

CHAPTER 1 EXECUTIVE SUMMARY

The City of Rice Lake owns and operates a 2.2 million gallon per day (mgd) advanced wastewater treatment plant (WWTP) that treats wastewater generated within the City limits and discharges treated effluent to the Red Cedar River. The City authorized this Facilities Plan to evaluate wastewater treatment alternatives for the planning area over a 20-year period (2010 through 2030) for the following reasons:

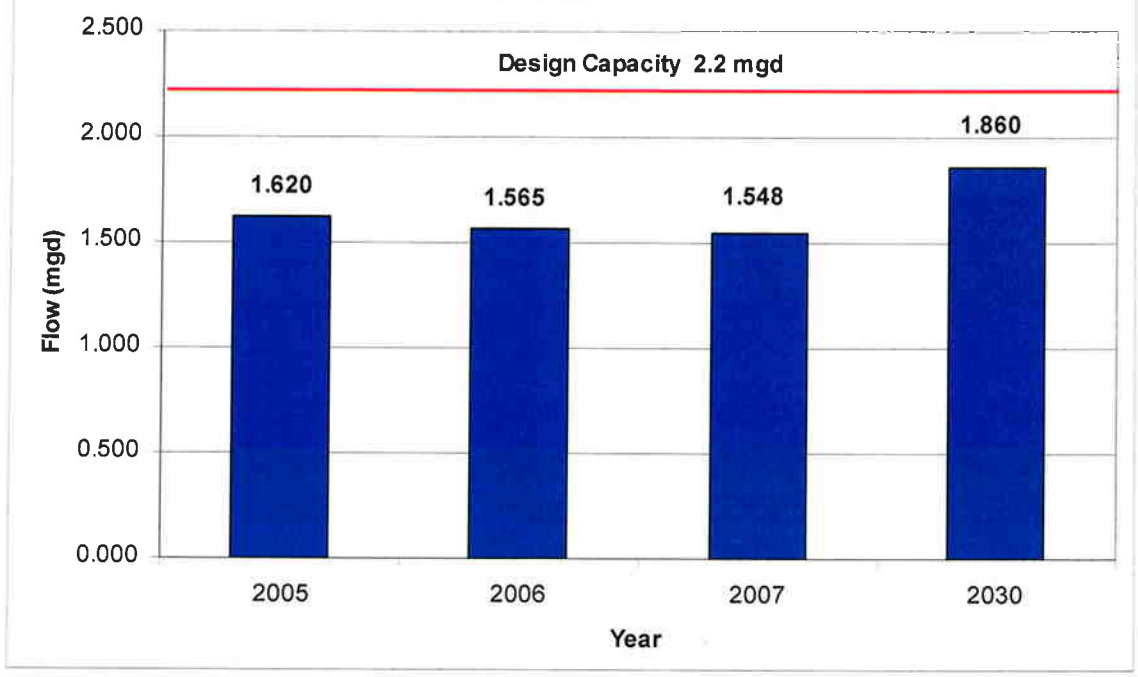
- The existing treatment plant is at 90% of its design capacity.
- The existing plant does not have capacity for future growth over the next 20 years.
- Pollutant loadings have caused operational problems.
- Many of the existing treatment plant components are obsolete due to age and condition.

The population of the City of Rice Lake was 8,653 in the year 2007 and is projected to grow to 9,669 by the year 2030. Wasteload projections were developed based on the population growth and the wasteloads from the two major industrial dischargers, McCain Foods USA and Birchwood Manufacturing. Figures 1-1 through 1-4 present the existing and projected flows and pollutant loadings at the treatment plant. These figures show that the existing plant is currently at 90% of its design capacity and will increase to 100% - 130% of its design capacity by the year 2030.

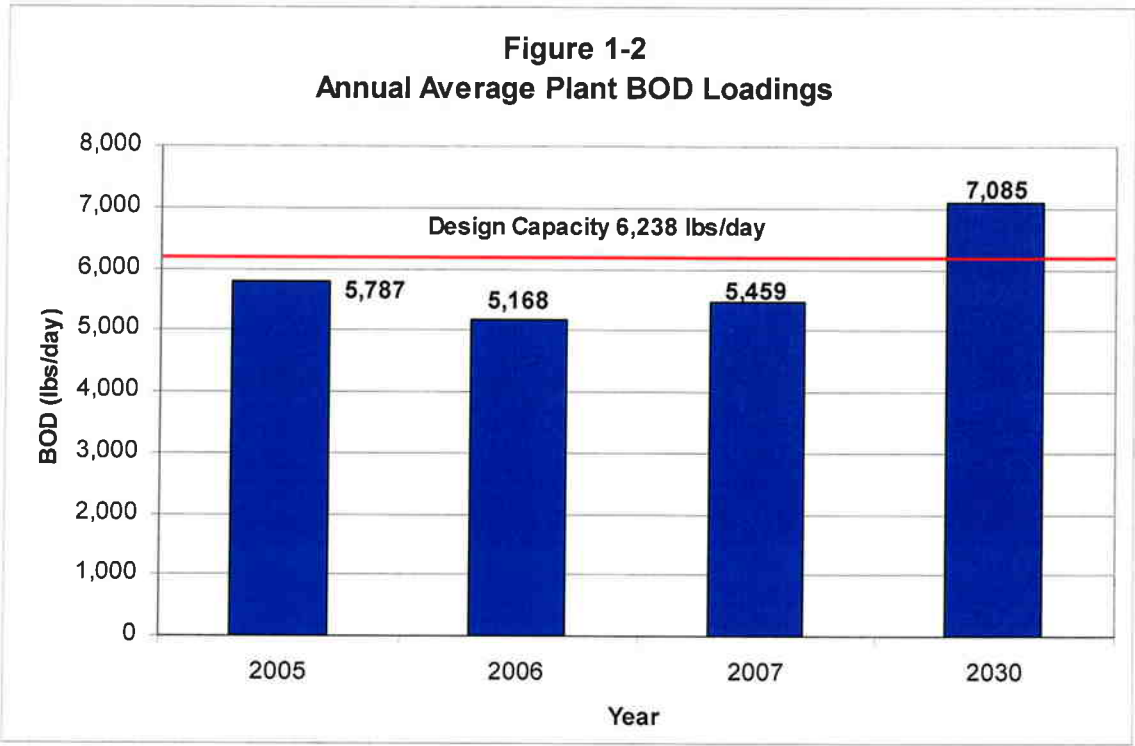
The wastewater treatment plant has consistently met current effluent limits in its discharge permit. This excellent treatment performance is due to the diligence and hard work of the plant's operating staff to stay abreast of the large and variable wasteloads received by the plant. However, as the existing facilities and equipment age, it will be even more difficult to meet increasingly stringent discharge limits in the future.

An analysis of infiltration/inflow (I/I) indicated that the Rice Lake WWTP is not experiencing excessive I/I flows. The plant will continue its current regime for handling and repairing I/I sources.

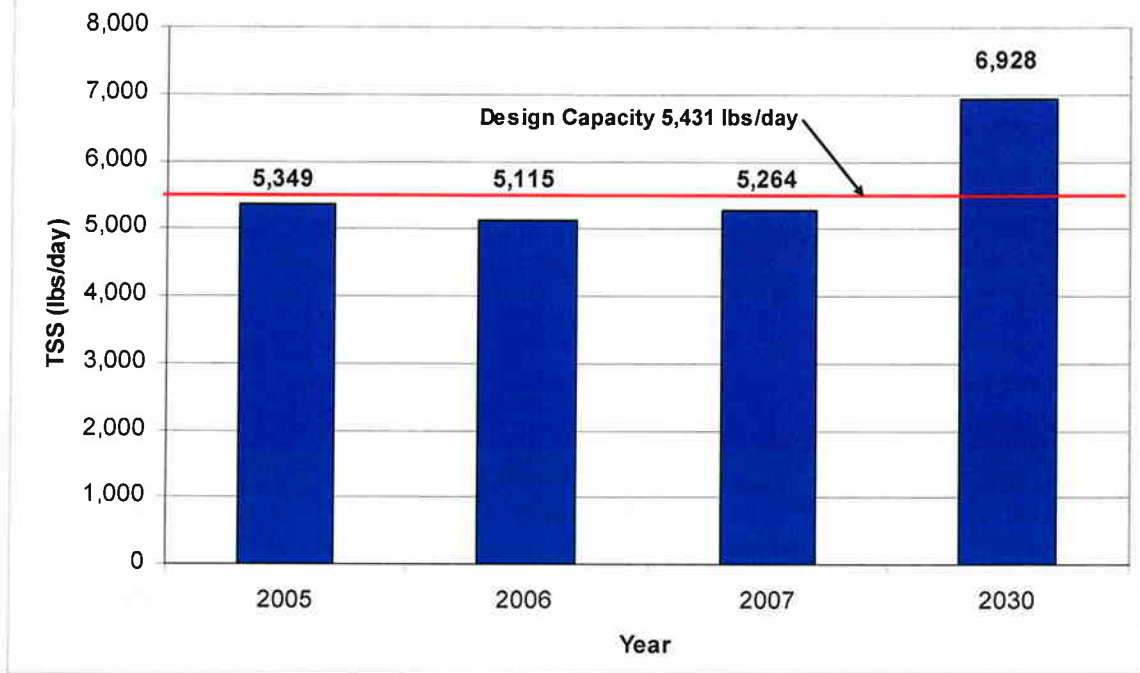
**Figure 1-1
Annual Average Plant Flows**



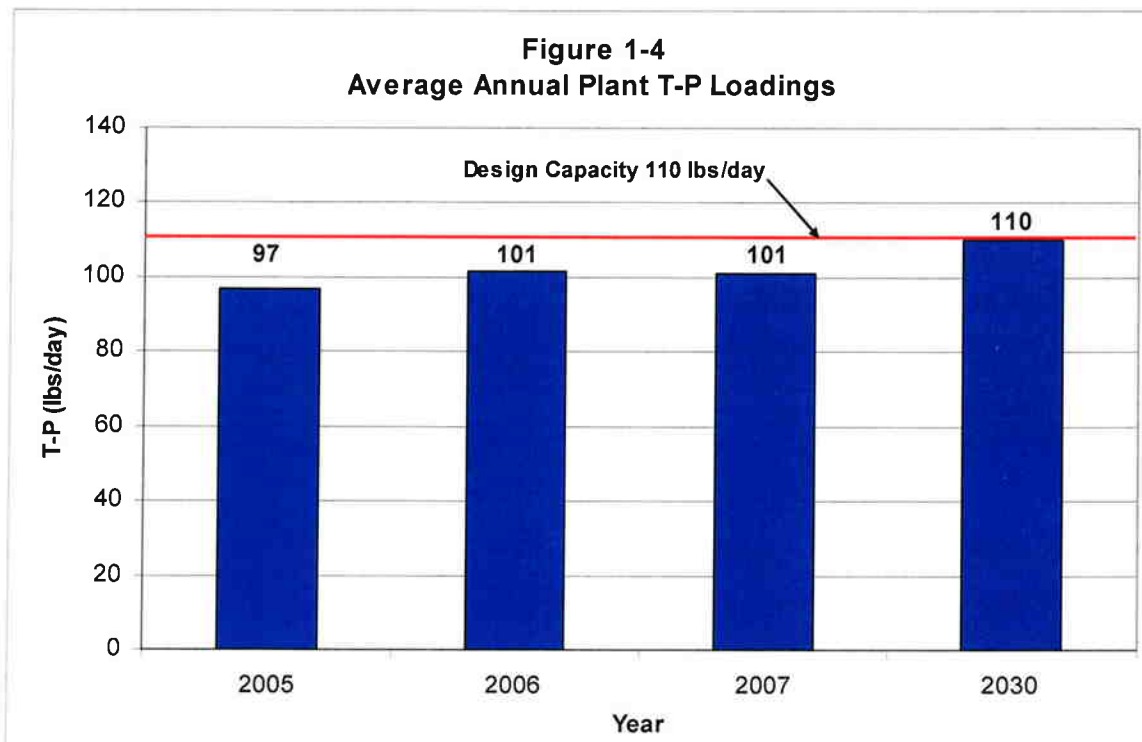
**Figure 1-2
Annual Average Plant BOD Loadings**



**Figure 1-3
Average Annual Plant TSS Loadings**



**Figure 1-4
Average Annual Plant T-P Loadings**



An evaluation was performed of selected facilities at the Rice Lake WWTP. The capacities of the facilities were compared to the current wasteloads and projected year 2030 design wasteloads. Deficiencies and shortfalls were discussed, and alternatives for upgrading or expanding the existing facilities were identified and evaluated. A site plan of the recommended plant improvements is shown on Figure 1-5.

The recommended plan includes separating the existing hauled waste receiving area into three areas to provide more efficient treatment of the various hauled wastes. Grease trap waste will be sent to a storage tank, where it will be fed directly into the anaerobic digesters. Landfill leachate will be deposited into a pretreatment system that will lower ammonia loadings, and then be fed into the aeration basins. The remaining hauled waste will be sent to the existing septage area, which will have new pumping and mixing equipment installed.

The grit removal system will have a new classifier installed with the capacity to treat the estimated peak day flows. A sluice gate will be added to the existing grit chamber bypass.

Primary treatment will be added to the WWTP's process train in the form of two 50-foot diameter primary clarifiers. A splitter box will be constructed to split the flow between the clarifiers, and a new Primary Treatment Building will be constructed to house the required equipment and controls.

The secondary treatment portion of the plant will utilize an expanded aeration activated sludge system. The aeration basin volume will be expanded by 25% to handle increased wasteloads at the plant and maintain compliance with effluent limits. Secondary treatment equipment, including fine-bubble membrane diffusers, blowers and RAS pumps, will be replaced or refurbished with the intent of improving the efficiency of the aeration system. Various piping and structural changes will be made to accommodate new equipment. A chemical phosphorus removal system will be installed as a backup and for future use as a primary removal system.

New steel covers will be installed on the primary and secondary anaerobic digesters; the primary digester will be equipped with a floating cover and the secondary digester will have an 8,500 cubic foot gas-holding cover installed. Both digesters will have the existing gas mixing systems replaced with new mechanical draft tube mixers, and will both be designed for sludge heating in order to provide operational flexibility. The existing sludge heating system will be replaced with a new dual fuel boiler and heat exchanger. New biogas safety equipment will also be installed.

The estimated capital cost for the recommended plan is \$7,674,900. The most likely sources of funds for this project are the plant's Equipment replacement fund, or a low interest loan from the DNR's Clean Water Fund. The current interest rate for eligible projects is 2.365%.

The steps and anticipated schedule for implementing the recommended plant upgrade are outlined below:

Conduct Public Hearing	May 2009
Submit Facilities Plan to DNR	May 2009
DNR Approval of Facilities Plan	July 2009
Begin Design	July 2009
Submit Plans and Specifications to the DNR	January 2010
Bidding	February 2010
DNR Approval of Plans and Specifications	March 2010
Submit Clean Water Fund Application*	March 2010
Award of Contract	March 2010
Begin Construction	April 2010
Final Completion/Startup of Facilities	June 2011
* Required for Clean Water Fund Loan	