLAs for outfalls 015 and 025 (identified in the TMDL as "Everett WWTP North" and "Everett WWTP South," respectively) for ammonia nitrogen (876 lbs/day for 015, 667 lbs/day for 025) and ultimate carbonaceous biochemical oxygen demand (3336 lbs/day for 015, 988 lbs/day for 025). These values do not appear in the numeric effluent limitations for these outfalls. How are the numeric effluent limitations consistent with the WLAs in the TMDL?

Ecology's Response to Comment #9[a]: *Special condition S1.A limits discharges to the Snohomish River through outfalls 015 and 025. This condition appropriately enforces TMDL-based limits consistent with the 1999 Snohomish River TMDL. Special Condition S1.B establishes limits to discharges to Port Gardner Bay through outfall 100. Since the 1999 Snohomish River TMDL does not extend into Port Gardner Bay, Special Condition S1.B does not include TMDL-based limits.*

As discussed in Ecology's Response to Comment #8, the permit includes an "Equivalent Oxygen Demand" limit (expressed as NBOD+CBOD) as a numeric TMDL-based limit. As explained in our response to comment #8 and as documented on pages 38 and 39 of the fact sheet, Ecology calculated the NBOD+CBOD limit based on the waste load allocations in the approved TMDL. Ecology has used the approach of implementing this TMDL-based limit as a single parameter limit since 2004. The draft permit is the third permit for the Everett WPCF to include the same numeric limit.

Special Condition S1.A does not include a TMDL-based ammonia (NH3-N) limit. The effect ammonia has on dissolved oxygen is incorporated into the calculated NBOD+CBOD parameter. As discussed in our response to comment #8, the Total Ammonia limit included in Special Condition S1.A is based on a reasonable potential determination that demonstrated a need for a water quality-based effluent limit to protect against ammonia toxicity in the receiving water. The Total Ammonia concentration Limit applies to all discharges through outfall 015, regardless of season, and the Everett WPCF must comply with this limit concurrently with the TMDL-based limit. The permit does not include a separate Total Ammonia limit for discharges from outfall 025 because, as documented in the fact sheet, there is no reasonable potential for ammonia toxicity from TF/SC system effluent discharged to the Snohomish River through that outfall.

Comment #9[b]: With reference to the TMDL, page 33 of the fact sheet states that "[s]ince the facility does not routinely use outfall 025, the proposed permit applies the waste load allocation only to outfall 015." This appears to mean that the numeric effluent limitations in the permit for 015 are derived from a summing of the WLAs for 015 and 025. What rule or policy or provision of the TMDL authorizes this? Soundkeeper questions whether this procedure renders the S1.A and S1.B effluent limitations inconsistent with the TMDL, which assigns WLA's separately to these two outfalls, which are located about a mile apart.

Ecology's Response to Comment #9[b]: *The 1999 Snohomish River Estuary Dissolved Oxygen TMDL study established a WLA for the Everett WPCF that was split between the two facility outfalls that were continuously discharging to the Snohomish River at the time of the TMDL study (outfalls 015 and 025). In 2004 the City ceased continuous discharges from outfall 025 to the Snohomish River and transferred the discharge to Port Gardner Bay through outfall 100. This left outfall 015 as the only continuously discharging outfall from the WPCF to the Snohomish River. Since the WPCF no longer continuously discharged to the Snohomish River from two separate outfalls, Ecology concluded that it was no longer appropriate to divide the WLA for the facility between two outfalls. The fact sheet for the 2004 permit for the WPCF documented Ecology's intent to consolidate the WLA for the two outfalls and apply them to discharges from outfall 015. Ecology received no objections to the consolidation during the public comment period for the 2004 permit and issued the 2004 permit with TMDL-based limits on outfall 015 calculated from the consolidated allocations. The 2015 draft permit is the third permit for the WPCF to apply the consolidated WLA for outfall 015.*

The original water quality model for the TMDL study included the entire estuary from the confluence of the Skykomish River to Port Gardner Bay. It is not likely that consolidating the two Everett outfall points would significantly affect the results. The WLA consolidation at the Everett WPCF provides the following safeguards:

- *The WLA consolidation does not result in an increasing in pollutant discharges to the watershed.*

- *Special Condition S1.A of the draft permit prohibits discharges from outfall 015 during periods when the WPCF discharges from outfall 025.*
- *Special Condition S1.A also specifies that the combined mass discharges from outfalls 015 and 025 must not exceed the mass limits for outfall 015, which includes TMDL-based mass discharge limits.*
- *The draft permit requires the Everett WPCF to monitor effluent discharge through outfall 025 each time the outfall is used and to calculate the combined mass discharge of pollutants from outfalls 015 and 025 each time the City uses outfall 025.*

Comment #10: Next, fact sheet p. 43 states that reasonable potential for violation of human health-based water quality standards is indicated for chlordane at outfall 025, but that no effluent limitation is proposed "[s]ince the proposed permit does not authorize continuous discharges from outfall 025." This appears to be contrary to rules requiring the imposition of WQBELs when reasonable potential is identified. 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d)(1); WAC 173-201A-510(1); WAC 173-220-130(1)(b). These rules provide no exception like that for non-continuous discharges upon which Ecology seeks to rely.

Ecology's Response to Comment #10: *Ecology agrees that the fact sheet needs to more clearly explain why the intermittent nature of the outfall 025 discharge justifies not including a human health-based limit for chlordane. The Reasonable Potential Analysis for outfall 025 presented on page 111 of the fact sheet does not accurately evaluate the potential water quality impacts of effluent discharged through that outfall. The analysis is overly conservative because the dilution factors used do not represent the intermittent nature, nor do they use appropriate ambient flow conditions for the human health dilution factors. Based on protocols for conducting mixing zone analyses that are included in Ecology's Permit Writer's Manual, the allowable dilution factor for outfall 025 should be on the order of 1500:1 for Human Health – Carcinogen parameters instead of the 15.6:1. If the analysis used appropriate dilution factors for human health criteria, it would not have shown a reasonable potential for chlordane to exceed applicable WQ standards.*

Chapter 7 of the Permit Writer's Manual provides guidelines for deriving water quality-based limits for protection of human health. Section 4.4 of this chapter identifies the annual average design flow for a POTW as the appropriate effluent flow to use in calculating dilution for carcinogenic pollutants. The section also states that, for intermittent discharges, Ecology will use the equivalent annual flow (highest total volume of all discharge events in one year divided by 365 days). Special Condition S1.A of the proposed permit limits the intermittent discharge from outfall 025 to a maximum flow rate of 18 MGD and at a frequency of no more than one day per week for no longer three hours on that day. Given this restriction, the equivalent annual average design flow for this outfall is calculated as follows:

$$\left(18\ MGD \text{Permitted flow rate} \times \frac{3\ hr\ permitted\ daily\ duration}{24\frac{hrs}{day} \times 1\ \frac{day}{week}} \times 52\frac{weeks}{year}\right) \div 365\ days = 0.32\ MGD$$

In contrast, the dilution model used in the 1996 mixing zone study for outfall 025 used the substantially higher maximum monthly discharge of 8 MGD to predict human health dilution.

Chapter 7, section 4.5, of the Permit Writer's Manual discusses the appropriate receiving water flow conditions to use in determining dilution for human health pollutants. Although Ecology uses the numeric criteria for marine waters as the appropriate WQ standard for pollutants in the lower Snohomish River, flow conditions of the receiving water more closely resemble a freshwater river system. Therefore the mixing zone analysis should use freshwater flow conditions to determine dilution. For carcinogenic pollutants, the Permit Writer's Manual specifies the use of the Harmonic Mean Flow of the river as the critical ambient flow condition. As a rule of thumb, the Harmonic Mean Flow is generally three times higher than the 7Q10 flow for a river. The dilution factor used in the reasonable potential analysis on page 111 of the fact sheet was based on a critical receiving water flow of 1,051 cfs, which is approximately one-third of the allowable flow rate for carcinogens.

As noted in our response to comment #5, the Everett WPCF is currently unable to discharge through outfall 025 due to silt accumulations around the outfall. The City plans to repair or replace the diffuser section of that outfall as funding becomes available. Ecology will require the City to complete a new mixing zone study for the outfall as part of the planning and design process for the project. That study will need to establish appropriate dilution for the outfall based on any physical changes to the diffuser and based on the intermittent operation authorized in the permit. Ecology will include the new dilution factors in future versions of the permit once Ecology approves the new mixing zone and the repaired outfall is returned to service.

Comment #11: According to the fact sheet, facility improvements to expand plant capacity are expected to be finished in August 2015. The upgraded facility capacity values are used to derive technology-based mass limits for CBOD and TSS (fact sheet at 23). However, the draft permit also includes several performance-based TBELs (fact sheet at 21 – 22) that do not appear to consider changes to performance that may be expected from the facility improvements. Why should TBELs in this new permit be based on performance data that will not be valid or representative of improved facility performance? Is there not a reasonable way to collect new performance data for a more valid statistical derivation of TBELs?

Ecology's Response to Comment #11: *Pages 11-13 of the fact sheet provide a detailed description of the treatment systems at the Everett WPCF. As described on these pages, flow to the WPCF first passes through preliminary screening and primary settling unit process before passing to aerated lagoon cells. Plant staff then split effluent from the aerated lagoons between two separate final treatment systems: the North Lagoon System and the South TF/SC System. The two final treatment systems are separate systems that operate in parallel and discharge through separate outfalls. The North Lagoon System discharges exclusively to the Snohomish River through outfall 015. The South TF/SC System discharges to Port Gardner through outfall 100 and is authorized to discharge to the Snohomish River through outfall 025 under limitations listed in Special Condition S1.A of the draft permit.*

As stated on page 12 of the fact sheet, the expansion project at the WPCF is limited to increasing the treatment capacity of the South TF/SC system and involves treatment components located downstream of the point where flow splits between the two final treatment systems. Any performance changes that result from this expansion will impact the quality of effluent discharged through outfall 100 and, on occasion, outfall 025. The expansion will not impact the

quality of effluent discharged through outfall 015. As described in the fact sheet, the technology-based limits for the TF/SC system are standard effluent limits codified in WAC 173-221 and 40 CFR 133. The limits codified in these regulations are recognized as AKART for domestic wastewater treatment plants. Mass limits for $CBOD_5$ and TSS discharged through outfall 100 are strictly based on AKART standards and the design flow for the TF/SC system.

"Performance-based" limits discussed in the fact sheet apply strictly to discharges from the North Lagoon System through outfall 015. As stated in the fact sheet, waste stabilization ponds (lagoons) and trickling filters may quality for alternative technology-based limits. In considering the appropriate application of alternative technology-based limits for the Everett WPCF, Ecology followed guidance published in Ecology's Permit Writer's Manual that provides a process for setting alternative limits based on levels demonstrated achievable at a facility. Ecology concluded that the TF/SC system consistently complies with standard technology-based limits and that alternative limits were not necessary for discharges from outfall 100 or 025. We also concluded that alternative limits for the North Lagoon System remain appropriate for TSS, based on an analysis of performance over more than a 15 year period, and that standard technology-based limits for CBOD5are appropriate for that system. Therefore, the draft permit contains alternative limits on TSS for discharges through outfall 015. It should be noted that the alternative limits for outfall 015 in the draft permit are more restrictive than the limits in the 2009 permit for the WPCF. The concentration and mass limits on TSS discharged from outfall 015 are approximately 10% lower in the draft permit and the draft permit contains a TSS Percent Removal requirement that was not included in the 2009 permit.

Comment #12: Condition S8.A states that "[t]his permit does not authorize a discharge from a CSO that causes adverse impacts that threaten characteristic uses of the receiving water …." Soundkeeper supports the apparent intent of this provision; discharges of the nature described would violate relevant water quality protection laws. However, this language is likely inadequate to the task because it would leave it less than entirely clear that such a discharge constitutes a permit violation, rendering enforcement potentially difficult. Soundkeeper suggests that this provision be rewritten to clearly prohibit these discharges (e.g., "this permit prohibits a discharge from a CSO that causes …"). Ecology may want to confer with its attorneys on this point.

Ecology's Response to Comment #12: *Ecology appreciates the comment and will modify the sentence in Special Condition S8.A to clarify that it applies to discharges from controlled CSO outfalls. By definition, discharges from CSO outfalls that do not meet the performance standard of "no more than one untreated discharge per year, on average" do not comply with the requirement for the "greatest reasonable reduction of combined sewer overflows" mandated by RCW 90.48.480. The permit authorizes discharges from uncontrolled CSO outfalls, which may not comply with applicable WQ standards, under the following conditions:*

1. *The permittee must fully implement the Nine Minimum Controls listed in Special Condition S8.B of the draft permit. The Nine Minimum Controls are technology-based requirements promulgated by EPA in the Federal CSO Control Policy. These controls are programmatic activates operators of combined sewer systems must take to minimize the impact a CSO discharge may have on receiving water quality.*
2. *The permittee must adhere to a compliance schedule that was developed to complete tasks needed to bring uncontrolled CSO outfalls into compliance with the performance standard*

for controlled outfalls. Special Condition S8.F contains a compliance schedule designed to bring most of the City's uncontrolled CSO outfalls into compliance with the performance standard by the end of 2017.

Compliance with the above conditions with respect to discharges from uncontrolled CSO outfalls constitutes compliance with the permit.

Special Condition S8.G lists requirements for CSO outfalls that meet the performance standard for "greatest reasonable reduction" as defined in WAC 173-245-020(22). Special Condition S8.G.a identifies three outfalls that comply with the performance standard and includes a requirement that the three outfalls "must continue to meet the performance standard." The plain language of this condition clearly establishes that failure to maintain compliance with the performance standard is a permit violation that is subject to appropriate enforcement action. Furthermore, Special Condition S8.G.c requires the City to implement a post construction monitoring program designed to demonstrate that discharges from controlled CSO outfalls comply with WQ standards and protect designated uses. This monitoring must be conducted according to a plan reviewed and approved by Ecology (Special Condition S8.G.d). Ecology considers the conditions listed in S8.G coupled with the revised sentence in S8.A that reads"[t]his permit does not authorize a discharge from a controlled CSO that causes adverse impacts that threaten characteristic uses of the receiving water as identified in the water quality standards, chapter 173-201A WAC" as sufficient language to establish whether a discharge from a controlled CSO outfalls violates the permit.

Comment #13: Condition S8.D requires a CSO reduction plan by March 31, 2020. Soundkeeper objects that this is an unreasonably long schedule for submission of this plan. According to the fact sheet (p.51), the original CSO plan was approved in 1987 and projected full compliance by 2017. In 2014, Everett presented projects and requested an additional 10 years for completion. Soundkeeper would prefer to see the updated plan for CSO reduction completion sooner to reduce the probability of yet further delays.

Ecology's Response to Comment #13: *Special Condition S8.D requires the City to "submit an amendment of its CSO Reduction Plan" (emphasis added) by March 31, 2020. This submission requirement is consistent with the requirements of WAC 173-245-090(2), which requires that "[i]n conjunction with its application for renewal of its applicable NPDES permit, the municipality shall submit an amendment to its CSO reduction plan". The City submitted an amendment to their CSO control plan in 2013, as required by the 2009 permit, and submitted another amendment in 2014. Ecology approved the 2014 amendment in July 2015 and used that amendment as the basis for the compliance schedule included as Special Condition S8.F.*

Ecology and the City signed Agreed Order #11638 (effective August 6, 2015) to establish a deadline of December 31, 2027 for the City to complete control projects on all of the City's CSO outfalls. The order requires the City to complete projects identified in the 2014 CSO Control Plan Update, or projects approved in future amendments to their control plan. The 2014 update proposed completing control projects on most of the City's CSO outfalls by the end of 2017. The plan also proposed delaying compliance for four outfalls until 2027 to allow the City time to construct the "Port Gardner Wet Weather Control Facility" at the former Kimberly-Clark mill site. The wet weather control facility will allow for greater control of combined sewage flows in the southwest portion of the City's combined service area and ensure a higher level of treatment

than previously proposed in the City's 1987 control plan. The compliance schedule included as Special Condition S8.F in the draft permit establishes enforceable deadlines that ensure nine of the City's 13 outfalls comply with the state standard of no more than one untreated discharge per year by the end of 2017. The draft permit also requires the City to submit a report by March 1, 2020 to update Ecology on the status of the "Port Gardner Wet Weather Facility". Ecology considers the compliance schedule in the draft permit combined with the agreed order sufficient to ensure the City completes control projects in a reasonable time.

Special Condition S12 of the draft permit requires the City to submit an application for permit renewal and it originally included a tentative date of March 31, 2020 for that submission, which was six months prior to the anticipated expiration of the permit. Ecology established these dates based on the assumption that the draft permit would become effective on October 1, 2015 and would expire September 30, 2020. Ecology now anticipates that this permit will become effective November 1, 2015 and will expire October 30, 2020. Therefore, Ecology will change the due dates for the application and for the CSO Control Plan Amendment to April 30, 2020 to coincide with the new projected permit expiration date.

Comment #14: Condition S8.G.c. requires submission of a "post construction compliance monitoring program to verify the effectiveness of CSO controls and to demonstrate compliance with water quality standards …." S8.G.d. sets the date for submission of this plan for Ecology review and approval. The provisions of the monitoring program should be made part of the permit and must be subject to public participation provisions for NPDES permitting. The permit and fact sheet should clarify how the monitoring program will be approved and implemented consistent with these requirements.

Ecology's Response to Comment #14: *Ecology will review the City's post construction monitoring plan for consistency with Special Condition S8.G.d and EPA's guidance document titled "CSO Post Construction Compliance Monitoring Guidance" (publication # EPA-833-K-11-001). Ecology will approve the plan under the authority of RCW 90.48.110 if, in our professional judgment, the plan is consistent with the permit requirement and demonstrates that the proposed monitoring will provide data necessary to assess compliance with appropriate WQ standards.*

It is inappropriate at this time to speculate whether the plan will recommend monitoring not already required by the permit. It is the City's responsibility to justify that any monitoring recommendations they make can provide necessary data to assess compliance with the WQ standards. In some cases, simple monitoring of CSO frequency and duration may provide the necessary data. The draft permit already includes this basic monitoring in Special Condition S2.B. In other cases, monitoring may need to include ambient monitoring of the water column and/or sediments. Once Ecology reviews and approves the City's plan, we will evaluate whether it is necessary to place additional monitoring in the permit. This may be done as a modification of this permit or as conditions in future permits.

Comment #15: Finally, Soundkeeper appreciates Ecology's correct decision to forgo lessening of effluent limitation stringency in a couple of instances where the antibacksliding provision applies (fact sheet at 22 and 37).

Ecology's Response to Comment #15: *Comment noted.*

City of Everett Draft NPDES Permit Comments, 8-20-2015

The City of Everett submitted the following comments on the draft permit:

1. Page 10, S2.A., Monitoring Schedule, (3) Whole effluent toxicity testing

   Please change the Acute Toxicity Testing, Minimum Sampling Frequency, to "Quarterly as specified in condition S10" or similar language that allows WET sampling to be done any time during the quarter as described in section S10.C.4.

   Response: *Ecology appreciates the City's discovery of this technical error. Prior to publishing the draft permit for public comment, Ecology modified the language in Special Condition S10 to specify that acute WET testing may occur during any month in a given calendar quarter rather than during four specific months each year. This flexibility is consistent with WET testing requirements placed in other NPDES permits in the state. Unfortunately Ecology neglected to make the necessary change to the monitoring table in Special Condition S2.A to reflect the change in S10. Ecology will make this change in the final permit.*

2. Page 34, S8.F., Compliance Schedule

   Items 4 and 5 – Change design document submittal dates for both the Hayes Street CSO Improvements Project and WPCF Structure Zero Improvements project to December 31, 2016.

   Item 7 – Change to: Complete construction of the "Sewer M" project by December 31, 2017.

   Response: *Ecology will make the requested change. Ecology erroneously listed the due dates for these tasks as "November" rather than "December".*

Technical Error Correction in Fact Sheet

Ecology discovered a typographical error in Table 24 (Comparison of limits for outfall 015). The fact sheet published with the draft permit did not include the correct TSS concentration and mass limits for the proposed permit. Those values have been corrected to match the values shown in tables 14 and 15.