Fact Sheet for NPDES Permit No. WA0022641

Lighthouse Point Water Reclamation Facility

Effective Date: July 1, 2019

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed combined National Pollutant Discharge Elimination System (NPDES) Reclaimed Water permit for the city of Blaine's Lighthouse Point Water Reclamation Facility (LPWRF or Lighthouse Point). It complies Section 173-220-060 and Section 173-219-280 of the Washington Administrative Code (WAC), which require Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing a NPDES or Reclaimed Water 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 LPWRF, NPDES permit WA0022641, were available for public review and comment from April 10, 2019, until May 10, 2019. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

The city of Blaine 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.

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 F - Response to Comments**, 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 city of Blaine operates an activated sludge wastewater treatment plant equipped with a membrane bioreactor that discharges to Semiahmoo Bay. The facility also is capable of producing Class A reclaimed water for irrigation and other beneficial uses. Ecology issued the previous permit for this facility on May 10, 2013. The proposed permit contains the same limits on effluent discharge to Semiahmoo Bay for BOD_5, Total Suspended Solids, Fecal Coliform Bacteria, and pH.

Ecology based requirements in the previous permit related to reclaimed water on its interim Water Reclamation and Reuse Standards, developed in collaboration with the Department of Health in 1997. The proposed permit imposes requirements contained in the Reclaimed Water Rule, Chapter 173-219 WAC. The proposed permit includes limits on Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, turbidity, total coliform and total nitrogen that are based on the performance standards for Class A reclaimed water. It also includes requirements related to the distribution and use of the water that are developed to maintain public health protection.

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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 Washington 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).

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.

In enacting the Reclaimed Water Use law, chapter 90.46 RCW, the Washington State Legislature found that it was in the best interest of present and future generations to encourage the use of reclaimed water in ways that protect the environment as well as the health and safety of all Washington citizens. The Legislature declared that the people of the state of Washington have a primary interest in the development of facilities to provide reclaimed water to replace potable water in nonpotable applications, to supplement existing surface and groundwater supplies, and to assist in meeting the future water requirements of the state. The law directed Ecology, in coordination with the Department of Health (DOH), to adopt rules for reclaimed water use. Ecology adopted the Reclaimed Water Rule, chapter 173-219 WAC, in January 2018.

RCW 90.46.220 and WAC 173-219-070 require any person proposing to generate any type of reclaimed water for a use regulated under the Reclaimed Water Use law to obtain a permit from either Ecology or DOH. The Reclaimed Water Rule designates the lead agency responsible for overseeing the engineering reviews and permitting of reclaimed water facilities based on the type of facility. Ecology is the lead agency when the source water for reclaimed water production is an effluent from a domestic wastewater treatment or water pollution control facility that would typically require a permit from Ecology for effluent disposal to surface water under WAC 173-220 or to groundwater under WAC 173-216. Reclaimed water facility owners must obtain a permit before they may distribute or use any reclaimed water.

All reclaimed water permits issued by Ecology must specify conditions requiring the facility to adequately and reliably treat its wastewater to a level appropriate for the approved beneficial uses of the water. In addition to meeting the water quality limits, the standards require specific treatment and disinfection requirements beyond those of most conventional wastewater treatment facilities. The standards also require automated alarms, redundancy of treatment units, emergency storage, stringent operator training requirements and public notification of reclaimed water use.

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 Comments. Ecology will summarize the responses to comments and any changes to the permit in **Appendix F**.

II. Background Information

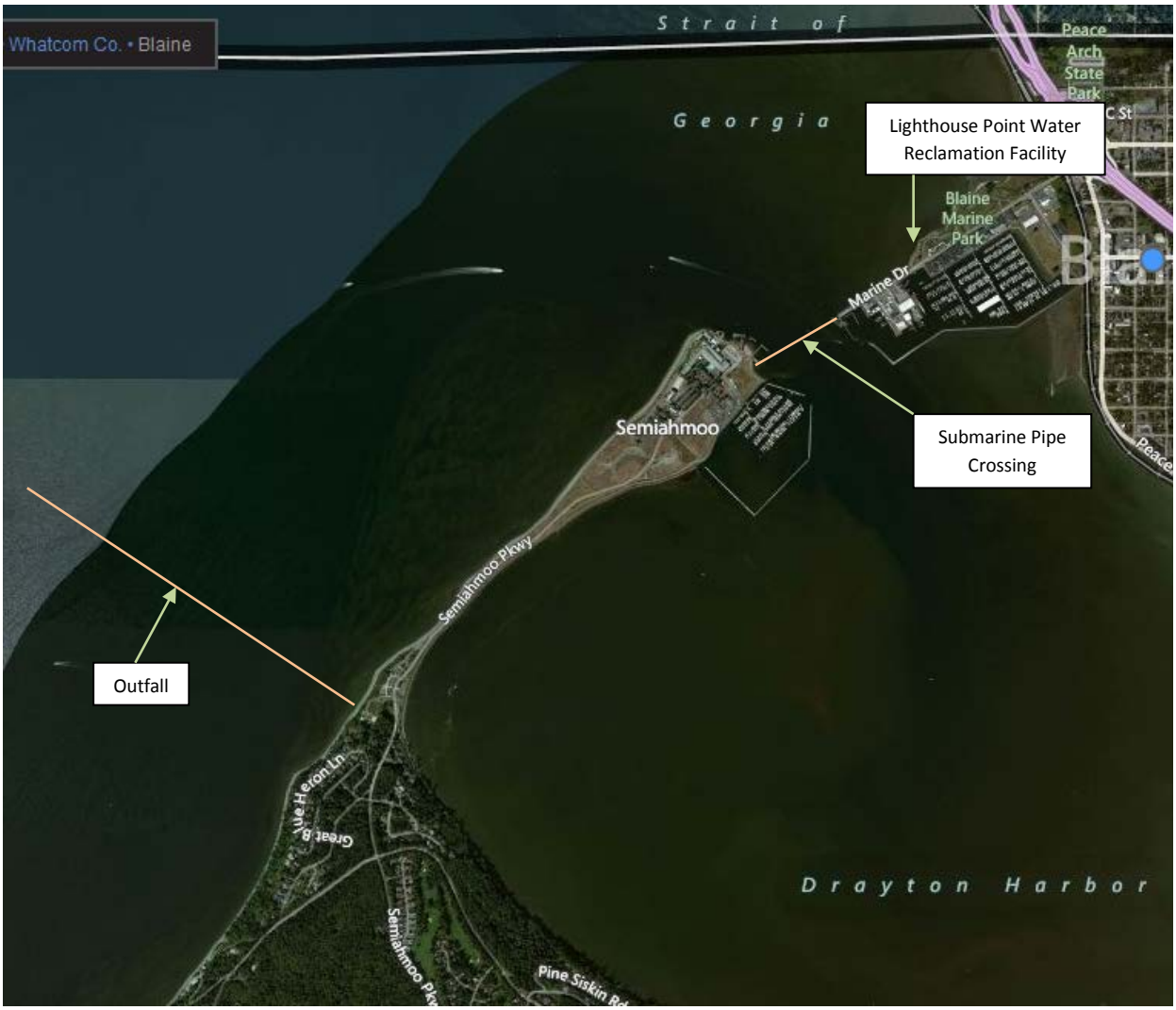
Table 1. General Facility Information

Facility Information	
Applicant	City of Blaine
Facility Name and Address	Lighthouse Point Water Reclamation Facility 272 Marine Drive Blaine, WA 98230
Contact at Facility	Name: Chrissy Ness Telephone #: 360-3323718
Responsible Official	Name: Ravyn Whitewolf Title: Public Works Director Address: 1200 Yew Avenue Telephone #: 360-332-8820 FAX #: 360-332-7124
Type of Treatment	Activated Sludge with Membrane Bioreactors
Facility Location (NAD83/WGS84 reference datum)	Latitude: 48.9944 Longitude: -122.7605
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Semiahmoo Bay, Strait of Georgia Latitude: 48.979444 Longitude: -122.801389
Type of reclaimed water treatment	Membrane filtration with disinfection
Highest class of reclaimed water produced	Class A
Approved beneficial uses	Irrigation, toilet flushing, and public water features.

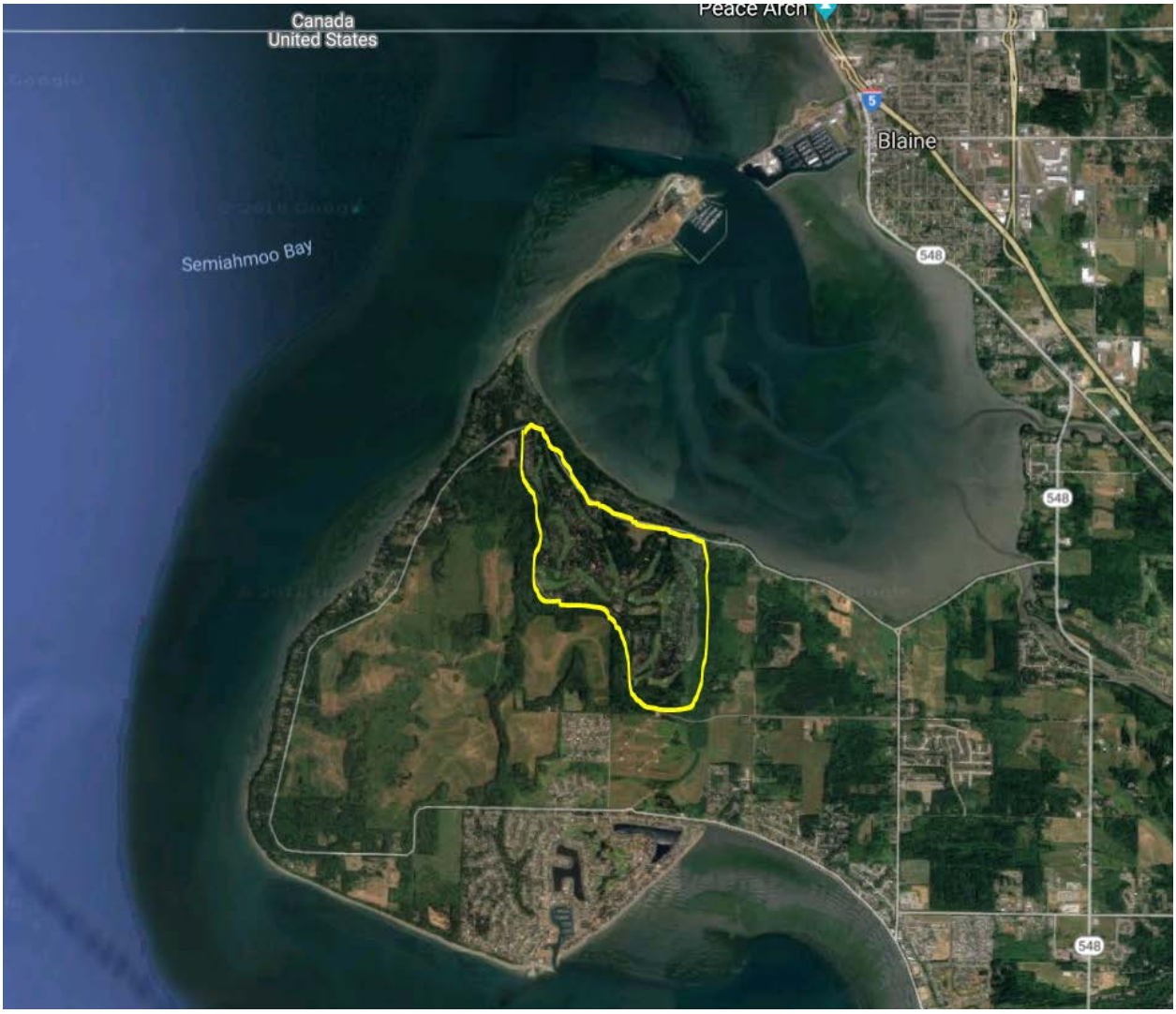
Permit Status	
Issuance Date of Previous Permit	May 10, 2013
Application for Permit Renewal Submittal Date	May 25, 2017
Date of Ecology Acceptance of Application	May 31, 2017

Inspection Status	
Date of Last Non-sampling Inspection Date	September 20, 2016

Figure 1. Facility Location Map




Lighthouse Point Water Reclamation Facility
Marine Dr
Marine Dr



Reclaimed Water Use Area (outlined in yellow)

A. Facility description

History

The current treatment plant is located at 272 Marine Drive in Blaine, Washington. It replaced the old Rotating Biologic Contactor (RBC) plant which was built in 1980, located on Semiahmoo Spit on the west side of Drayton Harbor, in northwestern Whatcom County. The outfall discharges to Semiahmoo Bay, which is part of the Strait of Georgia shared with Canada.

Industries in Blaine include a cereal manufacturing facility, a chocolate factory, a metal plating facility, and several seafood processing facilities. The metal finishing business is also regulated separately by an industrial state waste discharge. The cereal manufacturer is also regulated separately by its own industrial state waste discharge permit. It does not currently discharge to Blaine's wastewater plant. Three of the seafood processors formed a consortium,

received an NPDES permit, and leased a separate outfall from the city that discharged at the entrance of Drayton Harbor. The seafood companies have since disbanded their consortium and their permit has been canceled. During the late 1980s, seafood processing industries in Blaine discharged their wash-down water (fish, crab, and shellfish parts) to Blaine's sewage treatment plant. In the fall of 1989 this caused overloading of organic material to the plant and a plant upset so severe that the entire city system had to be bypassed for several weeks with raw sewage discharges to the mouth of Drayton Harbor. This necessitated that seafood processors obtain industrial discharge permits from Ecology, screen their wastewater, and use a separate outfall. A consortium of SeaK Fish Company, Boundary Fish Company, and Dakota Fish Company was formed in 1993, and a single NPDES permit was written for the three to use a single outfall.

In 1999 Nature's Path Foods, a cereal manufacturing plant, opened and began sending its wastewater to the Blaine wastewater plant. The effluent from this plant was high in sugars which created high biological oxygen demand (BOD) depleting oxygen in the wastewater. This affected performance at the wastewater plant. Currently the cereal manufacturer does not send industrial wastewater to the city of Blaine.

In 1995 Blaine submitted engineering documents to Ecology for approval. The documents proposed upgrading and rehabilitating the RBC facility. Blaine began excavation to update and improve the wastewater facility in 1999. During the course of excavation, ancient human remains were encountered and work was stopped. In an agreement with the Lummi Nation, Blaine has demolished the old RBC facility after a new wastewater facility was completed. The old RBC facility continued to operate while a new solution was found. A citizen's committee was formed and consultants hired to determine a new location and type of treatment. High quality effluent was the highest priority of the citizen's group. After two years with the help of consultants Blaine determined a portion of a city park along Marine Drive would house the new facility that would utilize membrane bioreactors to achieve high quality effluent. Blaine updated its general sewer plan and designed a new wastewater reclamation facility with significant input from the community. Engineered facility plans were submitted in March 2006 and were approved by Ecology in May 2006. Beneficial uses for reclaimed water listed in the submitted plans were seasonal irrigation at Semiahmoo Golf Course, and toilet flushing, wash-down water, and irrigation at the wastewater plant. The Lighthouse Point Water Reclamation Facility (LPWRF) was completed and in full operation on July 19, 2010.

Collection system status

The oldest sewer lines in the city of Blaine were installed in the 1920s. From 1980 to 1999 Blaine had collection system discharges, bypasses, and overflows of untreated wastewater to Drayton Harbor. The majority of these incidents were the result of an over-taxed and aging collection system. From 1996 to 1999 Blaine spent $2,566,893.00 on collection system improvements. The sewers in west Blaine were constructed after 1985. Blaine completed a major sewer rehabilitation project in 1992 and replaced or rehabilitated sewers and installed new storm sewers. This project rehabilitated approximately 16,000 feet of sanitary sewers, 57 manholes, and 249 service laterals. A little more than 13,000 feet of new storm sewers were installed, as well as 13 new storm sewer catch basins. Blaine began an infiltration and inflow (I&I) reduction project in 1998 that successfully indicated 43 illicit connections to the sanitary sewer system. In its 2017 I&I report, Blaine Public Works points out that the city's

system is significantly influenced by wet weather. The report uses census data from 2014 that shows Blaine's population to be 4,976. The document reports excessive infiltration of 147 gallons per capita per day (gpcd), which is above EPA's allowable threshold of 120 gpcd. Further, using the highest peak daily inflow to Blaine's WWTP, the report concludes that the city experiences excessive inflow of 460 gpcd during significant wet weather. EPA's threshold value is 275 gpcd. Blaine has purchased a remote controlled camera to systematically inspect the city's collection system. Blaine continues to smoke and dye test individual homes.

Blaine is comprised of an east and west side, separated by the mouth of Drayton Harbor, and wastewater is generated on both sides. Blaine uses two submarine force mains to transport treated and untreated wastewater from one side of the harbor to the other. The LPWRF is in East Blaine. Wastewater is treated at the facility and pumped under the mouth of Drayton Harbor via one of the submarine force mains to the outfall at the base of Semiahmoo Spit on the west side. Untreated wastewater from West Blaine gravity flows to the base of Semiahmoo Spit and is pumped via submarine force main under the mouth of Drayton Harbor to the LPWRF for treatment. The force main transporting untreated wastewater is a 10-inch seamless high density poly-ethylene (HDPE) pipe contained within an older 14-inch fiberglass host pipe. Prior to the installation of the HDPE pipe untreated wastewater was conveyed from East Blaine via a separate submarine force main made of multiple 20-foot sections of ductile iron pipe joined and buried in sediment beneath the mouth of Drayton Harbor. The ductile iron pipe is cathodically protected by an impressed current system. This piping now conveys treated effluent from LPWRF to Semiahmoo Spit where it is either discharged from the outfall or seasonally sent to an upland golf course water hazard to be used as irrigation water.

Blaine has invested in additional off-line storage for peak rain events that have contributed in the past to collection system overflows. In the past Blaine had deployed four 50,000-gallon bladder tanks during seasonal wet weather as off-line storage. These four bladder tanks (200,000 total gallons) plus the 60,000-gallon capacity of an old lift station gave the city a 260,000-gallon capacity to store wastewater for processing later. In addition to the bladder tanks, Blaine also had several tanker trucks on contract to haul wastewater around Drayton Harbor to the plant on Semiahmoo Drive. In the fall of 2006, Blaine completed installation of an off-line storage vault under Marine Drive to handle 400,000 gallons of wastewater and thereafter discontinued use of the bladder tanks.

Treatment processes

Blaine finished construction of the Lighthouse Point Water Reclamation Facility and began treating wastewater flows in July 2010. Due to site constraints the LPWRF was built on two levels to accommodate pump, piping galleries, and deep basins for sludge storage and membranes. ***Appendix E*** includes a facility schematic.

Wastewater enters the influent wet well and undergoes preliminary screening (not shown on schematic) before it flows through fine 2 mm rotary screens. The screenings are lifted by a shaftless screw conveyor to a perpendicular trough that moves them to an adjacent room where they drop into a plastic bag. The operators place the bags in a dumpster and dispose of the wastes at a landfill. Screened influent flows next into aeration basins.

Two separate, parallel covered aeration trains provide redundancy. Normally only one train is operated at a time. Screened influent flows first into an anoxic basin in the operating train, then into aeration basins. Pumps located at the end of the aeration basins recycle a portion of the mixed liquor back to the anoxic zone to promote the release of alkalinity and nitrogen. Separate pumps in the aeration basin transfer slow to the membrane basins where hollow fiber membrane filters provide ultra-filtration. The membranes allow treated water to pass through the membranes and exclude particles as small as 0.04 microns (µm). Although the membrane pores are small enough to filter out bacteria and some virus from the final effluent, Ecology still requires facilities that use membranes to use a disinfection process to ensure adequate protection of public health and the environment.

Clarified liquid from the MBR is directed to the contact chamber for hypochlorite disinfection, then is pumped to either the outfall or is used as reclaimed water. Chlorine contact time is achieved as disinfected effluent is pumped from the facility, under the mouth of Drayton Harbor to Semiahmoo Spit to a pump station where it is either directed to the outfall or uphill to the Semiahmoo Golf Course for seasonal reuse. The residence time in the pipe from the LPWRF to the pump station at Semiahmoo exceeds 30 minutes at peak flow to ensure disinfection. If flow is diverted to the outfall, it is dechlorinated before discharge to Semiahmoo Bay.

Most of the solids liquor from the membrane basins are returned to the aeration basins as returned activated sludge (RAS). However, a portion of the solids are diverted from the membrane basins as waste activated sludge (WAS), a membrane sludge thickener to reduce the liquid amount in the sludge. Currently space is available to add another membrane thickener in the future. Thickened sludge is pumped to either one of two storage tanks for later land disposal.

Reclaimed water treatment process

Membrane effluent from the LPWRF may discharge to two separate use areas. The main use area is located in West Blaine. As explained in the section above, all water discharge through the submarine pipe, located after the membranes and before the effluent pump station, continuously monitor the water clarity prior to the disinfection step. Chlorine is injected before it leaves the plant to achieve disinfection required before it arrives at pump station #11. The pipeline design allows disinfection to occur in transit by maintaining a chlorine residual of at least 1.0 mg/L for 30 minutes to the point of delivery. Total coliform samples are taken daily at pump station #11 during the May to September season that is contracted with the Semiahmoo Golf Course and Gleneagle Villas Condominiums. Once Class A reclaimed water reaches pump station #11, located at the old Blaine RBC WWTP, it is either diverted to use areas via dedicated purple pipe seasonally, or dechlorinated before being discharged to Semiahmoo Bay through the outfall. Reclaimed water is only delivered to these two entities during this specific season.

Residual total chlorine is sampled continuously at pump station #11 to ensure the minimum residual concentration of 0.5 mg/L. Blaine maintains a chlorine residual of 0.5 mg/L to prevent biological growth within delivery piping. However, a waiver for the reclaimed water requirement to maintain 0.5 mg/L total residual chlorine was granted by Washington State Department of Health on September 15, 2010 (see Appendix F). Blaine also installed a turbidity meter to continuously monitor reclaimed water to not exceed 0.5 Nephelometric Turbidity Units (NTUs) maximum. If turbidity is exceeded, the SCADA system shuts down the reclaimed water delivery system.

Blaine also uses Class A reclaimed water for toilet flushing, irrigation and for a decorative water feature in public areas adjacent to the LPWRF. A separate chlorination system at the plant site is designed to provide Class A disinfection for water used in these applications. As mentioned above, total coliform samples are taken at a sample port located in the basement gallery of the LPWRF, after disinfection.

Distribution system

When reclaimed water is seasonally demanded by the Semiahmoo Golf Course, pumps at pump station #11 divert Class A reclaimed water into a designated purple pipe that runs up the hill to the golf course and Gleneagle Villas Condominium Association. Chlorine is sampled continuously with a chlorine analyzer at the pump station. If chlorine concentration drops below 0.5 mg/L, reclaimed water delivery automatically stops and must be manually set to resume delivery. Blaine determined that turbidity is to be sampled continuously with a turbidimeter. The same automatic shut-down occurs if turbidity rises above 0.5 NTUs. The set point for each of these is slightly higher (in the case of chlorine) and slightly lower (for turbidity) to conservatively ensure compliance with permit limits. A sample tap was installed in the pipe just downstream of the pump station to allow operators to take grab samples and ensure consistent compliance with permit limits. A magnetic flow meter records flow from pump station #11.

The proposed permit includes limits applicable to distribution of Class A reclaimed water to private entities for commercial and industrial uses and/or to apply reclaimed water for irrigation at agronomic rates. The permit authorizes specific reclaimed water uses in Permit Condition R5A, including on-site for flushing toilets, as part of an on-site water feature, to fill applicable city-owned utility vehicles (e.g. water trucks), for plant wash down, and to seasonally irrigate a nearby golf course.

Operator certification

Chapter 173-219-250 requires an operator certified by Ecology under Chapter 173-230 to operate reclaimed water treatment facilities. Guidance in Ecology's *Permit Writer's Manual* and WAC 173-230 classify the treatment system at the Lighthouse Point Water Reclamation Facility as a Class III facility. As such, the operator in responsible charge of the day-to-day operations at the facility must, at a minimum, be rated as a Group III operator. An operator certified for at least a Group II facility must be in charge of each scheduled shift at the facility. In addition, LPWRF must use an operator or consultant certified under Department of Health's Waterworks Operator Certification Program (chapter 246-292) to perform certain tasks associated with the distribution of reclaimed water.

Lighthouse Point Water Reclamation Facility employs 4 certified operators at levels between Group III and Group I. Normal working hours for operators are from 7:00 to 4:00 five days a week. Staff are on a reoccurring rotation for weekends. In addition to the certified operators at the treatment facility, LPWRF employs a Certified Cross-connection Control Specialist to oversee its cross-connection control program.

Solid wastes/Residual solids

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings). Lighthouse Point drains grit, rags, scum, and screenings, and disposes this solid waste at the local landfill. Solids removed are thickened and land

applied under a permit from the Whatcom County Health District. This facility has met the solid waste requirements for screening, as required by WAC 173-308-205, by installing two rotary screens with fine 2 millimeter screens. A sludge management plan is included in the facility's O&M manual.

Authorized beneficial uses

LPWRF is authorized to distribute Class A reclaimed water for irrigation and water features. Currently Blaine has two contracts to sell reclaimed water seasonally. One is to Semiahmoo Golf Course and Country Club, and the second is with Eagleglen development. The Lighthouse Point Water Reclamation Facility seasonally uses reclaimed water for a water feature, on-site toilet flushing, and on-site irrigation in public areas adjacent to the plant.

Additional infrastructure for reclaimed water distribution (purple pipe) is planned for the Blaine Marina area around the LPWRF.

Water rights protection

Chapter 90.46.120 RCW states that the owner of a wastewater treatment facility producing reclaimed water under a reclaimed water permit has the exclusive rights to that water. That right is tempered, however, by chapter 90.46.130 RCW, which states that the use of reclaimed water must not impair any existing water rights downstream of any freshwater discharge points of the facilities unless compensation or mitigation is agreed upon by the holder of the affected water right. Ecology cannot issue a reclaimed water permit unless the permit applicant demonstrates compliance with water rights protection. An impairment analysis was performed before the previous reclaimed water permit was issued in April 2013. Since this facility discharges to marine waters, no impairment was found.

Discharge outfall

Treated and disinfected effluent flows into Semiahmoo Bay and the Strait of Georgia through a single outfall on Semiahmoo Spit. The outfall is 2,460 feet long with an attached 64-foot long diffuser, at a depth of 37 feet. The 24-inch diameter concrete outfall pipe is a bell and spigot type. Washington State Department of Health has designated a 900-foot radius shellfish closure zone around the diffuser. Figure 1 shows the location of the outfall relative to the plant's location.

The outfall was last inspected on July 14, 2016. The report by Cosmopolitan Marine Engineering describes the outfall; "In general, the outfall diffuser pipe, joints, anchors and discharge ports are in good condition. All ports are free of obstructions and flowing freely."

Vessels are known to anchor in Semiahmoo Bay. The Bay is also seasonally used for commercial crab fishing. Anchors and crab buys can either foul or break the city's outfall. A requirement for an outfall evaluation is included for these reasons.

B. Description of the receiving water

LPWRF discharges to Semiahmoo Bay. Other nearby point source outfalls include the city of White Rock, British Columbia, Canada located on the north side of the bay and across the US-Canadian border. Significant nearby non-point sources of pollutants include residential and area roads stormwater. A table of ambient copper is included in ***Appendix D.*** Section IIIE of this fact sheet describes any receiving waterbody impairments.

The ambient background data used for this permit includes the following (from Ecology's Environmental Assessment Program Ambient monitoring site GRG002 at Patos Island):

Table 2. Ambient Background Data

Parameter	Value Used
Temperature (highest annual 1-DADMax)	13.99 °C
pH (Maximum / Minimum)	8.2/7.1 standard units
Dissolved Oxygen	5.9 mg/L
Fecal Coliform	4.6/100 mL Ave. of 18 samples
Light Transmission %	77.7 %
Salinity	27.13 PSU (practical salinity unit)

C. Wastewater influent characterization

LPWRF reported the concentration of influent pollutants in discharge monitoring reports. The influent wastewater from 6/1/2013 to 1/1/2018 is characterized as follows:

Parameter	Units	Average Value	Maximum Value
Biochemical Oxygen Demand (BOD_5)	mg/L	**189**	**570**
Biochemical Oxygen Demand (BOD_5)	lbs/day	**924**	**3781**
Total Suspended Solids (TSS)	mg/L	**215**	**3451**
Total Suspended Solids (TSS)	lbs/day	**1102**	**19543**
Flow	MGD	**0.641**	**2.53**

D. Wastewater effluent characterization

LPWRF reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The tabulated data represents the quality of the wastewater effluent discharged from 6/1/2013 to 1/1/2018 as reported by the facility in their permit application. The wastewater effluent is characterized as follows:

Parameter	Units	Average Value	Maximum Value
Biochemical Oxygen Demand (BOD_5)	mg/L	**0.26**	**4.0**
Total Suspended Solids (TSS)	mg/L	**0.59**	**23.0**
Temperature	Degrees C	**17**	**23**
Total Residual Chlorine	mg/L	**0.045**	**0.21**
Total Ammonia	mg/L	**0.29**	**0.98**
Nitrate/Nitrite	mg/L	**14.4**	**20.0**
Dissolved Oxygen	mg/L	**9.19**	**11.0**
Total Kjeldahl Nitrogen	mg/L	**2.78**	**5.1**
Oil and Grease	mg/L	**2.24**	**4.0**
Total Phosphorus	mg/L	**3.52**	**5.02**
Total Dissolved Solids	mg/L	**412**	**440**
Antimony	µg/L	**3**	**3**
Arsenic	µg/L	**2.6**	**5**

Parameter	Units	Average Value	Maximum Value
Beryllium	µg/L	**.3**	**.3**
Cadmium	µg/L	**.5**	**3.2**
Chromium	µg/L	**7**	**7**
Copper	µg/L	**14.2**	**47**
Lead	µg/L	**.5**	**.5**
Mercury	µg/L	**0.00053**	**0.000682**
Nickel	µg/L	**5**	**5**
Selenium	µg/L	**2**	**2**
Silver	µg/L	**2**	**2**
Thallium	µg/L	**1**	**1**
Zinc	µg/L	**175.8**	**210**
Cyanide	µg/L	**<0.01**	**<0.01**
Total Phenolic's	µg/L	**<50000.0**	**<50000.0**
Methyl Chloride	µg/L	**0.194**	**0.97**
Bis (2-ethylhexyl) Phthalate	µg/L	**3.1**	**8.1**

Parameter	Units	Maximum Monthly Geometric Mean	Maximum Weekly Geometric Mean
Fecal Coliforms	#CFU/100 mL	**5**	**12**

Parameter	Units	Minimum Value	Maximum Value
pH	standard units	**6.5**	**8.1**

E. Reclaimed water characterization

LPWRF reported the concentration of pollutants in the final reclaimed water in the permit application and in discharge monitoring reports. Table 5 below summarizes the characteristics of the reclaimed water at pump station #11 prior to distribution to the use area.

Table 3. Reclaimed Water Characterization

Parameter	Units	Average Value	Maximum Value
Biochemical Oxygen Demand (BOD_5)	mg/l	**0.26**	**4.0**
Total Suspended Solids (TSS)	mg/l	**0.59**	**23.0**
Nitrate + Nitrite	mg/l as N	**2.47**	**8.2**
Ammonia	mg/l	**1.47**	**6.7**
Total Nitrogen-N	mg/l	**13.42**	**22.0**
Total Phosphate-P	mg/l	**3.62**	**4.95**
Total Residual Chlorine [1]	mg/l	**1.33**	**3.92**
Cadmium (total)	µg/l	**0.5**	**3.2**
Lead	µg/l	**.5**	**0.5**

[1] Total residual chlorine for reclaimed water is taken at pump station #11 before it enters distribution system

Parameter	Units	Average Value	Maximum Value
Mercury	µg/l	**0.00053**	**0.000682**
Selenium	µg/l	**2**	**2**
Silver	µg/l	**2**	**2**
Zinc	µg/l	**176**	**210**

Parameter	Units	7- day median	Maximum Value
Total Coliforms	CFU/100 mL	<1	<1

Parameter	Units	Minimum Value	Maximum Value
pH	standard units	**6.96**	**7.3**

F. Summary of compliance with previous permit issued May 10, 2013

The previous permit placed effluent limits on BOD, TSS, Flow, Total Residual Chlorine, pH, Fecal Coliform Bacteria, and Total Coliform Bacteria.

LPWRF has consistently complied with the effluent and reclaimed water limits of its past permit, however, several permit required reports were not received. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections.

The following table summarizes the violations that occurred during the permit term.

Submittal	Status	Due Date
Cross-Connection Control Report	Not Received	9/15/2013 0:00
Cross-Connection Control Report	Not Received	9/15/2015 0:00
O&M - Operation And Maintenance Manual (Update)	Not Received	2/1/2016 0:00

The following table summarizes compliance with report submittal requirements over the permit term.

Submittal	Status	Received Date
Signatory Requirements	Received	8/22/2013
Signatory Requirements	Received	8/15/2013
Signatory Requirements	Received	5/30/2013
Signatory Requirements	Received	4/4/2013
Service & Use Area Agreement	Received	5/12/2014
Water Reuse Summary Report	Received	5/12/2014
O&M - Operation And Maintenance Manual	Received	1/30/2015
Cross-Connection Control Report	Received	5/13/2013
Cross-Connection Control Report	Received	8/29/2016
Toxicity - Chronic Testing	Received	8/29/2016
Toxicity - Acute Testing	Received	8/29/2016
Outfall Evaluation	Received	7/15/2016
Mixing Study	Received	10/15/2015

Submittal	Status	Received Date
Spill Prevention Plan Update	Received	1/31/2014
Application For Permit Renewal	Received	5/31/2017
O&M - Operation And Maintenance Manual (Update)	Received	1/7/2014
O&M - Operation And Maintenance Manual (Update)	Received	1/31/2017

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. Ecology approved design criteria for this facility's treatment plant in the facility plan dated August 16, 2007 and prepared by CH2M Hill. The table below includes design criteria from the referenced report.

Table 4. Design Criteria for LPWRF

Parameter	Design Quantity
Maximum Month Design Flow (MMDF)	1.54 MGD
BOD_5 Loading for Maximum Month	3,060 lb/day
TSS Loading for Maximum Month	3,000 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.

The table below identifies technology-based limits for pH, fecal coliform, BOD_5, and TSS, as listed in chapter 173-221 WAC. Section III.F of this fact sheet describes the potential for water quality-based limits.

Table 5. Technology-based Limits

Parameter	Average Monthly Limit	Average Weekly Limit
BOD_5 (concentration)	30 mg/L	45 mg/L
BOD_5 (concentration)	In addition, the BOD_5 effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
TSS (concentration)	30 mg/L	45 mg/L
TSS (concentration)	In addition, the TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	

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

The existing permit has water quality-based chlorine limits of 0.09 mg/L (average monthly) and 0.25 mg/L (average weekly), and the facility is able to comply with them. The proposed permit includes the same limits. The past permit erroneously gave an average weekly limit instead of a daily maximum. This has been changed in this permit to a daily max of 0.25 mg/L.

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 BOD_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 6. Technology-based Mass Limits

Parameter	Concentration Limit (mg/L)	Mass Limit (lbs/day)
BOD_5 Monthly Average	30	385
BOD_5 Weekly Average	45	578
TSS Monthly Average	30	385
TSS Weekly Average	45	578

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

In 1992, U.S. EPA published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State in its National Toxics Rule (40 CFR (EPA, 1992). Ecology submitted a standards revision for 192 new human health criteria for 97 pollutants to EPA on August 1, 2016. In accordance with requirements of CWA section 303(c)(2)(B), EPA finalized 144 new and revised Washington specific human health criteria for priority pollutants, to apply to waters under Washington’s jurisdiction. EPA approved 45 human health criteria as submitted by Washington. The EPA took no action on Ecology submitted criteria for arsenic, dioxin, and thallium. The existing criteria for these three pollutants as adopted in the National Toxics Rule (40 CFR 131.36) remain in effect.

These newly adopted criteria, located in WAC 173-201A-240, 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.

- 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.

Ecology's analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

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) or WAC 173-201A-400(7)(b)(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* criteria are 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* criteria are 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 and four-tenths (2.4) liters/day for drinking water (increased from two liters/day in the 2016 Water Quality Standards update).
- 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 zone (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 LPWRF meets the requirements of AKART (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. 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/documents/92109.pdf

Table 7. Critical Conditions Used to Model the Discharge

Critical Condition	Value
Water depth at MLLW	-37 feet
Density profile with a difference of 22.41 sigma-t units between 37 feet and the surface	22.41
10^{th} or 90^{th} percentile current speeds for acute mixing zone	0.04_m/sec
Maximum average monthly effluent flow for chronic and human health non-carcinogen	0.948 MGD
Maximum daily flow for acute mixing zone	2.21 million gallons per day (MGD)

Ecology obtained ambient data at critical conditions in the vicinity of the outfall from Ecology's Environmental Assessment Program study conducted in February 2009 and July and October 2010, and from ambient station GRG002 located at Patos Island. A mixing zone study was performed in June 2016 by Cosmopolitan Engineering and approved by Ecology in July of the same year.

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.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics, and the discharge location. Based on this review, Ecology concluded that the discharge does 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, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone 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 changes. The 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 95^{th} percentile pollutant concentration, the 90^{th} percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

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

7. **Maximum size of mixing zone.**

   The authorized 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.

This mixing zone does not overlap another mixing zone.

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 tables included below summarize the criteria applicable to the receiving water's designated uses.

- Aquatic life uses are designated using the following general categories. All indigenous fish and non-fish aquatic species must be protected in waters of the state.

  a. Extraordinary quality 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.

  b. Excellent quality 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.

  c. Good quality salmonid migration and rearing; 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.

  d. Fair quality salmonid and other fish migration.

The *Aquatic Life Uses* and the associated criteria for this receiving water are identified below.

Table 8. Marine Aquatic Life Uses and Associated Criteria

Extraordinary Quality	
Temperature Criteria – Highest 1D MAX	13°C (55.4°F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	7.0 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 0.2 units.

- To protect shellfish harvesting, 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.

The recreational uses for this receiving water are identified below.

Table 9. Recreational Uses

Recreational Use	**Criteria**
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, with not 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.

- The *miscellaneous marine water uses* are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

E. Water quality impairments

Ecology has not documented any water quality impairments in the receiving water in the vicinity of the outfall. Based on samples of wastewater effluent taken in December 1996 from the old Blaine RBC wastewater treatment plant, there may have been a reasonable potential to exceed the chronic criteria for nitrogenous ammonia. This Category 2 listing still exists in the Washington State water quality assessment even though a new plant has been built. The new LPWRF has no reasonable potential to exceed the chronic criteria for nitrogenous ammonia.

As shown in Figure 1, the LPWRF outfall discharges to Semiahmoo Bay, which is part of the Strait of Georgia. Semiahmoo Bay is located northwest of Drayton Harbor and is separated from the harbor by Semiahmoo Spit. Drayton Harbor, a separate water body, has several 303(d) listings for fecal coliform bacteria. A TMDL for fecal coliform is slated to be completed in 2020.

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

Ecology must consider the narrative criteria described in WAC 173-201A-160 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

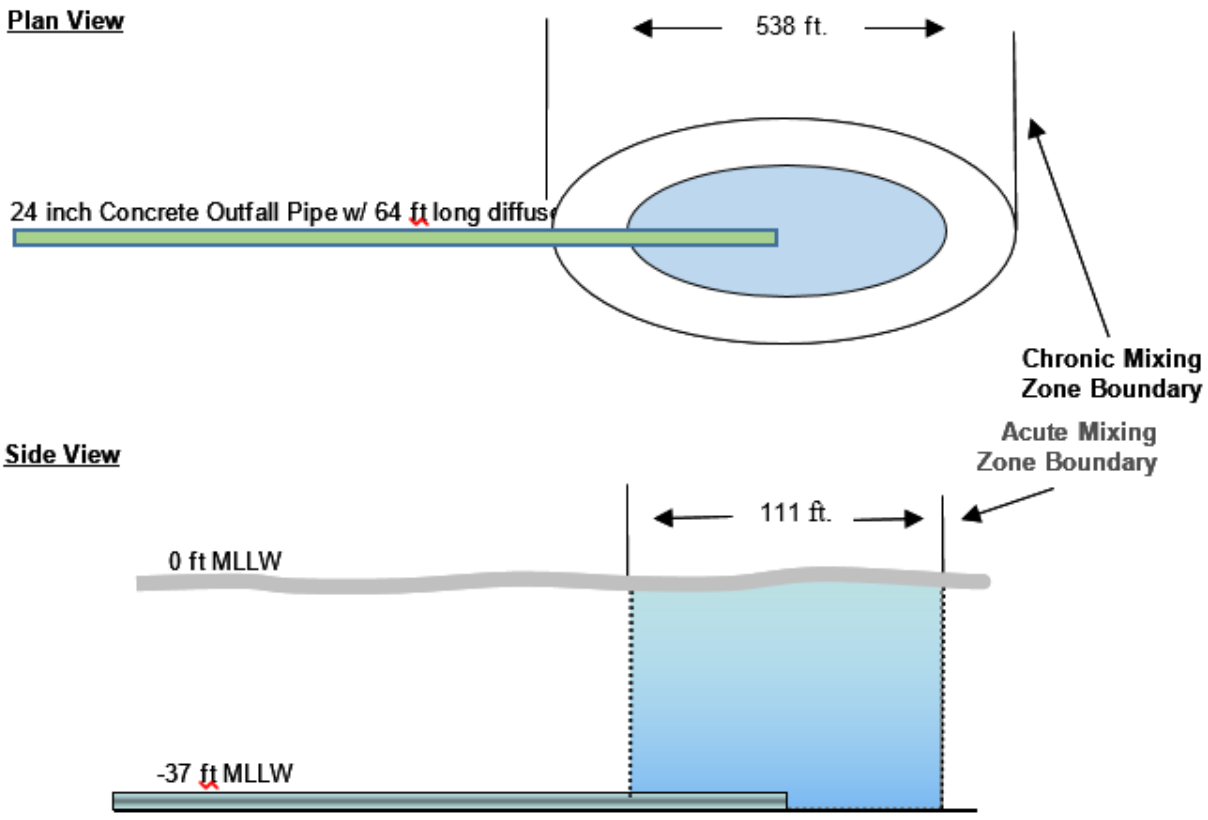


Figure 2. Outfall Mixing Zones

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 outfall pipe at Outfall 001 is 2,460 feet long with a diameter of 24 inches. The diffuser has a total of six ports, each is eight inches in diameter, configured in a T-shape. The diffuser depth is 37 feet at mean low-low water (MLLW). Ecology obtained this information from the Dilution Ratio Study Report submitted on July 24, 2016.

Ecology affirmed the dilution factors arrived at by Cosmopolitan Engineering occur within these zones at the critical condition using UM3 model. The mixing zone study can be found in Ecology's PARIS database. The dilution factors are listed below.

Table 10. Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	23	69
Human Health, Carcinogen		69
Human Health, Non-carcinogen		69

Ecology determined the impacts of dissolved oxygen deficiency, nutrients, 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--BOD_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 Biochemical Oxygen Demand (BOD_5) of an effluent sample indicates the amount of 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 oxygen demand potential in the receiving water.

Ecology modeled the impact of BOD_5 on the receiving water, at critical condition and with the technology-based effluent limit for BOD_5 described under "Technology-Based Effluent Limits" above. The calculations to determine dissolved oxygen impacts are shown in **Appendix D**.

Ecology predicted no violation of the surface water quality standards for dissolved oxygen due to the impacts of biochemical oxygen demand (BOD_5) under critical conditions. Therefore, the proposed permit contains the technology-based effluent limit for BOD_5. The permit also does not contain a limit on ammonia based on dissolved oxygen impacts (ammonia toxicity is examined elsewhere in this fact sheet).

pH--Compliance with the technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards of surface waters because of the high buffering capacity of marine water.

Fecal Coliform--Ecology modeled the numbers of fecal coliform by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 69.

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.

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.

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. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: chlorine, ammonia, antimony, arsenic, beryllium, cadmium, chromium (trivalent), copper, lead, mercury, nickel, nitrate\nitrite, selenium, silver, thallium, and zinc. Ecology conducted a reasonable potential analysis (See **Appendix D**) on these parameters to determine whether it would require effluent limits in this permit.

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 used the available receiving water information for ambient station GRG002 and Ecology spreadsheet tools.

No valid ambient background data were available for antimony, arsenic, beryllium, cadmium, chlorine, chromium(trivalent), lead, mercury, nickel, selenium, silver, thallium, and zinc. Ecology used zero for background.

Table 11. Valid Ambient Background Data Were Available for the Following:

Parameter	Where Found	Parameter Specifics
Temperature C	Ecology Ambient Monitoring [1]	Depths used = 11 & 11.5 meters
Salinity	Ecology Ambient Monitoring [1]	psu
Density	Ecology Ambient Monitoring [1]	Sigma t
Dissolved oxygen	Ecology Ambient Monitoring [1]	mg\L
pH	Ecology Ambient Monitoring [1]	Standard units
Fecal Coliform Bacteria	Environment Information Management System	MPN/100 mL
Copper	Environment Information Management System	µg\L at depths 10 to 20 meters

[1] Data comes from Ecology's long-term monitoring station GRG002 at Patos Island

Ecology used all applicable data to evaluate reasonable potential for this discharge to cause a violation of water quality standards.

Ecology determined that antimony, arsenic, beryllium, cadmium, chromium(trivalent), copper, lead, mercury, nickel, selenium, silver, thallium, and zinc pose no reasonable potential to exceed the water quality criteria at the critical condition using procedures given in EPA, 1991 (**Appendix D**) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

Temperature--The state temperature standards [WAC 173-201A-200-210 and 600-612] include multiple elements:

- Annual summer maximum threshold criteria (June 15 to September 15).
- Supplemental spawning and rearing season criteria (September 15 to June 15).
- Incremental warming restrictions.
- Protections against acute effects.

Ecology evaluates each criterion independently to determine reasonable potential and 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).

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 (Ti), calculated as:

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

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 22°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.

Reasonable potential analysis

Ecology calculated the reasonable potential for discharges from the LPWRF to exceed the annual 1-Day maximum temperature and incremental warming criteria at the edge of the chronic mixing zone during critical conditions. The ambient annual 1DAD max is 14.0°C for the May through September season and 10.7°C for the October through April season. As shown in Appendix D, Ecology predicts that the discharge will increase temperature in the vicinity of the outfall by 0.13°C to a temperature of 14.13°C for May – September, and 0.15°C for the October – April season. These values are below the allowable 0.3°C incremental warming allowed.

Based on the predicted temperature and incremental change at the edge of the chronic mixing zone, there is no reasonable potential for discharges from the LPWRF 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. The LPWRF 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.

H. Human health

Washington's water quality standards include numeric human health-based criteria for 97 priority pollutants that Ecology must consider when writing NPDES permits.

Ecology determined the effluent may contain chemicals of concern for human health, based on data or information indicating the discharge contains regulated chemicals. The following metals were detected in samples taken for the LPWRF permit application: antimony, mercury, nickel, selenium, thallium, and zinc.

Ecology evaluated the discharge's potential 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 the discharge has no reasonable potential to cause a violation of water quality standards, and an effluent limit is not needed.

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./progrgovams/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.

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/documents/9580.pdf), which is referenced in the permit. Ecology recommends that LPWRF send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water acute toxicity. The proposed permit will not include an acute WET limit. LPWRF 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. LPWRF may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing and/or chemical analyses after the process or material changes have been made. Ecology recommends that the Permittee check with it first to make sure that Ecology will consider the demonstration adequate to support a decision to not require an 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.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water chronic toxicity. The proposed permit will not include a chronic WET limit. LPWRF 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. LPWRF 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).

LPWRF does not discharge wastewater to the ground. No permit limits are required to protect groundwater.

L. Comparison of effluent limits with the previous permit issued on May 10, 2013

Table 12. Comparison of Previous and Proposed Effluent Limits

		Previous Effluent Limits: Outfall # 001		Proposed Effluent Limits: Outfall # 001	
Parameter	**Basis of Limit**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
Biochemical Oxygen Demand (5-day)	Technology	30	45	30	45
Total Suspended Solids	Technology	30	45	30	45

Parameter		**Monthly Geometric Mean Limit**	**Weekly Geometric Mean Limit**	**Monthly Geometric Mean Limit**	**Weekly Geometric Mean Limit**
Fecal Coliform Bacteria	Technology	200	400	200	400

Parameter		**Limit**	**Limit**
pH	Technology	6 - 9	6 - 9

Parameter		**Average Monthly**	**Average Weekly**	**Average Monthly**	**Maximum Daily**
Chlorine (total residual)	Technology	0.09 mg/L	0.25 mg/L	0.09 mg/L	0.25 mg/L

Reclaimed Water		**Previous Effluent Limits: Outfall #001**		**Proposed Effluent Limits: Outfall #001**	
Parameter	**Basis of Limit**	**Max 7-Day Median**	**Maximum**	**Max 7-Day Median**	**Maximum**
Total Coliform Bacteria	Technology	2.2 CFU/100 mL	23 CFU/100 mL	2.2 CFU/100 mL	23 CFU/100 mL

IV. Proposed Reclaimed Water Limits

The Reclaimed Water Use law, Chapter 90.46 RCW requires reclaimed water generators to adequately and reliably treat reclaimed water prior to distribution and beneficial use. Chapter 173-219-270 WAC requires Ecology to include enforceable limits on water quality in the reclaimed water permits it issues. The enforceable limits are based on:

- General performance standards listed in chapter 173-219-330 WAC.
- Specific use-based requirements listed in chapter 173-219-390 WAC.
- Water quality standards for groundwater of the State of Washington in chapter 173-200 WAC when the reclaimed water authorizes groundwater recharge as a beneficial use.
- Water quality standards for surface waters of the State of Washington in chapter 173-201A WAC when the reclaimed water permit authorizes surface water augmentation or wetland enhancements as a beneficial use.
- Drinking water maximum contaminant levels in chapter 246-290-310 WAC when the permit authorizes certain groundwater recharge and surface water augmentation beneficial uses.
- Ecology applies the most stringent of the standards listed above in developing 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, monitoring, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules and standards adopted by the State of Washington. Ecology does not develop reclaimed water limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, and are not listed in regulation.

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

A. Reclaimed treatment process design criteria

Under WAC 173-219-240, flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria for this facility's treatment plant in the Lighthouse Point Water Reclamation Facility Engineering Report dated August 16, 2007 and prepared by CH2M Hill. Table 6 below summarizes the approved design criteria for reclaimed water. The reason the flow value is less than the design criteria for maximum month design flow for the wastewater plant, is the city of Blaine did not want to contract for more reclaimed water than they could conservatively provide.

Table 13. Design Criteria for Reclaimed Water Production Facility

Parameter	Design Quantity
Maximum Month Design Flow (MMDF)	0.72 MGD

B. Limits based on reclaimed water performance standards

Reclaimed water produced and distributed in accordance with the proposed permit must meet minimum standards for biological oxidation, water clarity, and disinfection. The biological oxidation standard generally requires compliance with the secondary treatment requirements in chapter 173-221-040 WAC. Chapter 173-219-330 establishes the applicable performance standards for all Class A and Class B reclaimed water shown in Table 22.

Table 14. Minimum Biological Oxidation Standards

Parameter	Average Monthly Limit	Average Weekly Limit
Dissolved Oxygen	Must be measurably present (minimum of 0.2 mg/L)	
BOD_5 concentration	30 mg/L	45 mg/L
	In addition, the average BOD_5 effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
TSS concentration	30 mg/L	45 mg/L
	In addition, the average TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
	Minimum	**Maximum**
pH	6.0 standard units	9.0 standard units

The biological oxidation standard listed above primarily defines the minimum quality of the source water to the reclaimed treatment facility, with the compliance point typically after the last secondary treatment unit and prior to the reclaimed water filtration and disinfection systems. Since not all water reclamation facilities use separate side-stream treatment systems to produce reclaimed water, Ecology may specify alternate compliance points based on the design of each permitted facility. Sampling for BOD, TSS, and pH are monitored as effluent at LPWRF prior to being sent to pump station #11. Dissolved oxygen (DO) is monitored at pump station #11.

The performance standards require that dissolved oxygen be “measurably present” at the compliance point. Ecology includes a minimum limit of 0.2 mg/L in the permit for dissolved oxygen based on the quantitation level for dissolved oxygen testing using Standard Method 4500-OC/OG, as listed in Appendix A of the proposed permit.

In addition to the biological oxidation standards above for all Class A and B reclaimed water, each class of water must comply with separate standards for turbidity, a measure of water clarity, and disinfection. Lighthouse Point must ensure Class A reclaimed water from the permitted facility complies with following standards prior to distribution.

Table 15. Class A Turbidity and Disinfection Standards

Parameter	Average Monthly Limit	Sample Maximum Limit
Turbidity	0.2 NTU	0.5 NTU
	7-day Median Limit	**Sample Maximum Limit**
Total Coliform	2.2 or CFU/100 mL	23 or CFU/100 mL
Virus Removal	Minimum 4-log virus removal or inactivation see WAC 173-219-340	

Ecology based the turbidity standard on the levels typically achievable from a properly operated and maintained membrane filtration system, with the compliance point at the end of the filtration system prior to disinfection. Blaine's compliance point for turbidity is before disinfection at what is known as outfall 002. This compliance point is after the effluent wet well, before it leaves the facility and is pumped under the entrance to Drayton Harbor and on to pump station #11. Since continuous turbidity meters often record momentary fluctuations over the course of a day, the standards specify that a treatment system only violates the standard when the maximum turbidity remains over the sample maximum limit for more than five minutes.

At pump station #11 the flow is pumped through the reclaimed water distribution system, based on customer demands. When flows exceed customer demand, surplus water is discharged from this point thought outfall 001 to Semiahmoo Bay. Since the force main from the LPWRF to pump station #11 provides the necessary contact time for reclaimed water disinfection, pump station #11 is the Total Coliform compliance point for use areas in West Blaine. The Total Coliform compliance point for authorized uses adjacent to the treatment facility is a sample port after disinfection in the basement gallery of the LPWRF.

Although chapter 173-219-330 WAC include virus removal as a performance standard for Class A reclaimed water, Ecology does not place a numeric limit for this parameter in permits. As stated in WAC 173-219-340, the combination of biological treatment, filtration, and disinfection must achieve a minimum of 4-log virus removal or inactivation. In addition, the system must be capable of consistently complying with the water quality standard through the proper design, operation, and maintenance of each unit process in the treatment system. Ecology assesses whether proposed facility designs will comply with the virus removal standard during initial facility engineering reviews and approves the system designs before construction. The proposed permit requires LPWRF to properly operate and maintain all reclaimed water treatment processes according to the approved operations and maintenance manual to maintain compliance with the performance standards.

C. Distribution system limits

Chapter 173-219-370 requires that the producer and distributor of reclaimed water maintain a chlorine residual in the distribution system to prevent biological growth, prevent deterioration of the reclaimed water quality, and to protect public health. The residual requirement applies only to the distribution system conveying reclaimed water from the production facility to the point of use. It does not apply to water held in storage (in impoundments, storage tanks or storage ponds) or to water conveyed to a point of use through surface waters or groundwater. Ecology may also waive the requirement on a case-by-case basis.

A waiver for the reclaimed water requirement to maintain 0.5 mg/L total chlorine residual for 30 minutes to the point of delivery was granted by Washington State Department of Health on September 15, 2010 (see Appendix F). The city of Blaine maintains a minimum total chlorine residual of 0.5 mg/L throughout the distribution system for biofilm control. A chlorine meter is installed at pump station #11 to verify that the chlorine residual is at least 0.5 mg/L before being pumped to the irrigation pond at Semiahmoo Golf Course and to the water feature at Gleneagle Villas Condominiums.

D. Comparison of reclaimed water limits with the previous permit issued on May 10, 2013

Table 16. Comparison of Previous and Proposed Limits

		Previous Limits		Proposed Limits	
Parameter	**Monitoring Point**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
BOD_5	Outfall # 001B	30 mg\L	45 mg\L	30 mg\L	45 mg\L
TSS	Outfall # 001B	30 mg\L	45 mg\L	30 mg\L	45 mg\L
Reclaimed Water Flow	Outfall # 001B	0.72 MGD		0.72 MGD	
		Minimum	**Maximum**	**Minimum**	**Maximum**
Dissolved Oxygen	Outfall # 02/pump station 11	0.2 mg/L	N/A	0.2 mg/L	N/A
pH	Outfall # 02/pump station 11	6.0 standard units	9.0 standard units	6.0 standard units	9.0 standard units
Total Chlorine Residual	Outfall # 02/pump station 11	0.5 mg/L	N/A	0.5 mg/L	N/A
		Average Monthly	**Instantaneous Maximum**	**Average Monthly**	**Instantaneous Maximum**
Turbidity	Outfall # 02/pump station 11	0.2 NTU	0.5 NTU	0.2 NTU	0.5 NTU
		7-Day Median	**Sample Maximum**	**7-Day Median**	**Sample Maximum**
Total Coliform	Outfall # 02/pump station 11	2.2 or CFU/100 mL	23 or CFU/100 mL	2.2 or CFU/100 mL	23 or CFU/100 mL

V. 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. In addition, Chapter 173-219-260 WAC authorizes Ecology to require monitoring, recording, and reporting in reclaimed water permits as reasonably necessary to verify that the production, distribution or storage of reclaimed water complies with the terms and conditions of the permit.

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 92-109) for an activated sludge plant with a capacity of less than 2.0 MGD.

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.

B. Reclaimed water monitoring

Reclaimed Water Condition R2.A in the proposed permit lists the detailed monitoring requirements for the Lighthouse Point Water Reclamation facility. Specified monitoring frequencies take into account the quantity and variability of the reclaimed water, quantity of each of the approved uses, 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) for membrane bioreators.

C. 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). Ecology accredited the laboratory (accreditation number G718-18) at this facility for:

Table 17. Accredited Parameters

Parameter Name	Category	Method Name	Matrix Description
Turbidity	General Chemistry	SM 2130 B-01	Non-Potable Water
Solids, Total Suspended	General Chemistry	SM 2540 D-97	Non-Potable Water
Chlorine (Residual), Total	General Chemistry	SM 4500-Cl D-00	Non-Potable Water
pH	General Chemistry	SM 4500-H+ B-00	Non-Potable Water
Ammonia	General Chemistry	SM 4500-NH3 D-97	Non-Potable Water
Dissolved Oxygen	General Chemistry	SM 4500-O G-01	Non-Potable Water
Biochemical Oxygen Demand (BOD)	General Chemistry	SM 5210 B-01	Non-Potable Water
Total coliforms-count	Microbiology	SM 9222 B (M-endo)-97	Non-Potable Water
Fecal coliform-count	Microbiology	SM 9222 D (m-FC)-97	Non-Potable Water

VI. Other Permit Conditions

A. Reporting and record keeping

Ecology based Reclaimed Water Condition R3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-216-110).

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 173-216-110 require LPWRF to:

- Take the actions detailed in proposed permit Reclaimed Water Condition R.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.

Reclaimed Water Condition R.4 restricts the amount of flow.

C. Operation and maintenance

Ecology requires dischargers to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state regulations (WAC 173-240-080 and WAC 173-216-110). The facility has prepared and must submit an update of an operation and maintenance (O&M) manual for the wastewater facility.

Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit and ensures the facility provides AKART to the waste stream.

LPWRF suspects inflow and infiltration in its collection system and it needs to further characterize the problem. The proposed permit requires submission of an updated O&M manual for the entire sewage system.

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.

Federal and state pretreatment program requirements

Ecology administers the Pretreatment Program under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986) and 40 CFR, part 403. Under this delegation of authority, Ecology issues wastewater discharge permits for significant industrial users (SIUs) discharging to POTWs which have not been delegated authority to issue wastewater discharge permits. Ecology must approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i) and(iii)].

Industrial dischargers must obtain a permit from Ecology before discharging waste to the Lighthouse Point Water Reclamation Facility [WAC 173-216-110(5)]. Industries discharging wastewater that is similar in character to domestic wastewater do not require a permit.

Routine identification and reporting of industrial users

The permit requires non-delegated POTWs to take "continuous, routine measures to identify all existing, new, and proposed significant industrial users (SIUs) and potential significant industrial users (PSIUs)" discharging to their sewer system. Examples of such routine measures include regular review of water and sewer billing records, business license and building permit applications, advertisements, and personal reconnaissance. System maintenance personnel should be trained on what to look for so they can identify and report new industrial dischargers in the course of performing their jobs. The POTW may not allow SIUs to discharge prior to receiving a permit, and must notify all industrial dischargers (significant or not) in writing of their responsibility to apply for a State Waste Discharge Permit. The POTW must send a copy of this notification to Ecology.

Requirements for performing an industrial user survey

This POTW has the potential to serve significant industrial or commercial users and must conduct an industrial user (IU) survey. The purpose of the IU Survey is to identify all facilities that may be subject to pretreatment standards or requirements so that Ecology can take appropriate measures to control these discharges. The POTW should identify each such user, and require them to apply for a permit before allowing their discharge to the POTW to commence. For SIUs, the POTW must require they actually are issued a permit prior to accepting their discharge. The steps the POTW must document in their IU Survey submittal include:

1. The POTW must develop a master list of businesses that may be subject to pretreatment standards and requirements and show their disposition. This list must be based on several sources of information including business licenses, and water and sewer billing records.

2. The POTW must canvas all the potential sources, having them either complete a survey form or ruling them out by confirming they only generate domestic wastewater.
3. The POTW must develop a list of the SIUs and potential SIUs in all areas served by the POTW. The list must contain sufficient information on each to allow Ecology to decide which discharges merit further controls such as a state waste discharge permit.

Ecology describes the information needed in IU Survey submittals to allow Ecology to make permitting decision in the manual "Performing an Industrial User Survey". Properly completing an Industrial User Survey helps Ecology control discharges that may otherwise harm the POTW including its collection system, processes, and receiving waters. Where surveys are incomplete, Ecology may take such enforcement as appropriate and/or require the POTW to develop a fully delegated pretreatment program.

The proposed permit requires LPWRF to conduct an industrial user survey to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations [40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act)], with state regulations (chapter 90.48 RCW and chapter 173-216 WAC), and with local ordinances.

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 Whatcom County Health Department.

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. Spill plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

LPWRF developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the facility to update this plan, if needed, and submit it to Ecology.

G. 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.

VII. Permit Issuance Procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary, to comply 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 regulations.

B. Proposed permit issuance

This proposed permit meets all statutory requirements for Ecology to authorize a beneficial use of reclaimed water. 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.

VIII. References for Text and Appendices

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October 2010 (revised). *Water Quality Program Guidance Manual – Procedures to Implement the State's Temperature Standards through NPDES Permits*. Publication Number 06-10-100 (https://fortress.wa.gov/ecy/publications/summarypages/0610100.html)

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City of Blaine

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Appendix A--Public Involvement Information

Ecology proposes to reissue a permit to Blaine's Lighthouse Point Water Reclamation 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 Draft on April 10, 2019, in *Bellingham 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.
- 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, (360) 255-4392, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Bellingham Field Office
913 Squalicum Way #101
Bellingham, WA 98225

The primary author of this permit and fact sheet is Mark Henderson.

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--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.pdf

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

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).

Calculation of Water Quality-Based Effluent Limits:

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

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload 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 wasteload 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

Calculation of BOD_5 Oxidation with Temperature Adjustment

INPUT	
Effluent BOD_5 (mg/L)	3
Effluent Dissolved Oxygen (DO) (mg/L)	4
Receiving Water Temperature (deg C)	14
Receiving Water DO (mg/L)	7.5
DO WQ Standards (mg/L)	7
Chronic Mixing Dilution Factor	69.0
Time for effluent to travel from outfall to chronic mixing boundary (days)	0.007
Oxidation rate of BOD, base e at 20 deg C, k_1 (day^-1)*	0.23
OUTPUT	
Effluent Ultimate BOD (mg/L)	4.39
Oxidation rate of BOD at ambient temperature, base e (day^-1)	0.17
BOD oxidized between outfall and chronic mixing zone (mg/L)	0.01
RESULTS	
DO at chronic mixing zone	7.45
Difference between ambient DO and DO at chronic mixing boundary	0.05
There is no reasonable potential of not meeting the DO criteria under these conditions.	

Ambient Dissolved Copper Values From Ecology's EIM Database

Site	Depth in meters	µg\L total Copper
Juan de Fuca SILL	20	0.22
"	15	0.24
"	20	0.17
Juan de Fuca NORTH	20	0.26
"	20	0.25
"	20	0.22
"	20	0.48
Whidbey Basin	20	0.41
"	10	0.37
"	10	0.33
Haro Strait	20	0.28
"	20	0.27
"	20	0.21
	90^{th} percentile	0.366

Facility	LPWRF
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	23.0	69.0
Human Health Carcinogenic		0.0
Human Health Non-Carcinogenic		0.0

Pollutant, CAS No. & NPDES Application Ref. No.				ANTIMONY (INORGANIC) 7440360 1M	ARSENIC (dissolved) 7440382 2M	CHLORINE (Total Residual) 7782505	BERYLLIUM 7440417 3M	CADMIUM - 7440439 4M Hardness dependent	CHROMIUM(TRI) -16065831 5M Hardness dependent	COPPER - 744058 6M Hardness dependent	LEAD - 7439921 7M Dependent on hardness	MERCURY 7439976 8M	NICKEL - 7440020 9M - Dependent on hardness
Effluent Data	# of Samples (n)			4	4	366	4	4	4	4	4	4	4
	Coeff of Variation (Cv)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)			3	5	210	0.3	0.5	7	47	0.5	0.00068	5
	Calculated 50th percentile Effluent Conc. (when n>10)												
Receiving Water Data	90th Percentile Conc., ug/L												
	Geo Mean, ug/L			0									
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute		-	69	13	-	42	-	4.8	210	1.8	74
		Chronic		-	36	7.5	-	9.3	-	3.1	8.1	0.025	8.2
	WQ Criteria for Protection of Human Health, ug/L			90	-	-	-	-	-	-	-	0.15	100
	Metal Criteria Translator, decimal	Acute		-	1	-	-	0.994	-	0.83	0.951	0.85	0.99
		Chronic		-	-	-	-	0.994	-	0.83	0.951	-	0.99
	Carcinogen?			N	Y	N	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
s	$s^2=\ln(CV^2+1)$			0.555	0.555	0.555	0.555	0.555	0.555	0.555
Pn	$Pn=(1-\text{confidence level})^{1/n}$			0.473	0.992	0.473	0.473	0.473	0.473	0.473
Multiplier				2.59	1.00	2.59	2.59	2.59	2.59	2.59
Max concentration (ug/L) at edge of…		Acute		0.562	9.130	0.056	4.385	0.053	0.000	0.556
		Chronic		0.187	3.043	0.019	1.462	0.018	0.000	0.185
Reasonable Potential? Limit Required?				**NO**	**NO**	**NO**	**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	$s^2=\ln(CV^2+1)$	0.55451	0.554513029	0.55451
Pn	$Pn=(1-\text{confidence level})1/n$	0.473	0.473	0.473
Multiplier		1.03846	1.038458657	1.03846
Dilution Factor		69	69	69
Max Conc. at edge of Chronic Zone, ug/L		0.04515	1.02341E-05	0.07525
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**

Facility	LPWRF
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	23.0	69.0
Human Health Carcinogenic		0.0
Human Health Non-Carcinogenic		0.0

Pollutant, CAS No. & NPDES Application Ref. No.			SELENIUM 7782492 10M	SILVER - 7740224 11M dependent on hardness.	THALLIUM 7440280 12M	ZINC- 7440666 13M hardness dependent							
Effluent Data	# of Samples (n)		4	4	4	4							
	Coeff of Variation (Cv)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		2	2	1	210							
	Calculated 50th percentile Effluent Conc. (when n>10)												
Receiving Water Data	90th Percentile Conc., ug/L												
	Geo Mean, ug/L												
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	290	1.9	-	90							
		Chronic	71	-	-	81							
	WQ Criteria for Protection of Human Health, ug/L		200	-	6.3	1000							
	Metal Criteria Translator, decimal	Acute	-	0.85	-	0.946							
		Chronic	-	-	-	0.946							
	Carcinogen?		N	N	N	N							

Aquatic Life Reasonable Potential

Effluent percentile value			0.950	0.950		0.950							
s	$s^2=\ln(CV^2+1)$		0.555	0.555		0.555							
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.473	0.473		0.473							
Multiplier			2.59	2.59		2.59							
Max concentration (ug/L) at edge of…		Acute	0.225	0.191		22.330							
		Chronic	0.075	0.075		7.443							
Reasonable Potential? Limit Required?			**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	$s^2=\ln(CV^2+1)$	0.554513029	0.55451303	0.55451303
Pn	$Pn=(1\text{-confidence level})1/n$	0.473	0.473	0.473
Multiplier		1.038458657	1.03845866	1.03845866
Dilution Factor		69	69	69
Max Conc. at edge of Chronic Zone, ug/L		0.030100251	0.01505013	3.16052635
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	69.0
Receiving Water Fecal Coliform, #/100 ml	5
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*14*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**10**
Difference between mixed and ambient, #/100 ml	6

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

Marine Un-ionized Ammonia Criteria Calculation

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

INPUT	
1. Receiving Water Temperature, deg C (90th percentile):	14.0
2. Receiving Water pH, (90th percentile):	7.9
3. Receiving Water Salinity, g/kg (10th percentile):	30.0
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):	0.617
2. pKa8 at 25 deg C (Whitfield model "B"):	9.317
3. Percent of Total Ammonia Present as Unionized:	1.7%
4. Total Ammonia Criteria (mg/L as NH_3):	
Acute:	13.91
Chronic:	2.09
RESULTS	
Total Ammonia Criteria (mg/L as N)	
Acute:	**11.44**
Chronic:	**1.72**

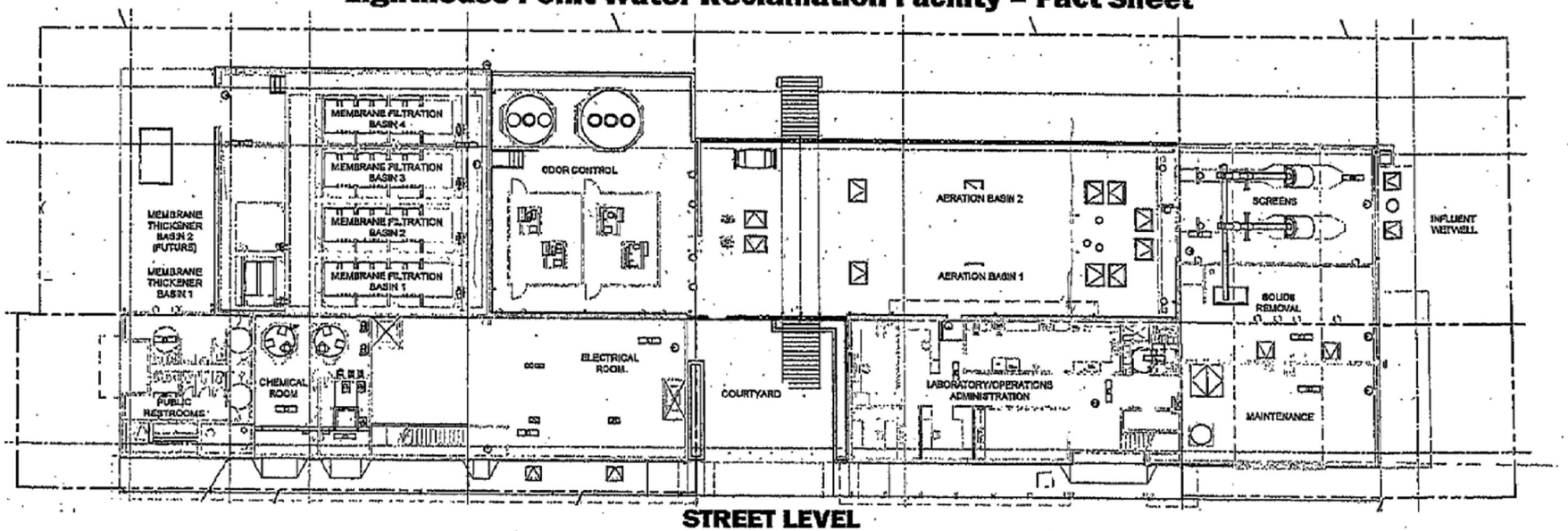
Marine Temperature Reasonable Potential and Limit Calculation

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

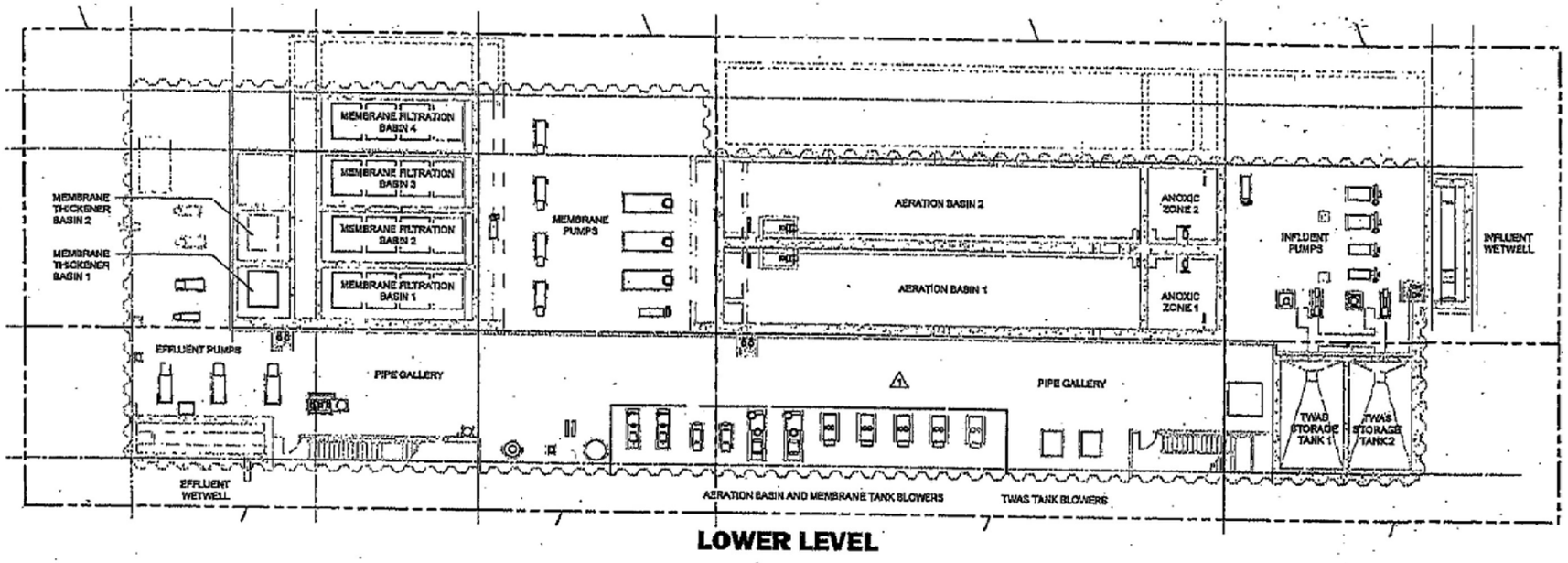
INPUT	May-Sep	Oct-Apr
1. Chronic Dilution Factor at Mixing Zone Boundary	69.0	69.0
2. Annual max 1DADMax Ambient Temperature (Background 90th percentile)	14.0 °C	10.7 °C
3. 1DADMax Effluent Temperature (95th percentile)	23.0 °C	21.0 °C
4. Aquatic Life Temperature WQ Criterion	13.0 °C	13.0 °C
OUTPUT		
5. Temperature at Chronic Mixing Zone Boundary:	14.12 °C	10.80 °C
6. Incremental Temperature Increase or decrease:	0.13 °C	0.15 °C
7. Incremental Temperature Increase 12/(T-2) if T≤ crit:	---	1.39 °C
8. Maximum Allowable Temperature at Mixing Zone Boundary:	14.29 °C	12.04 °C
A. If ambient temp is warmer than WQ criterion		
9. Does temp fall within this warmer temp range?	YES	NO
10. Temp increase allowed at mixing zone boundary, if required:	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
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**	**NO**
18. Temperature Limit if Required?	**NO LIMIT**	**NO LIMIT**

Appendix E--Facility Schematic

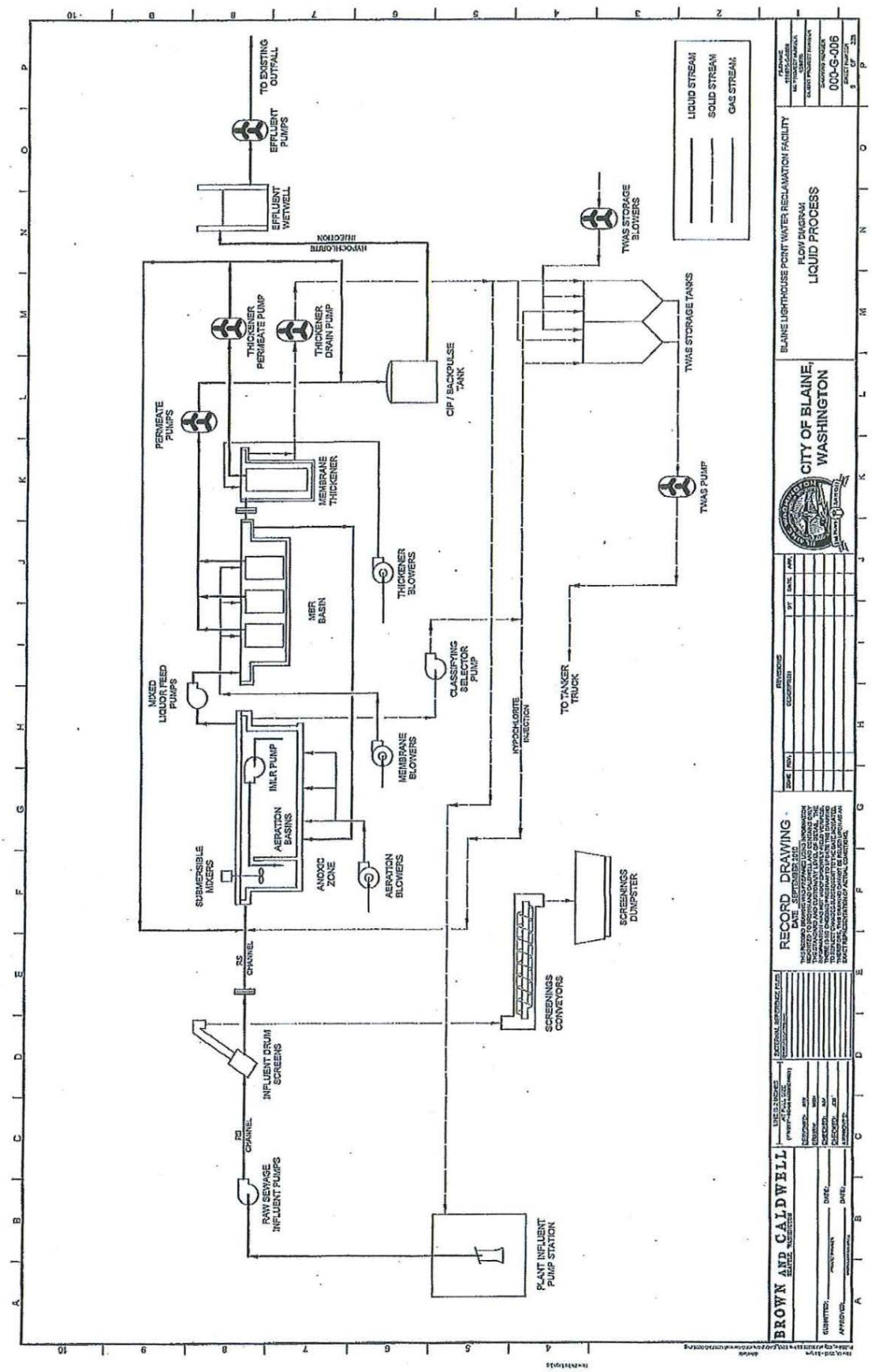
Lighthouse Point Water Reclamation Facility – Fact Sheet



STREET LEVEL



LOWER LEVEL


TO EXISTING OUTFALL
EFFLUENT PUMPS
EFFLUENT WETWELL
HYPOCHLORITE INJECTION
THICKENER PERMEATE PUMP
THICKENER DRAIN PUMP
CIP / BACKPULSE TANK
TWAS STORAGE BLOWERS
TWAS STORAGE TANKS
TWAS PUMP
PERMEATE PUMPS
MEMBRANE THICKENER
THICKENER BLOWERS
MBR BASIN
MIXED LIQUOR FEED PUMPS
CLASSIFYING SELECTOR PUMP
TO TANKER TRUCK
HYPOCHLORITE INJECTION
MEMBRANE BLOWERS
IMLR PUMP
AERATION BASINS
SUBMERSIBLE MIXERS
ANOXIC ZONE
AERATION BLOWERS
SCREENINGS DUMPSTER
RS CHANNEL
SCREENINGS CONVEYORS
INFLUENT DRUM SCREENS
RS CHANNEL
RAW SEWAGE INFLUENT PUMPS
PLANT INFLUENT PUMP STATION
LIQUID STREAM
SOLID STREAM
GAS STREAM
BLAINE LIGHTHOUSE POINT WATER RECLAMATION FACILITY
FLOW DIAGRAM
LIQUID PROCESS
CITY OF BLAINE, WASHINGTON
000-G-006
RECORD DRAWING
BROWN AND CALDWELL

Reclaimed Water Distribution Route

Appendix F--Waiver from Washington State Department of Health

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
OFFICE OF SHELLFISH AND WATER PROTECTION
16201 East Indiana Avenue, Suite 1500, Spokane Valley, Washington 99216
TDD Relay 1-800-833-6388

September 8, 2010

Mr. Steve Banham, P.E., Public Works Director
City of Blaine
1200 Yew Avenue
Blaine, Washington 98230

Dear Mr. Banham:

RE: City of Blaine, Whatcom County, Technical Memorandum / Engineering Report-Requirements for Reclaimed Water Use & Request for Waiver from Distribution System Residual Requirements; Approval

The Technical Memorandum / Engineering Report-Requirements for Reclaimed Water Use received in our office on February 2, 2010 together with the Request for Waiver from Distribution System Residual Requirements received May 11, 2010 for the Lighthouse Point Water Reclamation Plant have been reviewed in accordance with the provisions of WAC 246-271 and for conformance with the Water Reclamation and Reuse Standards and are hereby **APPROVED**.

Provided that:

1. The Operation and Maintenance Manual are submitted to the department for review and approval, and

2. The operation of the reclaimed water distribution system is consistent with the operational requirements of the approve operation and maintenance manual.

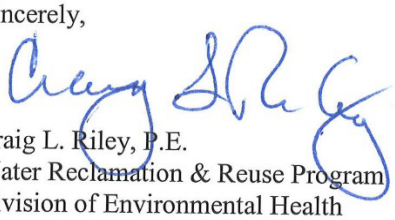
Please note that this approval addresses issues of concern of this department and is not intended to either supersede or replace requirements of or approvals required from the Washington Department of Ecology.

Regulations establishing a schedule of fees for review and approval of planning, engineering and construction documents were adopted July 1, 1987 and revised in

November 4, 1995. An invoice for review fees that included the review of these documents was issued previously. No other fees are required.

If you have any questions, please feel free to contact me at (509) 329-2146 or by email at craig.riley@doh.wa.gov.

Sincerely,



Craig L. Riley, P.E.
Water Reclamation & Reuse Program
Division of Environmental Health

cc: Whatcom County Health Department
Rick Kelly, Brown & Caldwell, Seattle
Steve Hood, Dept. of Ecology, NWRO- Bellingham Field Office
John Thielemann, WDOH, NWRO, Kent

Appendix G--Response to Comments

The Department of Ecology received no comments during the draft public comment period.