

FACT SHEET FOR NPDES PERMIT WA-002232-2 NEWPORT WASTEWATER TREATMENT PLANT

PURPOSE of this Fact Sheet

This fact sheet explains and documents the decisions Ecology made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for the City of Newport wastewater treatment plant.

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit *and accompanying fact sheet* for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the City of Newport Wastewater Treatment Plant NPDES permit **WA-002232-2**, are available for public review and comment from March 3, 2010 until April 5, 2010. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement**.

The City of Newport staff reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, discharges, or receiving water.

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 D - Response to Comments**, and publish it when issuing the final NPDES permit. Ecology will not revise the rest of the fact sheet, but the full document will become part of the legal history contained in the facility's permit file.

Patrick McGuire prepared the permit and this fact sheet.

SUMMARY

The City of Newport operates an oxidation ditch wastewater treatment plant with chlorine disinfection that discharges to the Pend Oreille River. Ecology issued the previous permit for this facility on June 28, 2004.

The proposed permit contains the same limits for BOD₅, TSS, pH, and total residual chlorine. Ecology has added water quality based limits for fecal coliform (100cfu/100 ml average monthly, 200 cfu/100 ml average weekly). In addition, the proposed permit requires continuous monitoring for the effluent temperature.

TABLE OF CONTENTS

II.	BACKGROUND INFORMATION	2
A.	Facility Description.....	3
	History.....	4
	Collection System Status	4
	Treatment Processes.....	5
	Discharge Outfall	5
	Solid Wastes.....	5
B.	Permit Status	6
C.	Summary of Compliance with Previous Permit Issued	6
D.	Wastewater Characterization	6
E.	Description of the Receiving Water.....	7
F.	SEPA Compliance	8
III.	PROPOSED PERMIT Limits.....	8
A.	Design Criteria.....	9
B.	Technology-Based Effluent Limits.....	9
C.	Surface Water Quality-Based Effluent Limits.....	10
	Numerical Criteria for the Protection of Aquatic Life and Recreation.....	10
	Numerical Criteria for the Protection of Human Health.....	11
	Narrative Criteria	11
	Antidegradation.....	11
	Mixing Zones.....	12
D.	Designated Uses and Surface Water Quality Criteria.....	17
E.	Evaluation of Surface Water Quality-Based Effluent Limits for Numeric Criteria	18
F.	Whole Effluent Toxicity	22
G.	Human Health	23
H.	Sediment Quality	23
I.	Ground Water Quality Limits	23
J.	Comparison of Effluent Limits With the Previous Permit Issued on June 28, 2004.....	24
IV.	MONITORING REQUIREMENTS.....	24
A.	Lab Accreditation.....	24
V.	OTHER PERMIT CONDITIONS	25
A.	Reporting and Record Keeping.....	25
B.	Prevention of Facility Overloading.....	25
C.	Operation and Maintenance (O&M).....	25
D.	Pretreatment	25
	Duty to Enforce Discharge Prohibitions	25
	Federal and State Pretreatment Program Requirements	26
	Routine Identification and Reporting of Industrial Users.....	26
	Industrial User Survey Update.....	26
E.	Solid Waste Control.....	27

Fact Sheet for NPDES Permit WA-002232-2
Newport Wastewater Treatment Plant

F.	General Conditions	27
VI.	PERMIT ISSUANCE PROCEDURES	27
A.	Permit Modifications	27
B.	Proposed Permit Issuance	27
VII.	REFERENCES FOR TEXT AND APPENDICES	28
	APPENDIX A—PUBLIC INVOLVEMENT INFORMATION	29
	APPENDIX B—GLOSSARY	30
	APPENDIX C—TECHNICAL CALCULATIONS	34
	APPENDIX D—RESPONSE TO COMMENTS	37

I. INTRODUCTION

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

The following regulations apply to municipal 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) and for ground waters (chapter 173-200 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 operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for requirements imposed by the permit.

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

II. BACKGROUND INFORMATION

Table 1 - General Facility Information

Applicant:	City of Newport
Facility Name and Address:	Newport Wastewater Treatment Plant 801 North Union Avenue Newport, WA 99156
Type of Treatment:	Oxidation ditch with chlorine disinfection
Discharge Location:	Pend Oreille River, approximately river mile 87.7 Latitude: 48° 11' 25" N Longitude: 117° 02' 25" W.

Figure 1: Facility Location Map

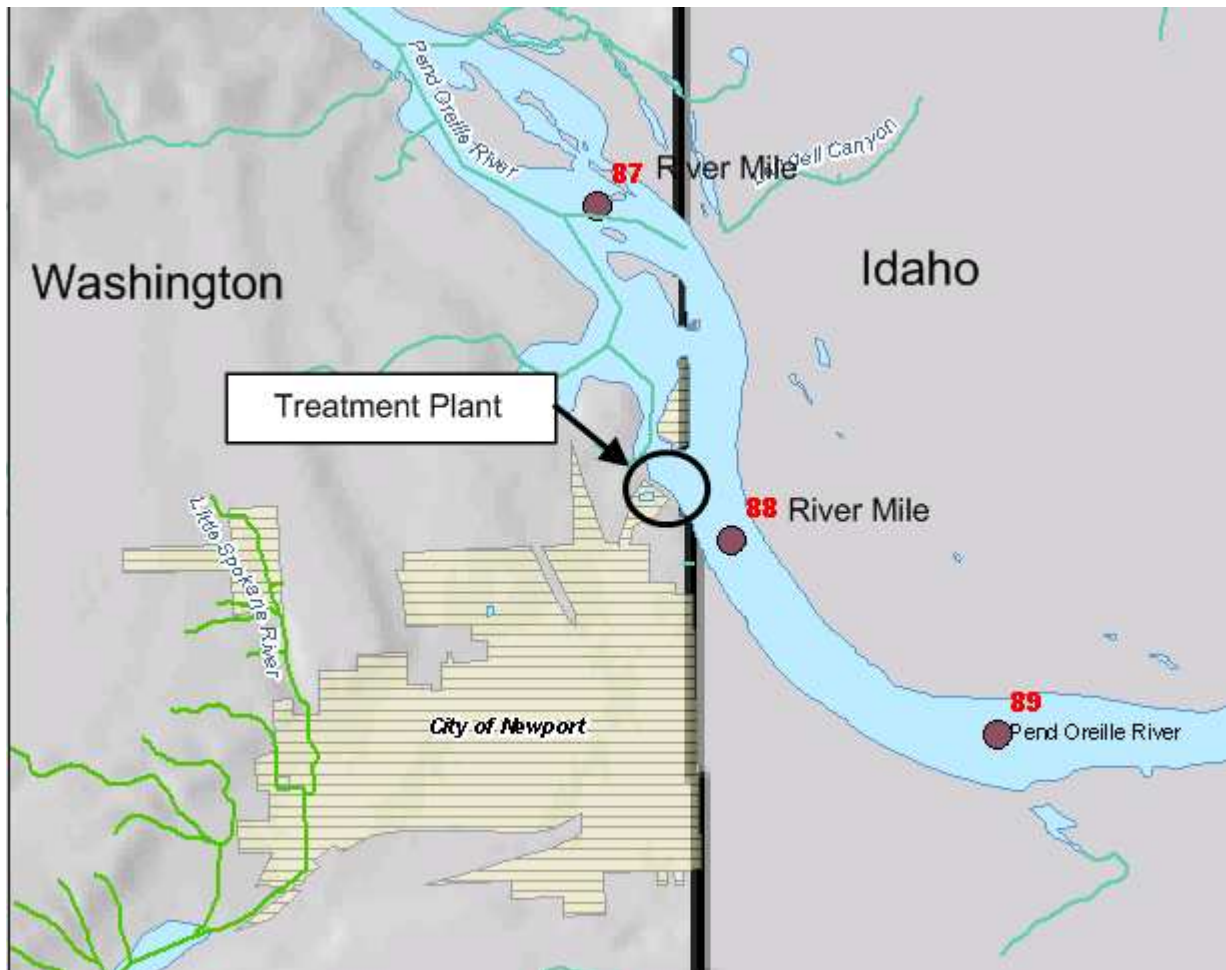


Figure 2: Facility Aerial View

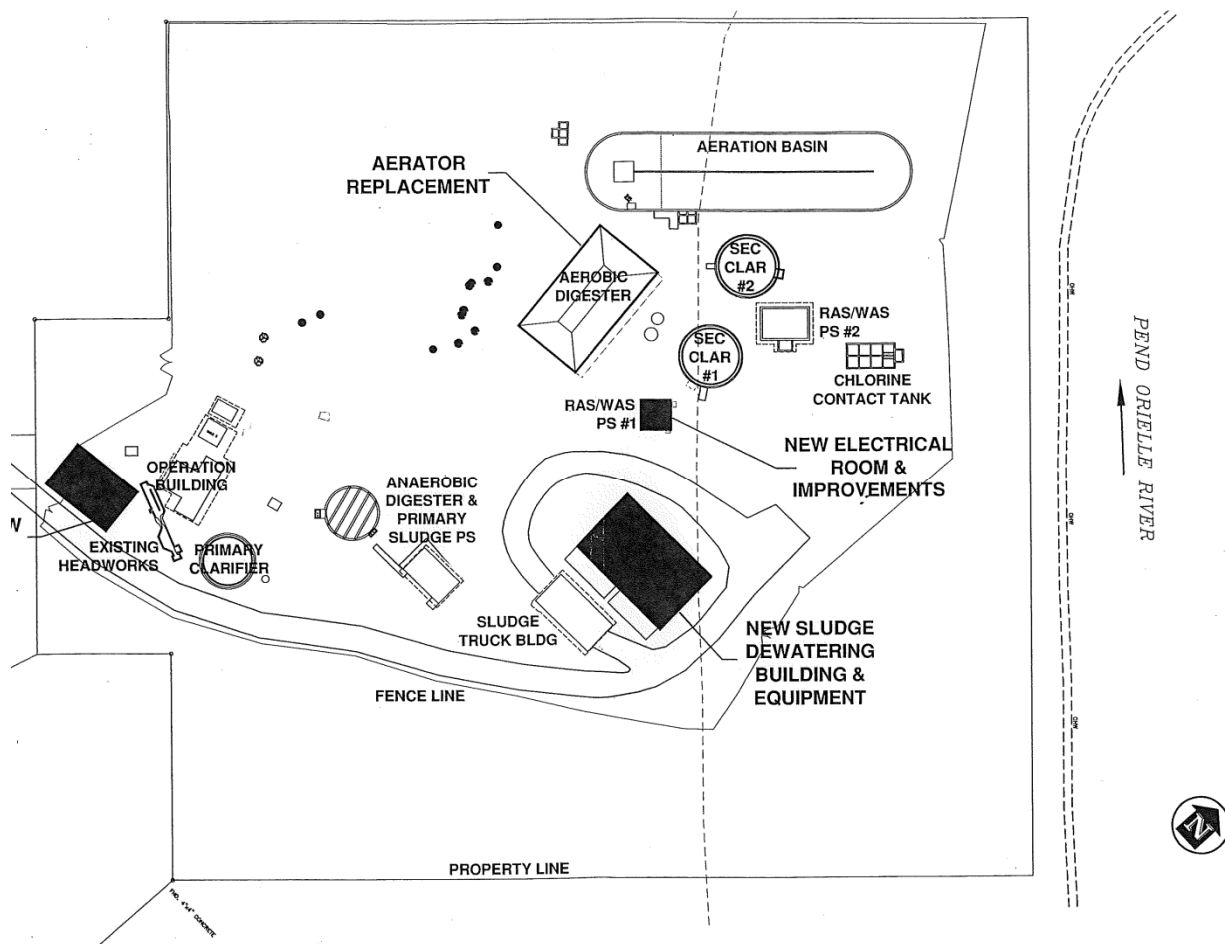


A. Facility Description

The Newport wastewater treatment plant is located on the north end of the city of Newport on the banks of the Pend Oreille River. The plant provides service to the city of Newport, the population is approximately 2,000, and a population of approximately 200 people in the West Bonner Sewer District in Old Town, Idaho.

The facility treats the wastewater with an Carrousel oxidation ditch activated sludge aeration basin and chorine disinfection.

Figure 3: Facility Layout



History

The City of Newport constructed its original primary sewage treatment plant in 1954. In 1974, the City upgraded the plant to secondary treatment with a design flow of 280,000 gallons/day. The upgrade included the addition of an aeration basin, a secondary clarifier, a pump house, and a final chlorine contact tank. In 1984, the plant was again upgraded with a new design flow of 500,000 gallons/day. This upgrade included a second secondary clarifier, a new Carrousel (proprietary trade name) oxidation ditch, and an additional pump house. The City converted the old aeration basin to an aerobic digester.

In 2004, the City of Newport upgraded the headworks and added a sludge de-watering facility with a filter fabric belt press.

Collection System Status

Currently, the plant collection system receives domestic wastewater from the City of Newport and the West Bonner Sewer District in Old Town, Idaho. Currently, about 20 to 25% of the influent comes from Old Town.

The influent flows have remained stable throughout the year which indicates that the system is in good repair and that infiltration and inflow is not excessive.

Treatment Processes

Wastewater enters the plant through an 18" diameter main line. The headworks consist of a Parshall flume and a comminutor with a bar screen by-pass. The head works is followed by a primary clarifier, whose sludge and scum are pumped to the old anaerobic digester. The primary clarifier effluent gravity flows to the oxidation ditch for biological treatment. Effluent from the ditch can flow to either of two secondary clarifiers, and the waste activated sludge and scum is pumped to the aerobic digester for stabilization.

Secondary effluent from both clarifiers then flows to the chlorine contact tank which has a minimum contact time of 19 minutes at design flow. The effluent flows into the Pend Oreille River, after disinfection through an outfall diffuser that extends about 70 or 80 feet into the river.

The classification of the Newport Treatment Plant is Level II. The treatment plant has two operators at Group II level.

Discharge Outfall

Secondary treated and disinfected effluent is discharged from the facility via a 10" outfall pipe into the Pend Oreille River. The plant's discharge diffuser is located in what is considered to be the original river channel (approximately 1,500 feet wide) between the western shoreline at the WTP and Kelly Island. It is supported above the river bottom by timber pilings and extends from outfall station 5+70 to outfall station 5+85. According to Army Corps of Engineers information and information supplied by the Public Works Director, Ray King, the average low flow elevation for the Pend Oreille River near the plant is 2034 .1 feet. Based on this value and the 1972 engineering drawings of the diffuser, Ecology determined the following outfall characteristics:

- diffuser length: 15 feet
- distance from WTP river bank to diffuser: 69 feet at average low flow
89 feet at normal high flow
- water depth over diffuser: 13 feet at average low flow
24 feet at normal high flow

Solid Wastes

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment.

Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the secondary clarifiers are treated aerobically, de-watered by a belt press and land applied under a permit from Ecology.

B. Permit Status

Ecology issued the previous permit for this facility on June 28, 2004. The previous permit placed effluent limits on:

- BOD₅
- Total Suspended Solids
- Fecal Coliform Bacteria
- pH
- Total Residual Chlorine

The City of Newport submitted an application for permit renewal on December 3, 2008. Ecology accepted it as complete on December 9, 2008.

C. Summary of Compliance with Previous Permit Issued

Ecology staff last conducted a non-sampling compliance inspection on November 6, 2009.

The Newport Treatment Plant has complied with the effluent limits and permit conditions throughout the duration of the permit issued on June 28, 2004. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections conducted by Ecology.

D. Wastewater Characterization

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The tabulated data represents the quality of the effluent discharged from June 2004 through December 2008.

The effluent is characterized as follows:

Table 2: Wastewater Characterization

Parameter	Average Value	Maximum Value
Flow	0.26 MGD	0.7 MGD (max daily)
pH	6.7 s.u. (minimum)	8.3 s.u. (maximum)
Temperature Summer		18.0 °C (maximum)
Temperature Winter		9.0 °C (maximum)
BOD ₅	6.7 mg/L	16.4 mg/L
Total Suspended Solids (TSS)	4.0 mg/L	13 mg/L
Chlorine (Total Residual)	0.31 mg/L	0.45 mg/L
Fecal Coliform	53 cfu/100 mL	297 cfu/100 mL
Ammonia (as N)	0.05 mg/L	0.10 mg/L
Dissolved Oxygen	8.3 mg/L	13.4 mg/L
TKN	1.1 mg/L	1.2 mg/L
Nitrate plus Nitrite Nitrogen	6.7 mg/L	8.4 mg/L
Oil and Grease	0.0 mg/L	0.0 mg/L
Phosphorous (total)	3.6 mg/L	3.9 mg/L
Total Dissolved Solids (TDS)	628 mg/L	798 mg/L

E. Description of the Receiving Water

The Newport wastewater treatment plant discharges to the Pend Oreille River at river mile 87.7. The outfall is just northwest of the Washington-Idaho border. There are no other nearby point source outfalls. Significant nearby non-point sources of pollutants include agricultural, forestry and recreation activities.

The Pend Oreille River is 303(d) listed for temperature in the vicinity of the treatment plant outfall. Ecology has prepared a draft temperature TMDL for the River. The initial Waste Load Allocation for the Newport treatment plant is 25.2° C, 1-DMax. Ecology expects that the EPA will approve the TMDL and is projected by the end of 2010.

The ambient background data used for this permit includes the following from: The Ecology water quality monitoring station 62A150:

Table 3: Ambient Background Data

Parameter	Value used
Temperature (highest annual 1-DADMax)	23.6° C
Temperature (highest annual 7-DADMax)	22.9° C
Flow	4653 MGD
pH (Maximum / Minimum)	8.7 / 7.7 s.u.
Dissolved Oxygen	10.7 mg/L
Total Ammonia-N	0.05 mg/L
Fecal Coliform	1/100 mL dry weather (21/100 mL storm related)
Turbidity	7.1 NTU
Hardness	84 mg/L as CaCO ₃
Alkalinity or Salinity	87.6 mg/L as CaCO ₃

F. SEPA Compliance

Regulation exempts 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 state rules and regulations. 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.

Nor does Ecology usually develop limits for pollutants that were not reported in the permit application but that may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. If significant changes occur in any constituent of the effluent discharge, the city is required to notify Ecology (40 CFR 122.42(a)). The Newport Wastewater Treatment Plant may be in violation of the permit until Ecology modifies the permit to reflect additional discharge of pollutants.

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 were obtained from the 1984 engineering report prepared by James A. Sewell and Associates and Esvelt Engineering.

Table 4: Design Criteria for Newport Wastewater Treatment Plant:

Parameter	Design Quantity
Average Daily Flow – maximum month	0.5 MGD
Monthly Maximum Flow	1.0 MGD
BOD ₅ loading for maximum month	1330 lb/day
TSS loading for maximum month	920 lb/day
Design population equivalent	4,500

B. Technology-Based Effluent Limits

Federal and state regulations define technology-based effluent limits for municipal 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 municipal wastewater.

Chapter 173-221 WAC lists the following technology-based limits for pH, fecal coliform, BOD₅, and TSS:

Table 5: Technology-based Limits.

Parameter	Limit
pH	The pH must measure within the range of 6 to 9 standard units.

Parameter	Limit
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 = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

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

Monthly effluent mass loadings (lbs/day) = maximum monthly design flow (0.5 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 125 lbs./day.

The weekly average effluent mass loading = 1.5 x monthly loading = 188 lbs/day.

C. Surface Water Quality-Based Effluent Limits

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

Numerical Criteria for the Protection of Aquatic Life and Recreation

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

When surface water quality based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other disease, 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

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.

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 existing and designated uses of the receiving water will be protected under the conditions of the proposed permit.

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 does not 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 use no more than 25% of the available width of the water body for dilution. 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 10 means that the effluent is 10% and the receiving water is 90% 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.

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

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

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

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

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

The proposed permit specifies the size and location of the allowed mixing zone.

For this discharge, the percent volume restrictions of the water quality standards resulted in a lower dilution factor than the distance and width restrictions. Therefore, the dilution factor calculated at a 10-year low flow was used to determine reasonable potential to exceed water quality standards.

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 the Newport Wastewater Treatment Plant 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 waterbody'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'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 <http://www.ecy.wa.gov/biblio/92109.html>.

Ecology used the following critical conditions to model the discharge:

- The seven-day-average low river flow with a recurrence interval of ten years (7Q10) 4653 MGD.
- River depth of 13 feet at the 7Q10 period.
- River depth of 15 feet at the 30Q5 period.
- River velocity: no data at site.
- Manning roughness coefficient: Not available.
- Slope: Not available.
- Channel width of 1,500 feet.
- Maximum average monthly effluent flow of 1.0 MGD for chronic and human health non-carcinogen.
- Annual average flow of 0.5MGD for human health carcinogen.
- Maximum daily flow of 1.0 million gallons per day (MGD) for acute mixing zone.
- 7DAD MAX Effluent temperature of 18.0 degrees C.

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 being discharged.

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. The plume rises through the water column as it mixes, 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 that it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

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 that the acute criteria will be met at 10% of the distance (or of the chronic mixing zone at the ten year low flow).

- **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, Table 602. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). Criteria applicable to this facility's discharge are summarized below in Table 6.

- Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for, the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

Table 6: Aquatic Life Uses & Associated Criteria

Salmonid Spawning, Rearing, and Migration	
Temperature Criteria: 1– DMAX	20.0°C [*] (not to be exceeded due to human activities). [*] When natural conditions exceed a 1– DMAX of 20.0° C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3° C; nor shall such temperature increases exceed $t = 34/(T+9)$.
Dissolved Oxygen Criteria: – Lowest 1-Day Minimum	8.0 mg/L
Turbidity Criteria	<ul style="list-style-type: none"> • 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
Total Dissolved Gas Criteria	Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.
pH Criteria	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.
Turbidity Criteria	<ul style="list-style-type: none"> • 5 NTU over background when the background is 50 NTU or less; or

	<ul style="list-style-type: none"> • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU
Total Dissolved Gas Criteria	Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.
pH Criteria	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

- The recreational uses are extraordinary primary contact recreation, primary contact recreation, and secondary contact recreation. The recreational uses for this receiving water are identified below.

Table 7. Recreational Uses and Associated Criteria

Recreational Use	Criteria
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 100 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 200 colonies /100 mL.

- The **water supply uses** are domestic, agricultural, industrial, and stock watering.
- The **miscellaneous freshwater uses** are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

The Pend Oreille River is 303(d) listed for temperature in the vicinity of the treatment plant outfall. Ecology has prepared a draft temperature TMDL for the River. The initial Waste Load Allocation for the Newport treatment plant is 25.2° C. Ecology expects the TMDL to be approved by the EPA by the end of 2010.

E. Evaluation of Surface Water Quality-Based Effluent Limits for Numeric Criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) 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 diffuser at Outfall 001 is fifteen feet long with a diameter of ten inches. The diffuser has one port. The diffuser depth is 13 feet at average low flow and about 24 feet at normal high flow.

Chronic Mixing Zone

WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than **25%** of the flow, and not occupy greater than **25%** of the width of the water body.

The flow volume restriction resulted in a smaller chronic dilution factor than the distance downstream. The dilution factor below results from the volume restriction.

Acute Mixing Zone

WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the distance towards the upstream and downstream boundaries of the chronic zone, not use greater than **2.5%** of the flow and not occupy greater than **25%** of the width of the water body.

The flow volume restriction resulted in a smaller chronic dilution factor than the distance downstream. The dilution factor below results from the volume restriction.

Ecology determined that the dilution factors that occur within these zones at the critical condition using RivPlum. You can find a copy of Ecology's permit tools including the RivPlum model at <http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html>.

The dilution factors are listed in Table 8 below:

Table 8: Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	117	2327
Human Health, Carcinogen		3258
Human Health, Non-carcinogen		11634

Ecology determined the impacts of temperature, pH, fecal coliform, chlorine, and ammonia 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.

BOD₅--With technology-based limits, this discharge results in a small amount of BOD loading relative to the large amount of dilution in the receiving water at critical conditions. Technology based limits will ensure that dissolved oxygen criteria are met in the receiving water.

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

Table 602 identifies a special condition for the Pend Oreille River. It states that the temperature shall not exceed a 1-DMax of 20° C due to human activities. When natural conditions exceed a 1-DMax of 20° C, no temperature increase will be allowed which will raise the temperature of the river.

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

- Annual summer maximum and supplementary spawning/rearing criteria

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

The threshold criteria apply at the edge of the chronic mixing zone. Criteria for the Pend Oreille River are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 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. These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning 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, 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

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.

General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

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.

Annual summer maximum, core summer criteria, and incremental warming criteria: Ecology calculated the reasonable potential for the discharge to exceed the annual summer maximum, **core summer criteria**, and the incremental warming criteria (See temperature calculations in Appendix C).

The discharge is only allowed to warm the water by a defined increment when the background (ambient) temperature is cooler or warmer than the assigned threshold criterion. Table 602 states, “the temperature shall not exceed 20.0° C due to human activities. When natural conditions exceed a 1-DMax of 20.0° C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3° C; nor shall such temperature increases, at any time, exceed $t = 34/(T+9)$).

The measured effluent maximum temperature for the Newport treatment plant is 18° C which is within the allowable 1DMax of 20° C and meets the draft TMDL waste load allocation (WLA) of 25.2 °C. Therefore, the proposed permit does not include a temperature limit. The proposed permit requires the City to begin using a thermistor to measure temperature continuously in the effluent. Based on Ecology’s experience with municipal dischargers, the measured maximum effluent temperature is likely to increase above the current measured high of 18 however it is unlikely to exceed the WLA of 25.2°C.

The permit requires additional continuous monitoring of effluent temperatures. Ecology will reevaluate the reasonable potential during the next permit renewal.

pH--Ecology modeled the impact of the effluent pH on the receiving water using the calculations from EPA, 1988, and the chronic dilution factor of 2327. The receiving water input variables used are listed above in Table 4. The effluent input variables used are included in Table 2.

Ecology predicts no violation of the pH criteria under critical conditions. The proposed permit includes technology-based effluent limits for pH of 6.0 to 9.0.

Fecal Coliform--Under critical conditions, modeling predicts no violation of the water quality criterion for fecal coliforms. The current permit includes a technology based limit for fecal coliforms of 200 organism per 100 ml on an average monthly basis and 400 organisms per 100 ml on a weekly average basis.

Because the facility has demonstrated it can meet the water quality standard in the discharge, the proposed permit includes a performance based limit set at the WQ standard. A performance based limit is one type of technology based limit. The proposed permit limits are an average monthly limit of 100 organisms per 100ml and a weekly average limit of 200 organisms per 100 ml.

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: **ammonia and chlorine**. Ecology conducted a reasonable potential analysis (See **Appendix C**) 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 and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information for ambient station Insert ambient station ID number and Ecology spreadsheet tools.

Valid ambient background data was available for ammonia and chlorine. Ecology used all applicable data to evaluate reasonable potential for this discharge to cause a violation of water quality standards.

Ecology determined that ammonia and chlorine pose no reasonable potential to exceed the water quality criteria at the critical condition using procedures given in EPA, 1991 (**Appendix C**) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

F. Whole Effluent Toxicity

The water quality standards for surface waters forbid discharge of effluent that causes 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.

Using the screening criteria in chapter 173-205-040 WAC, Ecology determined that toxic effects caused by unidentified pollutants in the effluent are unlikely. Therefore, this permit does not require WET testing. Ecology may require WET testing in the future if it receives information indicating that toxicity may be present in this effluent.

G. Human Health

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

Ecology determined the applicant's discharge does not contain chemicals of concern based on existing effluent data or knowledge of discharges to their system. Ecology will reevaluate this discharge for impacts to human health at the next permit reissuance.

H. 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 at <http://www.ecy.wa.gov/programs/tcp/smu/sediment.html>.

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

I. Ground Water Quality Limits

The ground water quality standards (chapter 173-200 WAC) protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

Newport Wastewater Treatment Plant does not discharge wastewater to the ground. No permit limits are required to protect ground water.

J. Comparison of Effluent Limits with the Previous Permit Issued on June 28, 2004.

Table 9: Comparison of Effluent Limits

	Basis of Limit	Previous Effluent Limits: Outfall # 001		Proposed Effluent Limits: Outfall # 001	
		Average Monthly	Average Weekly	Average Monthly	Average Weekly
Biochemical Oxygen Demand (5-day)	Technology	30 mg/L	45 mg/L	Same	Same
Total Suspended Solids	Technology	30 mg/L	45 mg/L	Same	Same
Fecal Coliform Bacteria	Water quality	200/100 ml	400/100 ml	100/100 ml	200/100 ml
pH	Water quality	6 Min/ 9 Max		Same	
Total residual chlorine	Technology	0.5 mg/L	0.75 mg/L	Same	Same

IV. MONITORING REQUIREMENTS

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

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

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.

The proposed permit requires the Newport Treatment Plant to continuously monitor for temperature to further characterize the effluent. When the Pend Oreille River temperature TMDL is finalized, the treatment plant will need to have an accurate assessment of the effluent temperature during the critical season.

A. 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 at this facility for BOD/CBOD, chlorine residual, dissolved oxygen, pH, total suspended solids, total volatile solids, and fecal coliform.

V. OTHER PERMIT CONDITIONS

A. Reporting and Record Keeping

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

B. Prevention of Facility Overloading

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

C. Operation and Maintenance (O&M)

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

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 B 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:
 - Are prohibited due to dangerous waste rules.
 - Are explosive or flammable.
 - Have too high or low of a pH (too corrosive, acidic or basic).
 - May cause a blockage such as grease, sand, rocks, or viscous materials.
 - Are hot enough to cause a problem.
 - Are of sufficient strength or volume to interfere with treatment.
 - Contain too much petroleum-based oils, mineral oil, or cutting fluid.
 - 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:
 - Cooling water in significant volumes.
 - Stormwater and other direct inflow sources.
 - 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 Newport Wastewater Treatment Plant (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.

Industrial User Survey Update

This provision requires the POTW to submit an updated list of existing and proposed significant industrial users (SIUs) and potential significant industrial users (PSIUs). This provides Ecology with notice of any new or proposed industrial users in the POTW's service area without a more rigorous “complete” Industrial User Survey. This level of effort is often sufficient for small municipalities which have not seen any adverse effects potentially attributable to industries, have loadings commensurate with domestic flows, and have a small proportion of industrial flow.

E. Solid Waste Control

To prevent water quality problems the facility 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 disposal of other solid waste is under the jurisdiction of the Northeast Tri-County Health Department.

F. General Conditions

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

VI. PERMIT ISSUANCE PROCEDURES

A. Permit Modifications

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

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

B. Proposed Permit Issuance

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of three and one-half years. The permit is issued for less than five years to allow for a review of the treatment plant performance relative to the temperature TMDL and allow for any corrective actions to be incorporated in the next NPDES Permit.

VII. REFERENCES FOR TEXT AND APPENDICES

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APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

Ecology proposes to reissue a permit to the Newport Wastewater Treatment Plant. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice of Draft on March 3, 2010 in the Newport Miner to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice –

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the proposed permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on Ecology's determination of compliance with anti-degradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the proposed NPDES permit.
- Explains 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 <http://www.ecy.wa.gov/biblio/0307023.html>.

You may obtain further information from Ecology by telephone at (509) 329-3567 or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205-1295

The primary author of this permit and fact sheet is Patrick McGuire.

APPENDIX B—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 period of time, 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).

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 Discharge Limit - The average of the measured values obtained over a calendar month's time.

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 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 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.

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 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.

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%.

Engineering Report - A document which 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.

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.

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) - 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.

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 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.

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.

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.

Quantitation Level (QL) - The smallest detectable concentration of analyte greater than the Method Detection Limit (MDL) where the accuracy (precision & bias) achieves the objectives of the intended purpose.

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).

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 is the particulate material in an effluent. Large quantities of TSS discharged to receiving waters 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.

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.

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 storm water drainage system into a defined surface water body, or a constructed infiltration facility.

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 on the concentration 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 receiving waters.

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 Ecology's homepage at <http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html>.

Fact Sheet for NPDES Permit WA-002232-2
Newport Wastewater Treatment Plant

T-MIX FRESH 8-30-08 a spreadsheet for calculating reasonable potential and limits for temperature

T-MixFresh is based on WAC 173-201A-200(1)(c)(i)–(ii) and Water Quality Program Guidance.

Developed by Eric Schlorff and Laura Fricke (2008)

All Data inputs must meet WQ guidelines.

The Water Quality temperature guidance document may be found at:

<http://www.ecy.wa.gov/biblio/0610100.htm>

Notes:

	Core Summer	Supplemental
	Criteria	Criteria
INPUT	July 1-Sept 14	Sept 15-July 1
1. Chronic Dilution Factor at Mixing Zone Boundary	1.0	
2. 7DADMax Ambient Temperature (T) (Upstream Background 90th percentile)	22.9 °C	
3. 1DMax Effluent Temperature (95th percentile)	18.0 °C	
4. Aquatic Life Temperature WQ Criterion in Fresh Water	17.5 °C	
OUTPUT		
5. Temperature at Chronic Mixing Zone Boundary:	18.0 °C	
6. Incremental Temperature Increase or decrease:	-4.9 °C	
7. Incremental Temperature Increase $28/(T+7)$ if $T \leq$ criteria:	---	
8. Maximum Allowable Temperature at Mixing Zone Boundary:	23.2 °C	
A. If ambient temp is warmer than WQ criterion		
9. Does temp fall within this warmer temp range?	YES	
10. Temp increase allowed at mixing zone boundary, if required:	NO LIMIT	
B. If ambient temp is cooler than WQ criterion but within $28/(T_{amb}+7)$ and within 0.3 °C of the criterion		
11. Does temp fall within this incremental temp. range?	---	
12. Temp increase allowed at mixing zone boundary, if required:	---	
C. If ambient temp is cooler than (WQ criterion-0.3) but within $28/(T_{amb}+7)$ of the criterion		
13. Does temp fall within this Incremental temp. range?	---	
14. Temp increase allowed at mixing zone boundary, if required:	---	
D. If ambient temp is cooler than (WQ criterion - $28/(T_{amb}+7)$)		
15. Does temp fall within this Incremental temp. range?	---	
16. Temp increase allowed at mixing zone boundary, if required:	---	
17. Do any of the above cells show a temp increase?	NO	
18. Temperature Limit if Required?	NO LIMIT	

*Fact Sheet for NPDES Permit WA-002232-2
Newport Wastewater Treatment Plant*

Summary of Effluent Reasonable Potential Determination & Limits					Facility Receiving Water Design Case					Newport wastewater treatment plant Pend Oreille River Reasonable Potential	
POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water	Acute Boundary		Chronic Boundary		Permit Limits	
					Upstream RW Conc, µg/L	RW Acute Criteria, µg/L	Conc @ Acute MZ Boundary, µg/L	RW Chronic (or Human Health) Criteria, µg/L	Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Daily Maximum Limit, µg/L	Monthly Average Limit, µg/L
AMMONIA unionized	N	WQ Stnd	150.0	NO	50.0	1499.7	50.9	170.1	50.0		
BACTERIA	N	WQ Stnd	11.5	NO	1.0	see	1.089	0.0	1.004		
CHLORINE (Total Residual) 7782505	N	WQ Stnd	220.4	NO	1.0	19.0	2.87	11.0	1.094		
pH	N	WQ Stnd	na	na	8.7	0.0		6.5 - 8.5			
SOLIDS SUSPENDED AND TURBIDITY	N	WQ Stnd		na	0.0	0.0		See FPA			

Effluent and Receiving Water Critical Conditions							
Facility: Newport wastewater treatment plant				Design Case: Reasonable Potential			
Receiving Water: Pend Oreille River							
Effluent Data				Receiving Water Data			
CLICK HERE FOR INSTRUCTIONS	Annual Average	Monthly Average	Daily	7Q10 Critical	30Q5 Critical	Harmonic	%flow for dilution
	Flow	Flow	Maximum Flow	Flow	Flow	Mean Flow	
Flow (MGD)	0.30	0.50	1.00	4653.36	6514.70	13960.08	25
(cfs)	0.46	0.77	1.55	7200.00			
Critical Temp (°C)	18.00	Effluent Data		23.60	Receiving Water Data		
(°F)	64.4			74.5			
Critical Hardness (mg/L CaCO3)	100.00			87.60			
Critical pH (s.u.)	8.30			8.70			
Critical Alkalinity (mg/L as CaCO3)	100.00			84.00			
Enter own pH & Temp for Ammonia Criteria?	n			Enter own Dilution Factors (DFs)?		n	
	pH	Temp (°C)			Acute DF		
@ Acute Boundary					Chronic DF		
@ Chronic Boundary				Human Health (non C) DF			
				Human Health (Carcn) DF			
	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@Harmonic Mean River Flow (Carcn)		
Dilution Factor	117.33	2327.68	9307.72	3258.35	11634.40		
(% effluent)	0.85	0.04	0.01	0.03	0.01		
Hardness	87.71	87.61	87.60	-	-		
Alkalinity	84.14	84.01	84.00	-	-		
Max pH (s.u.)	8.69	8.70	8.70	-	-		
Max Temp (°C)	23.55	23.60	23.60	-	-		
Max Temp (°F)	74.39	74.48	74.48	-	-		

APPENDIX D—RESPONSE TO COMMENTS

The public notice that informed the public that a draft permit was available for review was published in the Newport Miner on March 3, 2010. Ecology did not receive any comments on the draft permit following the 30-day public comment period.