

FACT SHEET FOR NPDES PERMIT WA-002264-1
Blaine Wastewater Treatment Plant



TABLE OF CONTENTS

INTRODUCTION 4

BACKGROUND INFORMATION 5

 DESCRIPTION OF THE FACILITY 5

 History..... 5

 Collection System Status 5

 Treatment Processes..... 6

 Discharge Outfall 7

 Residual Solids..... 7

 PERMIT STATUS..... 7

 SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT 7

 WASTEWATER CHARACTERIZATION 8

 SEPA COMPLIANCE..... 8

PROPOSED PERMIT LIMITATIONS..... 8

 DESIGN CRITERIA 9

 TECHNOLOGY-BASED EFFLUENT LIMITATIONS 9

 SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS 11

 Numerical Criteria for the Protection of Aquatic Life..... 11

 Numerical Criteria for the Protection of Human Health..... 11

 Antidegradation..... 12

 Critical Conditions 12

 Mixing Zones 12

 Description of the Receiving Water..... 15

 Surface Water Quality Criteria 15

 Consideration of Surface Water Quality-Based Limits for Numeric Criteria 15

 Whole Effluent Toxicity 17

 Human Health..... 18

 Sediment Quality 19

 GROUND WATER QUALITY LIMITATIONS..... 19

MONITORING REQUIREMENTS..... 19

 LAB ACCREDITATION 20

OTHER PERMIT CONDITIONS 20

 REPORTING AND RECORD KEEPING 20

 PREVENTION OF FACILITY OVERLOADING 20

 OPERATION AND MAINTENANCE (O&M)..... 20

 RESIDUAL SOLIDS HANDLING..... 21

 PRETREATMENT 21

 Federal and State Pretreatment Program Requirements 21

 Wastewater Permit Required 22

 Requirements for Routine Identification and Reporting of Industrial Users 22

 Requirements for Performing an Industrial User Survey 23

 Duty to Enforce Discharge Prohibitions 23

 Support by the Department for Developing Partial Pretreatment Program
 by POTW 23

OUTFALL EVALUATION	23
GENERAL CONDITIONS	24
PERMIT ISSUANCE PROCEDURES	24
PERMIT MODIFICATIONS	24
RECOMMENDATION FOR PERMIT ISSUANCE	24
REFERENCES FOR TEXT AND APPENDICES.....	25
APPENDIX A—PUBLIC INVOLVEMENT INFORMATION.....	26
APPENDIX B—GLOSSARY	27
APPENDIX C—TECHNICAL CALCULATIONS.....	32
APPENDIX D—RESPONSE TO COMMENTS.....	35

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits (chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC), water quality criteria for surface and ground waters (chapters 173-201A and 200 WAC), and sediment management standards (chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—*Public Involvement* of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D—*Response to Comments*.

GENERAL INFORMATION	
Applicant	City of Blaine
Facility Name and Address	9235 Semiahmoo Parkway Blaine, WA 98230
Type of Treatment	Rotating Biological Contactors
Discharge Location	Strait of Georgia Latitude: 48° 58' 46" N Longitude: 122° 48' 05" W
Waterbody ID Number	1229892484144

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The treatment plant is located on Semiahmoo Spit, on the west side of Drayton Harbor, in northwestern Whatcom County, Washington. The city's first wastewater treatment facility was located on Marine Drive. The present treatment facilities located on Semiahmoo Spit were constructed in 1980.

Industries in Blaine include a cereal manufacturing facility, a chocolate factory, a metal plating facility, and several seafood processing facilities. The seafood processors have combined to form a consortium and utilize a separate outfall that discharges at the entrance of Drayton Harbor. The metal finishing business is regulated separately by industrial state waste discharge permits as is the consortium of seafood processors. The cereal manufacturer does not presently discharge to Blaine's wastewater plant.

In previous years, the fish processing industries within the city of Blaine discharged to the city's sewage treatment plant. The result was an 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 the separate outfall used by the seafood processors.

In the past, the cereal manufacturing plant sent 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. The cereal manufacturer no longer sends industrial wastewater to the city of Blaine. It now trucks its wastewater to the city of Bellingham.

In 1995 the city of Blaine engineered plans that were approved by Ecology for upgrading and rehabilitating the present facility. The city 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. The facility continues to operate its present wastewater treatment plant despite much needed upgrading. The city has updated its general sewer plan and designed a new wastewater reclamation facility with significant input from the community. It is presently seeking funding to build a new wastewater treatment facility in the same general area of its original wastewater plant on Marine Drive. They expect to have the new facility built by 2010.

COLLECTION SYSTEM STATUS

The oldest sewer lines in the city of Blaine were installed in the 1920s. Most of these lines were replaced in the 1950s through the 1990s as the system was expanded. The sewers in west Blaine were constructed after 1985. The city 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. The city of Blaine began an infiltration and inflow (I&I) reduction project in 1998 that successfully indicated 43 illicit connections to the sanitary sewer system. I & I continues to be a focus for Blaine Public Works.

A grant was given to the city of Blaine for a video camera inspection of the Marine Drive portion of its forcemain collection system. The inspection covered those portions located from the railroad tracks west to the end of Marine Drive. Several cracks and breaks in the main pipe and manholes were documented. These cracks and breaks were repaired in August 2001.

The city utilizes a submarine forcemain to transport untreated wastewater from East Blaine to the treatment plant on Semiahmoo Spit. The submarine forcemain is constructed of multiple 20-foot sections of ductile iron pipe joined and buried in sediment beneath the mouth of Drayton Harbor. As a condition of the current permit, the city pressure tests the forcemain yearly to 1.5 times normal operating pressure.

The city has invested in additional off-line storage for peak rain events that, coupled with I&I problems, have contributed to the causes of overflow events. For the past five years the city had been deploying four bladder tanks capable of containing 60,000 gallons each during seasonal wet weather as additional storage of wastewater. These four bladder tanks (200,000 total gallons), plus the capacity of lift station #1 (50,000 gallons), gave the city a 260,000 gallon capacity to store wastewater for processing later. In addition to the bladder tanks, the city also had several tanker trucks on contract to haul wastewater around Drayton Harbor to the plant on Semiahmoo Drive. Use of the bladders was discontinued in the fall of 2006. The city has built an off-line storage vault under Marine Drive to handle 400,000 gallons of wastewater.

Blaine has recently spent a significant amount of time and money on updating its comprehensive sewer plan and completing an engineered design for a new wastewater treatment facility. In 1994 an update to the comprehensive sewer plan recommended constructing a new wastewater plant to address anticipated future growth. An engineering plan was developed and approved by Ecology in 1998. Construction began in 1999 but was halted when historic human remains were found. The city decided to abandon construction at that site and consider other options for their wastewater. While interim improvements were being made to their existing plant and collection system, Blaine looked at alternatives to their existing wastewater plant. Updates to its comprehensive sewer plan were completed in September 2004. From those updates came the formation of a citizen's advisory group to help the city with siting for a new plant as well as what type of wastewater system they preferred. Throughout the course of a year the citizens group decided that effluent water quality was their number one priority and that being able to generate reuse quality water was important. Engineered plans for a new wastewater plant have been completed and are awaiting review. The city plans to begin construction during this permit cycle.

TREATMENT PROCESSES

The city of Blaine's current wastewater treatment plant was constructed in 1980 on Semiahmoo Spit. Influent to the treatment plant comes from a ductile iron submarine forcemain that transfers wastewater from East Blaine, under the opening to Drayton Harbor, and wastewater from an upland development, Semiahmoo. The treatment process includes influent pumping, followed by two rotating screens. The wastewater proceeds to two banks of rotating biological reactors (RBC's), where suspended and dissolved organic material is treated by biological film adhering to the rotating disks. Wastewater then proceeds to the secondary sedimentation tanks where clarified effluent is separated from the biological solids which slough off the reactors. Solids are stabilized in an aerobic digester prior to disposal on land, at sites regulated by Whatcom County Health Department. Aerobically digested residual solids are transported by truck to Tjølker

Farms. Clarified effluent is disinfected with chlorine and then discharged into Semiahmoo Bay via the outfall. Semiahmoo Bay is an embayment and is part of the Strait of Georgia.

There are two full-time operators and an operator/sampler position that spends 50 percent of his time at the treatment facility. The two full-time operators are certified as Class 3 and Class 2, with the operator/sampler being certified Class 2. The plant operates and is staffed seven days a week for eight hours a day, 7:00 to 3:00. Staff rotates their duties of sampling and being on-call.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility by gravity via a 24-inch ductile iron pipe 2,450-foot long terminating in 37 feet of water into Semiahmoo Bay, an embayment of the Strait of Georgia. The outfall, which includes a diffuser consisting of six 8-inch diameter ports, was inspected by scuba divers in July 2003 and found to be sound. Another inspection was conducted in October 2003, which identified a hole approximately 100 feet from the diffuser. The hole was repaired in July of 2004.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (screenings), and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit is removed annually from the RBC's. Rags, scum, and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the secondary clarifier are removed by a contracted Vector truck and transported to a facility to be land applied under a permit from the Whatcom County Health Department and the Washington State Department of Ecology.

PERMIT STATUS

The previous permit for this facility was issued on March 13, 2003. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and total residual chlorine.

An application for permit renewal was submitted to the Department on November 27, 2006, and accepted by the Department on December 12, 2006.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on January 30, 2006. A compliance inspection with sampling was conducted on May 17, 2004.

During the history of the previous permit, the Permittee has had a number of non-compliance issues, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. Most of the non-compliance issues appear to be due to rain events since they occurred during the months of November, December, January, February, and March. Violations did occur in June 2004 (suspended solids average monthly mg/L), August 2004 (suspended solids average weekly, average monthly, and percent removal), and September 2004 (suspended solids percent removal, average weekly, average monthly, and mg/L).

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

Pollutant	Maximum Daily Discharge		Average Daily Discharge			Analytical Method
	Concentration	Units	Conc.	Units	# of Samples	
BOD ₅	43	mg/L	22.4	mg/L	365	
Total Suspended Solids	48	mg/L	27.6	mg/L	365	2540D
Fecal Coliform	<800	CFU/100 mL	49.6	CFU/100 mL	365	9222D
Ammonia	3.5	mg/L	2.9	mg/L	3	350.1
Total Residual Chlorine	0.8	mg/L	0.24	mg/L	365	Sm4500d
Dissolved Oxygen	9.7	mg/L	5.8	mg/L	365	Sm4500g
Nitrate plus Nitrite	19.8	mg/L	18.4	mg/L	3	Calculate
Phosphorus	5.1	mg/L	4.1	mg/L	3	365.1

SEPA COMPLIANCE

Blaine’s wastewater treatment plant is currently in compliance with SEPA.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance 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.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. 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. Effluent

limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances, the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the 1976 Engineering Report prepared by Hammond, Collier, and Wade-Livingstone Associates and are as follows:

Table 2: Design Standards for Blaine WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	0.8 MGD
Instantaneous peak flow	2.4 MGD
BOD ₅ influent loading	2,088 lbs/day
TSS influent loading	2642 lbs/day
Design population equivalent	7640

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 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 for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from chapter 173-221 WAC:

Table 3: Technology-based Limits.

Parameter	Limit
pH	Shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine	Average Monthly Limit = 0.35 mg/L Average Weekly Limit = 0.9 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, *Wastewater Engineering, Treatment, Disposal and Reuse*, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter. In this case, however, the average monthly (0.35 mg/L) and average weekly limits (0.9 mg/L) were originally water quality-based limits generated in a previous permit. The facility has shown that it is able to comply with these limits over the last ten years so they have become AKART.

AKART is defined in WAC 173-201A-020 as “all known, available, and reasonable methods of prevention, control, and treatment.” It further states that, “AKART shall represent the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge.” A federal provision of the Clean Water Act (402 (a)(1)(B) prohibits permit conditions or standards that are less stringent than those established in the past permit. **The existing permit has a chlorine limit of 0.35 mg/L or 2.3 lbs/day for a monthly average, and 0.9 mg/L or 6.0 lbs/day as a maximum daily limit** and the facility has been able to comply with it. The proposed permit includes the same limits as technology-based limits.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow (0.8MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = **200 lbs/day**.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = **300 lbs/day**.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. The Washington State surface water quality standards (chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's water quality standards for surface waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used 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 limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters. Blaine reported ten chemicals in their application. The reported sample values were run through a model developed by EPA and used by Ecology to determine the potential for these chemicals to pose a significant threat to human health. Nine of the reported chemicals had human health criteria and are shown not to require limits. One of the chemicals, benzo(GHI)perylene, does not have a human-health criteria assigned. A document research revealed that in animal studies mice exposed to over 900 parts per million (ppm) of benzo(GHI)perylene in food over several months developed liver and blood problems. The highest of ten samples taken by the city of Blaine was reported as 1.8 micro grams per liter (parts per billion). This value is more than an order of magnitude less than the value reported in the animal study. A value of 0.25 ppm was used in the model as a regulatory criteria and it did not generate a limit.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on Washington State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic waterbody uses. The critical conditions for the pollutants in this discharge are the months of July, August, and September.

MIXING ZONES

This permit authorizes an acute and a chronic mixing zone around the point of discharge as allowed by chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The water quality standards stipulate some criteria be met before a mixing zone is allowed. The requirements and Ecology's actions are summarized as follows:

1. The allowable size and location be established in a permit.

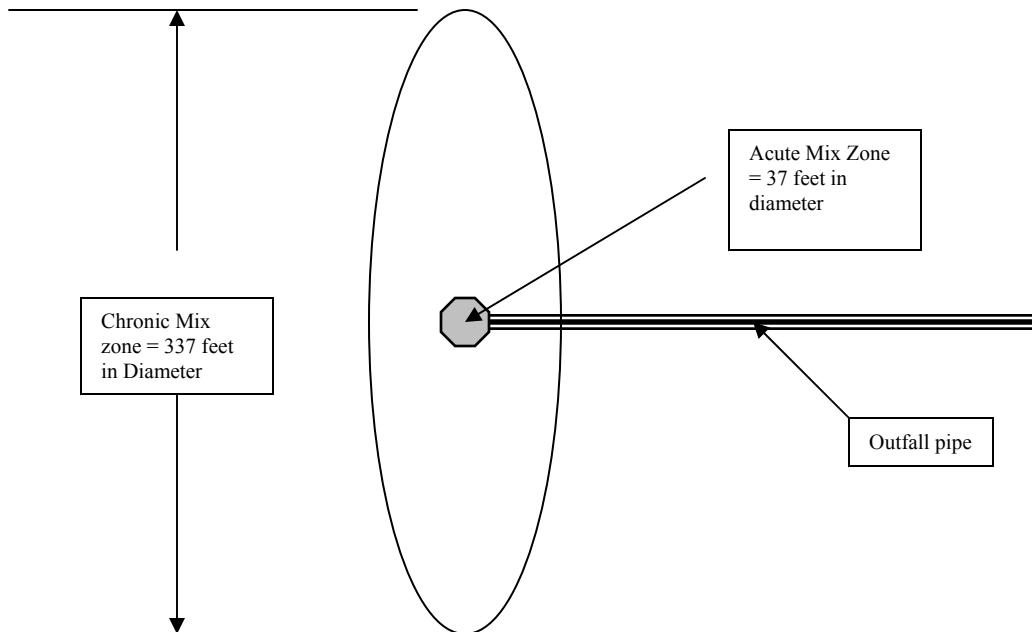
This permit specifies the mixing ratio of the allowed mixing zone.

Acute Mixing Zone is 19:1

Chronic Mixing Zone is 72:1

The definition for an oceanic outfall comes from WAC 173-201A-400 (c) "In oceanic waters, mixing zones, singularly or in combination with other mixing zones, shall not extend in any horizontal direction from the discharge port(s) for a distance greater than three hundred feet plus the depth of water over the discharge port(s) as measured during mean lower low water. For the purpose of this section, all marine waters not classified as estuarine in (b)(ii) of this subsection shall be categorized as oceanic."

(see figure below)



2. Fully apply “all known, available, and reasonable methods of treatment” (AKART).

The technology-based limitations determined to be AKART are discussed in an earlier section of this fact sheet on pages 10 and 11.

3. Consider critical discharge condition.

The critical discharge condition is often pollutant-specific or waterbody-specific and is discussed above on page 12.

4. Supporting information clearly indicates 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 or adversely affect public health.

The Department of Ecology has reviewed the information on the characteristics of the discharge, receiving water characteristics and the discharge location. Based on this information, Ecology believes this 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.

5. Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.

A reasonable potential analysis, using procedures established by USEPA and the Department of Ecology, was conducted for each pollutant to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.

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

The size of the mixing zone (in the form of the dilution factor) has been minimized by the use of design criteria with low probability of occurrence. For example, the reasonable potential analysis used the expected 95th percentile pollutant concentration, the 90th percentile background concentration, and the centerline dilution factor. The concentrations of the pollutants in the mixing zone have been minimized by requiring pollution prevention measures where applicable.

7. Maximum size of mixing zone

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

8. Acute Mixing Zone

A. Acute criteria met as near to the point of discharge as practicably attainable.

The acute criteria have been determined to be met at 10 percent of the chronic mixing zone. In this case the acute zone is 5.26 percent.

B. The concentration of, and 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.

The toxicity of pollutants is dependent upon the exposure which in turn is dependent upon the concentration and the time the organism is exposed to that concentration. For example, EPA gives the acute criteria for copper as “freshwater aquatic organisms and their uses should not be affected unacceptably if the 1-hour average concentration (in µg/l) does not exceed the numerical value given by $(0.960)(e^{(0.9422[\ln(\text{hardness})] - 1.464)})$ more than once every three years on the average.” The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water assuring that it will not cause translocation of indigenous organism near the point of discharge.

C. Comply with size restrictions.

The mixing zone authorized for this discharge meets the size restrictions of WAC 173-201A.

9. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Semiahmoo Bay which is designated as an Excellent receiving water in the vicinity of the outfall. Other nearby point source outfalls include Blaine Seafood Processors. Significant nearby non-point sources of pollutants include road run-off and stormwater outfalls. Characteristic uses include the following:

fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this caliber shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for aquatic plants and animals as well as human health for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	6.0 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	Less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in chapter 173-201A WAC and is defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the Plumes model. Mixing zone modeling was conducted by KCM Inc. in 1997. The dilution factors have been determined to be:

	Acute	Chronic
Aquatic Life	19	72
Human Health, Carcinogen	NA	72
Human Health Non-carcinogen	NA ¹	72

¹ Not applicable

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

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD₅—Under critical conditions there is no predicted violation of the water quality standards for surface waters. Therefore, the technology-based effluent limitation for BOD₅ was placed in the permit.

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

Fecal coliform—Under critical conditions there is no predicted violation of the water quality standards for surface waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, and phosphorus. The following metals were detected in Blaine's effluent: arsenic, copper, chromium, and zinc. In addition, the following volatile organic chemicals were detected: pentachlorophenol, phenol, Benzo(ghi)perylene, Benzo(K)fluoranthene, Bis(2-ethylhexyl) phthalate, Di-N-butyl-phthalate, Diethyl Phthalate, and Indeno(1,2,3-CD)Pyrene. A reasonable potential analysis (see Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit. The critical condition in this case occurs during the months of July, August, and September. The parameters used in the critical condition modeling are as follows: acute dilution factor 19, chronic dilution factor 72, receiving water temperature 13.35°C, and receiving water alkalinity 272 (as mg CaCO₃/L).

No valid ambient background data was available for pentachlorophenol, phenol, Benzo(ghi)perylene, Benzo(K)fluoranthene, Bis(2-ethylhexyl)phthalate, Di-N-butyl-phthalate, Diethyl Phthalate, and Indeno (1,2,3-CD)Pyrene). A determination of reasonable potential using zero for background resulted in no reasonable potential.

Water quality criteria for metals in chapter 173-201A WAC are based on the dissolved fraction of the metal. The model supplied by EPA and used by Ecology to determine if a reasonable potential exists to exceed water quality standards uses dissolved metals as its default.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in *USEPA Water Quality Standards Handbook*, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

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

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit would ordinarily contain requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in chapter 173-205 WAC. However, the Permittee is improving pollution control in order to meet other regulatory requirements. The results of an effluent characterization for toxicity would not be accurate until after the improvements have been completed.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center at (360) 407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

Acute Toxicity

The acute toxicity limit is set relative to the zone of acute criteria exceedence (acute mixing zone) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions. The ACEC for Blaine is 5.26 percent of the effluent.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

Chronic Toxicity

The chronic toxicity limit is set relative to the mixing zone established in accordance with WAC 173-201A-100. The chronic critical effluent concentration (CCEC) is the concentration of effluent existing at the boundary of the mixing zone during critical conditions. The CCEC for Blaine is 1.38 percent of the effluent.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on knowledge of data or process information indicating regulated chemicals occur in the discharge.

A determination of the discharge's potential to cause an exceedence of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) and the Department's *Permit Writer's Manual* (Ecology Publication 92-109, July 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the sediment management standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated ground water quality standards (chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

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

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of 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* (July 1994) for rotating biological contactors.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for (list parameters):

Parameter	Method
BOD	SM 5210
Total Residual Chlorine	SM 4500-CL G
DO	SM 4500-O G
pH	SM 4500-H
TSS	SM 2540 D
Fecal Coliform	SM 9222 D

OTHER PERMIT CONDITIONS

REPORTING AND RECORD KEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

Due to the age and construction methods employed during installation of the collection system, leaks are expected to be present. The permit already requires an I&I report to be performed each year and therefore the collection system will be characterized for the presence of leaks. The following questions should be evaluated:

- How much of the annual average and peak daily flow under worst conditions (inflow or infiltration) can be attributed to leaks?
- Where are the (individual) leaks?
- How large is each leak or how much inflow or infiltration does a run of sewer contribute?
- Are the forcemains and/or inverted siphons experiencing exfiltration?

Following characterization of the leaks, corrective actions may be required. Typically this would be done voluntarily by the Permittee. An administrative order may be used to enact repairs following review of the assessment unless the Permittee makes the needed repairs.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit 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 final use and disposal of biosolids shall be done in accordance with chapter 173-308 WAC ("Biosolids Management"), 40 CFR Part 503, and under coverage of the state general permit for biosolids management. The disposal of solid waste, other than biosolids, is regulated by the local jurisdictional health department in accordance with state solid waste regulations. The disposal of other solid waste is under the jurisdiction of the Whatcom County Health Department.

PRETREATMENT

An industrial user survey is required 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.

As sufficient data becomes available, the Permittee shall, in consultation with the Department, reevaluate its local limits in order to prevent pass-through or interference. Upon determination by the Department that any pollutant present causes pass-through or interference, or exceeds established sludge standards, the Permittee shall establish new local limits or revise existing local limits as required by 40 CFR 403.5. In addition, the Department may require revision or establishment of local limits for any pollutant that causes an exceedence of the water quality standards or established effluent limits, or that causes whole effluent toxicity. The determination by the Department shall be in the form of an administrative order. In order to develop these local limits, the Department will provide environmental criteria or limits for the various pollutants of concern.

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern. Any permit modification is subject to formal due process procedures pursuant to state and federal law and regulation.

FEDERAL AND STATE PRETREATMENT PROGRAM REQUIREMENTS

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), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (for example, tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, Part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to 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)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)]. (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.) Industrial dischargers need to apply for a State Waste Discharge Permit sixty (60) days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (for example, tracking the number and general nature of industrial dischargers to the sewerage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

WASTEWATER PERMIT REQUIRED

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

REQUIREMENTS FOR ROUTINE IDENTIFICATION AND REPORTING OF INDUSTRIAL USERS

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a state waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

REQUIREMENTS FOR PERFORMING AN INDUSTRIAL USER SURVEY

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of state waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedence of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users.

DUTY TO ENFORCE DISCHARGE PROHIBITIONS

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass-through or interference. The definitions of pass-through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

SUPPORT BY THE DEPARTMENT FOR DEVELOPING PARTIAL PRETREATMENT PROGRAM BY POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular, assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit Condition S.11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet water quality standards, sediment quality standards, or ground water standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. *National Toxics Rule*. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. *Technical Support Document for Water Quality-based Toxics Control*. EPA/505/2-90-001.
1988. *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling*. USEPA Office of Water, Washington, D.C.
1985. *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water*. EPA/600/6-85/002a.
1983. *Water Quality Standards Handbook*. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. *Wastewater Engineering, Treatment, Disposal, and Reuse*. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. *Characterization of Stream Reaeration Capacity*. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

- Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)
- Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Washington State Department of Ecology.

1994. *Permit Writer's Manual*. Publication Number 92-109

Water Pollution Control Federation.

1976. *Chlorination of Wastewater*.

Wright, R.M., and A.J. McDonnell.

1979. *In-stream Deoxygenation Rate Prediction*. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on January 4, 2007 and January 11, 2007, in *The Northern Light* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on August 2, 2007, in *The Northern Light* to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

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

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 676-2198, or by writing to the address listed above.

This permit and fact sheet were written by Mark Henderson.

APPENDIX B—GLOSSARY

Acute Toxicity—The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART—An acronym for “all known, available, and reasonable methods of prevention, control, and treatment.”

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.

Average Monthly Discharge Limitation—The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation—The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

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 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 a receiving water 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 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.

CBOD₅—The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

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

Chronic Toxicity—The effect of a pollutant 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.

Combined Sewer Overflow (CSO)—The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

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 to accomplish the purpose of a Compliance Inspection - Without Sampling and 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 percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four 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.

Dilution Factor—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 effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10 percent by volume and the receiving water 90 percent.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall 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 period of time as is feasible.

Industrial User—A discharger of wastewater to the sanitary sewer which 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 storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)—"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

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.

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 Limitation—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.

Method Detection Level (MDL)—The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

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—A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows 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.

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.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User—A potential significant industrial user is defined as an Industrial User which 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 percent 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 (for example, facilities which develop photographic film or paper, and car washes).

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

Quantitation Level (QL)—A calculated value five times the MDL (method detection level).

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.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, 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 storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids are the particulate materials 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 limitations 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 on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—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 on the Department’s homepage at (<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>) .

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.

Lotus File NH3SALT.WK1 Revised 19-Oct-93

INPUT	
1. Temperature (deg C):	9.9
2. pH:	7.7
3. Salinity (g/Kg):	29.0
OUTPUT	
1. Pressure (atm ;EPA criteria assumes 1 atm):	1.0
2. Molal Ionic Strength (not valid if >0.85):	0.595
3. pKa8 at 25 deg C (W hite H model "B"):	9.314
4. Percent of Total Ammonia Present as Unionized:	0.782%
5. Unionized ammonia criteria (mg un-ionized NH3 per liter) from EPA 440/5-88-004	
Acute:	0.233
Chronic:	0.035
6. Total Ammonia Criteria (mg/L as NH3)	
Acute:	29.80
Chronic:	4.48
7. Total Ammonia Criteria (mg/L as NH3-N)	
Acute:	24.49
Chronic:	3.68

Revised 3/00

Human Health Reasonable Potential Spreadsheet Parameter	Ambient Concentration (Geometric Mean) ug/L	Water Quality Criteria for Protection of Human Health ug/L	Max concentration at edge of chronic mixing zone. ug/L	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT ug/L	MAXIMUM DAILY EFFLUENT LIMIT ug/L	Estimated Percentile at 95% Confidence	Pn	Max effluent measured conc. ug/L	Coef of Variation CV	S	n	# of samples from which # in col. K was taken	Multiplier	Calculated 50th percentile Effluent Conc. (When n>10)	Dilution Factor
Benzo(GH)perylene		0.25	0.02	NO	2	NONE	NONE	0.50	0.74	1.8	0.60	0.6	10	10	0.70	0.00	72.0
Chloroform		470	0.01	NO		NONE	NONE	0.50	0.74	1.2	0.60	0.6	10	10	0.70		72.0
Benzo(K)Fluoranthene		0.031	0.01	NO		NONE	NONE	0.50	0.74	0.9	0.60	0.6	10	10	0.70		72.0
Dichlorobromomethane		22	0.01	NO		NONE	NONE	0.50	0.74	0.8	0.60	0.6	10	10	0.70		72.0
Bis-(2-ethylhexyl)phthalate		5.9	0.03	NO		NONE	NONE	0.50	0.74	3.4	0.60	0.6	10	10	0.70		72.0
pentachlorophenol		8.2	0.01	NO		NONE	NONE	0.50	0.74	0.7	0.60	0.6	10	10	0.70		72.0
Di-N-Butyl Phthalate		1200	0.02	NO		NONE	NONE	0.50	0.74	1.8	0.60	0.6	10	10	0.70		72.0
Phenol		4600000	0.07	NO		NONE	NONE	0.50	0.74	6.9	0.60	0.6	10	10	0.70		72.0
Diethyl Phthalate		120000	0.01	NO		NONE	NONE	0.50	0.74	1.44	0.60	0.6	10	10	0.70		72.0
Indeno(1,2,3-CD)Pyrene		0.031	0.01	NO		NONE	NONE	0.50	0.74	1.5	0.60	0.6	10	10	0.70		72.0

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB)

Parameter	Metal Criteria Translator as decimal		Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)		State Water Quality Standard		Max concentration at edge of...		Chronic Mixing Zone ug/L	Acute Mixing Zone ug/L	Chronic Mixing Zone ug/L	LIMIT REQ'D?	Effluent percentile value	Ph	Max effluent conc. measured (metals as total recoverable) ug/L	Coef Variation CV	s	# of samples n	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	COMMENT
	Acute	Chronic		Acute	Chronic	Acute	Chronic																
Chlorine						13.0000	7.5000	2.77	0.73	NO				0.95	0.992	80.00	0.60	0.55	365	0.66	19	72	
arsenic	1.00					69.0000	36.0000	0.37	0.10	NO				0.95	0.741	4.00	0.60	0.55	10	1.74	19	72	
chromium (hexavalen	0.99	0.99				1100.0000	50.0000	0.55	0.14	NO				0.95	0.741	6.00	0.60	0.55	10	1.74	19	72	
Copper	0.83	0.83				4.8000	3.1000	1.98	0.52	NO				0.95	0.741	26.00	0.60	0.55	10	1.74	19	72	
zinc	0.95	0.95				90.0000	81.0000	8.49	2.24	NO				0.95	0.741	98.00	0.60	0.55	10	1.74	19	72	
Cyanide						0.9000	2.8000	0.27	0.07	NO				0.95	0.741	3.00	0.60	0.55	10.00	1.74	19.00	72.00	
Ammonia						11.5400	20340.0000	563.52	157.20	NO				0.95	0.368	3500.00	0.60	0.55	3	3.00	19	72	

APPENDIX D—RESPONSE TO COMMENTS

No comments were received.