
WWTP FACILITY PLAN UPDATE

ES.1 FACILITY PLAN BACKGROUND

This Facility Plan Update for the Quincy Community Services District (QCSD) Wastewater Treatment Plant (WWTP) presents changes in the past five years since the last Facility Plan. These include upgrades made by staff to the treatment plant, changes in discharge requirements, and evaluations of what must be done to comply with the new discharge requirements.

The following sections briefly review the conclusions of each of the chapters in the Facility Plan Update.

ES.1.1 Existing Wastewater Treatment

The existing WWTP was designed and constructed in the early 1980s has been well operated and maintained by District staff. The flows and loads to the treatment plant have generally grown at a rate slightly slower than projected by the original design, with the exception of loads from septage. The performance of the existing WWTP has been excellent and in compliance with current requirements for discharge and reuse.

Significant loading to the plant is due to septage receiving. Section ES.2 of this Executive Summary reviews additional information regarding the impact of septage and determination of actual domestic wastewater loads.

ES.1.2 Projected Wastewater Flows and Loads

The WWTP currently treats flows from the District and from East Quincy Services District (EQSD), with a total of approximately 2,740 dwelling unit equivalents (DUEs). The Districts anticipate some near-term growth, and a long-term growth rate of approximately 2 percent. The flows and loads of major constituents are project to increase by 58 percent by the year 2025.

ES.1.3 Existing Capacity Analysis

The limiting constraint for current WWTP capacity is the ability to remove biochemical oxygen demand (BOD). The projected capacity of the plant is 2,890 pounds per day (ppd) of BOD on a maximum month basis. The current maximum month BOD load is approximately 2,400 ppd. The plant is at approximately 83 percent of capacity, not including septage loading.

ES.1.4 Regulatory Requirements

The NPDES permit adopted in 2004 requires direct discharge by October 2009 to Spanish Creek (not Clear Stream) to allow dilution credits. This permit also implemented stringent

effluent limits for copper, silver, and lead, as well as requirements for many studies and reports to determine the impact of the effluent on Spanish Creek. As a result, more stringent regulatory requirements are expected in the near future. The next NPDES permit, expected as early as October 2009, will add interim limitations for ammonia. Final effluent limitations for ammonia are likely by 2014. The existing treatment plant was not designed to remove these metals or ammonia.

ES.1.5 Septage Evaluation

The current level of septage receiving at the WWTP contributes significant loading of conventional constituents and metals. Effluent concentrations of these metals are partially the result of septage. Recent exceedances of the lead limit for biosolids are likely due to septage. Due to capacity limitations, metals limits, and biosolids results, the QCSD Board has ceased the acceptance of septage receiving at the WWTP, effective January 1, 2008.

ES.1.6 Alternatives Analysis

The alternative analysis recommends construction of oxidation ditches, secondary clarifiers, a solids handling process, wetlands treatment, and associated equipment. These upgrades were recommended to meet metals and ammonia limits, and provide sufficient wastewater treatment capacity to treat future flows. However, the reassessment of BOD data (discussed in Section ES.2 below) and cessation of septage receiving provides an opportunity to delay the implementation and costs of some of these upgrades while evaluating wetlands treatment.

Therefore, the Facility Plan recommends near-term improvements, including the conversion of the emergency storage pond into a wetlands treatment process and relocation of the discharge to Spanish Creek.

ES.1.7 Collection System Evaluation

The collection system evaluation reviews the progress of the projects identified in the 2001 Sewer System Master Plan, and makes recommendations for future improvements. The Capital Improvement Program recommends the completion of 10 projects and provides a schedule for their implementation over the next 10 years. The total costs for the recommended collection system improvements are estimated to be approximately \$2.25 million in 2007 dollars.

ES.2 REVISED BOD DATA ANALYSIS

The Draft WWTP Facility Plan Update reported an influent BOD load of 1,360 ppd on an average daily flow (ADF) basis, and 2,710 ppd on an average day maximum month flow (ADMMF) basis. The data, taken from influent data reported to the Regional Board, were assumed to exclude septage. However, subsequent analysis has shown that the data do in fact include some loading from septage. Therefore, analysis of East Quincy and Quincy Headworks data was undertaken to establish the true domestic wastewater BOD load.

Monitoring data from February 2005 through August 2007 were available on a weekly basis for each influent stream, prior to influence of septage. For this period, average BOD concentrations were 109 mg/L for QCSD and 285 mg/L for EQSD. Although QCSD contributes approximately 70 percent of the flow to the WWTP, the lower BOD concentrations mean that each District contributes roughly the same load. Annual average BOD loads were 511 ppd for QCSD and 555 ppd for EQSD, for a total ADF load of 1,066 ppd.

Figure ES.1 summarizes the revised domestic wastewater BOD loads. Because the WWTP must comply with monthly discharge requirements, the design must be based on ADMMF data. On a running average basis, the ADMMF BOD load was approximately 2,400 ppd. Therefore, the Draft Facility Plan overestimated domestic wastewater BOD loads.

In 2006, the number of DUEs was 2,740. The ADMMF BOD load (2,400 ppd) equates to 0.875 ppd of BOD per DUE. Given the calculated BOD removal capacity of 2,890 ppd, the plant capacity is approximately 3,300 DUEs. Therefore, the WWTP has capacity for growth of about 490 ppd BOD or 560 DUEs, given cessation of septage receiving.

Without the septage contribution to influent BOD, effluent BOD results may improve. However, it may be more difficult to comply with the requirement for 85 percent removal of BOD and TSS without the additional loads from septage. At the calculated ADMMF influent BOD concentration of 144 mg/L, effluent BOD would need to be less than 22 mg/L. Figure 3.2 shows that effluent BOD results tend to be below 20 mg/L during the peak flow period of December through March. Continued collection system improvements should reduce peak wet weather flows and increase influent BOD concentrations.

ES.3 IMPLEMENTATION PLAN

The recommended next steps for the WWTP are outlined below:

- 2008 Design and construct wetlands treatment and Spanish Creek outfall.
 Assess BOD data and treatment performance without septage.
- 2009 Prepare NPDES Permit Report of Waste Discharge.
- 2010 Evaluate wetlands treatment performance for metals and ammonia removal,
 review growth and capacity, and evaluate need for expansion and improvements.

Future improvements could include design and construction of secondary clarifiers, solids handling, oxidation ditches, and/or tertiary filtration depending on wetlands performance, growth, treatment plant performance without septage, and future regulatory requirements. The estimated project cost for the recommended facilities of Alternative 2 is approximately \$20 million in 2007 dollars, not including escalation.