

Fact Sheet for NPDES Permit WA0052132
Buena Publicly Owned Treatment Works
December 20, 2018

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Buena Publicly Owned Treatment Works (POTW).

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 Buena POTW, NPDES permit WA0052132, are available for public review and comment from October 24, 2018 until November 24, 2018. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

Buena POTW reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, wastewater discharges, or receiving water prior to publishing this draft fact sheet for public notice.

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

Summary

Yakima County is seeking the reissuance of the Buena POTW's NPDES wastewater discharge permit. The 2015 application lists a total of 1100 people served by the wastewater treatment facility including a few small commercial businesses. The unincorporated community of Buena is located approximately 18 miles southeast of the city of Yakima.

The Buena POTW consists of septic tanks located at each residence that provide partial treatment of the effluent. The wastewater from the septic tanks gravity flows to the treatment facility where two recirculating gravel filters provide biological treatment of the effluent. Ultraviolet lamps provide disinfection of the wastewater prior to discharge to an unnamed waterway tributary to the Yakima River. The tributary flows a short distance, and then through a culvert under Highway I-82 into a natural channel in the Yakima River's flood plain.

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I. Introduction

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

The following regulations apply to domestic wastewater NPDES permits:

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

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

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

After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in **Appendix E**.

II. Background Information

Table 1 General Facility Information

Facility Information	
Applicant	Buena Publicly Owned Treatment Works
Facility Name and Address	Buena Publicly Owned Treatment Works Physical Location: 1688 Buena Road Buena, WA 98021 Mailing Address: 128 North 2 nd Street, 4 th Floor Courthouse Yakima, WA 98901
Contact at Facility	Name: Joe Stump Telephone #: (509) 574-2300
Responsible Official	Name: David Haws Title: Environmental Services Director Address: 128 North 2 nd Street, 4 th Floor Courthouse Yakima, WA 98901 Telephone #: (509) 574-2300
Type of Treatment	Septic Tank Effluent Gravity system, followed by biological Treatment from two recirculating gravel filters; ultraviolet disinfection
Facility Location (NAD83/WGS84 reference datum)	Latitude: 46.41864 Longitude: -120.31745
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Unnamed Waterway Tributary to the Yakima River Latitude: 46.41702 Longitude: -120.31655

Permit Status	
Reauthorization of 2011 Permit	October 26, 2011
Application for Permit Renewal Submittal Date	November 30, 2015
Date of Ecology Acceptance of Application	December 7, 2015

Inspection Status	
Date of Last Non-sampling Inspection	May 3, 2018

Figure 1 Facility Location Map



A. Facility description

History

The Yakima County Public Services currently owns and operates the Buena POTW. The county initiated the design and construction of the original treatment plant in the 1989 to 1993 time frame in response to failing septic drainfields and shallow drinking water wells which were contaminated with improperly treated wastewater.

The initial septic tank effluent gravity system (STEG) to a one-cell Recirculating Gravel Filter (RGF) went into operation in 1993. An additional RGF was constructed and essentially doubled the design capacity in 2000.

Collection system status

Households within the community of Buena have individual septic tanks. There are approximately 200 septic tanks that are owned and maintained by the county. Effluent from all individual service connections is conveyed, via a gravity collection system, to the treatment facility.

Hydrogen sulfide gas is a bi-product of the anaerobic processes in each septic tank. The oxidation of hydrogen sulfide gas creates sulfuric acid which in turn deteriorates the concrete, cast iron rings and covers of the collection system. The system has little velocity and long detention times compounding the hydrogen sulfide problem by increasing the degradation of the collection system in susceptible areas. Most septic tanks in the community are comprised of concrete and some are fiberglass.

*The original collection system included PVC lined manholes and PVC sewer lines. Several manholes, since the original wastewater treatment facility installation, have been installed for new housing developments and provide better access for maintenance. These manholes included other methods of protecting the concrete from hydrogen sulfide with varying degrees of success.

- 2002 – 3 manholes installed, Buena Nueva housing project. Some signs of failure on protective coating noted in 2008.
- 2005 – 2 manholes installed, Kirkpatrick Investments. Coated with Polymorphic Polymers Corporation (PPC). As of 2008 the coatings in the manholes are holding up.
- 2006 – 2 manholes installed, Trident Agriculture project. Coated with Polymorphic Polymers Corporation (PPC). As of 2008 the coatings in the manholes are holding up.
- 2009 – 4 manholes installed to provide better access for jet rodding the sewer lines.

There was noticeable corrosion of manhole covers and the sewer collection system for a long-term solution has yet to be resolved. One manhole cover was powder coated to see how well it would hold up against the hydrogen sulfide to sulfuric acid deterioration. The Buena POTW determined that the powder coating helped but other options such as replacing them with composite rings and covers are being considered.

The county continues to inspect the collection system and have proposed measures they plan to take to increase the longevity of system.

**This paragraph has been modified after the public review period. Modifications made were at the request of Yakima County. The revised language more accurately describes the collection system.*

Treatment processes

The Buena POTW is comprised of three primary units.

1. Septic Tank Effluent Gravity system (STEG)
2. Recirculating Gravel Filter (RGF)
3. Ultraviolet disinfection (UV)

A large amount of the pollutant load is reduced by septic tanks. Anaerobic decomposition inside the septic tanks remove approximately two-thirds of the 5-day biological demand (BOD₅) and settleable solids.

Upon reaching the wastewater treatment facility, influent passes through a 3" Parshall Flume installed with an ultrasonic level transmitter to obtain proper volumes of flow. An influent refrigerated composite sampler is located just above the Parshall Flume.

The septic tank effluent, which is the influent to the treatment facility, goes through physical, chemical, and biological treatment. The influent enters into recirculation tanks where it is combined with effluent that has been filtered through the RGF. Recirculation pumps disperse the wastewater onto the filter media through a series of small perforated pipes under pressure. The gravel media is contained in two 12,000 ft² concrete filter beds, which are 5 ft. deep. The media in each RGF are similar to that of pea gravel. Frequent applications over the filter beds must take place to ensure the biodegradation or decomposition of wastewater constituents provide enough nutrient as a food source to the aerobic organisms on the wetted media. Approximately 80% of the effluent collected in the underdrains is returned to the recirculation tanks for further treatment. The remaining 20% of effluent is directed to the UV disinfection system prior to discharging to the outfall.

On February 8, 2017, Ecology received a letter from Yakima County intended to satisfy the O&M manual update or review that was due September 1, 2012. Brief descriptions regarding upgrades to the POTW along with revisions to the routine operation procedures that are attached to the letter to ecology in 2006 were also mentioned. The attached revisions to the 2006 letter for the O&M manual update were marked as received but not approved. A hydrogen sulfide evaluation and work performed to mitigate the effects of the hydrogen sulfide within the collection system is noted to have been completed in 2011.

The Buena POTW per WAC 173-230-140 is classified as a Class II treatment facility. To date, it has been staffed with one full-time Group I certified operator. The draft permit (S5.A) requires facility staffing to be upgraded with Group II staffing, as per regulation. WAC 173-230-040 states: "The operator in charge of the wastewater treatment plant must be certified at least at a level equal to or higher than the classification of the plant. . . ."

The operator in responsible charge of the Buena POTW utilizes the help of two other full-time Yakima County Public Service employees when specific duties require additional assistance.

Solid wastes/Residual Solids

There are two primary sources of solids that are generated.

1. Septic tanks (Septage)
2. Recirculation Tanks (Biosolids)

Septic tanks serve as combined settling and skimming tanks. The organic constituents of the settled solids at the bottom of each septic tank undergoes facultative and anaerobic decomposition. The settled solids form a layer of sludge at the bottom of the septic tank. Septic pumpers are contracted by Yakima County to remove solids from the treatment systems septic tanks. The septage is sent to the Yakima County Cheyne Landfill for further treatment.

The recirculation tanks have been designed with sloping floors to enhance the collection of settleable solids. A series of baffles inside the recirculation tanks limit the amount of solids from entering the recirculation pumps. The operator monitors the sludge depth in each recirculation tank to determine the need to remove solids as they build. Biosolids sludge in the recirculation tanks at the Buena POTW are removed by a contracted septic pumper, transported to Natural Selection Farms, and land applied onto approved fields.

The Buena POTW received coverage under the State's Biosolids General Permit in April 2006. The Buena POTW still maintains coverage for biosolids and uses Natural Selection Farms as their beneficial use Facility.

Discharge outfall

The treated effluent is released from a pipe into an unnamed irrigation return waterway. The waterway flows through a culvert under Interstate Highway 82

approximately 3,000 meters southeast via a natural flood plain channel to the Yakima River at river mile 91.4.

B. Description of the receiving water

The Buena POTW discharges to an unnamed irrigation return waterway that is a tributary to the Yakima River. The area's ground water table is elevated due to the proximity of the Yakima River to the south and possibly, water leaking from the unlined Sunnyside irrigation canal 1 mile to the north.

The unnamed waterway passes under Interstate Highway 82 a short distance from the outfall, and then flows into a natural flood channel in the Yakima River's flood plain. The flood channel courses approximately 3,000 meters towards the southeast to the confluence with the Yakima River at mile 91.7.

Other nearby point source outfalls include a fruit packer approximately 2 miles upstream on the Yakima River and Zillah POTW outfall at Yakima River mile 89.6. Significant nearby non-point sources of pollutants include irrigated agriculture and livestock. Section IIIE of this fact sheet describes any receiving waterbody impairments.

C. Wastewater influent characterization

The Buena POTW reported the concentration of influent pollutants in discharge monitoring reports. The influent data below represents values taken from January 1, 2015 to December 31, 2017. The wastewater influent is characterized as follows:

Table 2 Wastewater Influent Characterization

Parameter	Units	# of Samples	Average Value	Maximum Value
Flow	MGD	1,096	0.091	0.182
Biochemical Oxygen Demand (BOD ₅)	mg/L	156	85.4	144.0
Biochemical Oxygen Demand (BOD ₅)	lbs/day	156	62.8	108.1
Total Suspended Solids (TSS)	mg/L	156	24.7	95.0
Total Suspended Solids (TSS)	lbs/day	156	18.3	76.9

D. Wastewater effluent characterization

The Buena POTW reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The tabulated data represents the quality of the wastewater effluent discharged from January 1, 2015 to December 31, 2017. The wastewater effluent is characterized as follows:

Table 3 Wastewater Effluent Characterization

Parameter	Units	# of Samples	Average Value	Maximum [or 95 th %tile]
Biochemical Oxygen Demand (BOD ₅)	mg/L	156	3.5	15.2
Biochemical Oxygen Demand (BOD ₅)	lbs/day	156	2.6	9.9
Total Suspended Solids (TSS)	mg/L	156	4.2	17.4
Total Suspended Solids (TSS)	lbs/day	156	3.1	12.6
Ammonia	mg/L	36	0.38	0.83 (95 th %tile)
Parameter	Units	# of Samples	Maximum Monthly Geometric Mean	Maximum Weekly Geometric Mean
Fecal Coliforms	cfu/100ml	156	7.5	34
Parameter	Units	# of Samples	Minimum Value	Maximum Value
pH	standard units	474	6.2	6.8

E. Summary of compliance with previous permit issued

The Buena POTW has consistently complied with the effluent limits and permit conditions throughout the duration of the permit issued on October 26, 2011. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections.

The following table summarizes the violations and permit triggers that occurred during the permit term. Permit triggers are not violations but rather when triggered require the permit holder to take an action defined in the permit.

Table 4 Violations and Triggers

Date	Parameter	Category	Event Category
9/1/2015	Failure to Submit Report	Permit Violation	Reporting Violations
9/1/2015	Failure to Submit Report	Permit Violation	Reporting Violations

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

Table 5 Permit Submittals

Submittal	Submittal Name	Status	Report Date	Due Date	Received Date
Infiltration And Inflow Evaluation	Infiltration And Inflow Evaluation	Received		9/1/2012	12/13/2012
Wasteload Assessment	Wasteload Assessment	Received		9/1/2015	1/9/2017
O&M - Operation And Maintenance Manual (Update)	O&M - Operation And Maintenance Manual (Update)	Received		9/1/2012	2/8/2017
Application for Permit Renewal (Individual Permit)	Application For Permit Renewal	Accepted		11/30/2015	11/30/2015
Infiltration And Inflow Evaluation	Infiltration And Inflow Evaluation	Received		9/1/2015	1/9/2017
Signatory Requirements	Signatory Requirements - G1	Received	12/15/2011		12/19/2011
Signatory Requirements	Signatory Requirements - G1	Received			4/8/2014

F. State environmental policy act (SEPA) compliance

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

III. Proposed Permit Limits

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

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

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

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

A. Design criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria for this facility's treatment plant in the March 1999 Engineering Report for the Community of Buena Publicly Owned Treatment Works expansion prepared by Yakima County Public Works Department. The table below includes design criteria from the referenced report.

Table 6 Design Criteria for Buena Wastewater Treatment Plant

Parameter	Design Quantity
Maximum Month Design Flow (MMDF)	0.120 MGD
BOD ₅ Loading for Maximum Month	214 lbs/day
TSS Loading for Maximum Month	126 lbs/day
Influent Nitrogen Loading	40 lbs/day

B. Technology-based effluent limits

Federal and state regulations define technology-based effluent limits for domestic wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available, and reasonable methods of prevention, control, and treatment (AKART) for domestic wastewater.

The table below identifies technology-based limits for pH, fecal coliform, BOD₅, and TSS, as listed in chapter 173-221 WAC. Section III.F of this fact sheet describes the potential for water quality-based limits.

Table 7 Technology-based Limits

Parameter	Average Monthly	Average Weekly
BOD ₅ (concentration)	30 mg/L	45 mg/L
BOD ₅ (concentration)	In addition, the BOD ₅ effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
TSS (concentration)	30 mg/L	45 mg/L
TSS (concentration)	In addition, the TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	

Parameter	Monthly Geometric Mean	Weekly Geometric Mean
Fecal Coliform Bacteria	200 organisms/100 mL	400 organisms/100 mL

Parameter	Daily Minimum	Daily Maximum
pH	6.0 standard units	9.0 standard units

Table 8 Technology-based Mass Limits

Parameter	Concentration Limit (mg/L)	Mass Limit (lbs/day)
BOD ₅ Monthly Average	30	30
BOD ₅ Weekly Average	45	45
TSS Monthly Average	30	30
TSS Weekly Average	45	45

Technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b). Ecology calculated the monthly and weekly average mass limits for BOD₅ and Total Suspended Solids as follows:

$$\text{Mass Limit} = \text{CL} \times \text{DF} \times \text{CF}$$

where:

CL = Technology-based concentration limits listed in the above table

DF = Maximum Monthly Average Design flow (MGD)

CF = Conversion factor of 8.34

WAC 173-221-040 Domestic Wastewater Facility Discharge Standards require that the BOD₅ and TSS concentration in the influent be reduced a minimum of 85% prior to the discharge of effluent to a receiving water. The interceptor tanks in a STEG-

RGF system remove a substantial proportion of the influent BOD5 and TSS concentration and mass loading.

The permit provides equations to account for a BOD5 and TSS “removal credit” when performing the percent removal calculation (the equations are provided in footnotes to the permit’s S2.A Monitoring Requirements table). This removal credit is based on the performance of other STEG-RGF systems in the United States. Treatment works that receive less concentrated wastes from separate sewer systems (in Buena’s case, the interceptor tanks) can qualify to have less stringent percent removal requirement [40 CFR 133.103(d)].

Technology-based ammonia limit

The Buena POTW sufficiently treats domestic wastewater from the small community of Buena. Relatively small volumes of treated wastewater flow through the small unnamed waterway into the Yakima River.

During the permit reissuance process, Ecology considered extending the mixing zone into the Yakima River, as allowed by WAC 173-201A-400(12). An extended mixing zone, and attendant large dilution factors, would have resulted in no reasonable potential for ammonia to exceed WQ criteria. Rather than adopting this time-consuming water-quality-based permitting endeavor for ammonia, Ecology proposes a technology-based ammonia limit.

The Buena POTW has demonstrated performance that it can remove sufficient amounts of ammonia into the unnamed waterway. The Buena POTW meets performance standards that constitute all known, available, and reasonable methods of prevention, control, and treatment (AKART) for domestic wastewater treatment of ammonia. Ecology determined it reasonable to maintain Ecology’s previous issued permits performance based ammonia limit.

C. Surface water quality-based effluent limits

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

Numerical criteria for the protection of aquatic life and recreation

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

Numerical criteria for the protection of human health

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

These newly adopted criteria, located in WAC 173-201A-240, are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative criteria

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

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

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

Antidegradation

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

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

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

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

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

Facility Specific Requirements -- This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.

- For waters that do not meet assigned criteria, or protect existing or designated uses, Ecology will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards.
- Whenever the natural conditions of a water body are of a lower quality than the assigned criteria, the natural conditions constitute the water quality criteria. Where water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in chapter 173-201A WAC.

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

Mixing zones

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

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

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

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely

to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 4 means the effluent is 25% and the receiving water is 75% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

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

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

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two and four tenths (2.4) liters/day for drinking water (increased from two liters/day in the 2016 Water Quality Standards update).
- A one-in-one-million cancer risk for carcinogenic chemicals.

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

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

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

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

Ecology has determined that the treatment provided at the Buena POTW meets the requirements of AKART (see “Technology-based Limits”).

3. Ecology must consider critical discharge conditions.

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

The critical discharge condition is often pollutant-specific or waterbody-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water.

Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology’s *Permit Writer’s Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology’s website at:

<https://fortress.wa.gov/ecy/publications/SummaryPages/92109.html>.

The table below contains ambient data at critical conditions gathered from the 2008, 2009 and 2010 Receiving Water Data Summary completed by the Buena POTW. The data measurements were taken as part of the receiving water study as required by S8 of the existing permit. The reported results are as follows:

Table 9 Critical Conditions (Receiving Water Data)

Parameter	Value used
Low Flow 10 th Percentile	0.83 cfs
Temperature (Max) °C	25.5°C
Temperature 95 th Percentile °C	25.4°C
pH (Min / Max)	7.82 / 8.90
Dissolved Oxygen (Min / Max)	1.69 / 11.1
Total Ammonia-N (Max)	0.16

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

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

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

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

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

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

Because this is a domestic wastewater discharge, the effluent contains fecal coliform bacteria. Ecology developed the water quality criteria for fecal coliforms (discussed below) to assure that people wading (secondary contact recreation) in water meeting the criteria would not develop gastro enteric illnesses. Ecology has authorized a mixing zone for this discharge; however, the discharge is subject to a technology-based effluent limit of 200 colony forming units/100mL. This means the effluent meets the water quality criteria at the point of discharge and doesn't need dilution to meet the water quality criteria.

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 mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

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

the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

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

7. Maximum size of mixing zone.

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

8. Acute mixing zone.

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

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

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

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

- **Comply with size restrictions.**

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

9. Overlap of mixing zones.

This mixing zone does not overlap another mixing zone.

D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). The tables included below summarize the criteria applicable to the receiving water's designated uses.

- Aquatic Life Uses are designated 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 10 Freshwater Aquatic Life Uses and Associated Criteria

Core Summer Salmonid Habitat	
Salmonid Spawning, Rearing, and Migration	
Temperature Criteria – Highest 7-DAD MAX	17.5°C (63.5°F)
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 must not exceed 110 percent of saturation at any point of sample collection.
pH Criteria	The pH must measure 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* for this receiving water are identified below.

Table 11 Recreational Uses and Associated Criteria

Recreational Use	Criteria
Secondary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 200 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 400 colonies /100 mL.

E. Water quality impairments

The Buena POTW effluent discharges into an unnamed irrigation return waterway. The course of the return drain has undoubtedly been reconfigured over time. Agricultural practices and road construction in the area have also impacted the creek over the years. Ground water in this area is elevated due to the proximity of the Yakima River to the south and possibly, the unlined Sunnyside Irrigation Canal 1 mile to the north of the POTW.

A 1988 Groundwater Transmissivity Study prepared for the construction of the wastewater treatment facility found that the water table near the treatment plant was 780 feet elevation above sea level, which is near the elevation of the receiving water. Given these facts, ground water drainage likely constitutes a significant fraction of the creek's flow on an annual basis.

The creek passes under Interstate Highway 82 and then flows into a natural flood channel in the Yakima River's flood plain. The flood channel courses approximately 3,000 meters towards the southeast to the confluence with the Yakima River at river mile 91.7.

Ecology has not documented any water quality impairments in the receiving water in the vicinity of the outfall.

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

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biochemical oxygen demand (BOD₅) 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.

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 dilution factor than the distance downstream. The dilution factor below is a result from the volume restriction of the creek.

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 the dilution factors that occur within these zones at the critical condition using PermitCalc. The dilution factors are listed below.

Table 12 Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	1.2	3.0

Ecology determined the impacts of 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.

Dissolved Oxygen--BOD₅ and Ammonia Effects -- Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The 5-day Biochemical Oxygen Demand (BOD₅) of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of oxygen demand potential in the receiving water.

Under critical conditions, modeling predicts no violation of the water quality criterion for fecal coliform. In this situation, Ecology generally imposes the technology-based effluent limit for fecal coliform bacteria. The Buena WWTP has demonstrated it can reliably meet the water quality standard for fecal coliforms for primary contact recreation in the discharge. Therefore, the proposed permit includes the primary contact recreation standard for fecal coliform as a performance-based (technology-based) effluent limit for fecal coliform bacteria.

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

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

Ammonia is a toxic pollutant present in the discharge. Ecology conducted a reasonable potential analysis (See **Appendix D**) 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 and Ecology spreadsheet tools.

The existing permit contains an average monthly limit for ammonia of 3.1 mg/L. Ecology's PermitCalc tool, employing the limited dilution available in the small receiving water, resulted in an ammonia limit more stringent than the existing ammonia limit. However, Ecology has determined that the Buena POTW is currently meeting the AKART standard for wastewater ammonia reduction. The proposed permit retains the current permit limit for ammonia of 3.1 mg/L. See this fact sheet's technology-based permit limit discussion for details and the rationale of Ecology's determination.

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

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

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

- Annual 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 most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for

marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- Incremental warming criteria

The water quality standards 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.

- Protections for 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 two 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.

G. Human health

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

Ecology determined the applicant's discharge is unlikely to contain chemicals regulated to protect human health, or, does not contain chemicals of concern based on existing effluent data or knowledge of discharges to the wastewater treatment system. Ecology will re-evaluate this discharge for impacts to human health at the next permit cycle.

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. <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. Whole effluent toxicity

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

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.

J. Groundwater quality limits

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

The Buena POTW does not discharge wastewater to the ground. No permit limits are required to protect groundwater.

K. Comparison of effluent limits with the previous permit issued in 2011.

The draft permit has the same effluent limits as the permit issued on October 26, 2011.

Table 13 Comparison of Previous and Proposed Effluent Limits

		Previous Effluent Limits: Outfall # 001		Proposed Effluent Limits: Outfall # 001	
Parameter	Basis of Limit	Average Monthly	Average Weekly	Average Monthly	Average Weekly
Biochemical Oxygen Demand (5-day)	Technology	30 mg/L 30 lbs/day	45 mg/L 45 lbs/day	30 mg/L 30 lbs/day	45mg/L 45 lbs/day
Total Suspended Solids	Technology	30 mg/L 30lbs/day	45 mg/L 45 lbs/day	30 mg/L 30 lbs/day	45mg/L 45 lbs/day
Ammonia	Water Quality	3.1 mg/L	N/A	3.1 mg/L	N/A

Parameter	Basis of Limit	Monthly Geometric Mean Limit	Weekly Geometric Mean Limit	Monthly Geometric Mean Limit	Weekly Geometric Mean Limit
Fecal Coliform Bacteria	Technology	200 cfu/100ml	400 cfu/100ml	200 cfu/100ml	400 cfu/100ml

Parameter	Basis of Limit	Previous Limit	Proposed Limit
pH	Technology	Minimum 6 Maximum 9 Standard Units	Minimum 6.0 Maximum 9.0 Standard Units

IV. Monitoring Requirements

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

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

A. Wastewater monitoring

The monitoring schedule is detailed in the proposed permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (Publication Number 92-109) for a recirculating gravel filter wastewater facility.

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 biosolids removed from the recirculation tanks are transported to Natural Selection Farms and land applied for soil nutrients. Septic pumpers are contracted by Yakima County to remove solids from the community septic tanks. The septage removed from the community septic tanks are taken to a septage lagoon at the Cheyne Landfill for further treatment. The Buena POTW is permitted by the Department of Ecology with additional oversight approval from the Yakima Health District.

B. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). Ecology accredited the laboratory at this facility for:

Table 14 Accredited Parameters

Buena Wastewater Treatment Plant 1688 Buena Rd Buena, WA 98921 Contact: Jose Campos Phone: (509) 494-3429 Tests internal samples only					Accreditation #: W984-17 Revision Date: 4/29/2017 Expiration Date: 04/28/2018 County: Yakima				
State	City	CompanyName	MatrixDescription	Matrix	Category	MethodName	MethodCode	AnalyteName	AnalyteID
WA	Buena	Buena Wastewater Treatment Plant	Non-Potable Water	N	General Chemistry	Hach 10360 Rev 1.1	60027807	Dissolved Oxygen	1880
WA	Buena	Buena Wastewater Treatment Plant	Non-Potable Water	N	General Chemistry	SM 2540 D-97	20051201	Solids, Total Suspended	1960
WA	Buena	Buena Wastewater Treatment Plant	Non-Potable Water	N	General Chemistry	SM 4500-H+ B-00	20105219	pH	1900
WA	Buena	Buena Wastewater Treatment Plant	Non-Potable Water	N	General Chemistry	SM 9222 D (m-FC)-97	20210008	Fecal coliform-count	2530

The Buena POTW retains a weekly BOD composite sample, which is taken to Cascade Analytical for analysis. The Buena POTW does not foresee, in the near future, obtaining BOD accreditation.

V. Other Permit Conditions

A. Reporting and record keeping

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

B. Prevention of facility overloading

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

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

Special Condition S.4 restricts the amount of flow.

If a municipality intends to apply for Ecology-administered funding for the design or construction of a facility project, the plan must meet the standard of a "Facility Plan", as defined in WAC 173-98-030. A complete "Facility Plan" includes all elements of an "Engineering Report" along with State Environmental Review Process (SERP) documentation to demonstrate compliance with 40 CFR 35.3140 and 40 CFR

35.3145, and a cost effectiveness analysis as required by WAC 173-98-730. The municipality should contact Ecology's regional office as early as practical before planning a project that may include Ecology-administered funding.

C. Operation and maintenance

The proposed permit contains Special Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, 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 Buena Publicly Owned Treatment Works takes adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment.

The existing Ecology approved Operations and Maintenance manual (O&M), provided by Gray and Osborne (G&O) in 1994, is dated and does not properly reflect the current status of the Buena POTW. The proposed permit for the Buena POTW requires an update to the O&M manual that meets the requirement of WAC 173-240-080.

Ecology requires the day to day operation and maintenance of the Buena POTW to be conducted by a Class II certified operator, as stated in the draft permit's S5.A.

Yakima County has documented or suspects inflow, infiltration, overflows, failures in its collection system and it needs to further characterize the problem. The proposed permit requires submission of an updated operation and maintenance manual for the entire sewage system. The requirements for content and submission of the report are contained in Permit Special Condition S5.G.

D. Solid wastes

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

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

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

E. Outfall evaluation

The proposed permit requires Buena POTW to conduct an outfall inspection and submit a report detailing the findings of that inspection (Special Condition S.11). The inspection includes but is not limited to an evaluation of the physical condition of the discharge pipe and diffusers, and evaluation of the extent of sediment accumulations in the vicinity of the outfall.

F. General conditions

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

VI. Permit Issuance Procedures

A. Permit modifications

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

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

B. Proposed permit issuance

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

VII. References for Text and Appendices

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(<https://fortress.wa.gov/ecy/publications/summarypages/0610100.html>)

Laws and Regulations (<https://ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking>)

Permit and Wastewater Related Information (<https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits>)

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

Ecology proposes to reissue a permit to the Buena POTW. 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 October 24, 2018 in the Yakima Herald Republic 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 antidegradation 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.

NOTICE: ANNOUNCEMENT OF AVAILABILITY OF DRAFT PERMIT

PERMIT NO.: WA0052132

APPLICANT: Yakima County Public Services

128 N. 2nd Street, Fourth Floor Courthouse
Yakima, WA 98901

FACILITY: Community of Buena Publicly Owned Treatment Works

Yakima County Public Services has applied for renewal of National Pollutant Discharge Elimination System (NPDES) Permit No. WA0052132 for the Community of Buena POTW in accordance with the provisions of Chapter 90.48 Revised Code of Washington (RCW) and Chapter 173-220 Washington Administrative Code (WAC), and the Federal Clean Water Act.

Yakima County Public Services presently owns or operates for the Community of Buena POTW which is designed to handle a monthly maximum flow of 0.120 million gallons per day. The wastewater, following treatment, must meet the requirements of the Washington State Water Pollution Control Act and applicable regulations for a permit to be issued.

Following evaluation of the application and other available information, a draft permit has been developed which would allow the discharge of treated domestic wastewater from 1680 Buena Road, Buena, WA to an unnamed waterway, tributary to the Yakima River at River Mile 91.4. All discharges to be in compliance with the Department of Ecology's Water Quality Standards for a permit to be issued.

A tentative determination has been made on the effluent limitations and special permit conditions that will prevent and control pollution. A final determination will not be made until all timely comments received in response to this notice have been evaluated.

PUBLIC COMMENT AND INFORMATION

The draft permit and fact sheet may be viewed at the Department of Ecology (Department) website:

<https://fortress.wa.gov/ecy/paris/PermitDocumentSearch.aspx?PermitNumber=WA0052132&FacilityName=&City=&County=&Region=0&PermitType=0> . The application, fact sheet, proposed permit, and other related documents are also available at the Department's Central Regional Office for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m., weekdays. To obtain a copy or to arrange to view copies at the Central Regional Office, please call Jackie Cameron at (509) 575-2027, e-mail jackie.cameron@ecy.wa.gov , or write to the address below.

Interested persons are invited to submit written comments regarding the proposed permit. All comments must be submitted by November 24, 2018 to be considered for the final determination. Submit comments online at:

<http://ws.ecology.commentinput.com/?id=GEPjg>

Written comments should be sent to: Cynthia Huwe, WQ Permit Coordinator, Department of Ecology, Central Regional Office, 1250 West Alder Street, Union Gap, WA 98903-0009.

Any interested party may request a public hearing on the proposed permit within 30 days of the publication date of this notice. The request for a hearing shall state the interest of the party and the reasons why a hearing is necessary. The request should be sent to the above address. The Department will hold a hearing if it determines that there is significant public interest. If a hearing is to be held, public notice will be published at least 30 days in advance of the hearing date. Any party responding to this notice with comments will be mailed a copy of a hearing public notice.

Please bring this public notice to the attention of persons who you know would be interested in this matter. The Department is an equal opportunity agency. If you need this publication in an alternate format, please contact us at (509) 575-2490 or TTY (for the speech and hearing impaired) at 711 or 1-800-833-6388.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting*, which is available on our website at

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<https://ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking/Rulemaking-FAQ>

You may obtain further information from Ecology by telephone, 509-457-7105 or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
1250 West Alder Street
Union Gap, WA 98903

The primary author of this permit and fact sheet is Erik Van Doren.

Appendix B—Your Right to Appeal

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

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

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

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

ADDRESS AND LOCATION INFORMATION

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

Appendix C—Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).
Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) -- The lowest level at which the entire analytical system must give a recognizable signal

and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to $(1,2, \text{or } 5) \times 10^n$, where n is an integer. (64 FR 30417).

ALSO GIVEN AS:

The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

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

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

Sample Maximum -- No sample may exceed this value.

Significant industrial user (SIU) --

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

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

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

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

Soil scientist -- An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

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

Soluble BOD₅ -- Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD₅ test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD₅ test is sufficient to remove the particulate organic fraction.

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

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

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

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

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

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

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

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

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

Appendix D—Technical Calculations

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

Calculation of Dilution Factors and Concentrations at Mixing Zone Boundaries

Use to calculate volume-restricted dilution factors

INPUT	
1. Effluent Flow (95th Percentile)	0.103
2. Effluent Concentration	1
3. Receiving Water Flow (10th Percentile)	0.83
4. Receiving Water Concentration	1
OUTPUT	
Concentration - complete mix (same units as #1 above)	1.0
Dilution Factor - complete mix	9.1
Dilution Factor - Acute, 2.5% Dilution	1.2
Dilution Factor - Chronic, 25% Dilution	3.0

Freshwater Un-ionized Ammonia Criteria Calculation

Based on Chapter 173-201A WAC, amended November 20, 2006

		mixed @ Acute Boundary	mixed @ Chronic Boundary	mixed @ Whole River
INPUT				
1. Receiving Water Temperature (deg C):	25.3	19.7	7.2	2.4
2. Receiving Water pH:	8.8	#DIV/0!	#DIV/0!	#DIV/0!
3. Is salmonid habitat an existing or designated use?	Yes	Yes	Yes	Yes
4. Are non-salmonid early life stages present or absent?	Present	Present	Present	Present
OUTPUT				
Using mixed temp and pH at mixing zone boundaries?	no			
Ratio	13.500	#DIV/0!	#DIV/0!	#DIV/0!
FT	1.400	1.400	2.424	3.383
FPH	1.000	#DIV/0!	#DIV/0!	#DIV/0!
pKa	9.237	9.413	9.828	9.999
Unionized Fraction	0.268	#DIV/0!	#DIV/0!	#DIV/0!
Unionized ammonia NH3 criteria (mg/L as NH ₃)				
Acute:	0.401	#DIV/0!	#DIV/0!	#DIV/0!
Chronic:	0.042	#DIV/0!	#DIV/0!	#DIV/0!
RESULTS				
Total ammonia nitrogen criteria (mg/L as N):				
Acute:	1.232	#DIV/0!		#DIV/0!
Chronic:	0.130		#DIV/0!	#DIV/0!

Note: Use total ammonia, not unionized ammonia, in the reasonable potential calculation. Criteria are based on either total or unionized ammonia, depending on salmonid presence, but permittees measure total ammonia. This spreadsheet calculates the concentration of total ammonia in the effluent (as measured by permittee) that will result in the criteria concentration in the receiving water.

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Reasonable Potential Calculation

Facility	Buena POTW
Water Body Type	Freshwater
Rec. Water Hardnes	

Dilution Factors:	Acute	Chronic
Aquatic Life	1.2	3.0
Human Health Carcinogenic		
Human Health Non-Carcinogenic		

[illegible]

Aquatic Life Reasonable Potential

[illegible]

Freshwater Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)–(ii) and the Water Quality Program Guidance. All data inputs must meet WQ guidelines. The Water Quality temperature guidance document may be found at:
<https://fortress.wa.gov/ecy/publications/summarypages/0610100.html>

	Core Summer Criteria
INPUT	July 1-Sept 14
1. Chronic Dilution Factor at Mixing Zone Boundary	3.2
2. 7DADMax Ambient Temperature (T) (Upstream Background 90th percentile)	25.3 °C
3. 7DADMax Effluent Temperature (95th percentile)	22.5 °C
4. Aquatic Life Temperature WQ Criterion in Fresh Water	17.5 °C
OUTPUT	
5. Temperature at Chronic Mixing Zone Boundary:	24.4 °C
6. Incremental Temperature Increase or decrease:	-0.9 °C
7. Maximum Allowable Incremental Temperature Increase:	0.3 °C
8. Maximum Allowable Temperature at Mixing Zone Boundary:	25.6 °C
A. If ambient temp is warmer than WQ criterion	
9. Does temp fall within this warmer temp range?	YES
10. Temperature Limit 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:	---
RESULTS	
17. Do any of the above cells show a temp increase?	NO
18. Temperature Limit if Required?	NO LIMIT

Appendix E—Response to Comments

YAKIMA COUNTY COMMENTS

Comment 1 - Page 9/Footnote “f”/Permit

Page 9, footnote f. This footnote says to calculate the percent removal of BOD and TSS using the above equation. With footnote “g” added, should this just reference BOD?

Ecology Response

Footnote “f”

Ecology agrees that footnote “f” should just reference BOD only. The permit was revised to reflect this change.

Comment 2 - Permit

Page 9, footnote g. A 50% removal credit will help account for the removal of TSS in the septic tanks. However, there may still be times when our effluent TSS is well below the permit limit and still not meet the percent removal limit. Can a larger percent removal from the septic tanks be justified? Our recent (October 2018) draft Buena Wastewater Treatment Facility Plan notes a TSS removal in the septic tanks of 91 percent based on a reference entitled, “Design and Performance of Septic Tanks”, by T.R. Bounds. A draft Department of Health report entitled “Septic Tank Effluent Values” indicates a TSS removal in septic tanks of 60-80 percent.

Ecology Response

Footnote “g”

Ecology obtained a copy of the document titled, “Design and Performance of Septic Tanks” by T.R. Bounds, referenced in the draft Buena Wastewater Treatment Facility Plan by G&O. After reviewing the document, Ecology determined it reasonable to increase the credit for the removal of TSS from 50% to 90%. Footnote “g” was revised to include the 90% credit within the calculation.

Comment 3 - Page 20/Section S5.A.

Page 20, paragraph S5.A. Our preference is to maintain the plant’s current classification as a Class 1 plant if that classification is still appropriate. Our engineering consultant

thought that while the Buena plant is considered a biofilter, they felt the operation is less complex than most biofilters and would only require a Class 1. Their reasoning was there was very little process control that can be done at the plant. If the plant classification does change to a Class 2, then we'll work with our operators to become certified at the higher level.

Ecology Response

Page 20/Section S5.A./Permit

*A copy of the 1994 NPDES issued permit for the Buena POTW can be found at the end of Section 2.3 of the 1994 Buena POTW Operations and Maintenance Manual. Appendix C of the 1994 NPDES issued permit, shows an old method for scoring a treatment plant per **WAC 173-230-140** at the time. The Buena POTW scored as a Class I in 1994. The scoring method for classifying treatment plants no longer exists. The current **WAC 173-230-140** properly classifies facilities by treatment type and design flow.*

*During the facility commenting period, Ecology provided a response to facility comments referencing two Washington Administrative Codes **WAC 173-230-020(2)** and **WAC 173-230-140**.*

WAC 173-230-020(2) defined **Biofiltration**.

- *means the process of passing a liquid through a biological filter that contains fixed media on surfaces which develop zoogeal films that absorb and adsorb fine suspended, colloidal, and dissolved solids and release products of biochemical action.*

WAC 173-230-140 lists the current criteria for determining classification of wastewater treatment plants. See the table below:

Treatment Plant Classification Criteria		
Treatment type	Design flow MGD	Classification
Primary	≤ 1	I
	$> 1 \leq 10$	II
	$> 10 \leq 20$	III
	> 20	IV
Lagoon (Nonaerated)	All	I
Lagoon (Aerated)	≤ 1	I
	> 1	II
Biofiltration	≤ 1	II
	$> 1 \leq 10$	III
	> 10	IV
Extended aeration	≤ 5	II
	> 5	III
Activated sludge	≤ 1	II
	$> 1 \leq 10$	III
	> 10	IV
Wetlands	≤ 1	I
	$> 1 \leq 5$	II
	> 5	III
Tertiary	≤ 5	III
	> 5	IV

WAC 173-230-140 states that plants may be classified in a group different than indicated in this section if:

(1) They have characteristics that make operation less complex or more difficult than other similar plants of the same flow range; or

(2) The conditions of flow or the use of the receiving waters require an unusually high degree of plant operational control; or

(3) They use an approved method of wastewater treatment that is not included in this section.

- *The Klickitat POTW (NPDES permit No. WA0023698) a similar STEG/RGF facility constructed by G&O, is permitted as a Class II plant on record from 2007 to current day. Additionally, the Klickitat POTW's population, number of*

interceptor tanks to maintain, and flows are approximately 1/3 that of the Community of Buena.

- *The Town of South Prairie (NPDES permit No. WA0040479) operates a similar STEP/RGF facility similar to that of Klickitat in terms of size relative to the Buena POTW. The Town of South Prairie POTW is permitted as a Class II plant.*

Ecology determined it reasonable to permit the Buena POTW as a Class II facility to coincide with the WACs mentioned above and is consistent with the classification of facilities similar to the Buena POTW.

The Department of Ecology's Wastewater Operator Certification Program Coordinator, Poppy Carre, confirmed on November 29, 2018 that the certified operator in responsible charge would receive a one-time provisional certification.

- *A provisional certificate is a one-time Class II certificate issued to the certified operator in responsible charge.*
- *It is not transferable and becomes null and void when the operator vacates the position requiring the provisional certification.*
- *The operator must meet renewal and professional growth requirements to maintain their certification while they hold a provisional Class II certificate.*
- *If the operator does not upgrade certification while they hold a provisional certificate, they will return to their former certification level when they vacate the position requiring the provisional certification.*

Comment 4 – Fact Sheet

Page 8, third paragraph. Some parts of this paragraph do not accurately describe the collection system. For instance, the original project replaced on-site septic systems rather than an existing collection system. All of the collection system is PVC. The original collection system included PVC lined manholes. The PVC lined manhole bases and barrels are holding up well. However, the concrete grade rings are showing signs of deterioration due to delamination of the protective coating. There were preexisting manholes and a section of PVC sewer line in Highland Drive that were installed prior to the original collection system as part of an earlier road project. These manholes did not include measures for protection from hydrogen sulfide and are showing signs of deterioration. One option for this paragraph is as follows:

The original collection system included PVC lined manholes and PVC sewer lines. Several manholes, since the original wastewater treatment facility installation, have been installed for developments and to provide better access for maintenance. These manholes included other methods of protection the concrete from hydrogen sulfide with varying degrees of success.

Ecology Response

Page 8/ Collection System Status

Ecology revised the draft permit to incorporate language that accurately describes the collection system. The revised paragraph is as follows:

The original collection system included PVC lined manholes and PVC sewer lines. Several manholes, since the original wastewater treatment facility installation, have been installed for new housing developments and provide better access for maintenance. These manholes included other methods of protecting the concrete from hydrogen sulfide with varying degrees of success.

Department of Fish and Wildlife Comment Letter

On November 21, 2018, Ecology received a letter submitted by Eric Bartrand, a senior biologist with the Department of Fish and Wildlife (WDFW). The letter and images submitted by Eric Bartrand were received during the public commenting period for proposed Buena POTW draft NPDES permit, WA0052132. See the letter and images below:



Washington

Department of Fish and Wildlife

South Central Region 3 – 1701 S. 24th Ave., Yakima WA 98902-5720
Phone: (509) 575-2740, Fax (509) 575-2474

November 21, 2018

Cynthia Huwe
WQ Permit Coordinator
Department of Ecology
1250 Alder Street
Union Gap, WA 98903-0009

**Subject: Comments on NPDES Permit Renewal for Buena Community-Owned
WWTP Treatment Facility, WA0052132, Yakima County.**

Dear Cynthia,

Thank you for the opportunity to comment on this NPDES permit renewal. We anticipate that substantive actions on the facility will not occur prior to further environmental review. It should be useful here for Yakima County to incorporate our concerns with the current facility operation and our observation of unusual environmental degradation.

I viewed the natural wetlands where effluent from this plant discharged to on April 28, 2015. I took five photographs of the location then and they're attached here. Based on the condition of the wetland flora there and its setting (there are many similarly-situated habitats along the Yakima River) on that date, I am very concerned that unusual toxicity in the water was present. I'm a senior biologist with WDFW and have decades of experience working in aquatic habitats within the Yakima Basin.

I cannot definitively say that salmonids would never exist in that connected off-channel wetland habitat- at least as it existed on that date. However, my previous field experience in such habitats with those general floral indicators is, that upon sampling, salmonids would be sparse or absent for up-to many-hundreds or thousands of feet from them. Temperature or dissolved oxygen deficiencies would normally be among the problem issues there.

That particular connected off-channel waterway should function as salmonid habitat. Middle Columbia Steelhead (ESA –Threatened), and coho and chinook salmon are well-known to use similarly-situated habitats along the Yakima River for winter rearing. It can function for that, provided the effluent from Buena WWTP has proper treatment. Thus, an indicator for NPDES permit compliance could be comparable utilization by salmonid species of this and nearby “control” habitats. I advocate that biotic and floral scientific sampling be done in that off-channel habitat that can be compared to a

Cynthia Huwe
NPDES Permit Renewal
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Page 2

properly-selected control habitat. This type of periodic monitoring program could serve as a needed check on the facility's treatment and discharge performance into the future.

Thank you for your consideration. Please feel free to contact me with any questions or clarifications you may require. My phone number is 457-9310.

Sincerely,



Eric Bartrand

Department of Fish and Wildlife
Area Habitat Biologist
1701 S 24th Avenue
Yakima, WA 98902

EB:eb

Attachments:

IMGP0137.jpg
IMGP0138.jpg
IMGP0139.jpg
IMGP0154.jpg
IMGP0156.jpg

IMGP0137.jpg



IMGP0138.jpg



IMGP0139.jpg



IMGP0154.jpg



IMGP0156.jpg



Ecology's Response

Ecology appreciates the time taken by the Department of Fish and Wildlife to comment on the draft Buena POTW permit (WA0052132) regarding the facility's effluent discharges and its potential effects on the water quality to its receiving water.

The unnamed irrigation return waterway that is a tributary to the Yakima River, has been the receiving water for the Buena POTW dating back to 1993. As discussed in the draft fact sheet, the Buena POTW has consistently complied with the effluent limits and permit conditions throughout the duration of permit issuance. The receiving water significant non-point sources of pollutants include irrigated agriculture and livestock. This reference can be found in the draft fact sheet for NPDES permit WA0052132 (Section II.B. Description of the receiving water). The draft fact sheet also describes in some detail a Groundwater Transmissivity Study conducted in 1988, prior to the construction of the Buena wastewater treatment facility. The study concluded that groundwater drainage likely contributed a significant fraction of the unnamed waterway flow annually (Section III.E. Water quality impairments).

Ecology observed historical satellite images showing similar algal blooms similar to images provided, immediately north and further upstream from the Buena POTW effluent discharge location over the years.

Ecology supports WDFW's idea that an environmental study to include a periodic monitoring program would be beneficial. Ecology's environmental study approach will be to require a receiving water study on the unnamed waterway. The language requiring the Buena POTW to conduct a receiving water study requirement is located in S10 of the draft permit. The purpose of the receiving water study will be to gather ambient water quality data that is currently unavailable.

Before a monitoring program to assess the receiving water quality could proceed, Ecology must have an approved Quality Assurance (QA) Project Plan. The permit will require the Buena POTW to submit a QA Project Plan.

The guidance document for preparing QA Project Plans for environmental studies webpage link is provided below:

<https://fortress.wa.gov/ecy/publications/documents/0403030.pdf>