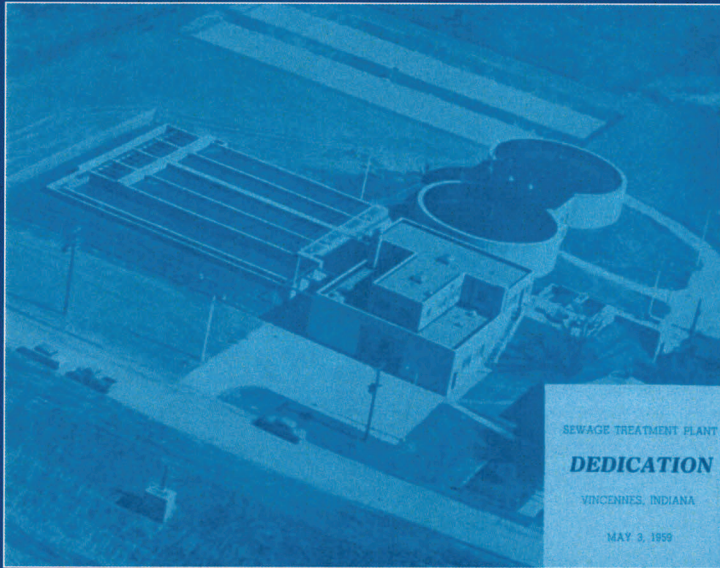




City of Vincennes, Indiana

Wastewater Treatment Facilities Improvements





The new headworks at the facility is designed to provide fine screening, grit removal and preaeration of influent wastewater.



The two new primary clarifiers each handle a peak flow of 11 MGD.

History

The City of Vincennes owns and operates a Class IV activated sludge wastewater treatment facility that provides preliminary, primary and secondary treatment for influent wastewater. The wastewater treatment facility treats domestic, commercial and industrial wastewater prior to discharge to the Wabash River in Knox County, IN.

Since its original installation in 1912, several improvement projects were completed at the facility. The original wastewater facility consisted of only one pump station and bar rack for preliminary screening before discharge to the Wabash River. In 1958, a new pump station and primary treatment facilities were constructed that had a design flow of 4.56-million-gallons-per-day (MGD). The facilities included comminution, grit removal, primary settling, chlorine disinfection and anaerobic sludge digestion.

The facility was modified in 1973 with the addition of secondary biological treatment, including aeration and clarification. Other facility improvements and equipment replacement were conducted in 1995. Despite these improvements, the wastewater treatment capacity did not increase beyond the original 4.56 MGD.

To address the City's improvement and expansion needs, as well as regulatory concerns, a plan for the expansion and upgrade of the Vincennes wastewater collection system and wastewater treatment facility was established. The plan called for the extension of sewer service to existing developed areas with failing septic systems, for accommodating anticipated wastewater flow from new residential, commercial and industrial growth, and for the treatment of infiltration and inflow sources from the sewer system.

Current Improvements

The collection system improvements include new sanitary sewer interceptors and existing interceptor improvements to collect wastewater from currently unsewered areas and to convey wastewater to a new lift station. The new, larger lift station at Watson Street pumps wastewater through a force main directly to the plant headworks. New structures and equipment for the improvements at the wastewater treatment facility include:

- Influent fine screens and new grit removal system
- Two new primary and secondary clarifiers
- Expanded aeration basins and new blowers
- Addition of ultraviolet disinfection system
- New gravity belt thickeners, dewatering presses, sludge heating and mixing systems
- Digester modifications and digested sludge storage building expansion
- Significant rehabilitation and replacement of all facility equipment



Secondary aeration at the facility was expanded to fully treat a 22 MGD peak wet weather flow.

Vincennes Wastewater Treatment Facility Improvements

The expansion and upgrade, which was completed in 2004, increased treatment capacity to an average design daily flow of 7.5 MGD. This is an approximately 64% increase over the existing 4.56 MGD average daily flow design capacity. Additionally, the design peak hourly flow increased from 5.65 MGD to 22 MGD to fully treat all wet weather flow at the facility.

DESIGN DATA

Current population (2000):

- 18,701 persons (City)
- 39,256 persons (County)
- 27,000 persons (Present service)

Design Year Population (2023):

- 20,594 persons (City)
- 45,200 persons (County)

Design Population Equivalent (PE):

- 67,070 persons

Design Flows

- Current Design Average Daily Flow: 4.56 MGD
- Future Design Average Daily Flow: 7.5 MGD
- Current Design Peak Hourly Flow: 5.65 MGD
- Maximum plant flow capacity: 22 MGD

Primary Clarifier (Net Area):

- 14,176 ft²

Aeration Tanks (Net Volume):

- 233,200 ft³

Primary Clarifier Detention Time:

- 5.6 hours

Activated Sludge Detention Time:

- 5.17 hours

Total Aeration Required:

- 8,800 ft³/minute

Ultraviolet Radiation Contact Time:

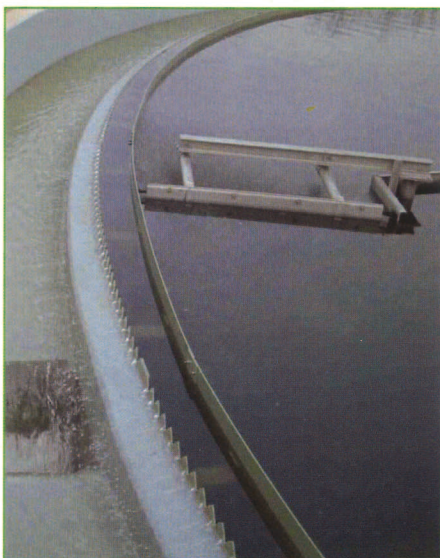
- 1.2 minute

Total Sludge Storage (Net Volume):

- 186,800 ft³

Total Construction Cost:

- \$16 million



Secondary clarification removes aeration solids prior to the return of the treated wastewater to the environment.



Treated effluent is re-aerated to make sure the aquatic life in the Wabash River is protected.



Significant modifications were made to the digestion and storage facilities to meet the needs of the expanded facility.



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