# Fact Sheet for NPDES Permit WA0024961

Grays Harbor Energy Center

Date of Public Notice: 09/29/2025

Permit Effective Date: xx/xx/2025

## Purpose of this fact sheet

This fact sheet explains and documents the decisions the Energy Facility Site Evaluation Council (EFSEC) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Grays Harbor Energy Center (GHEC).

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

EFSEC 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 Grays Harbor Energy Center, NPDES permit WA0024961, are available for public review and comment from Monday, September 29, 2025 until close of business Tuesday, October 8, 2025. For more details on preparing and filing comments about these documents, please see Appendix A - Public Involvement Information.

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

After the public comment period closes, EFSEC will summarize substantive comments and provide responses to them. EFSEC will include the summary and responses to comments in this fact sheet as Appendix G Response to Comments, and publish it when issuing the final NPDES permit. EFSEC 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

Grays Harbor Energy Center (GHEC) is an electrical power generating plant capable of producing a maximum output of 662 megawatts. GHEC runs intermittently as a peaking plant, whenever market conditions are economically advantageous. GHEC treats wastewater generated onsite and discharges it to the Chehalis River. EFSEC

issued the previous permit for this facility on June 19, 2019 and made it effective on July 1, 2019.

The proposed permit retains the effluent limits for temperature, total suspended solids (TSS), oil and grease (O&G), chromium, and pH; replaces free available chlorine limit with total residual chlorine limit; reduces chromium monitoring frequency; and removes turbidity from annual monitoring.

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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 EFSEC. The Legislature defined EFSEC's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to industrial NPDES permits:

- Procedures EFSEC follows for issuing NPDES permits (chapter 173-220 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC)
- Water quality criteria for ground waters (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 industrial 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 performance requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, EFSEC must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. EFSEC 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, EFSEC may make changes to the draft NPDES permit in response to comment(s). EFSEC will summarize the responses to comments and any changes to the permit in Appendix G.

# II. Background information

**Table 1 - Facility information**

| **Applicant:** | |
|---|---|
| Facility name and address | Grays Harbor Energy Center<br>401 Keys Road<br>Elma, WA 98541 |
| Contact at facility | Name: Eric Page<br>Title: Plant Engineer<br>Telephone #: (360) 482-6292 |
| Responsible official | Name: Christopher Sherin<br>Title: Plant Manager<br>Address: 401 Key Road, Elma, WA 98541<br>Telephone #:(360) 482-4349<br>FAX #: (360) 482-4376 |
| Industry type | Electrical Power Generation |
| Categorical industry | 40 CFR Part 423 |
| Type of treatment | Multimedia Filtration, Dechlorination, and Neutralization |
| SIC codes | 4911 |
| NAIC codes | 221112 |
| Discharge waterbody name and location (NAD83/WGS84 reference datum) | Outfall 001: Chehalis River<br>Latitude: 46.972056<br>Longitude: -123.490528<br>Outfall 002B: Infiltrated into ground<br>Latitude: 46.972183<br>Longitude: -123.482778 |

**Permit status**

Issuance date of previous permit: June 19, 2019

Application for permit renewal submittal date: December 27, 2023

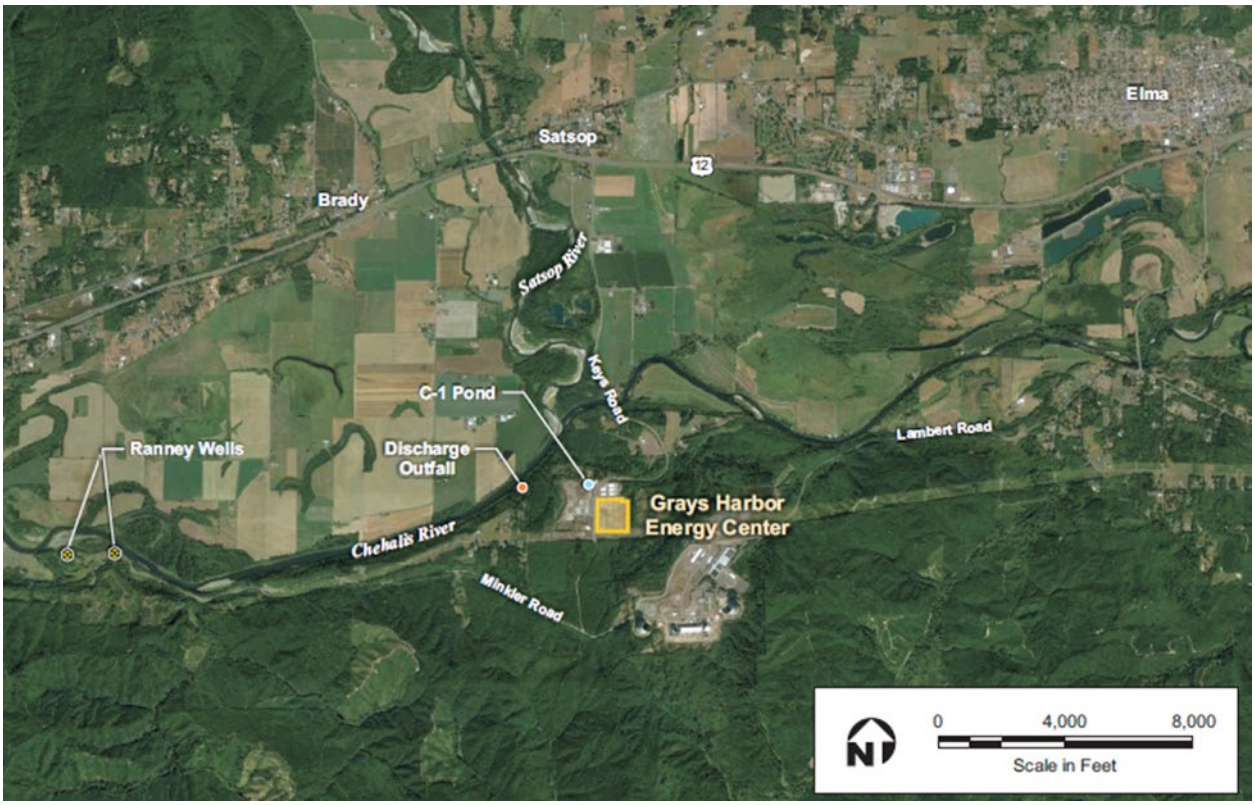
Date of EFSEC acceptance of application: March 18, 2024

**Inspection status**

Date of last sampling inspection: February 22, 2023

Date of last non-sampling inspection: April 8, 2025

**Figure 1 - Facility location map**




## II.A. Facility description

### 1. History

The Grays Harbor Energy Center (GHEC) formerly known as the Satsop Combustion Turbine Project is located on an approximately 22-acre site south of the Chehalis River near the town of Elma. The construction of the facility was completed in spring of 2008 and the facility became operational in July 2008. The facility is owned and operated by Grays Harbor Energy LLC.

### 2. Cooling water intakes

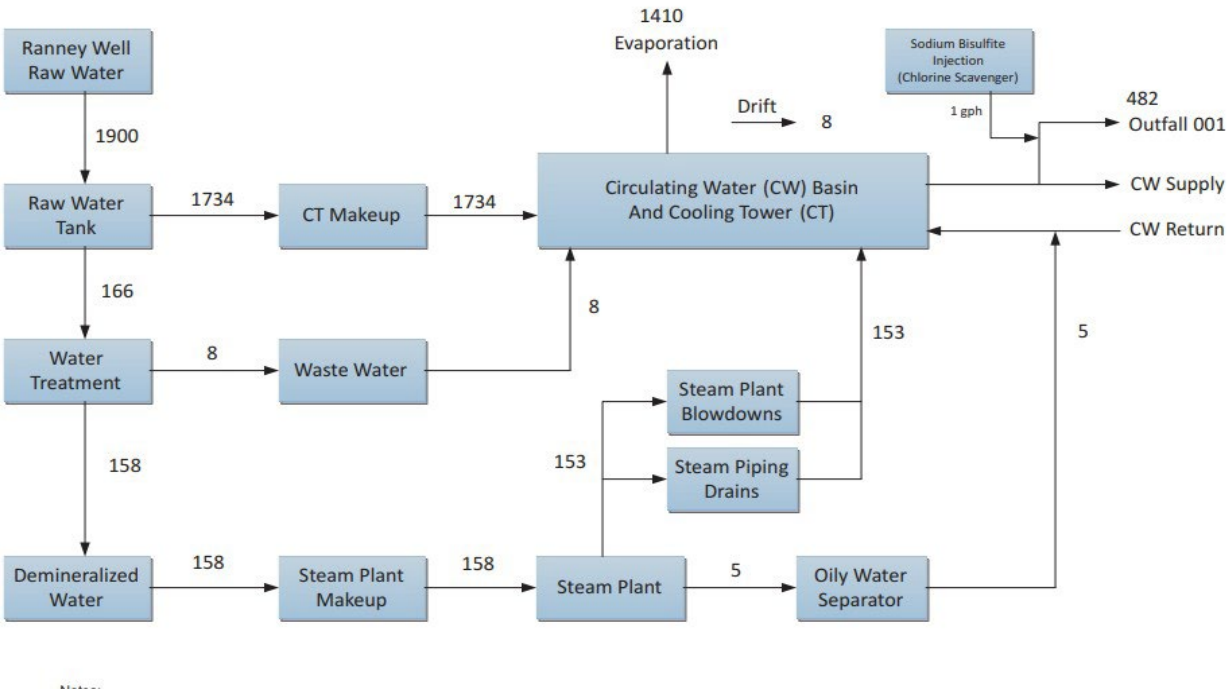
CWA § 316(b) requires the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Since July 2013, EFSEC has required a supplemental application for all applicants using EPA Form 2-C. GHEC indicated that no cooling water intake is associated with the facility.

## 3. Industrial processes

Grays Harbor Energy Center is an electrical power generating plant consisting of two natural gas-fired turbines on a 2-on-1 configuration with a single steam turbine. Each gas turbine powers a generator capable of producing 181 megawatts (MW). The gas turbine's exhaust energy is reclaimed in a closed system called Heat Recovery Steam Generator (HRSG) producing steam to drive a steam turbine. The steam turbine powers a generator capable of producing 300 MW. GHEC is capable of producing a maximum output of 662 MW. The electric power produced is transmitted to the Bonneville Power Administration (BPA) transmission grid and sold for profit.

## 4. Wastewater treatment processes

**Figure 2 - Process water flow diagram (gpm)**




The facility withdraws ground water at a rate of approximately 1,900 gallons per minute (gpm) from a Ranney well for process water supply. The well is located on the southern bank of the Chehalis River, approximately 4 miles downriver of the plant site near the river's confluence with Elizabeth Creek.

The facility discharges wastewaters from the low volume waste sources including: wastewaters from ion exchanges water treatment systems, water

treatment from evaporation blowdown, laboratory and sampling streams, boiler blowdown, floor drains, and cooling tower basin cleaning wastes.

The facility has two wastewater streams generated from cooling tower blowdown and an oil/water separator. The cooling system at the plant consists of a circulating cooling water system, a condenser, and a 9-cell mechanical draft cooling tower. The circulating cooling water system routes the cooling water to the condenser at approximately 175,000 gpm to condense the steam. The cooling tower continuously receives heated cooling water from the condenser where it is cooled by an evaporative process. Cooling tower evaporation and "drift" losses average approximately 1,400 gpm. The temperature of the cooling water has been reduced when it reaches the cooling tower basin, where it is collected and returned to the cooling system.

This cooling cycle is repeated and the dissolved salts in the remaining cooling water become more concentrated as a result of the evaporative process. When the concentration of the dissolved salts nears their solubility limit, scale formation can occur on the condenser tubes and hinder heat transfer. Therefore, a portion of the cooling water, called blowdown, is removed from the system and discharged to address this concentration effect. Fresh cooling water is continuously added to the process to offset evaporation losses and blowdown discharges. The facility uses a heat exchanger to cool the discharge temperature before it enters the Chehalis River. Raw supply water passes through the heat exchanger to cool the discharge prior to entering the facility.

The facility adds sodium hypochlorite up to 1 ppm to the cooling tower to prevent microbial growth. If chlorine is detected in the cooling tower blowdown, sodium bisulfite is added to neutralize the residual chlorine. During this time, the facility does not discharge the effluent to Outfall 001. The elevated chlorine water is recirculated up to 24 hours until the chlorine level dissipates below the normal limits. Then the facility resumes the discharge to Outfall 001.

The oil/water separator (OWS) collects water from wastewater streams in the plant that may potentially contain oil, grease, and suspended solids. Sources of these constituents are the steam turbine lube oil purification system and equipment and floor drains. The OWS is continually processing wastewater at a rate of approximately 5 gpm. The wastewater from the OWS is mixed with the cooling tower blowdown water before entering the blowdown line. A

reservoir connected to the OWS collects any recovered oil for offsite recycling.

The facility discharges treated cooling tower blowdown and oil/water separator water through Outfall 001 to the Chehalis River at an annual average flow rate of 0.38 MGD during the permit cycle.

### 5. Solid wastes

GHEC generates various solid wastes onsite including: general refuse, wood products, scrap metal, metal drums, petroleum products, oil and solvent rags, worn tires, spent batteries, and lamps. These solid wastes are disposed of and recycled in accordance with the solid waste regulations. GHEC submitted a Solid Waste Control Plan Update to Ecology on 7/1/2021.

Sanitary sewage from the facility is treated in a septic tank system and discharged to a drain field onsite. The sanitary waste stream flow to the onsite system is less than 3,500 gallons per day, which is regulated by the Grays Harbor County Health Department. Grays Harbor County approved the sanitary waste facility design for GHEC on June 13, 2002.

### 6. Discharge outfall

The treated and disinfected effluent from the plant is discharged to the Chehalis River through Outfall 001. The conveyance pipe to the outfall consists of a combination of 21-inch diameter reinforced concrete pipe, 20-inch diameter carbon steel pipe, and 18-inch diameter carbon steel pipe that extends north of the plant and below the Chehalis River to a diffuser structure.

Stormwater runoff from the facility is collected in a storm drain system (designated as Outfall 002B), conveyed through a pipe beneath Keys Road, and discharged to a stormwater detention pond (C-1 pond) that is adjacent to the facility. This pond is located on property owned by the Port of Grays Harbor and is designed to handle a 100-year storm event. The pond also receives stormwater discharges from the surrounding properties that are not under the control of the GHEC.

The stormwater in the pond evaporates and infiltrates into the ground. If stormwater exceeds the C-1 pond design capacity, the stormwater is discharged to a drainage area leading to the Chehalis River. Stormwater in this pond has never exceeded the design capacity, even during a 100-year rainfall event.

## II.B. Description of the receiving water

GHEC discharges to the Chehalis River. This section of the river is tidally influenced because of the proximity to Grays Harbor. Other nearby point source outfalls include the Elma Sewage Treatment Plant. Significant nearby non-point sources of pollutants include agricultural activities.

The ambient background data in Table 2 below used in preparing this permit were obtained from the 2022 GHEC Receiving Water Study Report prepared by Landau Associates.

**Table 2 - Ambient background data**

| Parameter | Maximum Value | No. of Samples |
|---|---|---|
| Temperature (highest annual 1-DMax) | 19.3 °C | 9 |
| pH | 7.2 standard units | 9 |
| Dissolved Oxygen | 10.3 mg/L | 9 |
| Total Ammonia-N | 0.015 U mg/L | 9 |
| Turbidity | 3.7 NTU | 9 |
| Hardness | 33.2 mg/L as CaCO3 | 9 |
| Alkalinity | 36.0 mg/L as CaCO3 | 9 |
| Copper | 2.7 µg/L | 9 |
| Lead | 0.11 J µg/L | 9 |
| Zinc | 3.0 J µg/L | 9 |
| Nickel | 0.74 µg/L | 9 |

Notes:
U - Not detected above the level of the reported sample quantitation limit
J - Result is an estimated quantity

## II.C. Wastewater characterization

GHEC reported the concentration of pollutants in the discharge at Outfall 001 in the permit renewal application dated December 27, 2023 and in monthly discharge monitoring reports. The wastewater effluent at Outfall 001 is characterized as follows:

**Table 3 - Wastewater characterization Outfall 001**

| Parameter | Units | # of Samples | Average value | Maximum value |
|---|---|---|---|---|
| Biochemical Oxygen Demand (BOD5) | mg/L | 1 | -- | <2.0 |
| Total Suspended Solids (TSS) | mg/L | 52 | -- | 21.0 |
| Oil and Grease | mg/L | 52 | -- | 4.4 |
| Chlorine, total residual | mg/L | 5 | -- | 0.1 |

| Parameter | Units | # of Samples | Average value | Maximum value |
|---|---|---|---|---|
| Chemical Oxygen Demand (COD) | mg/L | 1 | -- | 9 |
| Sulfate | mg/L | 1 | -- | 493 |
| Total Organic Carbon (TOC) | mg/L | 1 | -- | 2.9 |
| Nitrate-nitrite | µg/L | 1 | -- | 9800 |
| Nitrogen, total organic (as N) | µg/L | 1 | -- | 1240 |
| Fluoride | µg/L | 1 | -- | 220 |
| Phosphorous | µg/L | 1 | -- | 1030 |
| Temperature (winter) | ºC | 1251 | -- | 15.3 |
| Temperature (summer) | ºC | 1251 | -- | 15.7 |
| Ammonia - N | µg/L | 5 | -- | 180 |
| Antimony, total | µg/L | 5 | -- | 2.29 |
| Arsenic, total | µg/L | 56 | -- | 8.7 |
| Cadmium, total | µg/L | 5 | -- | 0.021 |
| Chromium, total | µg/L | 24 | -- | 2.6 |
| Copper, total | µg/L | 5 | -- | 0.87 |
| Lead, total | µg/L | 5 | -- | 0.038 |
| Mercury, total | µg/L | 5 | -- | 0.00724 |
| Nickel, total | µg/L | 5 | -- | 0.68 |
| Selenium, total | µg/L | 5 | -- | 1.4 |
| Zinc, total | µg/L | 5 | -- | 3 |
| Phenols | µg/L | 1 | -- | 7 |
| Chloroform | µg/L | 2 | -- | 0.39 |
| Dichlorobromomethane | µg/L | 2 | -- | 0.08 |
| Aluminum, total | µg/L | 1 | -- | 4 |
| Barium, total | µg/L | 1 | -- | 15.7 |
| Boron, total | µg/L | 1 | -- | 77.2 |
| Cobalt, total | µg/L | 1 | -- | 0.019 |
| Iron, total | µg/L | 5 | -- | 56.9 |
| Magnesium, total | µg/L | 1 | -- | 47100 |
| Molybdenum, total | µg/L | 1 | -- | 3.12 |
| Manganese, total | µg/L | 1 | -- | 2.12 |
| Tin, total | µg/L | 1 | -- | 0.06 |
| Titanium, total | µg/L | 1 | -- | 0.2 |

| Parameter | Units | # of Samples | Minimum value | Maximum value |
|---|---|---|---|---|
| pH | SU | 1251 | 6.3 | 8.9 |

GHEC reported the concentration of pollutants in the discharge at Outfall 002B in the renewal application.

**Table 4 - Stormwater Monitoring Data for Outfall 002B**

| Parameter | Units | No. of Samples | Average Value | Maximum Value | Ground Water Criteria |
|---|---|---|---|---|---|
| pH | SU | 11 | 7.01 | 7.73 | 6.5 - 8.5 |
| Chloride | mg/L | 11 | 1.74 | 3.25 | -- |
| Copper | µg/L | 11 | 3.33 | 10.5 | 1,000 |
| Iron | mg/L | 11 | 0.246 | 1.23 | 5,000 |
| Zinc | µg/L | 11 | 3.62 | 13.2 | -- |

### II.D. Summary of compliance with previous permit Issued

The previous permit placed effluent limits on Temperature, Free Available Chlorine, pH, Total Suspended Solids (TSS), Oil and Grease (O&G), and total chromium (Cr).

GHEC has complied with the effluent limits and permit conditions throughout the duration of the permit issued on June 9, 2019. EFSEC assessed compliance based on its review of the facility's information in the Ecology Permitting and Reporting Information System (PARIS), discharge monitoring reports (DMRs) and on inspections.

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

**Table 5 - Permit submittals**

| Submittal name | Submittal status | Due date | Received date |
|---|---|---|---|
| Operation And Maintenance Manual Update | Submitted | 1/1/2020 | 12/9/2019 |
| Operation And Maintenance Manual Confirmation Letter | Submitted | 1/1/2024 | 11/7/2023 |
| Solid Waste Control Plan Update | Submitted | 7/1/2021 | 3/10/2021 |
| Application for Permit Renewal | Submitted | 1/1/2024 | 12/27/2023 |
| Spill Plan Update | Submitted | 7/1/2021 | 12/23/2019 |
| Outfall Evaluation Inspection Report | Submitted | 10/1/2023 | 10/29/2021 |
| Acute Toxicity: Characterization Written Report | Submitted | 2/15/2021 | 12/21/2020 |
| Chronic Toxicity: Characterization Written Report | Submitted | 2/15/2021 | 12/21/2020 |
| Receiving Water Study - Permit | Submitted | 1/1/2024 | 3/7/2023 |

### II.E. 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 EFSEC 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 Federal Water Quality Criteria Applicable to Washington (40 CFR 131.45).
- EFSEC 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.). EFSEC evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. EFSEC 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.

EFSEC 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 EFSEC if significant changes occur in any constituent [40 CFR 122.42(a)]. Until EFSEC modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

### III.A. Design criteria

According to WAC 173-220-150(1)(g), neither flows nor waste loadings may exceed approved design criteria, however, EFSEC does not have an engineering report that specifies the design criteria for the wastewater treatment plant at this facility. The proposed permit requires that GHEC submit an O&M manual that includes design criteria for wastewater treatment processes used onsite to

EFSEC for review and approval. EFSEC will impose an appropriate design criteria in the next permit cycle if necessary to ensure that GHEC operates and maintains the facilities or systems of control at all times to achieve compliance with the terms and conditions of the NPDES permit.

### III.B. Technology-based effluent limits

Technology-based limitations are set by regulation in the federal effluent guidelines or on a case-by-case basis using Best Professional Judgment (BPJ) when no effluent guidelines exist for an industrial category. Technology-based effluent limits represent the best treatment a facility can achieve consistent with the economic means of the industry as a whole (in the case of effluent guidelines) of the specific facility being permitted (in the case of BPJ). Technology-based effluent limits are process control parameters or numbers which indicate that a process, which in this case is wastewater treatment, is not functioning properly.

The Environmental Protection Agency (EPA) promulgated the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (40 CFR 423 Part 423.15) in 1974 and amended the regulations in 1977, 1978, 1980, 1982, and 2015. EFSEC must ensure that facilities provide all known, available, and reasonable methods of prevention, control, and treatment (AKART) when it issues a permit. EFSEC determined that the federal effluent guidelines constitute AKART.

The technology-based concentration values and other requirements in the NSPS section of the federal effluent guidelines were used to establish limits in the proposed permit except as indicated in the following discussion.

PCBs are commonly found in transformer fluid in the steam electric power generating industry. PCBs were not detected in the facility's final effluent. EFSEC has included the same effluent limit for PCBs in the proposed permit as the effluent limit for priority pollutants from federal effluent guidelines.

The federal effluent limitations for this category give the permit writer the discretion to express the allowable discharge quantity as a concentration limit rather than a mass limit. The technology-based concentration values in the NSPS section of the federal effluent guidelines were used except as indicated in the following discussion.

The monthly average and daily maximum permit limits proposed (see following table) for total suspended solids (TSS), oil and grease, chromium, zinc, and total residual chlorine are from the federal guideline allowances.

In addition to the above requirements, NSPS requirements include a condition that the effluent shall not include priority pollutants, with the exception of chromium and zinc, in detectable amounts. Chromium and zinc have specific limits. Metals have been detected in the effluent at low levels because they are present in the source water and may be incidentally added in the process. Metal detection levels have greatly improved since the federal effluent guidelines were published in 1982. Metal parameters were also evaluated to ensure protection of aquatic life and no metal demonstrated reasonable potential to exceed water quality criteria (see Appendix E). Therefore, to satisfy the requirement that "priority pollutants contained in chemicals added for cooling water maintenance" are not discharged in detectable amounts, the Permittee must submit an annual certification stating that chemicals added for cooling water maintenance do not contain the priority pollutants of concern (see Special Condition S12). If priority pollutants are contained in chemicals added for cooling tower maintenance, a mass balance must be performed to demonstrate that the use of particular maintenance chemicals will not result in detectable amounts of priority pollutants in the discharge. Chemicals and quantities used for cooling water maintenance must be reported to EFSEC and Ecology. An annual priority pollutant scan is required per Special Condition S2.

**Table 6 - Technology-based limits**

| Parameter | Average monthly limit | Maximum daily limit |
|---|---|---|
| Polychlorinated Biphenyl Compounds (PCBs) | Discharge prohibited | Discharge prohibited |
| **Low Volume Waste Sources** | | |
| Total Suspended Solids (TSS) | 30 mg/L | 100 mg/L |
| Oil and Grease | 15 mg/L | 20 mg/L |
| **Cooling Water Blowdown** | | |
| Zinc, Total | 1 mg/L | 1 mg/L |
| Chromium, Total | 0.2 mg/L | 0.2 mg/L |
| Total Residual Chlorine [a] | -- | 0.2 mg/L |
| 126 Priority Pollutants [b] contained in chemicals used for cooling water maintenance, not including Chromium and Zinc | -- | No detectable amount |

| Parameter | Daily minimum | Daily maximum |
|---|---|---|
| pH | 6.0 standard units | 9.0 standard units |

Notes:

[a] Total residual chlorine may not be discharged from any unit for more than two hours per day unless the Permittee demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control per 40 CFR 423.13. GHEC submitted a justification letter to Ecology demonstrating that limiting the total residual chlorination discharge to two hours per day is inadequate for effective control of biological growth in the cooling water system at GHEC. Ecology accepted GHEC's justification and determined that limiting total residual chlorination discharge from any unit to two hours per day is not applied.
[b] The priority pollutants contained in chemicals added for cooling tower maintenance, except for chromium and zinc.

### III.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).

#### 1. Numeric criteria for the protection of aquatic life and recreation

Numeric 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. EFSEC 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.

#### 2. Numeric criteria for the protection of human health

Numeric criteria for the protection of human health are promulgated in Chapter 173-201A WAC and 40 CFR 131.45. These criteria are designed to protect human health 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.

#### 3. Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1)) 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) and of all marine waters (WAC 173-201A-210) in the state of Washington.

**4. Antidegradation**

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330) 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.
- EFSEC 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. EFSEC 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.
- EFSEC'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.

**5. 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. EFSEC 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 EFSEC 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)).

EFSEC uses modeling to estimate the amount of mixing within the mixing zone. Through modeling EFSEC 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. EFSEC 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. 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. EFSEC uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

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

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

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two 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:

a. EFSEC 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).

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

EFSEC has determined that the treatment provided at GHEC meets the requirements of AKART (see "Technology-based Limits").

c. EFSEC 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 (Ecology, 2018) describes additional guidance on criteria/design conditions for determining dilution factors.

**Table 7 - Critical conditions used to model the discharge**

| Critical condition | Value |
|---|---|
| Seven-day-average low river flow with a recurrence interval of ten years (7Q10) | 522 cfs |
| Thirty-day low river flow with a recurrence interval of five years (30Q5) | 731 cfs |
| River depth at the 7Q10 period | 3 feet |
| River velocity | 0.2 ft/s |
| Manning roughness coefficient | 0.04 |
| Slope | 0.001 ft/ft |
| Channel width | 260 feet |
| Maximum average monthly effluent flow for chronic and human health non-carcinogen | 0.56 MGD |

| Critical condition | Value |
|---|---|
| Annual average flow for human health carcinogen | 0.44 MGD |
| Maximum daily flow for acute mixing zone | 0.98 MGD |
| 7-DAD MAX/1-DAD-MAX effluent temperature | 14.6 degrees C |

EFSEC obtained ambient data at critical conditions in the vicinity of the outfall from Table 1-4 in the Mixing Zone Analysis prepared by URS Corporation and submitted to EFSEC in February 2014.

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. EFSEC 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.

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

EFSEC 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, EFSEC 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.

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

EFSEC conducted a reasonable potential analysis, using procedures established by the EPA and by EFSEC, 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.

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

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. Because tidal currents change direction, the plume orientation within the mixing zone changes. The plume mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. EFSEC 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.

EFSEC 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. EFSEC 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, EFSEC 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, EFSEC has effectively minimized the size of the mixing zone authorized in the proposed permit.

f. Maximum size of mixing zone.

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

g. Acute mixing zone.

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

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

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

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

- Comply with size restrictions.

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

h. Overlap of mixing zones.

This mixing zone does not overlap another mixing zone.

## III.D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. The table included below summarizes the criteria applicable to this facility's discharge.

### 1. Freshwater aquatic life uses and associated criteria

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 8 - Salmonid spawning, rearing, and migration**

| Criteria | Value |
|---|---|
| Temperature – Highest 7-DAD MAX | 17.5°C (63.5°F) |
| Dissolved oxygen – Lowest 1-Day minimum | 8.0 mg/L |
| Turbidity | 5 NTU over background when the background is 50 NTU or less; or<br>A 10 percent increase in turbidity when the background turbidity is more than 50 NTU. |
| Total dissolved gas | Total dissolved gas must not exceed 110 percent of saturation at any point of sample collection. |
| pH | 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. |

**2. Recreational use and criteria**

The recreational use for this receiving water is primary contact recreation. *E.coli* organism levels must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL.

**3. Water supply uses**

The water supply uses are domestic, agricultural, industrial, and stock watering.

**4. Miscellaneous freshwater uses**

The miscellaneous freshwater uses are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

### III.E. Water quality impairments

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

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

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

EFSEC considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable

methods of treatment and prevention (AKART) as described above in the technology-based limits section. When EFSEC determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

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

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

### 1. Mixing zones and dilution factors

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality based effluent limits varies with the point at which the pollutant has its maximum effect.

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

The buried diffuser manifold at Outfall 0001 is approximately 30 feet long with a diameter of 18 inches. The diffuser has a total of two 8 inch diameter ports. The distance between ports is approximately 10 feet. The diffuser depth is 5 feet. The mean lower low water (MLLW) depth is approximately 8 feet.

**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 mixing zone extends from the bottom to the top of the water column.

The chronic dilution factor below is based on a downstream distance of 303 feet.

**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 mixing zone extends from the bottom to the top of the water column.

The acute dilution factor below is based on a downstream distance of 30.3 feet.

EFSEC determined the dilution factors that occur within these zones at the critical condition using from the Mixing Zone Analysis Summary prepared by URS dated February 27, 2014 (Appendix L of the 2018 Engineering Report). The dilution factors at Outfall 001 are listed below.

**Table 9 - Dilution factors**

| Criteria | Acute | Chronic |
|---|---|---|
| Aquatic Life | 4 | 51 |
| Human Health, Carcinogen | | 67 |
| Human Health, Non-carcinogen | | 67 |

EFSEC determined the impacts of pH, ammonia, metals, other toxics, and temperature as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

**1. pH**

EFSEC modeled the impact to receiving waters under critical conditions using limits for pH from applicable Federal effluent guidelines (40 CFR 423.12) and the *pH-mix-fresh* worksheet in EFSEC's PermitCalc spreadsheet. Model calculations predict no violation of the pH criteria under critical conditions. Therefore, the proposed permit includes limits from the Federal effluent guidelines.

**2. Turbidity**

EFSEC evaluated the impact of turbidity based on the range of turbidity in the effluent and turbidity of the receiving water. Based on visual observation of the facility's effluent and annual sampling results, EFSEC expects no violations of the turbidity criteria outside the designated mixing zone.

### 3. Toxic pollutants

Federal regulations (40 CFR 122.44) require EFSEC 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. EFSEC does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: aluminum, ammonia, total arsenic, antimony, total residual chlorine, cadmium, total chromium, copper, chloroform, dichlorobromomethane, iron, lead, manganese, mercury, nickel, phenol, selenium, and zinc. EFSEC conducted a reasonable potential analysis (See Appendix E) on these parameters to determine whether it would require effluent limits in this permit.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, EFSEC used the available receiving water information for ambient from the 2022 GHEC Receiving Water Study Report prepared by Landau Associates and Ecology's spreadsheet tools.

Valid ambient background data were available for ammonia, arsenic, turbidity, copper, lead, zinc, and nickel (See Table 2). EFSEC used all applicable data to evaluate reasonable potential for this discharge to cause a violation of water quality standards.

EFSEC determined that aluminum, ammonia, arsenic, antimony, cadmium, total chromium, copper, chloroform, dichlorobromomethane, iron, lead, manganese, mercury, nickel, phenol, selenium, and zinc pose no reasonable potential to cause or contribute to exceedances of the water quality criteria at the critical condition using procedures given in the *Technical Support Document for Water Quality-Based Toxics Control* (USEPA, 1991) (Appendix E) and as described above. EFSEC's determination assumes that this facility meets the other effluent limits of this permit.

There is no water quality standard available to evaluate reasonable potential to exceed the water quality criteria for free available chlorine. EFSEC replaced the free available chlorine monitoring requirement with the total residual chlorine in the proposed permit. EFSEC will evaluate the reasonable potential to exceed the water quality criteria for total residual chlorine in next permit cycle.

**4. Temperature**

The state temperature standards (WAC 173-201A, WAC 173-201A-200, WAC 173-201A-600, and WAC 173-201A-602) include multiple elements:

a. Annual summer maximum threshold criteria (June 15 to September 15)
b. Supplemental spawning and rearing season criteria (September 15 to June 15)
c. Incremental warming restrictions
d. Guidelines on preventing acute lethality and barriers to migration of salmonids

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

a. Annual summer maximum and supplementary spawning/rearing criteria

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), and WAC 173-201A-602, 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 some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

b. 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)]. 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.

c. Guidelines to prevent acute lethality or barriers to migration of salmonids. These site-level considerations do not override the temperature criteria listed above.
   i. 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.
   ii. General lethality and migration blockage: The temperature at the edge of a chronic mixing zone must not exceed either a 1DMax of 23°C or a 7DADMax of 22°C. When adjacent downstream temperatures are 3°C or more cooler, the 1DMax at the edge of the chronic mixing zone must not exceed 22°C.
   iii. Lethality to incubating fish: The temperature must not exceed 17.5°C at locations where eggs are incubating.

**Reasonable potential analysis**

Annual summer maximum, supplementary spawning criterion, and incremental warming criteria: EFSEC calculated the reasonable potential for the discharge to exceed the annual summer maximum, the supplementary spawning criterion, and the incremental warming criteria.

The discharge is allowed to warm the water by a defined increment only when the background (ambient) temperature is cooler than the assigned threshold criterion. EFSEC allows warming increments only when they do not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

The incremental increase for this discharge is within the allowable amount. The reasonable potential to exceed analysis showed that no limit was required for temperature.

The proposed permit retains the daily maximum limit of 16°C for effluent temperature at Outfall 001 which was established by the Site Certification Agreement between EFSEC and GHEC in 2003. This limit was based on a Stipulated Agreement with the Washington State Department of Fish and Wildlife. Under critical conditions, the temperature criterion for the receiving water could be exceeded.

GHEC discharges all of its stormwater to the C-1 detention pond and the stormwater infiltrates into the ground. EFSEC determined that temperature is not a significant stormwater pollutant parameter. Therefore, the proposed

permit does not include a temperature limit at Outfall 002B and it does not require the facility to monitor temperature in the stormwater discharge.

### III.H. Human health

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

EFSEC determined the effluent may contain chemicals of concern for human health, based on data or information indicating the discharge contains regulated chemicals.

EFSEC evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) (USEPA, 1991) and EFSEC's *Permit Writer's Manual* (Ecology, 2018) to make a reasonable potential determination. The evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards, and an effluent limit is not needed.

The EPA disapproved Ecology's proposed total arsenic criteria in November 2016 and retained the inorganic arsenic human health criteria set in the 1992 National Toxics Rule (NTR; 40 CFR 131.36). The existing marine and freshwater inorganic arsenic human health criteria remain in effect.

Natural background concentrations of total arsenic in both marine and freshwaters in Washington often exceed the inorganic arsenic criteria.

This discharge includes intake raw water with arsenic concentrations above 0.018 µg/L, which passes through the wastewater treatment plant after initial use. In this situation, no implementation tool exists to account for the naturally occurring element in the intake water source. Intake credits (WAC 173-201A-460) do not apply in this situation because the source water and the receiving water must be the same body of water or proven to be hydraulically connected.

In addition, there is currently no 40 CFR 136-approved analytical method for inorganic arsenic. Evaluation of point source discharges for effluent limit compliance must use 40 CFR 136 methods. The current 40 CFR 136-approved method for arsenic measures the total recoverable portion of the metal, and does not differentiate the inorganic portion. No federally approved translator for inorganic-to-total recoverable arsenic in discharges exists.

Because of these issues, it is not feasible to apply numeric effluent limits for inorganic arsenic. Where numeric effluent limits are infeasible, 40 CFR 122.44(k)

provides for the use of best management practices (BMPs) to control or abate the discharge of pollutants. Monitoring for internal process control or BMP evaluation may use laboratory methods not approved under 40 CFR 136. The proposed permit includes requirements to monitor effluent for total recoverable arsenic, implementation of source control BMPs, and an adaptive management process to refine BMPs for continuous pollutant minimization.

The proposed permit requires GHEC to evaluate contributions from chemicals used in cooling tower maintenance, and reviewing quality assurance reports from bulk chemical suppliers to minimize the arsenic levels in the effluent.

### III.I. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards EFSEC 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[1].

GHEC's discharge of an average 0.38 MGD consists primarily of non-contact cooling water with very low suspended solids concentrations and dissolved and non-dissolved fractions of metals. The metals tend not to bind to the sands and gravels in the river; therefore metals accumulation is not expected to be of concern. Through a review of the discharger characteristics and of the effluent characteristics, EFSEC determined that this discharge has no reasonable potential to violate the sediment management standards.

Permit Special Condition S8 requires GHEC to observe the natural conditions and any solids deposition surrounding Outfall 001 during the outfall evaluation and document these observations in the report.

### III.J. Groundwater quality limits

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

GHEC discharges its stormwater to C-1 pond which is unlined allowing the stormwater to infiltrate into the ground. The stormwater monitoring data for Outfall 002B in Table 4 was compared to the Groundwater Quality Standards. Overall, the stormwater data was below the groundwater quality criteria.

[1] https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Sediment-cleanups

### III.K. Whole effluent toxicity

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

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

Laboratories accredited by Ecology for WET testing must use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format according to the procedures in the *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (Publication 95-80) (Ecology, 2016). EFSEC recommends that each regulated facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

During the previous permit term, the facility conducted effluent characterization for acute and chronic toxicity in 2020 and 2023. Appendix F shows that all test results for Outfall 001 met the performance standards.

The proposed permit requires GHEC to conduct the acute and chronic toxicity testings on the final effluent once in the last summer and once in the last winter prior to submission of the application for permit renewal.

### III.L. Comparison of effluent limits with the previous permit

**Table 10 - Comparison of previous and proposed effluent limits – Outfall 001**

| Limit | Basis of limit | Existing permit limit | Proposed permit limit |
|---|---|---|---|
| Total Suspended Solid (TSS) – Average Monthly | Technology | 30 mg/L | 30 mg/L |
| Total Suspended Solid (TSS) – Maximum Daily | Technology | 100 mg/L | 100 mg/L |
| Total Residual Chlorine – Maximum Daily | Technology | -- | 0.2 mg/L |
| Oil and Grease – Average Monthly | Technology | 15 mg/L | 15 mg/L |
| Oil and Grease – Maximum Daily | Technology | 20 mg/L | 20 mg/L |
| Chromium, Total – Maximum Daily | Technology | 0.2 mg/L | 0.2 mg/L |
| pH – Daily Minimum | Technology | 6.0 SU | 6.0 SU |
| pH – Daily Maximum | Technology | 9.0 SU | 9.0 SU |
| Temperature – Maximum Daily | Site Certification Agreement | 16 °C | 16 °C |

## IV. Monitoring requirements

EFSEC 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.

### IV.A. Wastewater monitoring

The monitoring schedule for Outfalls 001 and 002B is detailed in the proposed permit under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, and significance of pollutants.

EFSEC may reduce monitoring frequency by examining the performance of a discharge. The amount of reduction is dependent upon the ratio of the long term effluent average to the monthly average effluent limit based on the EPA Performance-Based Reduction of Monitoring Frequency guidance.

EFSEC is proposing to reduce the frequency of chromium monitoring from quarterly to semi-annually and to remove turbidity from annual monitoring based upon the evaluations.

### IV.B. Lab accreditation

EFSEC 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). GHEC sends their final effluent and stormwater samples to the ALS Environmental Lab in Kelso, WA with an accreditation No. C544-24. The ALS Environmental Lab is accredited for: pH, total residual chlorine, total suspended solids, ammonia, chromium, oil & grease, arsenic, iron, zinc, and copper.

### IV.C. Effluent limits which are near detection or quantitation levels

The water quality-based effluent concentration limits in the permit are near the limits of current analytical methods to detect or accurately quantify. The method detection limit (MDL) is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results (as determined by a specific laboratory method). The quantitation level (QL) is the level at which a laboratory can reliably report concentrations with a specified level of error. Estimated concentrations are the values between the DL and the QL. EFSEC requires permitted facilities to report estimated concentrations. When reporting maximum daily effluent concentrations, EFSEC requires the facility to report "less than X" where X is the required detection level if the measured effluent concentration falls below the detection level.

## V. Other permit conditions

### V.A. Reporting and record keeping

EFSEC 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).

### V.B. Spill plan

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

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

### V.C. Solid waste control plan

GHEC must prevent pollution of the waters of the state through inappropriate disposal of solid waste or through the release of leachate from solid waste.

This proposed permit requires this facility to update the approved solid waste control plan designed to prevent solid waste from causing pollution of waters of the state. The facility must submit the updated plan to EFSEC for approval (RCW 90.48.080). Refer to the Ecology guidance document, Developing a Solid Waste Control Plan[2].

### V.D. Outfall evaluation

The proposed permit requires GHEC to conduct an outfall inspection and submit a report detailing the findings of that inspection (Special Condition S.8). The inspection must evaluate the physical condition of the discharge pipe and diffusers, and evaluate the extent of sediment accumulations in the vicinity of the outfall.

### V.E. Operation and maintenance manual

EFSEC requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations [40 CFR 122.41(e) and WAC 173-220-150 (1)(g)]. The facility has prepared and submitted an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit.

### V.F. General conditions

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

## VI. Permit issuance procedures

### VI.A. Permit modifications

EFSEC 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, after obtaining new

[2] https://apps.ecology.wa.gov/publications/documents/0710024.pdf

information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

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

### VI.B. Proposed permit issuance

This proposed permit includes all statutory requirements for EFSEC 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. EFSEC proposes to issue this permit for a term of five years.

## VII. References for text and appendices

Ecology. (2010). *Water Quality Program Guidance Manual: Procedures to Implement the State's Temperature Standards through NPDES Permits, Publication 06-10-100.* Retrieved from https://apps.ecology.wa.gov/publications/summarypages/0610100.html

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Ecology. (2016). *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (Publication 95-80).* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/9580.html

Ecology. (2018). *Water Quality Program Permit Writer's Manual, Publication 92-109.* Retrieved from https://apps.ecology.wa.gov/publications/summarypages/92109.html

Ecology. (2019). *Stormwater Management Manual for Eastern Washington, Publication 18-10-044.* Retrieved from https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMEW/2019SWMMEW.htm

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Ecololgy. (2019). *Developing a Solid Waste Control Plan, Publication 07-10-024.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/0710024.html

USEPA. (1985). *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. Part 2, EPA/600/6-85/002B.*

USEPA. (1988). *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling.*

USEPA. (1991). *Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001).* Washington, DC. Retrieved from https://www3.epa.gov/npdes/pubs/owm0264.pdf

USEPA Region 10. (2021). *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load.* Seattle, WA.

**Washington State and EFSEC website general reference links:**

Laws and Regulations[3]

Permit and Wastewater Related Information[4]

[3] http://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx
[4] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance

## Appendix A – Public Involvement Information

EFSEC proposes to reissue a permit to GHEC. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and EFSEC's reasons for requiring permit conditions.

EFSEC will place a Public Notice of Draft on September 28th, 2025 in The Olympian and September 30th, 2025 in The Daily World 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 (the EFSEC office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Urges people to submit their comments, in writing, before the end of the Comment Period
- Tells how to request a public hearing of comments about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.

Frequently Asked Questions about Effective Public Commenting[5]

You may obtain further information from Sara Randolph at (360) 485-1594 or Liem Nguyen by telephone (360) 790-4730 or by writing to the addresses listed below.

Water Quality Permit Coordinator Department of Ecology
Industrial Section
PO Box 47706
Olympia, WA 98504-7600

EFSEC
621 Woodland Square Loop SE
PO Box 43172
Olympia, WA 98503-3172

The primary author of this permit and fact sheet is Liem Nguyen.

[5] https://apps.ecology.wa.gov/publications/SummaryPages/0307023.html

## Appendix B – Your Right to Appeal

The terms and conditions of coverage under this permit are subject to judicial review pursuant to RCW 34.05 (WAC 463-76-063). EFSEC's reissuance, modification, or revocation of the permit is subject to these same provisions.

## 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 RCW 90.48.520, 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.

**$BOD_5$** – 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 $BOD_5$ is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although $BOD_5$ is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

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

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

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

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

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

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

**Compliance inspection-with sampling** – A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. EFSEC 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 level** – or method detection limit means the minimum concentration of an analyte (substance) that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results as determined by the procedure given in 40 CFR part 136, Appendix B.

**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 WAC 173-240-130.

**Enterococci** – A subgroup of fecal streptococci that includes *S. faecalis*, *S. faecium*, *S. gallinarum*, and *S. avium*. The enterococci are differentiated from other streptococci by their ability to grow in 6.5% sodium chloride, at pH 9.6, and at 10°C and 45°C.

***E. coli*** – A bacterium in the family Enterobacteriaceae named Escherichia coli and is a common inhabitant of the intestinal tract of warm-blooded animals, and its presence in water samples is an indication of fecal pollution and the possible presence of enteric pathogens.

**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 limit (MDL)** – See Detection level.

**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 EFSEC defines following procedures outlined in state regulations (chapter 173-201A WAC).

**National pollutant discharge elimination system (NPDES)** – Section 402 of the Clean Water Act, 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 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. EFSEC determines this limit on a site-specific basis. EFSEC 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:

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

EFSEC 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 (ML) – The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (DL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the DL in a method, or the DL determined by a laboratory, by a factor of 3. For the purposes of NPDES compliance monitoring, EPA considers the following terms to be synonymous: "quantitation limit," "reporting limit," and "minimum level".

**Reasonable potential** – A reasonable potential to cause or contribute to 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)** –

- All industrial users subject to Categorical Pretreatment Standards under 40 CFR Chapter I, Subchapter N and 40 CFR 403.6 and;
- 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 the second paragraph 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 EFSEC 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 $BOD_5$** – Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble $BOD_5$ test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard $BOD_5$ test is sufficient to remove the particulate organic fraction.

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

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

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

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

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

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

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

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

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

## Appendix D — Technical Calculations

Reasonable Potential Analysis:

EFSEC uses spreadsheet tools to determine reasonable potential (to cause or contribute to violations of the aquatic life and human health water quality numeric standards) and to calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets come from the *Technical Support Document for Water Quality-based Toxics Control*, (EPA 505/2-90-001) (USEPA, 1991). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b).

# Appendix E — Reasonable Potential Calculation

## Reasonable Potential Calculation

| | |
|---|---|
| **Facility** | Grays Harbor Energy Center |
| **Water Body Type** | Freshwater |
| **Rec. Water Hardness** | 33.2 mg/L |

| Dilution Factors: | Acute | Chronic |
|---|---|---|
| Aquatic Life | 4.0 | 51.0 |
| Human Health Carcinogenic | | 67.0 |
| Human Health Non-Carcinogenic | | 67.0 |

| Pollutant, CAS No. & NPDES Application Ref. No. | | | AMMONIA, Criteria as Total NH3 | ANTIMONY (INORGANIC) 7440360 1M | CADMIUM - 7440439 4M Hardness dependent | COPPER - 744058 6M Hardness dependent | LEAD - 7439921 7M Dependent on hardness | MERCURY 7439976 8M | NICKEL - 7440020 9M - Dependent on hardness | SELENIUM 7782492 10M | ZINC - 7440666 13M hardness dependent | PHENOL 108952 10A | CHLOROFORM 67663 11V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effluent Data** | # of Samples (n) | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | 2 |
| | Coeff of Variation (Cv) | | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| | Effluent Concentration, ug/L (Max. or 95th Percentile) | | 180 | 2.29 | 0.021 | 0.87 | 0.038 | 0.00724 | 0.68 | 1.4 | 3 | 7 | 0.39 |
| | Calculated 50th percentile Effluent Conc. (when n>10) | | | | | | | | | | | | |
| **Receiving Water Data** | 90th Percentile Conc., ug/L | | 0 | | | 2.7 | 0.11 | | 0.74 | | 3 | | |
| | Geo Mean, ug/L | | | | | | | | | | | | |
| **Water Quality Criteria** | Aquatic Life Criteria, ug/L | Acute | 19,727 | - | 1.119587 | 6.02116 | 19.09078 | 2.1 | 556.883 | 20 | 44.9641 | - | - |
| | | Chronic | 1,549 | - | 0.455799 | 4.42428 | 0.74394 | 0.012 | 61.84633 | 5 | 41.0591 | - | - |
| | WQ Criteria for Protection of Human Health, ug/L | | - | 6 | - | 1300 | - | 0.14 | 80 | 60 | 1000 | 9000 | 100 |
| | Metal Criteria Translator, decimal | Acute | - | - | 0.943 | 0.996 | 0.466 | 0.85 | 0.998 | - | 0.996 | - | - |
| | | Chronic | - | - | 0.943 | 0.996 | 0.466 | - | 0.997 | - | 0.996 | - | - |
| | Carcinogen? | | N | N | N | N | N | N | N | N | N | N | Y |

**Aquatic Life Reasonable Potential**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Effluent percentile value | | | 0.950 | | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | 0.950 | |
| s | $s^2=\ln(CV^2+1)$ | | 0.555 | | 0.555 | 0.555 | 0.555 | 0.555 | 0.555 | 0.555 | 0.555 | |
| Pn | Pn=(1-confidence level)$^{1/n}$ | | 0.549 | | 0.549 | 0.549 | 0.549 | 0.549 | 0.549 | 0.549 | 0.549 | |
| Multiplier | | | 2.32 | | 2.32 | 2.32 | 2.32 | 2.32 | 2.32 | 2.32 | 2.32 | |
| Max concentration (ug/L) at edge of… | | Acute | 105 | | 0.012 | 2.529 | 0.093 | 0.004 | 0.949 | 0.814 | 3.986 | |
| | | Chronic | 8 | | 0.001 | 2.687 | 0.109 | 0.000 | 0.756 | 0.064 | 3.077 | |
| **Reasonable Potential? Limit Required?** | | | **NO** | | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | |

**Aquatic Life Limit Calculation**

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

**Human Health Reasonable Potential**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| s | $s^2=\ln(CV^2+1)$ | 0.55451 | 0.55451 | 0.554513 | 0.554513 | 0.55451 | 0.55451 | 0.55451 | 0.55451 |
| Pn | Pn=(1-confidence level)1/n | 0.549 | 0.549 | 0.549 | 0.549 | 0.549 | 0.549 | 0.050 | 0.224 |
| Multiplier | | 0.93363 | 0.93363 | 0.933632 | 0.933632 | 0.93363 | 0.93363 | 2.48953 | 1.5242 |
| Dilution Factor | | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 |
| Max Conc. at edge of Chronic Zone, ug/L | | 0.03191 | 0.01212 | 1.0E-04 | 9.5E-03 | 0.01951 | 0.0418 | 0.2601 | 0.00887 |
| **Reasonable Potential? Limit Required?** | | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** |

## Reasonable Potential Calculation - Page 2

| | |
|---|---|
| **Facility** | Grays Harbor Energy Center |
| **Water Body Type** | Freshwater |
| **Rec. Water Hardness** | 33.2 mg/L |

| Dilution Factors: | Acute | Chronic |
|---|---|---|
| Aquatic Life | 4.0 | 51.0 |
| Human Health Carcinogenic | | 67.0 |
| Human Health Non-Carcinogenic | | 67.0 |

| Pollutant, CAS No. & NPDES Application Ref. No. | | DICHLOROBROMOMETHANE 75274 12V | ALUMINUM, pH 5.0-10.5 7429905 | IRON 7439896 | MANGANESE 7439965 | ARSENIC (dissolved) 7440382 2M | CHROMIUM(HEX) 18540299 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effluent Data** | # of Samples (n) | 2 | 1 | 5 | 1 | 56 | 56 | 56 | | | | | |
| | Coeff of Variation (Cv) | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | |
| | Effluent Concentration, ug/L (Max. or 95th Percentile) | 0.08 | 4 | 56.9 | 2.12 | 8.7 | 2.6 | 2.6 | | | | | |
| | Calculated 50th percentile Effluent Conc. (when n>10) | | | | | | | 3.095 | | | | | |
| **Receiving Water Data** | 90th Percentile Conc., ug/L | | | | | | | | | | | | |
| | Geo Mean, ug/L | | | | | | | | | | | | |
| **Water Quality Criteria** | Aquatic Life Criteria, ug/L — Acute | - | 750 | - | - | 360 | 15 | | | | | | |
| | Aquatic Life Criteria, ug/L — Chronic | - | 87 | 1000 | - | 190 | 10 | | | | | | |
| | WQ Criteria for Protection of Human Health, ug/L | 0.73 | - | 300 | 50 | - | - | | | | | | |
| | Metal Criteria Translator, decimal — Acute | - | - | - | - | 1 | - | | | | | | |
| | Metal Criteria Translator, decimal — Chronic | - | - | - | - | 1 | - | | | | | | |
| | Carcinogen? | Y | N | N | N | Y | N | | | | | | |

### Aquatic Life Reasonable Potential

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effluent percentile value | | | 0.950 | 0.950 | | 0.950 | 0.950 | | | | | | |
| s | $s^2=\ln(CV^2+1)$ | | 0.555 | 0.555 | | 0.555 | 0.555 | | | | | | |
| Pn | $Pn=(1\text{-confidence level})^{1/n}$ | | 0.050 | 0.549 | | 0.948 | 0.948 | | | | | | |
| Multiplier | | | 6.20 | 2.32 | | 1.00 | 1.00 | | | | | | |
| Max concentration (ug/L) at edge of… | Acute | | 6.198 | 33.063 | | 2.175 | 0.650 | | | | | | |
| | Chronic | | 0.486 | 2.593 | | 0.171 | 0.051 | | | | | | |
| **Reasonable Potential? Limit Required?** | | | **NO** | **NO** | | **NO** | **NO** | | | | | | |

### Aquatic Life Limit Calculation

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

### Human Health Reasonable Potential

| | | | | |
|---|---|---|---|---|
| s | $s^2=\ln(CV^2+1)$ | 0.55451 | 0.554513 | 0.55451 |
| Pn | Pn=(1-confidence level)1/n | 0.224 | 0.549 | 0.050 |
| Multiplier | | 1.5242 | 0.933632 | 2.48953 |
| Dilution Factor | | 67 | 67 | 67 |
| Max Conc. at edge of Chronic Zone, ug/L | | 0.00182 | 0.792891 | 0.07877 |
| **Reasonable Potential? Limit Required?** | | **NO** | **NO** | **NO** |

# Appendix F — WET Test Result Summary

**WET Test Results Summary for GHEC (WA0024961)**

| Scheduled | Test Code | Collected | Start Date | Duration | Organism | Endpoint | NOEC | LOEC | Effluent Survival (100%) | Met Performance Standard? |
|---|---|---|---|---|---|---|---|---|---|---|
| 2020 November | CDUD1658 | 11/9/2020 | 11/10/2020 | Chronic | *Daphnia* Water Flea | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Reproduction | 20% | 40% | | |
| 2020 November | CDUD1659 | 11/9/2020 | 11/10/2020 | Chronic | *pimephales promelas* Fathead Minnow | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Biomass | 100% | >100% | | |
| | | | | | | 7-Day Weight | 100% | >100% | | |
| 2020 November | CDUD1660 | 11/9/2020 | 11/10/2020 | Acute | *Daphnia* Water Flea | 48-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2020 November | CDUD1661 | 11/9/2020 | 11/10/2020 | Acute | *pimephales promelas* Fathead Minnow | 96-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2020 August | CDUD1662 | 8/17/2020 | 8/18/2020 | Chronic | *Daphnia* Water Flea | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Reproduction | 100% | >100% | | |
| 2020 August | CDUD1663 | 8/17/2020 | 8/18/2020 | Chronic | *pimephales promelas* Fathead Minnow | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Biomass | 100% | >100% | | |
| | | | | | | 7-Day Weight | 100% | >100% | | |
| 2020 August | CDUD1664 | 8/17/2020 | 8/18/2020 | Acute | *Daphnia* Water Flea | 48-Hour Survival | 100% | >100% | 95.0% | Yes |
| 2020 August | CDUD1665 | 8/17/2020 | 8/18/2020 | Acute | *pimephales promelas* Fathead Minnow | 96-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2020 April | CDUD1666 | 4/6/2020 | 4/7/2020 | Chronic | *Daphnia* Water Flea | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Reproduction | 20% | 40% | | |
| 2020 April | CDUD1667 | 4/6/2020 | 4/7/2020 | Chronic | *pimephales promelas* Fathead Minnow | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Biomass | 100% | >100% | | |
| | | | | | | 7-Day Weight | 100% | >100% | | |
| 2020 April | CDUD1668 | 4/6/2020 | 4/7/2020 | Acute | *Daphnia* Water Flea | 48-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2020 April | CDUD1669 | 4/6/2020 | 4/7/2020 | Acute | *pimephales promelas* Fathead Minnow | 96-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2020 January | CDUD1670 | 4/6/2020 | 4/7/2020 | Chronic | *Daphnia* Water Flea | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Reproduction | 100% | >100% | | |
| 2020 January | CDUD1671 | 4/6/2020 | 4/7/2020 | Chronic | *pimephales promelas* Fathead Minnow | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Biomass | 100% | >100% | | |
| | | | | | | 7-Day Weight | 100% | >100% | | |
| 2020 January | CDUD1672 | 4/6/2020 | 4/7/2020 | Acute | *Daphnia* Water Flea | 48-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2020 January | CDUD1673 | 4/6/2020 | 4/7/2020 | Acute | *pimephales promelas* Fathead Minnow | 96-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2023 January | CDUD1674 | 1/25/2020 | 1/26/2020 | Chronic | *Daphnia* Water Flea | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Reproduction | 100% | >100% | | |
| 2023 January | CDUD1675 | 1/25/2020 | 1/26/2020 | Chronic | *pimephales promelas* Fathead Minnow | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Biomass | 100% | 10% | | |
| | | | | | | 7-Day Weight | 100% | 10% | | |
| 2023 January | CDUD1676 | 1/25/2020 | 1/26/2020 | Acute | *Daphnia* Water Flea | 48-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2023 January | CDUD1677 | 1/25/2020 | 1/26/2020 | Acute | *pimephales promelas* Fathead Minnow | 96-Hour Survival | 100% | >100% | 95.0% | Yes |
| 2023 August | CDUD1678 | 8/2/2023 | 8/3/2023 | Chronic | *Daphnia* Water Flea | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Reproduction | 100% | >100% | | |
| 2023 August | CDUD1679 | 8/2/2023 | 8/3/2023 | Chronic | *pimephales promelas* Fathead Minnow | 7-Day Survival | 100% | >100% | NA | Yes |
| | | | | | | 7-Day Biomass | 100% | 10% | | |
| | | | | | | 7-Day Weight | 100% | 10% | | |
| 2023 August | CDUD1680 | 8/2/2023 | 8/3/2023 | Acute | *Daphnia* Water Flea | 48-Hour Survival | 100% | >100% | 100.0% | Yes |
| 2023 August | CDUD1681 | 8/2/2023 | 8/3/2023 | Acute | *pimephales promelas* Fathead Minnow | 96-Hour Survival | 100% | >100% | 97.5% | Yes |

## Appendix G — Response to Comments

[EFSEC will complete this section after the public notice of draft period.]