

FACT SHEET FOR NPDES PERMIT WA-002403-1

CITY OF LYNNWOOD

June XX, 2008

PURPOSE of this Fact Sheet

This fact sheet explains and documents the decisions Ecology made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for the City of Lynnwood Wastewater Treatment Plant. This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit *and accompanying fact sheet* for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before we issue the final permit. Copies of the fact sheet and draft permit for the City of Lynnwood Wastewater Treatment Plant NPDES permit WA-002403-1, are available for public review and comment from (insert month day, year) until (month day, year). For more details on preparing and filing comments about these documents, please see *Appendix A—Public Involvement*.

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

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as *Appendix F—Response to Comments*.

SUMMARY

The City of Lynnwood operates an activated sludge wastewater treatment plant that discharges to Browns Bay-Puget Sound. The previous permit for this facility was issued on February 20, 2003.

The proposed permit contains the same effluent limits for Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids, Fecal Coliform Bacteria, and pH as the permit issued in 2003.

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I. INTRODUCTION

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

The following regulations apply to municipal NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC),
- Technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC) and for ground waters (chapter 173-200 WAC)
- Sediment management standards (chapter 173-204 WAC).

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

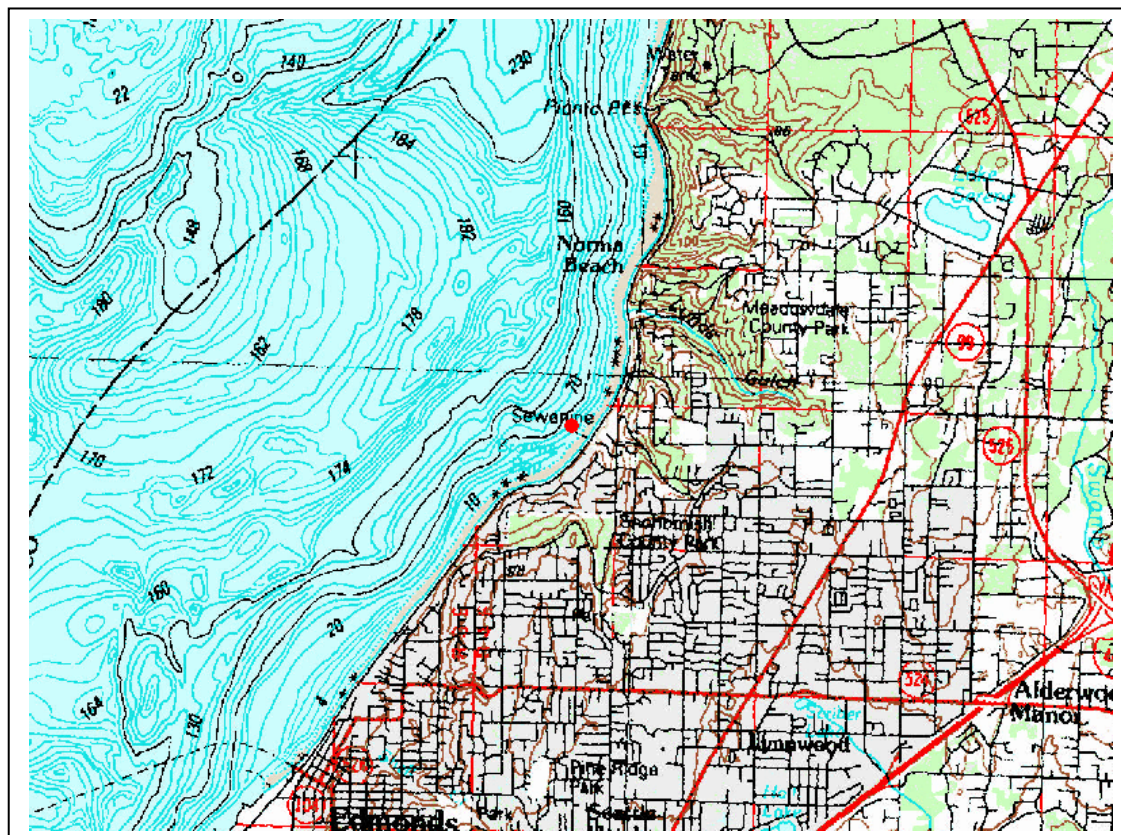
Under the NPDES permit program, Ecology must prepare a draft permit and accompanying fact sheet, and make it available for public review. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments on the draft permit, during a period of thirty days (WAC 173-220-050). (See *Appendix A—Public Involvement* for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit. Ecology will summarize the responses to comments and any changes to the permit in Appendix F.

II. BACKGROUND INFORMATION

Table 1. General Facility Information

| | |
|----------------------------|--|
| Applicant: | City of Lynnwood 19100 – 44 th Avenue West Lynnwood, WA 98036 |
| Facility Name and Address: | Lynnwood Wastewater Treatment Plant 17000 – 76 th Avenue West Edmonds, WA 98026 |
| Type of Treatment: | Activated Sludge |
| Discharge Location: | Browns Bay - Puget Sound Latitude: 47° 50' 52" N Longitude: 122° 20' 33" W |
| Waterbody ID Number: | 1224819475188 |

Figure 1. Facility Location Map ~ Lynnwood Wastewater Treatment Plant



A. Facility Description

History

The City of Lynnwood (City) operates a wastewater treatment facility located on Browns Bay. The treatment facility was originally constructed to provide primary treatment. The Department of Ecology (Ecology) later ordered the City to provide secondary treatment. The City converted its wastewater treatment to an activated sludge secondary treatment plant with chlorine disinfection and incineration of sewage sludge in 1990, increasing the plant's capacity to a maximum month flow of 7.4 MGD. Additional improvements to the wastewater treatment plant were completed in 1998.

The 1998 improvements included replacing the existing corrugated metal outfall pipe with a new HDPE pipe, installing a self-cleaning bar screen, retrofitting the sludge handling system, and installing new clarifier pumps and piping. In addition, the City renovated the odor control system, adding additional capacity for controlling treatment plant emissions and increased the incinerator capacity. With these improvements Ecology issued the current City of Lynnwood NPDES operating permit, which increased the BOD and total suspended solids capacities 17 percent over previous permitted levels. The hydraulic capacity remained at 7.4 MGD, but the capacity for BOD and TSS increased to 15,120 pounds per day. The permit was renewed effective March 1, 2003, and expired June 30, 2007.

Collection System Status

The collection system for the City of Lynnwood is comprised of approximately 100 miles of pipe varying in size from 6-inch collectors to 36-inch interceptors. The City owns and operates six sanitary lift stations. The system is divided into five major drainage basins. They include Lift Station No. 10 Basin, Lift Station No. 12 Basin, Browns Bay Trunk Basin, Western Gravity Basin, and the Edmonds Service Area Basin. Smaller basins associated with the system include Lift Station No. 4 Basin, Lift Station No. 8 Basin, and Lift Station No. 14 Basin.

The Lift Station No. 10 Basin is the City's largest and includes the City Center area of the City. It receives flow from all of the Scriber Creek Drainage Basin and a portion of the Swamp Creek Drainage Basin. Other areas contributing flows to Lift Station No. 10 include the areas associated with three minor lift stations: Lift Station No. 4, Lift Station No. 8, and Lift Station No. 14. Lift Station Nos. 4 and 8 serve portions of the Swamp Creek drainage basin (Alderwood Mall Area). Flows from Lift Station No. 10 are pumped through a 24-inch force main and discharged into a 36-inch interceptor near the intersection of 204th Street and 68th Avenue West, on to the wastewater treatment plant.

Lift Station No.14 collects flows from the relatively small basin associated with the Embassy Suite Complex, south of Interstate 5 and west of 44th Avenue West. Lift Station No. 12 is located southwest of the City's services, an area of approximately 880 acres. Lift Station No. 12 pumps flows through an 18-inch force main to the interceptor line along 76th Avenue West, where it combines with the flows from Lift Station No. 10.

The Browns Bay Trunk Basin, located north of the City, drains primarily east to west to Olympic View Drive in a series of 12-inch and 15-inch pipelines. Flow continues south along Olympic View Drive to the 76th Avenue West Interceptor and flows north to the WWTP. Another small Lift Station No. 7 services a small area in the northwest corner of the basin, pumping flows to the Olympic View Drive system. Sewage from the remainder of the system, including areas in Edmonds serviced by the City of Lynnwood, drains to the 36-inch interceptor line along 76th Avenue West and flows north to the wastewater treatment plant.

Treatment Processes

The City of Lynnwood Wastewater Treatment Plant liquid stream treatment process includes influent screening, grit removal, primary settling, the main lift station, biological treatment in aeration basin, secondary settling, and disinfection with gaseous chlorine. Primary sludge and waste activated sludge thicken in separate gravity thickeners. Operators use a centrifuge to mix and dewater thickened primary sludge and thickened waste activated sludge. Dewatered sludge is burned in a fluidized bed incinerator. A WWTP process schematic and WWTP layout are included in Appendix E.

The facility's primary source of wastewater is domestic sewage from residential and light commercial activities in the City of Lynnwood and a portion of the City of Edmonds.

The City of Lynnwood received approval of its pretreatment program on August 28, 1984. The City does not have any categorical industrial discharges or other significant industrial users (SIU). They do have a large quantity of small industrial and commercial facilities that have the potential to impact the wastewater collection and treatment systems. The facilities are surveyed and inspected regularly.

Discharge Outfall

The treated and disinfected effluent flows into Browns Bay through an outfall pipe and diffuser. The existing outfall pipe is 36-inch diameter High Density Polyethylene (HDPE) pipe. The outfall pipe includes a total of 850 lineal feet (LF); 750 LF offshore, and 100 LF onshore. The onshore portion leaves the chlorine contact tank and proceeds in a westerly direction for approximately 90 LF. It encounters the east manhole, passes under the Burlington Northern Railroad tracks, and encounters the west manhole prior to beach and continues offshore.

The offshore portion terminates at an elevation approximately -98 mean lower low water (MLLW) datum. From this point, 240 LF of 36-inch diameter diffuser section continues to an elevation of approximately -114 MLLW datum. The diffuser has 82 ports.

Residual Solids

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit is removed in a grit chamber and collector, then pumped to a dewatering screw conveyor,

and discharged into a sealed dumpster. A private contractor disposes of the dewatered grit. Scum removed from the primary clarifier is routed to the scum collection basin along with primary sludge from the gravity sludge thickener. Scum flows from the scum collection basin to the sludge blending tank. Secondary clarifier scum flows back to the headworks. Blended scum, primary sludge, and secondary sludge are dewatered in a centrifuge and incinerated in a fluidized bed incinerator. Ash from the incinerator is thickened and dewatered in a vacuum filter for final disposal to a landfill by a private contractor.

B. Permit Status

Ecology issued the previous permit for this facility on February 20, 2003. The previous permit placed effluent limits on 5-day Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS), pH, Chlorine and Fecal Coliform Bacteria.

The City of Lynnwood Wastewater Treatment Plant submitted an application for permit renewal on December 21, 2006. Ecology accepted it as complete on January 26, 2007.

The permit was extended on June 18, 2007.

C. Summary of Compliance with Previous Permit Issued

Ecology staff last conducted a sampling compliance inspection on November 27, 2007. The facility appeared to be in very good condition and operating well.

During the history of the NPDES permit issued on February 20, 2003, the Lynnwood Wastewater Treatment Plant has had one effluent Total Suspended Solids violation. Ecology did not consider it a serious violation and the city took the appropriate steps to address the violation. In addition, the facility had two Influent Flow warnings during the last permit cycle. Ecology warned the facility since it exceeded 85% of the rated design capacity. Table 1 below shows a summary of compliance during the permit cycle. Ecology's assessment of compliance is based on our review of the facility's Discharge Monitoring Reports (DMRs) and on inspections conducted by Ecology.

Table 2. Compliance Summary

| Count of Violation from January 1, 2002 to March 13, 2008 | | | | | |
|---|-----------|-----------------|---------|--------------------|----------------------|
| Monitoring Point | Parameter | | Unit | Number of Warnings | Number of Violations |
| Influent | Flow | Monthly Average | MGD | 1 ^a | |
| Influent | Flow | Monthly Average | MGD | 1 ^a | |
| Effluent | TSS | Weekly Average | LBS/DAY | | 1 ^a |

^a Warnings for flow, influent BOD, and influent TSS when reported value is greater than 85% of design.

D. Wastewater Characterization

The concentration of pollutants in the discharge was reported in the NPDES application and in Discharge Monitoring Reports. Appendix D provides the data reported on DMR's between Mar.-03 and Dec.-07. The facility's primary source of wastewater is domestic sewage from residential and light commercial activities in the City of Lynnwood and a portion of the City of Edmonds. As a result, the potential for toxic pollutants in the effluent is assumed very low. The effluent is characterized as follows:

Table 3. NPDES Application Data Summary

| Parameter | Maximum Daily Value | | Average Daily Value | | |
|----------------------|---------------------|----------------|---------------------|-------|-------------------|
| | Value | Units | Value | Units | Number of Samples |
| pH (Minimum) | 6.5 | Standard Units | | | |
| pH (Maximum) | 7.1 | Standard Units | | | |
| Flow Rate | 12.9 | mgd | 4.49 | mgd | 365 |
| Temperature (Winter) | 19.6 | °C | 15.6 | °C | 181 |
| Temperature (Summer) | 23.0 | °C | 20.7 | °C | 184 |

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML/MDL |
|--|-------------------------|-------|-------------------------|-------|-------------------|-------------------|---------|
| | Conc. | Units | Conc. | Units | Number of Samples | | |
| Conventional and Nonconventional Compounds | | | | | | | |
| CBOD ₅ | 40 | mg/L | 12 | mg/L | 156 | SM 5210 | 25/40 |
| Fecal Coliform | 2400 | MPN | 82 | MPN | 156 | SM 9221E | 200/400 |
| Total Suspended Solids (TSS) | 58 | mg/L | 16 | mg/L | 156 | SM 2540D | 30/45 |

NPDES Application B6.

NPDES Application No.

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML/MDL |
|--|-------------------------|-------|-------------------------|-------|-------------------|-------------------|---------|
| | Conc. | Units | Conc. | Units | Number of Samples | | |
| Conventional and Nonconventional Compounds | | | | | | | |
| Chlorine (Total Residual, TRC) | 790 | µg/L | 135 | µg/L | 365 | MS 4500-Cl G | 318/834 |
| Dissolved Oxygen | 9.9 | mg/L | 8.5 | mg/L | 365 | SM 4500-O G | -- |
| Oil and Grease | 1.0 | mg/L | < 1 | mg/L | 4 | EPA 1664 | -- |

NPDES Permit Application D. Pollution Present in Detectable Levels.

| NPDES Permit Application D: Pollution Present in Detectable Levels: | | | | | | | |
|---|-------------------------|-------|-------------------------|-------|-------------------|-------------------|--------|
| POLLUTANT | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML/MDL |
| | Conc. | Units | Conc. | Units | Number of Samples | | |
| Metals (Total Recoverable), Cyanide, Phenols, and Hardness | | | | | | | |
| Arsenic | .002 | µg/L | .001 | µg/L | 4 | EPA 200.9 | .001 |
| Chromium | .001 | µg/L | <.001 | µg/L | 4 | EPA 200.7 | .001 |
| Copper | .014 | µg/L | .005 | µg/L | 4 | EPA 200.7 | .001 |

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML/MDL |
|------------|-------------------------|-------|-------------------------|-------|-------------------|-------------------|--------|
| | Conc. | Units | Conc. | Units | Number of Samples | | |
| Lead | .001 | µg/L | <.001 | µg/L | 4 | EPA 239.2 | .001 |
| Selenium | .001 | µg/L | <.001 | µg/L | 4 | EPA 270.2 | .001 |
| Zinc | .053 | µg/L | .045 | µg/L | 4 | EPA 200.7 | .001 |
| Chloroform | 2.3 | µg/L | 2 | µg/L | 3 | EPA 624 | 1 |

Low level mercury test was completed by Lynnwood as a part of Ecology's request to complete low level mercury testing the results are as follows:

| Sample Date | Mercury Conc. (ng/l) | Mercury Conc. Avg. (ng/l) |
|-------------|----------------------|---------------------------|
| 1/17/2007 | 9.39 | 12 |
| 7/11/2007 | 14.7 | |

III. PROPOSED PERMIT LIMITS

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

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

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

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

A. Design Criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Ecology-approved design criteria for this facility's treatment plant were obtained from the City of Lynnwood Wastewater Treatment Engineering Report prepared by HDR Engineering, Inc. and approved by Ecology on April 19, 2005.

Table 4. Design Criteria for Lynnwood WWTP

| Parameter | Design Quantity |
|--------------------------------------|-----------------|
| Monthly average flow (maximum month) | 7.4 MGD |
| BOD ₅ influent loading | 15,120 lb./day |
| TSS influent loading | 15,120 lb./day |

B. Technology-based Effluent Limits

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

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

Table 5. Technology-based Limits.

| Parameter | Limit |
|--------------------------------------|--|
| pH | Shall be within the range of 6.0 to 9.0 standard units. |
| Fecal Coliform Bacteria | Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL |
| CBOD ₅ (concentration) | Average Monthly Limit is the most stringent of the following: - 25 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 40 mg/L |
| TSS (concentration) | Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L |
| Chlorine | Average Monthly Limit = 0.5 mg/L (500 µg/L) Average Weekly Limit = 0.75 mg/L (750 µg/L) |

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

The existing permit has a water quality-based chlorine limit of 318 µg/L, monthly average and 834 µg/L daily maximum. Since the facility has demonstrated the ability to achieve this limit, the new permit will use this limit unless a more stringent limit is necessary for water quality protection.

The CBOD₅ limits shown above are used in place of BOD₅ limits according to WAC 173-221-050 (6).

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

Monthly effluent mass loadings for TSS (lbs/day) = maximum monthly design flow (7.4 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 1,851 lbs./day.

Monthly effluent mass loadings for CBOD (lbs/day) = maximum monthly design flow (7.4 MGD) x Concentration limit (25 mg/L) x 8.34 (conversion factor) = mass limit 1,543 lbs./day.

The weekly average effluent mass loading for both CBOD₅ (lb/day) = 7.4 MGD x 40mg/L x 8.34 (conversion factor) = 2,469 lbs/day

The weekly average effluent mass loading for both TSS (lb/day) = 7.4 MGD x 45mg/L x 8.34 (conversion factor) = 2,777 lbs/day

C. Surface Water Quality-based Effluent Limits

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

Numerical Criteria for the Protection of Aquatic Life and Recreation

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

Numerical Criteria for the Protection of Human Health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

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

Antidegradation

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

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

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

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

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

This facility must meet Tier I requirements.

- Existing and designated uses must be maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.

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

Table 6. Demonstration of 'No Measurable Change' at edge of chronic mixing zone.

| Parameter | Definition of 'Measurable Change' From Ambient Conditions* | Estimated Change at Edge of Chronic Mixing Zone |
|---------------------------------|--|---|
| Temperature | Increase of 0.3°C or greater | 0.00°C |
| Dissolved oxygen | Decrease of 0.2 mg/L or greater | |
| Bacteria level (fecal coliform) | Increase of 2 cfu/100 mL or greater | 2 cfu/100 mL |
| pH | Change of 0.1 units or greater | Marine waters have high buffering capacity. No increase expected. |
| Turbidity | Increase of 0.5 NTU or greater | No increase expected. |
| Toxic or radioactive substances | Any detectable increase | No increase expected. |

* As defined by Ecology, 2005: *Supplementary Guidance, Implementing the Tier II Antidegradation Rules*, page 6. Concentrations at Chronic Mixing Zone.

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 diluting wastewater does not interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

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

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control and treatment (AKART). Mixing zones typically require compliance with water quality criteria within 200 to 300 feet from the point of discharge, and use no more than 25% of the available width of the water body for dilution. We use modeling to estimate the amount of mixing within the mixing zone. Through modeling we determine the potential for violating the water quality standards at the edge of the mixing zone and derive any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to

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

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 10 means the effluent is 10% and the receiving water is 90% of the total volume of water at the boundary of the mixing zone. We use dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

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

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

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

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

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

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

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

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

3. Ecology must consider critical discharge conditions.

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

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology uses the water depth at mean lower low water (MLLW) for marine waters. Ecology's *Permit Writer's Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology's website at: <http://www.ecy.wa.gov/biblio/92109.html>.

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

- Have a reasonable potential to cause the loss of sensitive or important habitat,
- Substantially interfere with the existing or characteristic uses,
- Result in damage to the ecosystem, or
- 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 95% of the species tested and to fully protect all commercially and recreationally important species.

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

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column.

Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

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

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics, and the discharge location. Based on this review, we conclude 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.

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

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant. We concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone.

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

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

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

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

7. Maximum size of mixing zone.

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

8. Acute Mixing Zone.

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

We determined the acute criteria will be met at 10% of the distance of the chronic mixing zone at the MLLW.

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

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

- **Comply with size restrictions.**

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

9. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

D. Description of the Receiving Water

Lynnwood WWTP discharges to Browns-Bay Puget Sound. Other nearby point source outfalls include the Picnic Point Wastewater Treatment Plant, which discharges into Possession Sound in the central Puget Sound and Edmonds Wastewater Treatment Plant which also discharges into Possession Sound in the central; Puget Sound's significant nearby non-point sources of pollutants include stormwater runoff from the primarily residential area.

The ambient background data used for this permit used Ecology's ambient marine monitoring data of monitoring station PSS010 (available at http://www.ecy.wa.gov/programs/eap/mar_wat/mwm_intr.html):

Table 7. Ambient Background Data.

| Parameter | Value Used |
|---------------------------------------|---------------------------------------|
| Temperature (highest annual 1-DADMax) | 12.9° C (95 th Percentile) |
| pH Maximum/Minimum | 7.6 |
| Dissolved Oxygen | 6.8mg/L |
| Salinity | 30 psu |

E. Designated Uses and Surface Water Quality Criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). Criteria applicable to this facility's discharge are summarized below in Table 8.

Table 8. Aquatic Life Uses & Associated Criteria

| Extraordinary Quality | |
|--|--|
| Temperature Criteria – Highest 1D MAX | 13°C (55.4°F) |
| Dissolved Oxygen Criteria – Lowest 1-Day Minimum | 7.0 mg/L |
| Turbidity Criteria | <ul style="list-style-type: none"> • 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU. |
| pH Criteria | pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.2 units. |

- To protect **shellfish harvesting**, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.
- The **recreational uses** are primary contact recreation and secondary contact recreation.

The recreational uses for this receiving water are identified below.

Table 9. Recreational Uses.

| Recreational Use | Criteria |
|----------------------------|---|
| Primary Contact Recreation | Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL. |

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

F. Evaluation of Surface Water Quality-based Effluent Limits for Numeric Criteria

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

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

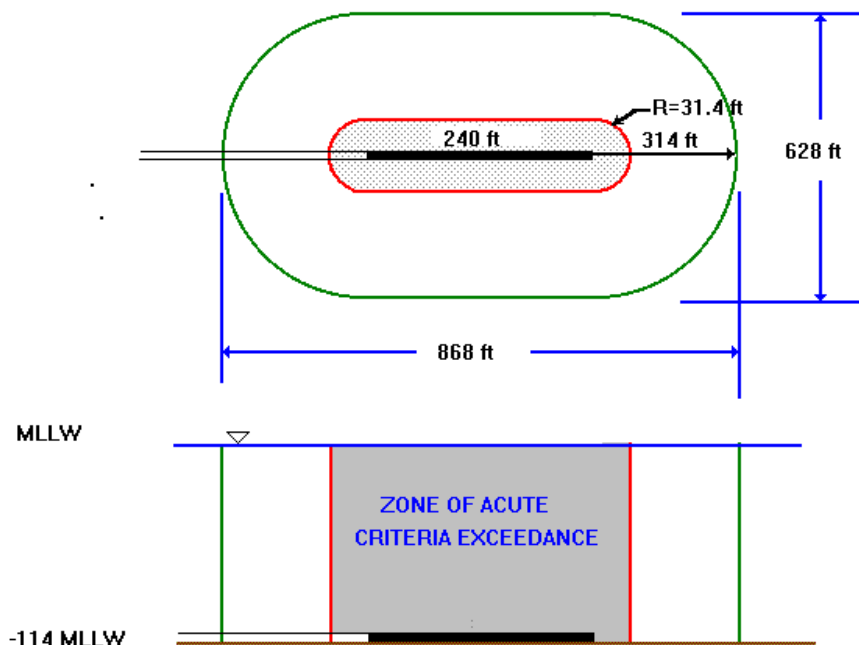
Chronic Mixing Zone

WAC 173-201A-400(7)(b) specifies that mixing zones must not extend in any horizontal direction from the discharge ports for a distance greater than 200 feet plus the depth of water over the discharge ports as measured during MLLW.

The horizontal distance of the chronic mixing zone is 298 feet. The mixing zone extends from the seabed to the top of the water surface.

Acute Mixing Zone

WAC 173-201A-400(8)(b) specifies that in estuarine waters a zone where acute criteria may be exceeded must not extend beyond 10% of the distance established for the chronic zone. The acute mixing zone for Outfall 001 extends 31.4 feet in any direction from any discharge port.



The diffuser is 240 feet long. The diameter is 36 inches. The diffuser has a total of 80 ports. The ports are 4 feet apart. The depth is -122 feet. The MLLW depth and the diffuser is -114 feet.

Ecology determined the dilution factors that occur within these zones at the critical condition using Plumes Model. The dilution factors are listed in Table 10.

Table 10. Dilution Factors (DF)

| Criteria | Acute | Chronic |
|------------------------------|-------|---------|
| Aquatic Life | 64 | 186 |
| Human Health, Carcinogen | | 186 |
| Human Health, Non-carcinogen | | 186 |

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

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

Temperature—the state temperature standards include multiple criteria, each with different durations of exposure and points of application. Ecology evaluates each criterion independently to determine reasonable potential and permit limits.

A conservative screening analysis can be performed with just effluent temperature data and the dilution factor to show that a reasonable potential clearly does not exist. No reasonable potential exists to exceed the temperature criterion where:

$$\begin{aligned}
 &(\text{Criterion} + 0.3) > \text{Criterion} + \frac{(T_{\text{effluent95}} - \text{Criterion})}{186} \\
 &13 + 0.3 > 13 + [(18.6 - 13)/186] \\
 &13.3 > 13.03
 \end{aligned}$$

This screening analysis must be performed with both the annual maximum and any supplementary spawning criterion.

- Temperature Chronic Effects

a) Annual summer maximum and supplementary spawning criteria.

The annual maximum temperature criteria (13°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures. Marine water criteria are expressed as the highest one-day annual maximum temperature (1-DMax).

b) Incremental warming criteria.

Some waters are naturally incapable of meeting their assigned threshold temperature criteria. At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

- Temperature Acute Effects

a) 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. The upper 99th percentile daily maximum effluent temperature prior to discharge is less than 33°C. Therefore, there is no instantaneous lethality for passing fish.

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

Fecal Coliform—Ecology modeled the numbers of fecal coliform by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 186.

Under critical conditions modeling predicts no violation of the water quality criterion for fecal coliform. Therefore, the proposed permit includes the technology-based effluent limitation for fecal coliform bacteria.

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

The following toxic pollutants are present in the discharge: chlorine, arsenic, chromium, copper, selenium and zinc. Ecology conducted a reasonable potential analysis (See Appendix C) to determine whether effluent limits for these pollutants would be required in this permit, using procedures given in EPA, 1991.

No valid ambient background data was available for list pollutants. Ecology found no reasonable potential to exceed the water quality criteria using zero for background. The proposed permit requires background concentrations near the point of discharge. This information may result in a permit modification or additional limits in the next permit cycle.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature, pH, and salinity of the receiving marine water. Ecology did not evaluate ammonia toxicity as there was no available data in the NPDES Application for ammonia in the effluent. Lynnwood WWTP will monitor the final effluent for ammonia three times per year.

G. Whole Effluent Toxicity

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

- *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 retarded growth or reduced 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 survival.

Ecology-accredited WET testing laboratories use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know how to calculate an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (<http://www.ecy.wa.gov/biblio/9580.html>) which is referenced in the permit. Ecology recommends that each regulated facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

Ecology-accredited WET testing laboratories use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff knows about WET testing and how to calculate an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (<http://www.ecy.wa.gov/biblio/9580.html>), which is referenced in the permit. Ecology recommends that Lynnwood WWTF send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water chronic toxicity. The proposed permit will not impose a chronic WET limit. Lynnwood WWTP must retest the effluent before submitting an application for permit renewal.

- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization.
- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased. Lynnwood WWTP may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing after the process or material changes have been made.

H. Human Health

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

Ecology determined the effluent contains chloroform which is of concern for human health, based on data or information indicating regulated chemicals occurs in the discharge.

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

I. Sediment Quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards, Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400).

Ecology determined that this discharge has potential to cause a violation of the sediment quality standards because of the size of the facility. Ecology recommends baseline sediment testing for all facilities greater than 1 MGD. The proposed permit includes a condition requiring Lynnwood Wastewater Treatment Plant to demonstrate either:

- The point of discharge is not an area of deposition; or
- Toxics do not accumulate in the sediments even though the point of discharge is a depositional area.

J. Ground Water Quality Limits

The ground water quality standards (chapter 173-200 WAC) protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100). The Lynnwood Wastewater Treatment Plant has no discharge to ground and therefore no permit limitations are required to protect the ground water.

K. Comparison of Effluent Limits with the Previous Permit Issued on February 20, 2003.

Table 11. Comparison of Effluent Limits.

| | Basis of Limit | Previous Effluent Limits: Outfall # 001 | | Proposed Effluent Limits: Outfall # 001 | |
|--|----------------|---|--------------------------|--|--------------------------|
| Parameter | | Average Monthly | Average Weekly | Average Monthly | Average Weekly |
| Carbonaceous Biochemical Oxygen Demand (5-day) | Technology | 25 mg/L, 1543 lbs/day | 40 mg/L, 2469 lbs/day | 25 mg/L, 1543 lbs/day | 40 mg/L, 2469 lbs/day |
| Total Suspended Solids | Technology | 30 mg/L, 1851 lbs/day | 45 mg/L, 2777 lbs/day | 30 mg/L, 1851 lbs/day | 45mg/L, 2777 lbs/day |
| Fecal Coliform Bacteria | Technology | 200/100 mL | 400/100 mL | 200 mL | 400/100 mL |
| pH | Technology | Shall not be outside the range of 6.0to 9.0 | | Shall not be outside the range of 6.0 to 9.0 | |
| | Basis of Limit | Previous Effluent Limits: Outfall # 001 | | Proposed Effluent Limits: Outfall # 001 | |
| Parameter | | Average Monthly | Maximum Daily | Average Monthly | Maximum Daily |
| Total Residual Chlorine | Water Quality | 318 µg/L | 834 µg/L | 318 µg/L | 834 µg/L |

There are no changes to the permit limits from the permit issued on February 20, 2003.

IV. MONITORING REQUIREMENTS

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

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for activated sludge treatment plant.

A. Lab Accreditation

Ecology requires that all monitoring data (with the exception of certain parameters) must be prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. Ecology accredited the laboratory at this facility for CBOD, BOD, TSS, DO, pH, fecal coliform and residual chlorine.

V. OTHER PERMIT CONDITIONS

A. Reporting and Record Keeping

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

B. Prevention of Facility Overloading

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

C. Operation and Maintenance (O&M)

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

Inflow and Infiltration (I&I) Study

Significant portions of the collection system are over thirty years old, were constructed using techniques such as concrete pipes with oakum packing and/or have numerous manholes which were not installed using modern materials. Leaks are anticipated to be present in

significant quantities or in sensitive locations. Due to the age and construction methods employed during installation of the collection system, leaks are expected to be present. The permit will require the collection system to be characterized for the presence of leaks:

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

Three good references to aid in these tasks are: 1) American Society of Civil Engineers and Water Environment Federation Manual of Practice FD-6. *Existing Sewer Evaluation and Rehabilitation*; 2) U.S. Environmental Protection Agency. *Handbook for Sewer System Infrastructure Analysis and Rehabilitation*. EPA/625/6-91/030. 1991; and 3) Washington State Department of Transportation. *Standard Specifications for Road, Bridge, and Municipal Construction*. 2002.

Following characterization of the leaks, Ecology may require corrective actions by issuing an administrative order following review of the assessment.

D. Pretreatment

To provide more direct and effective control of pollutants, Ecology has delegated permitting, monitoring, and enforcement authority to the City of Lynnwood for industrial users discharging to their treatment system. Ecology oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC).

E. Residual Solids Handling

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

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

F. Spill Plan

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

The proposed permit requires this facility to develop and implement a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs.

G. Outfall Evaluation

The proposed permit requires Lynnwood Wastewater Treatment Facility to conduct an outfall inspection and submits a report detailing the findings of that inspection (Condition S14). The report may include photos and / or video on DVD of the inspection. 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.

H. General Conditions

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

VI. PERMIT ISSUANCE PROCEDURES

A. Permit Modifications

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

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

B. Proposed Permit Issuance

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

VII. REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

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

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

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

Washington State Department of Ecology.

2006. Permit Writer's Manual. Publication No. 92-109 (<http://www.ecy.wa.gov/biblio/92109.html>)

Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

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

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

VIII. APPENDICES

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

Ecology proposes to reissue a permit to the Lynnwood Wastewater Treatment Facility limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Application (PNOA) on February 1, 2007, and February 8, 2007, in *The Everett Herald* to inform the public about the submitted application and to invite comment on the reissuance of this permit.

Ecology will place a Public Notice of Draft (PNOD) on XXXX in *The Everett Herald* to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The Notice –

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website.).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the proposed permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on Ecology's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing of comments about the proposed NPDES Permit.
- Explains the next step(s) in the permitting process.

Ecology has published a document entitled **Frequently Asked Questions about Effective Public Commenting** which is available on our website at <http://www.ecy.wa.gov/biblio/0307023.html>.

You may obtain further information from Ecology by telephone, 425-649-7201, or by writing to the address listed below.

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

The primary author of this permit and fact sheet is Bernard Jones, P.E.

APPENDIX B—GLOSSARY

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

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

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

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

Average Monthly Discharge Limitation—The average of the measured values obtained over a calendar month's time.

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

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

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

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

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

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

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

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

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

Continuous Monitoring—Uninterrupted, unless otherwise noted in the permit.

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

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

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

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

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

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

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

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

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

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

Mixing Zone—An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (chapter 173-201A WAC).

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

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

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

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

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

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

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

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

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

Water Quality-based Effluent Limit—A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into receiving waters.

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at <http://www.ecy.wa.gov>.

Department of Ecology~B Jones

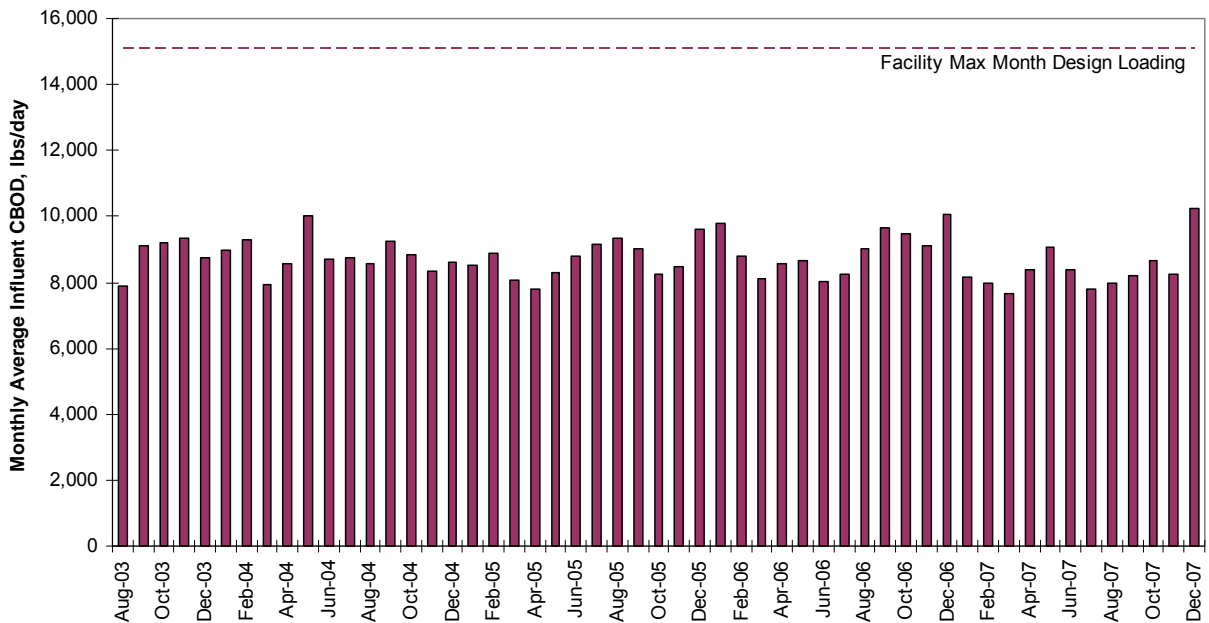
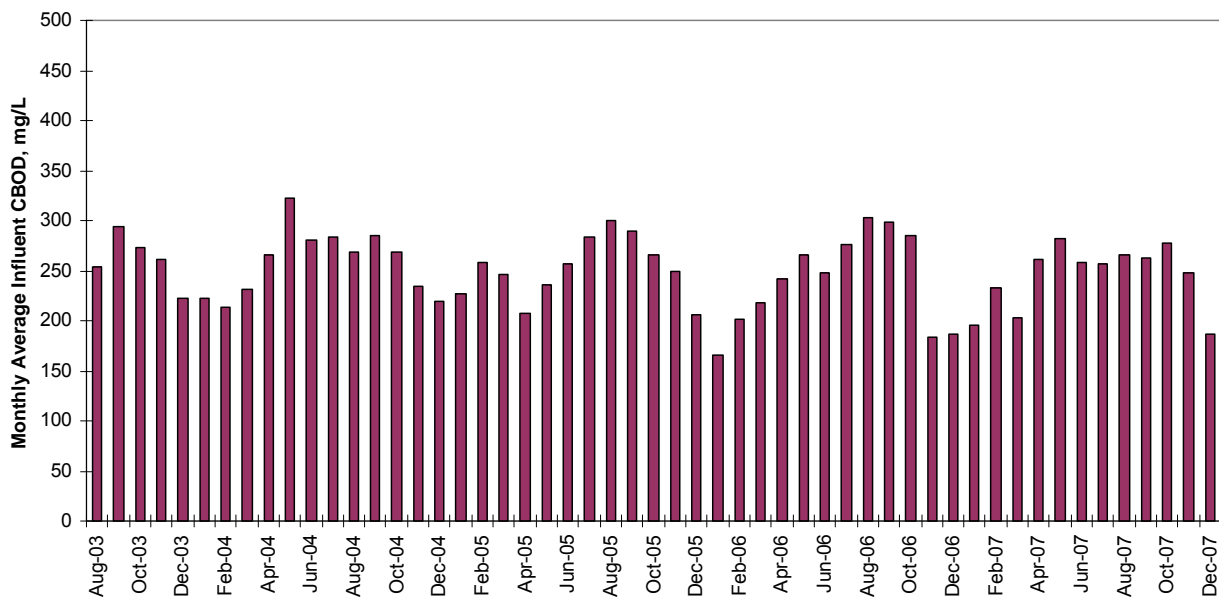
APPENDIX D—DMR DATA

| Date | Influent | | | | | | | | | | | | | | | |
|----------|------------|-------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|--|--|
| | Flow, MGD | | BOD, mg/L | | BOD, ppd | | CBOD, mg/L | | CBOD, ppd | | TSS, mg/L | | TSS, ppd | | | |
| | Mnthly Ave | | Mnthly Ave | | Mnthly Ave | | Mnthly Ave | | Mnthly Ave | | Mnthly Ave | | Mnthly Ave | | | |
| | Ave | Max | Ave | Wkly Ave | Ave | Wkly Ave | Ave | Wkly Ave | Ave | Wkly Ave | Ave | Wkly Ave | Ave | Wkly Ave | | |
| 1-Mar-03 | 4.81 | 7.96 | 226 | 280 | 8,504 | 9389 | 215 | 260 | 8107 | 9389 | 184 | 208 | 6979 | 7986 | | |
| 1-Apr-03 | 4.20 | 4.64 | 246 | 280 | 8,805 | 9714 | 232 | 270 | 8252 | 9165 | 213 | 277 | 7588 | 9402 | | |
| 1-May-03 | 3.81 | 4.37 | 268 | 320 | 8,685 | 9958 | 251 | 280 | 8216 | 9294 | 233 | 273 | 7578 | 8796 | | |
| 1-Jun-03 | 3.65 | 4.22 | 272 | 320 | 8,294 | 9661 | 249 | 280 | 7604 | 8453 | 259 | 278 | 7921 | 8532 | | |
| 1-Jul-03 | 3.61 | 4.29 | 276 | 330 | 8,329 | 9715 | 259 | 320 | 7692 | 8570 | 262 | 292 | 7918 | 8787 | | |
| 1-Aug-03 | 3.66 | 4.29 | 253 | 300 | 7,897 | 9107 | 239 | 270 | 7478 | 8229 | 254 | 280 | 7941 | 8802 | | |
| 1-Sep-03 | 3.70 | 4.07 | 294 | 400 | 9,096 | 12076 | 280 | 380 | 8569 | 11473 | 259 | 283 | 8071 | 8791 | | |
| 1-Oct-03 | 4.20 | 12.00 | 273 | 330 | 9,207 | 10541 | 268 | 370 | 8933 | 12251 | 237 | 307 | 7919 | 9806 | | |
| 1-Nov-03 | 4.77 | 11.50 | 261 | 290 | 9,350 | 10495 | 239 | 290 | 9227 | 12468 | 208 | 238 | 8075 | 11989 | | |
| 1-Dec-03 | 4.69 | 6.05 | 223 | 250 | 8,735 | 9624 | 222 | 250 | 8695 | 9624 | 189 | 220 | 7355 | 8277 | | |
| 1-Jan-04 | 5.43 | 10.94 | 223 | 260 | 8,956 | 10257 | 210 | 240 | 8382 | 9651 | 172 | 206 | 6853 | 7545 | | |
| 1-Feb-04 | 4.97 | 7.08 | 214 | 260 | 9,290 | 10680 | 201 | 240 | 8753 | 10118 | 178 | 214 | 7805 | 9790 | | |
| 1-Mar-04 | 4.11 | 4.67 | 232 | 270 | 7,942 | 9028 | 217 | 260 | 7326 | 8782 | 201 | 241 | 6870 | 7361 | | |
| 1-Apr-04 | 3.78 | 4.29 | 265 | 300 | 8,586 | 9858 | 252 | 310 | 8066 | 9201 | 226 | 261 | 7237 | 8576 | | |
| 1-May-04 | 3.74 | 4.10 | 323 | 420 | 10,034 | 13065 | 313 | 410 | 9797 | 12754 | 253 | 298 | 7934 | 9718 | | |
| 1-Jun-04 | 3.70 | 4.29 | 281 | 320 | 8,700 | 9875 | 269 | 320 | 8182 | 9341 | 241 | 264 | 7466 | 8346 | | |
| 1-Jul-04 | 3.64 | 4.05 | 284 | 360 | 8,730 | 11529 | 276 | 350 | 8501 | 11209 | 269 | 317 | 8326 | 10152 | | |
| 1-Aug-04 | 3.83 | 4.33 | 269 | 300 | 8,547 | 9390 | 249 | 280 | 7863 | 904 | 276 | 299 | 8751 | 9912 | | |
| 1-Sep-04 | 3.87 | 4.29 | 285 | 340 | 9,257 | 11314 | 238 | 260 | 7699 | 8652 | 258 | 287 | 8370 | 9550 | | |
| 1-Oct-04 | 3.97 | 4.56 | 268 | 300 | 8,852 | 10734 | 243 | 280 | 8026 | 10018 | 248 | 301 | 8152 | 9553 | | |
| 1-Nov-04 | 4.14 | 5.53 | 235 | 270 | 8,342 | 10889 | 220 | 250 | 7597 | 8478 | 218 | 273 | 7755 | 12386 | | |
| 1-Dec-04 | 4.85 | 7.84 | 219 | 260 | 8,590 | 10088 | 206 | 260 | 8173 | 9801 | 195 | 233 | 7782 | 9794 | | |
| 1-Jan-05 | 4.37 | 5.63 | 227 | 260 | 8,505 | 10191 | 214 | 240 | 8029 | 9408 | 196 | 222 | 7357 | 8968 | | |
| 1-Feb-05 | 4.07 | 5.06 | 258 | 360 | 8,865 | 12700 | 243 | 300 | 8354 | 10583 | 213 | 346 | 7333 | 12206 | | |
| 1-Mar-05 | 3.97 | 6.09 | 247 | 290 | 8,085 | 9481 | 236 | 280 | 7698 | 9154 | 217 | 264 | 7083 | 8367 | | |
| 1-Apr-05 | 4.60 | 7.12 | 208 | 240 | 7,780 | 10300 | 190 | 210 | 7122 | 9758 | 188 | 222 | 7021 | 9019 | | |
| 1-May-05 | 4.22 | 5.99 | 236 | 270 | 8,290 | 13488 | 220 | 260 | 7617 | 11990 | 223 | 249 | 7743 | 11640 | | |
| 1-Jun-05 | 4.15 | 4.74 | 257 | 280 | 8,788 | 9390 | 232 | 270 | 7923 | 8760 | 229 | 249 | 7839 | 8416 | | |
| 1-Jul-05 | 3.87 | 4.29 | 283 | 430 | 9,155 | 14309 | 256 | 300 | 8270 | 10734 | 267 | 416 | 8629 | 13843 | | |
| 1-Aug-05 | 3.75 | 4.14 | 300 | 340 | 9,354 | 10917 | 260 | 320 | 8088 | 10275 | 274 | 323 | 8519 | 9967 | | |
| 1-Sep-05 | 3.75 | 4.03 | 289 | 360 | 9,028 | 11499 | 247 | 320 | 7700 | 10222 | 264 | 316 | 8246 | 10094 | | |
| 1-Oct-05 | 3.78 | 4.35 | 266 | 370 | 8,227 | 11911 | 210 | 250 | 6544 | 8715 | 237 | 285 | 7365 | 9175 | | |
| 1-Nov-05 | 4.17 | 5.46 | 249 | 290 | 8,468 | 10876 | 222 | 260 | 7591 | 9265 | 203 | 235 | 6939 | 8701 | | |
| 1-Dec-05 | 5.15 | 8.05 | 206 | 260 | 9,619 | 12756 | 208 | 250 | 8433 | 11030 | 188 | 239 | 7706 | 10059 | | |
| 1-Jan-06 | 7.32 | 12.87 | 165 | 230 | 9,784 | 16120 | 146 | 220 | 9167 | 15112 | 135 | 171 | 8544 | 14709 | | |
| 1-Feb-06 | 5.62 | 9.94 | 201 | 240 | 8,813 | 12930 | 188 | 220 | 8162 | 12170 | 164 | 195 | 7080 | 9203 | | |
| 1-Mar-06 | 4.45 | 5.45 | 218 | 290 | 8,098 | 11029 | 207 | 260 | 7507 | 9888 | 184 | 203 | 6689 | 7887 | | |
| 1-Apr-06 | 4.50 | 11.43 | 242 | 270 | 8,586 | 10083 | 219 | 250 | 7659 | 8920 | 200 | 226 | 6980 | 7973 | | |
| 1-May-06 | 3.88 | 4.46 | 265 | 340 | 8,671 | 10492 | 231 | 260 | 7591 | 9671 | 223 | 286 | 7273 | 8825 | | |
| 1-Jun-06 | 3.83 | 4.71 | 248 | 300 | 8,026 | 9820 | 235 | 280 | 7652 | 9428 | 225 | 246 | 7292 | 8210 | | |
| 1-Jul-06 | 3.58 | 3.93 | 276 | 340 | 8,252 | 10634 | 254 | 310 | 7587 | 9695 | 235 | 252 | 7039 | 7713 | | |
| 1-Aug-06 | 3.62 | 4.25 | 303 | 340 | 9,029 | 9811 | 289 | 350 | 8736 | 10713 | 244 | 266 | 7392 | 7839 | | |
| 1-Sep-06 | 3.84 | 7.02 | 298 | 430 | 9,646 | 14165 | 256 | 300 | 8290 | 12096 | 243 | 316 | 7844 | 10410 | | |
| 1-Oct-06 | 3.88 | 6.33 | 285 | 340 | 9,485 | 16894 | 259 | 320 | 8614 | 15310 | 233 | 294 | 7715 | 12934 | | |
| 1-Nov-06 | 5.67 | 8.51 | 183 | 260 | 9,123 | 11559 | 168 | 210 | 8196 | 10917 | 168 | 255 | 8233 | 10596 | | |
| 1-Dec-06 | 6.75 | 14.66 | 186 | 280 | 10,049 | 15897 | 181 | 260 | 9618 | 14674 | 156 | 188 | 8372 | 14674 | | |
| 1-Jan-07 | 5.09 | 8.38 | 195 | 250 | 8,140 | 11881 | 192 | 240 | 8047 | 11182 | 168 | 195 | 7049 | 10483 | | |
| 1-Feb-07 | 4.06 | 4.78 | 233 | 260 | 7,989 | 9693 | 228 | 260 | 7783 | 9320 | 205 | 227 | 6992 | 7829 | | |
| 1-Mar-07 | 4.51 | 5.22 | 203 | 240 | 7,644 | 8967 | 195 | 230 | 7364 | 8709 | 183 | 203 | 6919 | 8059 | | |
| 1-Apr-07 | 3.85 | 4.45 | 261 | 300 | 8,400 | 11134 | 251 | 300 | 8079 | 11134 | 214 | 237 | 6887 | 7758 | | |
| 1-May-07 | 3.81 | 4.32 | 282 | 340 | 9,087 | 10885 | 277 | 330 | 8930 | 11236 | 248 | 274 | 8008 | 9059 | | |
| 1-Jun-07 | 3.91 | 6.16 | 258 | 300 | 8,372 | 9908 | 244 | 280 | 7908 | 9277 | 258 | 300 | 8347 | 9858 | | |
| 1-Jul-07 | 3.66 | 4.06 | 256 | 290 | 7,809 | 9215 | 243 | 300 | 7395 | 9107 | 258 | 319 | 7871 | 9711 | | |
| 1-Aug-07 | 3.57 | 3.95 | 266 | 300 | 7,972 | 9683 | 253 | 290 | 7601 | 9360 | 256 | 290 | 7649 | 8876 | | |
| 1-Sep-07 | 3.64 | 4.21 | 263 | 310 | 8,217 | 10600 | 244 | 280 | 7614 | 9574 | 282 | 328 | 8764 | 10156 | | |
| 1-Oct-07 | 3.73 | 4.17 | 277 | 450 | 8,678 | 12685 | 240 | 400 | 7525 | 11276 | 258 | 338 | 8090 | 10627 | | |
| 1-Nov-07 | 3.87 | 4.74 | 248 | 310 | 8,244 | 10471 | 228 | 290 | 7586 | 9795 | 242 | 286 | 8019 | 9422 | | |
| 1-Dec-07 | 6.01 | 19.27 | 186 | 230 | 10,238 | 21948 | 192 | 290 | 9407 | 21948 | 176 | 224 | 8874 | 25727 | | |
| AVE: | 4.27 | 6.23 | 250 | 306 | 8,711 | 11229 | | | | | 222 | 264 | 7696 | 9877 | | |
| MIN: | 3.57 | 3.93 | 165 | 230 | 7,644 | 8967 | | | | | 135 | 171 | 6689 | 7361 | | |
| MAX: | 7.32 | 19.27 | 323 | 450 | 10,238 | 21948 | | | | | 282 | 416 | 8874 | 25727 | | |
| LIMIT: | 6.29 | | | | 12,835 | | | | | | | | 12835 | | | |
| DESIGN: | 7.40 | | | | 15,100 | | | | | | | | 15100 | | | |

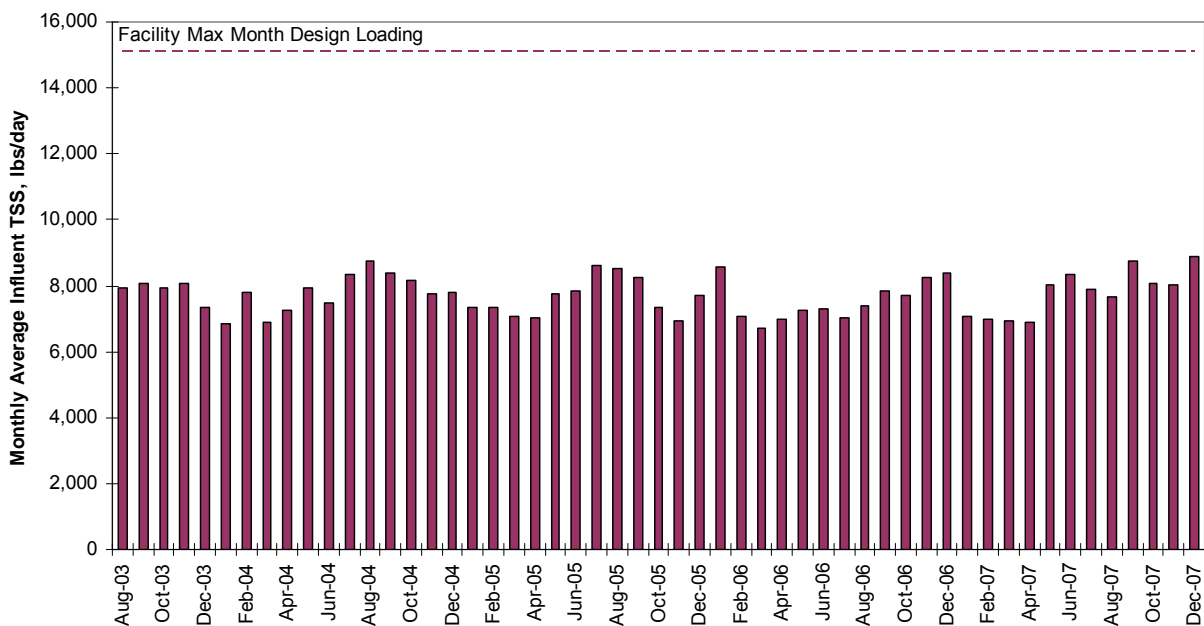
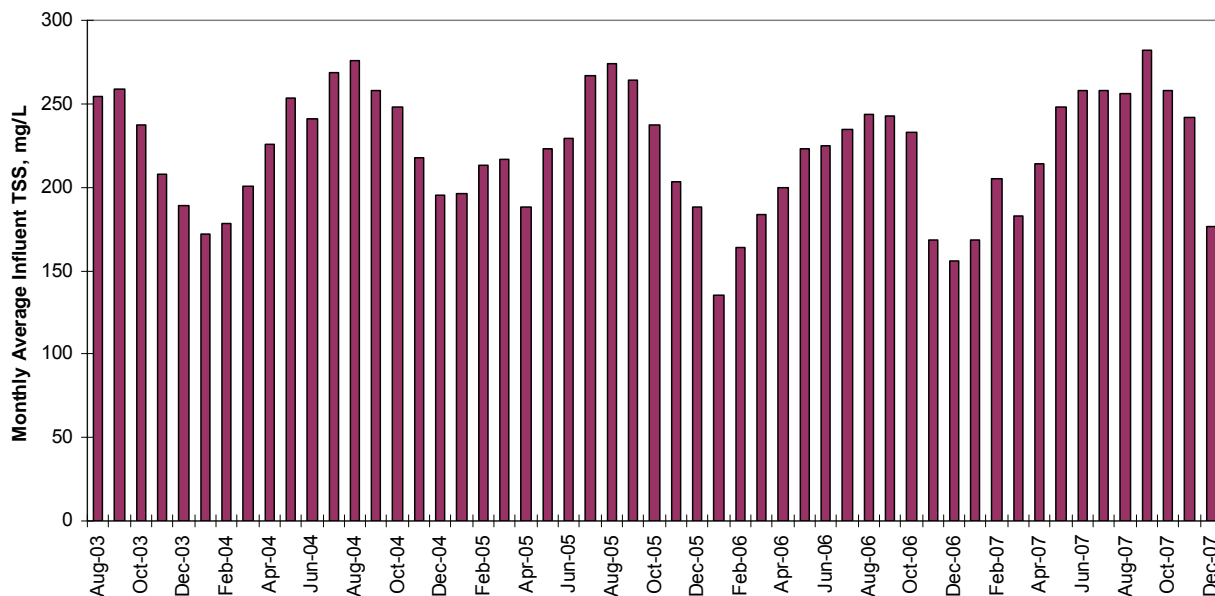
| Effluent | | | | | | | | | | | | | | | |
|----------|------------|------------|------------|-----------|-----------------|------------|-----------|------------|----------|----------------|-----|-----|--------------------------|--------------------------|----------------|
| Date | CBOD, mg/L | CBOD, mg/L | CBOD, ppd | CBOD, ppd | CBOD, % Removal | TSS, mg/L | TSS, mg/L | TSS, ppd | TSS, ppd | TSS, % Removal | PH | PH | Fecal Coliform, #/100 ml | Fecal Coliform, #/100 ml | Chlorine, ug/L |
| | Mnthly Ave | Wkly Ave | Mnthly Ave | Wkly Ave | Ave | Mnthly Ave | Wkly Ave | Mnthly Ave | Wkly Ave | Ave | Min | Max | GEM | GM7 | Mnthly Ave |
| 1-Mar-03 | 8 | 8 | 303 | 334 | 96 | 12 | 13 | 461 | 555 | 93.4 | 6.4 | 6.9 | 21 | 33 | 110 |
| 1-Apr-03 | 12 | 17 | 430 | 557 | 95 | 17 | 22 | 609 | 735 | 91.9 | 6.5 | 7.0 | 11 | 26 | 236 |
| 1-May-03 | 10 | 15 | 336 | 486 | 96 | 16 | 24 | 521 | 761 | 93.2 | 6.8 | 7.0 | 13 | 19 | 200 |
| 1-Jun-03 | 12 | 13 | 364 | 409 | 95 | 18 | 20 | 558 | 614 | 92.9 | 6.8 | 7.0 | 154 | 358 | 145 |
| 1-Jul-03 | 9 | 12 | 262 | 338 | 97 | 13 | 19 | 404 | 550 | 94.8 | 6.9 | 7.2 | 54 | 249 | 105 |
| 1-Aug-03 | 9 | 11 | 268 | 330 | 96 | 14 | 17 | 434 | 537 | 94.5 | 6.9 | 7.2 | 29 | 52 | 67 |
| 1-Sep-03 | 10 | 11 | 321 | 352 | 96 | 13 | 17 | 406 | 542 | 95 | 6.8 | 7.1 | 51 | 179 | 125 |
| 1-Oct-03 | 11 | 11 | 363 | 388 | 96 | 17 | 18 | 572 | 695 | 92.5 | 6.3 | 7.1 | 13 | 20 | 132 |
| 1-Nov-03 | 7 | 9 | 297 | 438 | 97 | 14 | 17 | 584 | 907 | 93 | 6.2 | 7.0 | 26 | 38 | 150 |
| 1-Dec-03 | 9 | 11 | 367 | 432 | 96 | 15 | 19 | 584 | 832 | 92.1 | 6.2 | 6.8 | 43 | 79 | 93 |
| 1-Jan-04 | 8 | 12 | 341 | 515 | 96 | 14 | 20 | 572 | 862 | 91.7 | 6.3 | 7.0 | 23 | 38 | 186 |
| 1-Feb-04 | 12 | 15 | 517 | 642 | 94 | 15 | 19 | 669 | 815 | 91.4 | 6.6 | 7.0 | 76 | 113 | 166 |
| 1-Mar-04 | 7 | 7 | 228 | 261 | 97 | 11 | 14 | 378 | 447 | 94.5 | 6.6 | 6.8 | 70 | 347 | 81 |
| 1-Apr-04 | 12 | 21 | 374 | 642 | 96 | 18 | 26 | 582 | 817 | 92 | 6.6 | 7.1 | 46 | 73 | 136 |
| 1-May-04 | 13 | 15 | 414 | 472 | 96 | 24 | 25 | 742 | 813 | 90.5 | 6.4 | 6.9 | 37 | 195 | 101 |
| 1-Jun-04 | 14 | 16 | 440 | 486 | 95 | 21 | 28 | 666 | 849 | 90.9 | 6.4 | 7.0 | 38 | 134 | 163 |
| 1-Jul-04 | 9 | 12 | 287 | 368 | 97 | 12 | 14 | 377 | 439 | 95.5 | 6.8 | 7.2 | 52 | 151 | 177 |
| 1-Aug-04 | 11 | 15 | 346 | 488 | 96 | 14 | 19 | 448 | 617 | 94.8 | 6.8 | 7.2 | 64 | 208 | 186 |
| 1-Sep-04 | 13 | 15 | 406 | 490 | 95 | 19 | 22 | 623 | 707 | 92.6 | 6.7 | 7.0 | 85 | 347 | 69 |
| 1-Oct-04 | 10 | 12 | 339 | 397 | 96 | 14 | 15 | 460 | 496 | 94.3 | 6.7 | 7.0 | 162 | 376 | 178 |
| 1-Nov-04 | 10 | 12 | 344 | 432 | 96 | 17 | 26 | 622 | 909 | 92 | 6.6 | 6.9 | 47 | 115 | 178 |
| 1-Dec-04 | 8 | 11 | 336 | 429 | 96 | 14 | 21 | 564 | 832 | 92.7 | 6.5 | 6.9 | 22 | 48 | 94 |
| 1-Jan-05 | 9 | 12 | 359 | 437 | 96 | 14 | 17 | 547 | 652 | 92.6 | 6.6 | 6.9 | 106 | 243 | 149 |
| 1-Feb-05 | 8 | 8 | 267 | 320 | 97 | 12 | 16 | 430 | 532 | 94 | 6.6 | 6.9 | 34 | 80 | 173 |
| 1-Mar-05 | 7 | 9 | 242 | 314 | 97 | 12 | 12 | 389 | 452 | 94.5 | 6.7 | 7.0 | 38 | 114 | 149 |
| 1-Apr-05 | 9 | 12 | 356 | 453 | 95 | 14 | 19 | 530 | 732 | 92.6 | 6.6 | 7.0 | 89 | 285 | 219 |
| 1-May-05 | 10 | 18 | 388 | 789 | 95 | 19 | 39 | 727 | 1733 | 91.4 | 6.7 | 7.0 | 78 | 140 | 190 |
| 1-Jun-05 | 13 | 16 | 431 | 536 | 95 | 20 | 23 | 688 | 760 | 91.2 | 6.2 | 7.0 | 75 | 130 | 150 |
| 1-Jul-05 | 9 | 11 | 295 | 342 | 96 | 17 | 18 | 537 | 581 | 93.6 | 6.8 | 6.9 | 94 | 275 | 94 |
| 1-Aug-05 | 12 | 14 | 364 | 429 | 95 | 17 | 19 | 540 | 571 | 93.6 | 6.7 | 6.9 | 39 | 190 | 200 |
| 1-Sep-05 | 13 | 15 | 409 | 455 | 95 | 17 | 18 | 522 | 561 | 93.6 | 6.8 | 7.0 | 85 | 171 | 136 |
| 1-Oct-05 | 11 | 12 | 350 | 371 | 95 | 17 | 19 | 534 | 613 | 92.7 | 6.8 | 7.0 | 93 | 112 | 78 |
| 1-Nov-05 | 11 | 12 | 366 | 413 | 95 | 16 | 18 | 561 | 615 | 91.8 | 6.8 | 6.9 | 63 | 141 | 165 |
| 1-Dec-05 | 10 | 14 | 473 | 927 | 95 | 14 | 21 | 667 | 1409 | 91.6 | 6.5 | 6.9 | 37 | 165 | 171 |
| 1-Jan-06 | 14 | 18 | 920 | 1576 | 90 | 19 | 26 | 1259 | 2253 | 85.3 | 6.5 | 6.8 | 91 | 222 | 74 |
| 1-Feb-06 | 14 | 16 | 608 | 779 | 93 | 16 | 18 | 702 | 826 | 90.7 | 6.5 | 7.0 | 11 | 21 | 173 |
| 1-Mar-06 | 12 | 13 | 423 | 482 | 94 | 14 | 16 | 520 | 580 | 92.2 | 6.6 | 6.8 | 67 | 246 | 90 |
| 1-Apr-06 | 9 | 11 | 300 | 402 | 96 | 11 | 14 | 389 | 483 | 94.4 | 6.7 | 6.9 | 54 | 92 | 177 |
| 1-May-06 | 7 | 8 | 234 | 266 | 97 | 11 | 14 | 354 | 453 | 95.2 | 6.6 | 6.9 | 68 | 376 | 120 |
| 1-Jun-06 | 10 | 11 | 314 | 346 | 96 | 15 | 16 | 488 | 526 | 93.2 | 6.6 | 7.0 | 197 | 297 | 172 |
| 1-Jul-06 | 11 | 14 | 318 | 388 | 96 | 19 | 28 | 558 | 806 | 92 | 6.8 | 7.1 | 91 | 309 | 124 |
| 1-Aug-06 | 13 | 15 | 392 | 467 | 96 | 18 | 28 | 545 | 720 | 93 | 6.6 | 7.0 | 57 | 259 | 133 |
| 1-Sep-06 | 15 | 19 | 490 | 685 | 94 | 21 | 24 | 683 | 870 | 91.3 | 6.8 | 7.0 | 188 | 359 | 104 |
| 1-Oct-06 | 14 | 20 | 515 | 912 | 95 | 20 | 30 | 697 | 1337 | 91.4 | 6.8 | 7.1 | 57 | 184 | 112 |
| 1-Nov-06 | 8 | 9 | 390 | 457 | 95 | 12 | 13 | 600 | 645 | 92.8 | 6.6 | 7.0 | 81 | 142 | 233 |
| 1-Dec-06 | 10 | 15 | 746 | 1330 | 93 | 18 | 27 | 1335 | 2478 | 86.4 | 6.4 | 6.9 | 27 | 172 | 191 |
| 1-Jan-07 | 10 | 15 | 449 | 792 | 95 | 18 | 29 | 851 | 1630 | 89 | 6.6 | 6.8 | 32 | 51 | 212 |
| 1-Feb-07 | 8 | 9 | 256 | 292 | 97 | 15 | 16 | 512 | 538 | 92.6 | 6.7 | 6.8 | 54 | 111 | 60 |
| 1-Mar-07 | 8 | 8 | 287 | 312 | 96 | 15 | 19 | 579 | 675 | 91.4 | 6.5 | 6.9 | 29 | 165 | 137 |
| 1-Apr-07 | 10 | 10 | 321 | 331 | 96 | 16 | 18 | 526 | 597 | 92.3 | 6.6 | 6.9 | 79 | 128 | 71 |
| 1-May-07 | 10 | 10 | 312 | 356 | 97 | 12 | 14 | 400 | 464 | 95 | 6.7 | 7.1 | 60 | 373 | 202 |
| 1-Jun-07 | 8 | 12 | 264 | 405 | 97 | 14 | 16 | 431 | 524 | 94.7 | 6.8 | 7.1 | 31 | 141 | 68 |
| 1-Jul-07 | 7 | 9 | 211 | 265 | 97 | 13 | 15 | 384 | 474 | 95.1 | 6.7 | 7.1 | 72 | 295 | 101 |
| 1-Aug-07 | 10 | 10 | 292 | 312 | 96 | 13 | 14 | 393 | 423 | 94.8 | 6.7 | 7.0 | 67 | 278 | 135 |
| 1-Sep-07 | 10 | 10 | 307 | 330 | 96 | 11 | 11 | 341 | 368 | 96.1 | 6.7 | 7.0 | 82 | 190 | 106 |
| 1-Oct-07 | 11 | 12 | 334 | 388 | 96 | 13 | 16 | 411 | 523 | 94.9 | 6.7 | 7.0 | 61 | 249 | 126 |
| 1-Nov-07 | 12 | 14 | 392 | 479 | 95 | 15 | 19 | 513 | 633 | 93.6 | 6.6 | 7.2 | 147 | 251 | 179 |
| 1-Dec-07 | 12 | 18 | 924 | 2142 | 93 | 17 | 29 | 1342 | 3137 | 89.9 | 6.4 | 6.8 | 11 | 53 | 166 |
| AVE: | 10 | 13 | 379 | 517 | 95 | 15 | 20 | 575 | 802 | 93 | 6.6 | 7.0 | 63 | 176 | 142 |
| MIN: | 7 | 7 | 211 | 261 | 90 | 11 | 11 | 341 | 368 | 85 | 6.2 | 6.8 | 11 | 19 | 60 |
| MAX: | 15 | 21 | 924 | 2142 | 97 | 24 | 39 | 1342 | 3137 | 96 | 6.9 | 7.2 | 197 | 376 | 236 |
| LIMIT: | 25 | 40 | 1543 | 2469 | 85 | 30 | 45 | 1851 | 2777 | 85 | 6.0 | 9.0 | 200 | 400 | 318 |
| DESIGN: | | | | | | | | | | | | | | | |

exceeds permit limits

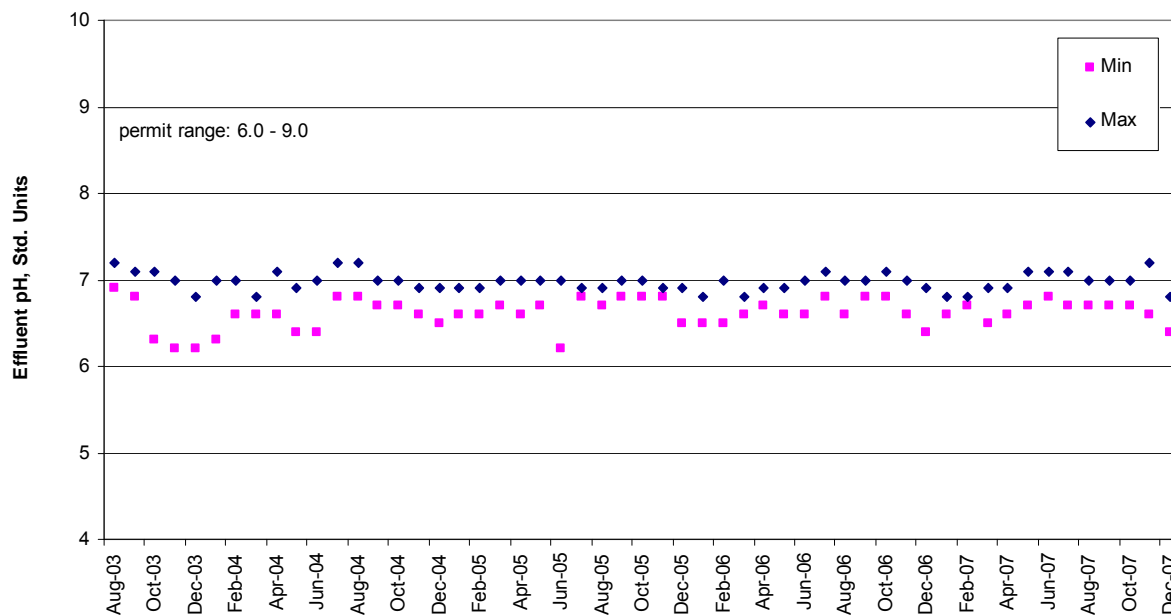
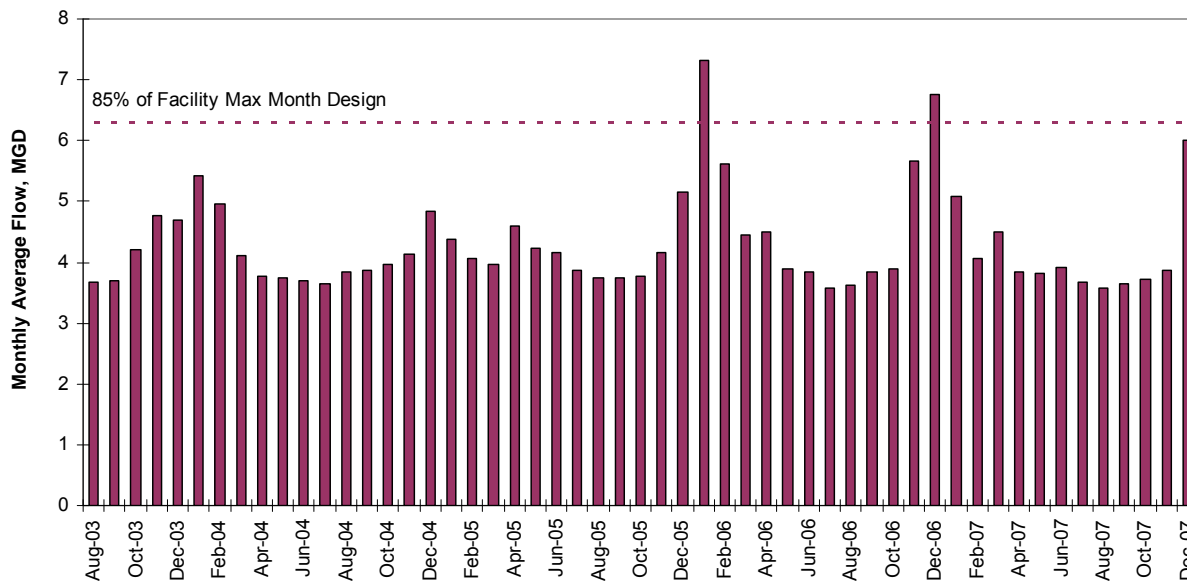
APPENDIX D—DMR DATA (continued)

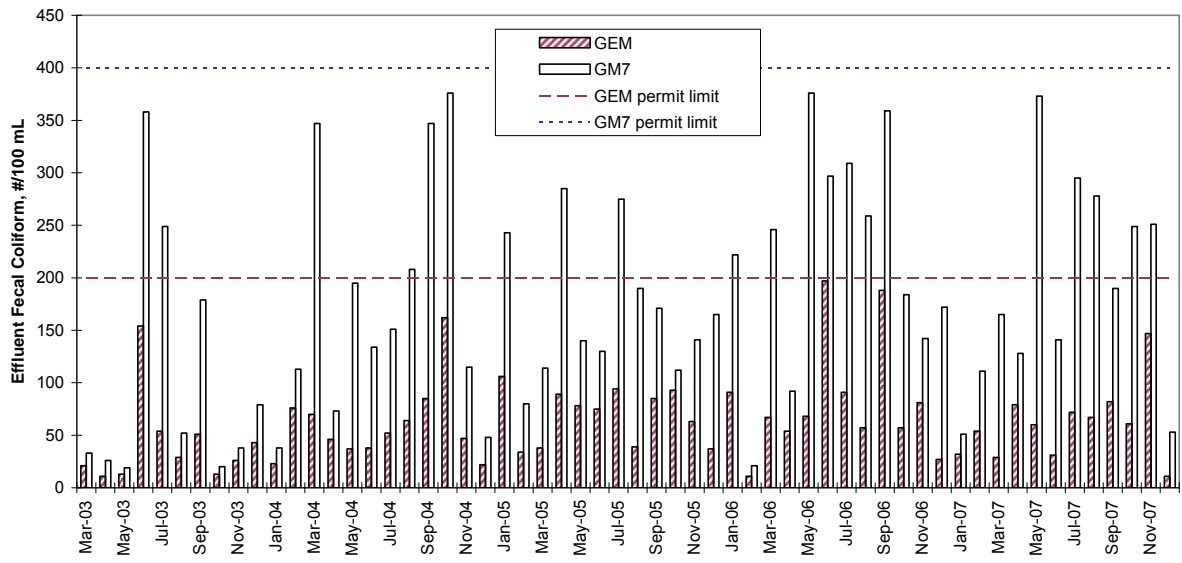


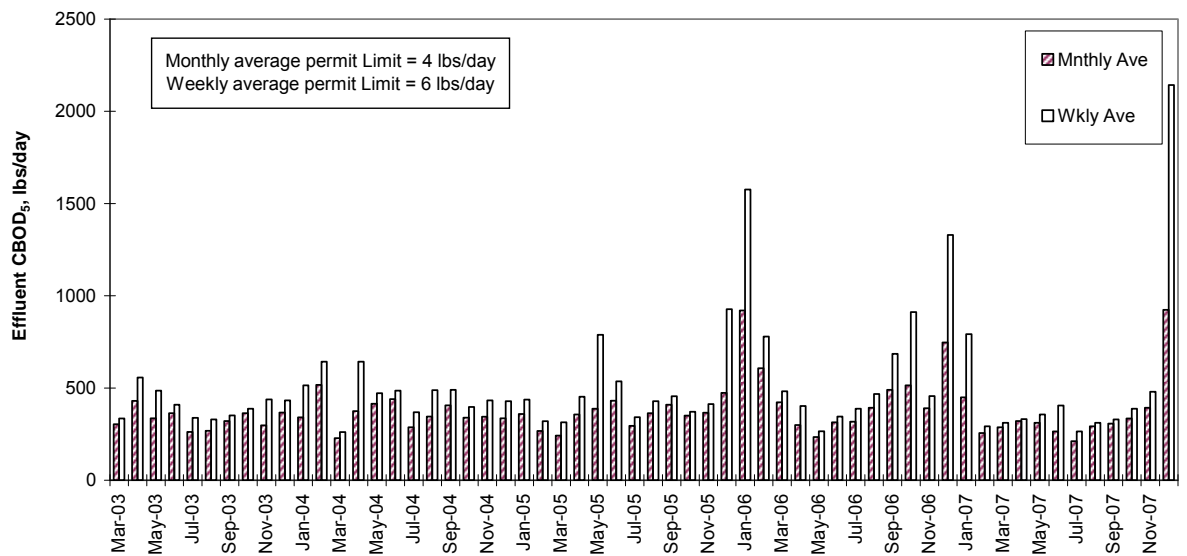
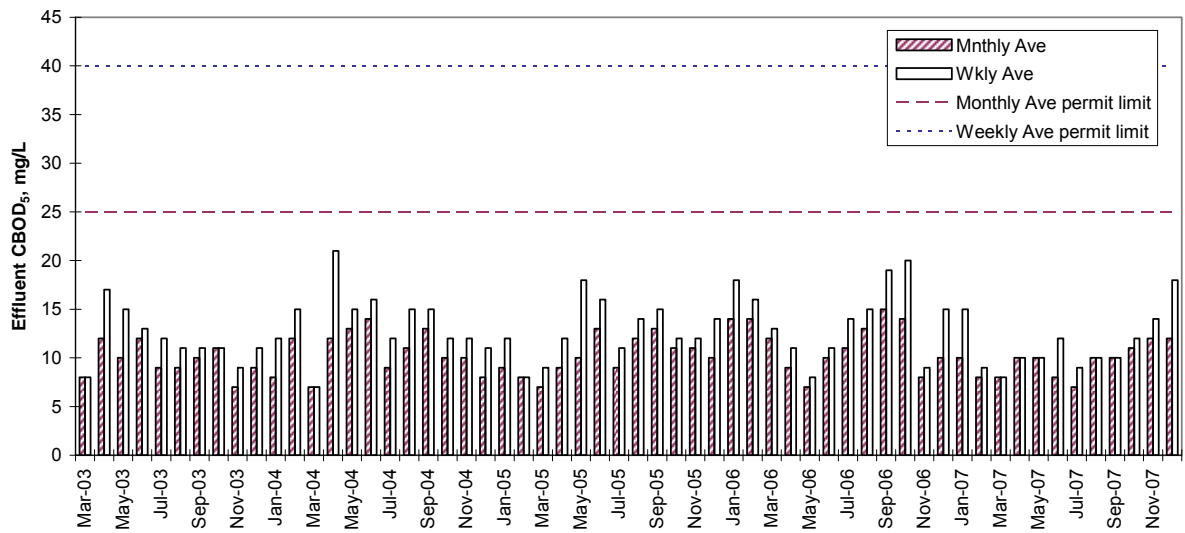
APPENDIX D—DMR DATA (continued)

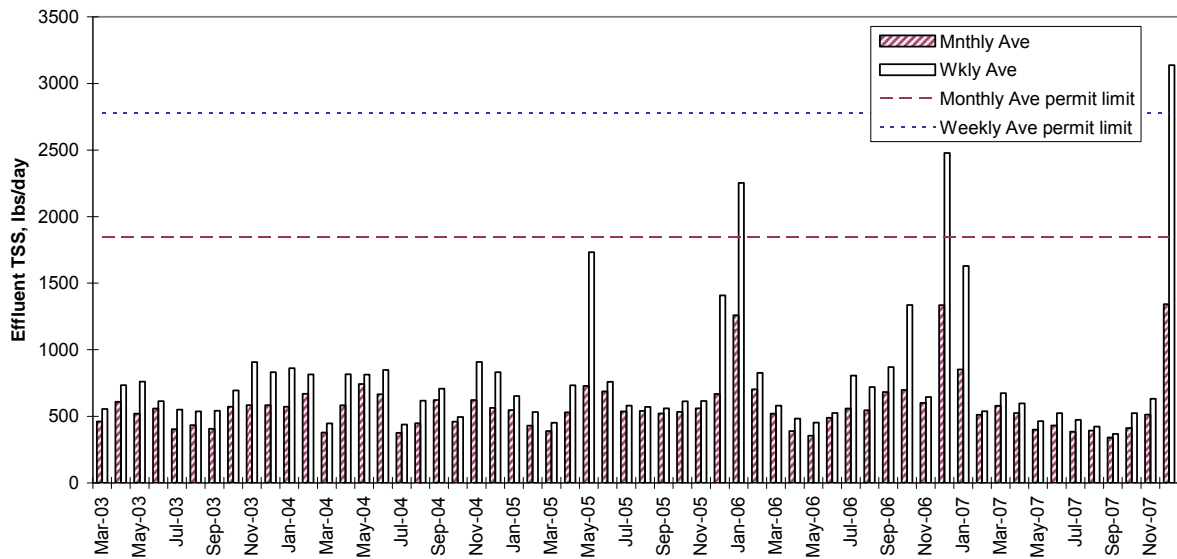
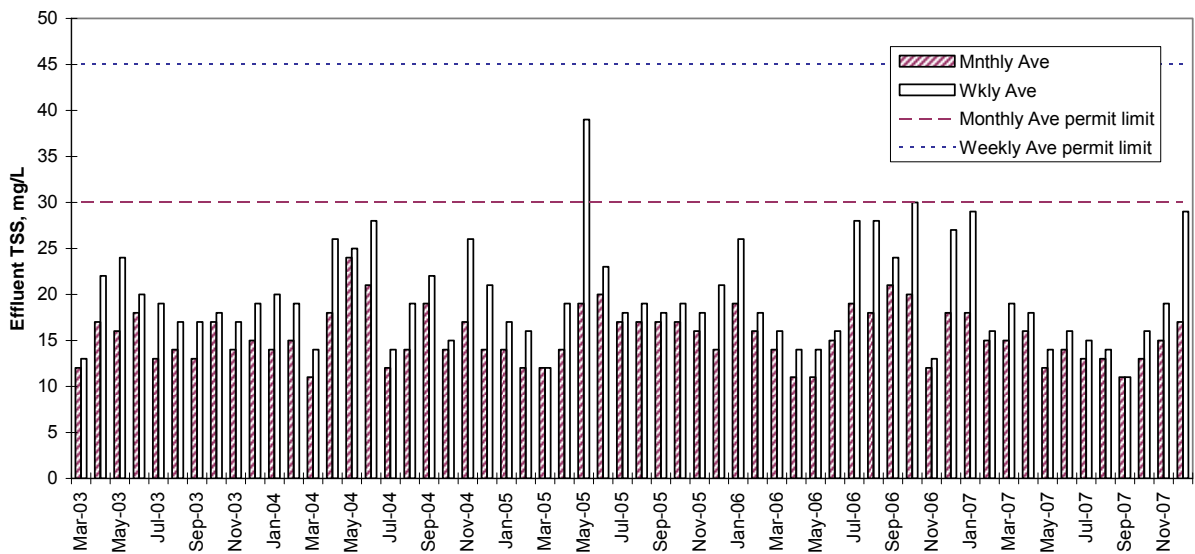


APPENDIX D—DMR DATA (continued)



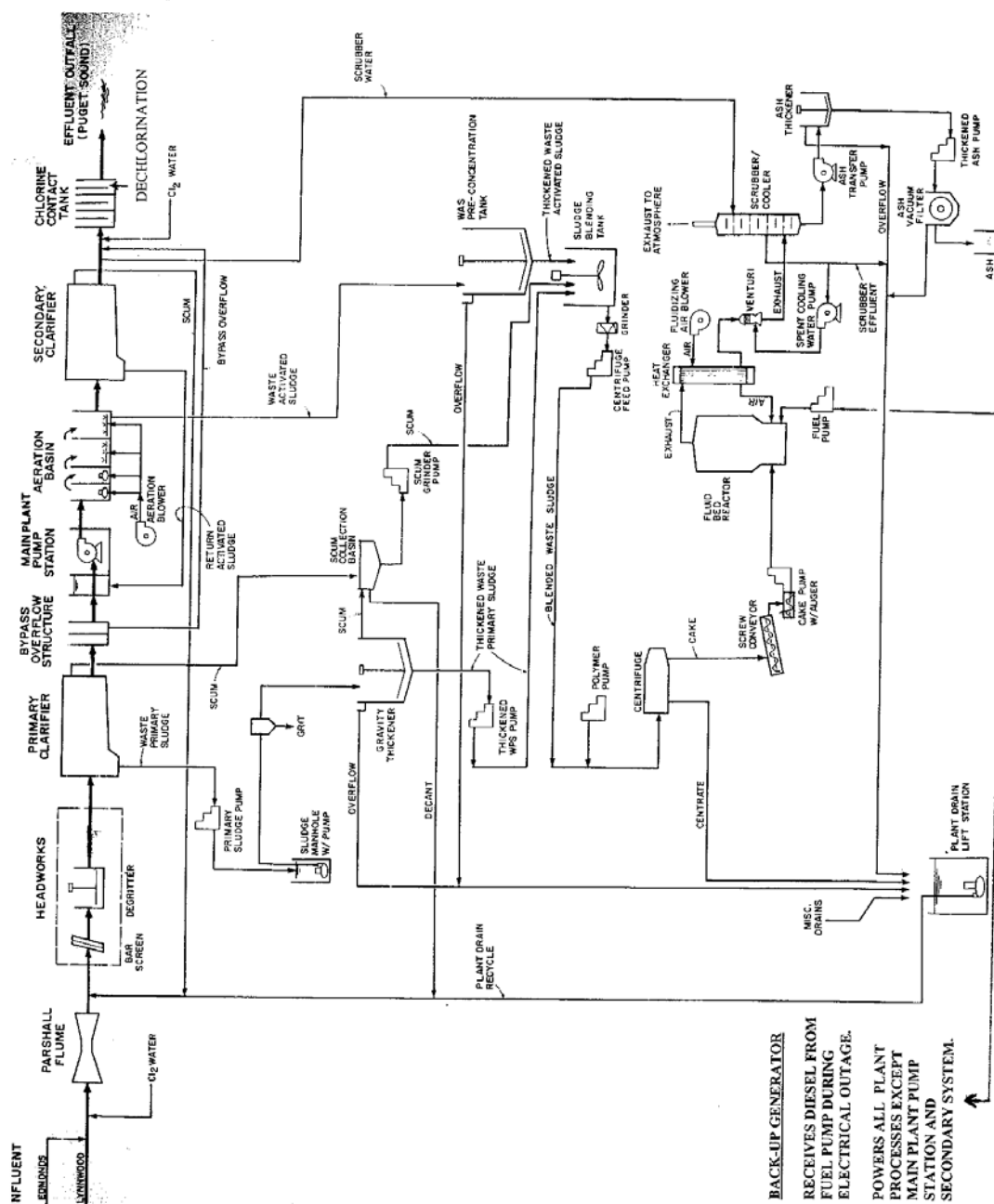




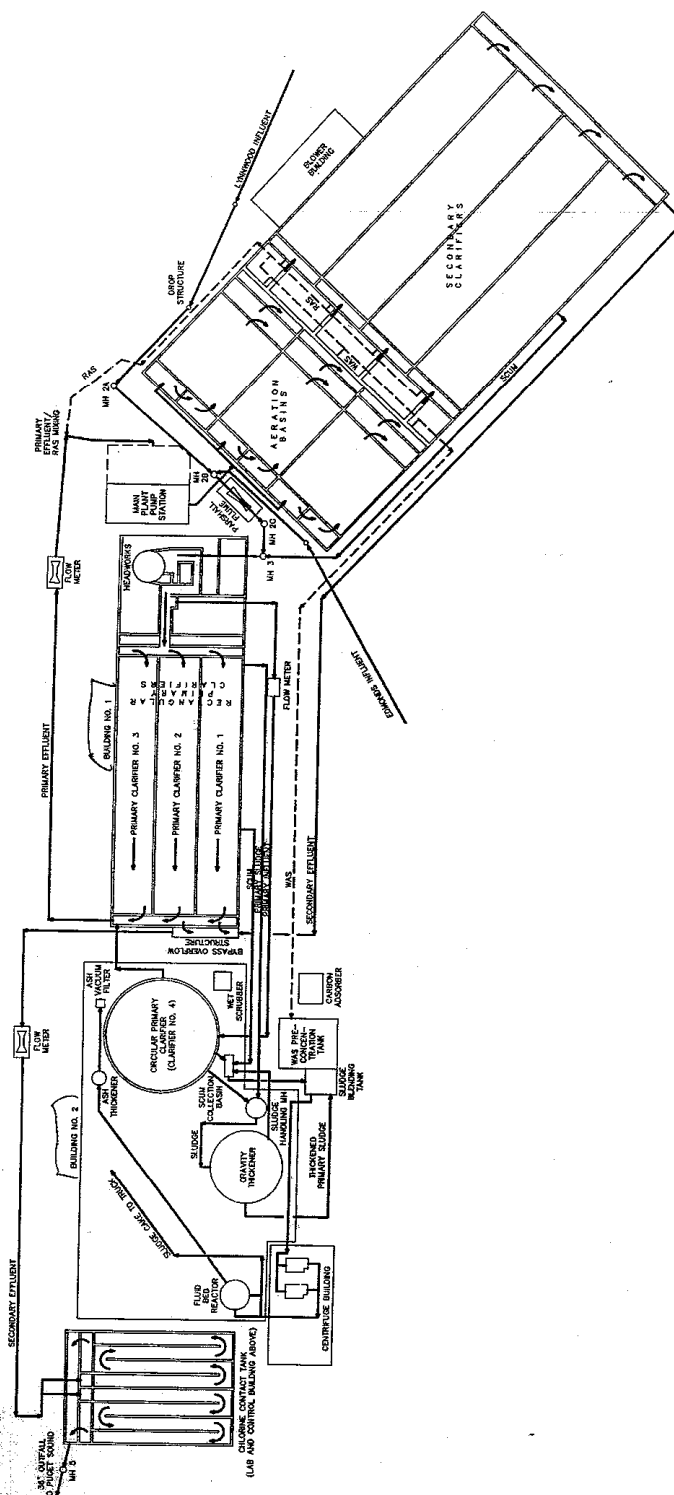


APPENDIX E—SITE MAPS

B.3. PROCESS FLOW SCHEMATIC



B.2.a. Major Pipes and Structures Through Treatment Plant



APPENDIX F—RESPONSE TO COMMENTS