

NEW Water's Green Bay Facility



NEW Water's new front gate sign, reflecting the rebranding from the "Green Bay Metropolitan Sewerage District"

NEW Water's Green Bay Facility (GBF), located at the mouth of the Fox River, receives on average 32 million gallons per day of wastewater from 18 surrounding communities. The GBF has been treating wastewater since 1935, and has had numerous upgrades through the years to maintain the ever-changing effluent permit requirements. The current GBF was built in 1975 and was the first wastewater treatment facility in the country to treat both municipal and paper mill waste.

In 2008, NEW Water acquired the De Pere wastewater treatment plant. As a result, conveyance pipelines and interceptors were built to transport waste sludge, mill waste, and raw wastewater to the GBF for further treatment.

The GBF is staffed 24/7/365 by four rotating crews that continually monitor plant operations to ensure permit compliance. In fact, the Green Bay Facility is recognized as a Platinum award winner by the National Association of Clean Water Agencies (NACWA) for 100% permit compliance for 11 years running.

Green Bay Facility process description

A. Influent Pumping Station –

Domestic wastewater arrives at the facility near the bottom of the Pump Station through a large (108")

interceptor. The domestic wastewater passes through one of two coarse bar screens where material larger than two inches are removed. Four 900hp pumps, with the ability to pump 40mgd each, lift the wastewater to the start of the treatment process.

B. Headworks/Primary Clarifiers –

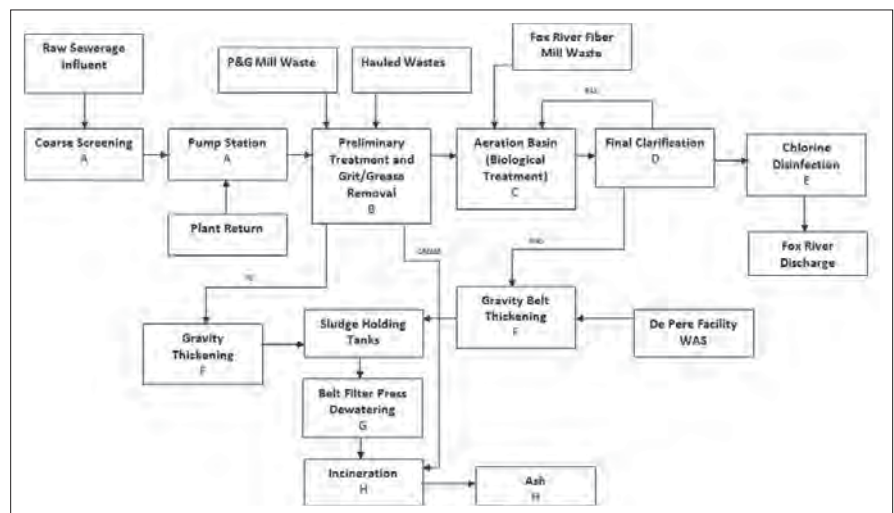
Fine screens and grit removal teacups are used to remove rags, grit and other debris from the waste stream before the flow enters the primary clarifiers. The primary clarifiers allow solids to settle out where they are then

removed for further processing. The liquid portion is sent to the aeration basins for further treatment.

C. Aeration Basins – The liquid flows from the primary clarifiers to the aeration basins which were redesigned for biological phosphorus removal. Air is provided by four centrifugal air compressors which can output 20,000-55,000 scfm each. Air outputs are controlled to achieve the desired aeration basin dissolved oxygen concentration.

D. Final Clarifiers – Following aeration, the treated wastewater and

Green Bay Facility Process Flow Chart



biological floc flows to the clarifiers. Settled solids (RAS) are returned to aeration and a portion is wasted (WAS) and pumped to the thickening process. The clean water flows over the weirs to be disinfected.

E. Disinfection – The current chemical disinfection system uses sodium hypochlorite to kill disease-causing bacteria. Before the flow is discharged to the river, sodium bisulfite is added to remove any residual chlorine. Following disinfection, the final effluent is discharged into the Fox River.

F. Thickening: Gravity and Gravity Belt – Both gravity belt thickeners and gravity thickeners are used to thicken both the primary sludge and waste activated sludge produced earlier in the process. Sludge is thickened to 4-6% solids before it is dewatered further.

G. Dewatering: Belt Filter Presses – The thickened sludge is then dewatered using a belt filter press. Sludge is simply compressed between two belts producing 17-20% dry cake for incineration.

H. Incineration – The dewatered belt filter press sludge is burned to an ash within two multiple hearth incinerators. Incinerator off-gas is treated using an advanced wet scrubber system and the leftover ash is then collected and sent to the landfill.

Green Bay Facility design data

Design Flow, million gallons per day (MGD)	
Average Flow	32
Maximum Daily	112
Design Loadings, thousand pounds per day	
Biochemical Oxygen	
Demand (BOD ₅) Design	74
Suspended Solids (SS) Design	64
Phosphorus (mg/l as P) Design	15
Influent Pumps	
Number	4
Total Installed Capacity, MGD	160
Primary Clarifiers	
Number	4
Volume, MG	1.25
Activated Sludge System	
Anoxic Basins	
Number	6
Volume, MG (North Plant)	0.33
Volume, MG (South Plant)	0.25
Contact Basins	
Number	6
Volume, MG (North Plant)	3.85
Volume, MG (South Plant)	2.5

Final Clarifiers (North)	
Number	8
Volume	1.7 MG each
Final Clarifiers (South)	
Number	2
Volume	1.93 MG each
Thickening – Gravity Belt Thickeners	
Number	3
.....	2 meter belts
Thickening – Gravity Thickeners	
Number	4
Volume, MG	0.15

Dewatering – Belt Filter Presses	
Number	43 meter belts
Incinerators	
Number	2
Emergency Generators	
Number	2
Capacity each unit (KW)	1,600
Plant Effluent Quality Requirements	
Carbonaceous Biochemical	
Oxygen Demand CBOD, mg/l ...	25
Suspended Solids, mg/l	30
Phosphorus, mg/l	1.0




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