

## PLANT PROFILE

# City of Owatonna

By Dean Nelson

**C**lean water has always been a priority for the City of Owatonna. The city's sanitary sewer system dates back to 1916, although it was not until 1940 that the first wastewater treatment facility was constructed. The facility was expanded in 1961 and planning for Owatonna's newest wastewater treatment plant began in the early 1970s the new \$17 million facility began treating wastewater in December 1987.

The treatment plant was constructed on an abandoned landfill necessitating the excavation of 100,000 cubic yards of refuse which was transported to and safely deposited in the Steele County sanitary landfill.

Raw wastewater entering the pumping station is metered and then screened to remove rags, sticks and other objectionable materials. After screening, wastewater is pumped by three 3,000 gallon/minute and one 1,200 gallon/minute pumps to the treatment units located above ground. Removal of sand and grit from the wastewater is accomplished in an aerated grit tank. Twin 250 gpm pumps, specially designed to withstand the abrasiveness of the grit slurry, pump the mixture to a grit separator and washer from which it is eventually hauled to the sanitary landfill.

Twin 65-foot diameter primary clarifiers provide conditions to settle suspended solids from the wastewater. The settled sludge is collected and pumped by three 90 gpm air-operated diaphragm pumps to the sludge processing facility at the plant.

The heart of the treatment process consist of four aeration basins each measuring 180 feet long by 32 feet wide and containing 15 feet of liquid. Air is injected into the tanks by a grid of 5,000 ceramic diffusers creating fine bubbles for gentle mixing and providing oxygen to the micro-organisms. Two 85-foot diameter final clarifiers covered with aluminum geodesic domes provide for solids separation. From the clarifiers, wastewater flows into six gravity sand filters where a four-foot bed of sand removes remaining particulates in the waste stream. The filters are



periodically cleaned by backwashing them with plant effluent to remove accumulated debris. Dual chlorine contact tank provides the proper detention for chlorine to kill harmful bacteria prior to discharging the effluent to the Straight River. Sulfur dioxide is added at the end of the tanks to eliminate the chlorine residual to further protect aquatic organisms.

The sludge processing facilities consist of a 60-foot diameter primary digester with a fixed steel cover and two mechanical

mixers, a 60-foot diameter secondary digester with a floating gas holding cover that provides for storage of the methane gas. This methane is collected and burned in an engine/generator which helps offset operating costs. There are also two biosolids holding tanks on-site with a total capacity of 1.7 million gallons.

Plans are being made at present for an upgrade to include phosphorus removal and biosolids handling improvements. [CS](#)

The existing plant design summary is as follows:

Flow	5.0mgd	TSS	7800 lbs/day
BOD	8500 lbs/day	NH3-N	900 lbs/day

NPDES Permit Conditions:

BOD5:	5 mg/l
TSS:	30 mg/l
Ammonia N	1.5 mg/l



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