

NEW Water De Pere Facility overview

NEW Water’s De Pere Facility (DPF), located on the north end of the City of De Pere, sits on a 23-acre site along the west side of the Fox River. The service area is comprised of the City of De Pere, a major part of the Village of Ashwaubenon, and portions of the Towns of Lawrence, De Pere, Bellevue, Hobart, and Rockland. The DPF has been treating wastewater since 1937, and has had numerous upgrades through the years to maintain the ever-changing effluent permit requirements. The facility incorporates single stage aeration with biological phosphorus removal, Tertiary Treatment, and UV Disinfection. The average daily flow is 8 million gallons per day (MGD), but receives close to half of NEW Water’s total loadings.

In 2010, the DPF was upgraded for remote operation from NEW Water’s Green Bay Facility (GBF) which allows for the facility to run unstaffed during evenings, overnight, and on weekends; this upgrade also decommissioned the solids operation at the DPF. In its place, conveyance pipelines and interceptors were built to transport waste sludge, mill waste, and raw wastewater to the GBF for further treatment. The DPF is now only staffed during the hours of 7:00 a.m. to 3:00 p.m. Monday through Friday, and three hours on Saturday and Sunday.

“The average daily flow is 8 million gallons per day (MGD), but receives close to half of NEW Water’s total loadings.”



Aerial view of NEW Water’s De Pere Facility

NEW Water De Pere Facility process description

A. Influent Pumping Station –

Interceptors bring wastewater to the plant from East De Pere, West De Pere, and Ashwaubenon. The flow passes through fine screening where the material removed is washed and compacted and sent to the landfill. Six variable speed influent pumps send flow to the Preliminary Treatment Units for future treatment at the DPF, or can divert up to 5.5 MGD of influent to the GBF.

B. Preliminary Treatment Units (PTU) –

As raw wastewater flows through the PTU, the velocity is slowed to one foot per second, allowing sand and other coarse non-organic material to settle at the bottom. The settlings are removed, washed, and sent to the landfill. Oil, grease, and other materials less dense than water rise to the surface of the tank and are skimmed off for further processing at the GBF.

C. Aeration Basins –

The liquid flows from the PTU to the aeration basins which were redesigned for biological phosphorus removal. Air is provided by six energy-efficient HST Integral high speed centrifugal air compressors which have variable speed drives to match compressor output with demand. Compressor output is 2100-5300 scfm each. They are controlled

to achieve the desired aeration basin dissolved oxygen concentration.

D. Waste Activated Sludge (WAS) and Mill Conveyance Systems –

In 2010, conveyance lines and pumps were added to convey mill waste and WAS to the GBF. Two 10” pipelines, seven miles long, provide the ability to pump all WAS flow and a portion of mill waste to the GBF. Each pipeline has a service water flushing system as well as chemical addition. WAS flow rates range from 250-650 gpm. Mill waste transferred to the GBF varies up to 750 gpm to aid in biological phosphorus removal. The remaining flow is diverted to the DPF aeration basins.

E. Intermediate/Final Clarifiers –

Following aeration, the treated wastewater and biological floc flows to the clarifiers. After settling, the secondary effluent flows to the Tertiary Treatment process. Settled solids (RAS) are returned to aeration and a portion is wasted (WAS) and pumped to the thickening process at the GBF.

F. Tertiary Treatment –

The secondary effluent is passed through filtering media in five gravity sand filters which captures any remaining suspended solids not removed in the clarifiers. These filters backwash automatically during off-peak hours to conserve energy.

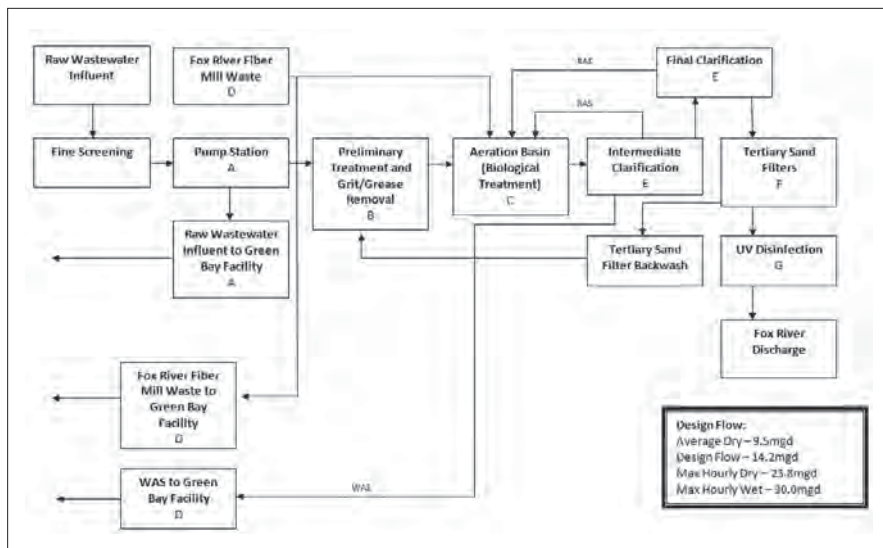
G. Disinfection –

The current Ultraviolet Disinfection system was installed in the spring of 2014. The UV system is a vertical lamp, two channel Ozonia low pressure high output system, which is energy efficient and capable of treating up to 30 MGD. Following disinfection, the final effluent is discharged into the Fox River.



Photo taken in October 2014 of NEW Water’s award-winning effluent, which is cleaner than the receiving waters in the Fox River

NEW Water De Pere Facility Process Flow Chart



NEW Water De Pere Facility design data

Design Flow, million gallons per day (MGD)	
Average Dry Weather Flow	9.5
Design Flow	14.2
Maximum Hourly –	
Dry Day Flow	23.8
Maximum Hourly –	
Wet Day Flow	30
Design Loadings, thousand pounds per day	
Biochemical Oxygen Demand (BOD ₅) Design	41
Suspended Solids (SS) Design	28.9
Phosphorus (mg/l as P) Design	15
Total Available Ammonium (mg/l as N) Maximum	22.2



NEW Water Treatment Operator Aaron Eichhorst (promoted to Treatment Leader since this photo was taken!) braving one of the worst winters in Green Bay on record, 2014

Influent Pumps

Number	6
Total Installed Capacity, MGD	55
Horsepower each pump	150

Preliminary Treatment Units

Number	2
Size, Feet	50x50

Activated Sludge System

Anoxic Basins

Number	2
Volume, MG (Both Basins)	2.2

Contact Basins

Number	2
Volume, MG (Both Basins)	4.4

Intermediate Clarifiers

Number	2
Diameter, Feet	100
Sidewater Depth, Feet	13.7
Overflow Rate at	
Design Flow, gpd/ft ²	1000

Final Clarifiers

Number	3
Diameter, Feet	125
Side Water Depth, Feet	10.9
Overflow Rate at	
Design Flow, gpd/ft ²	420

Tertiary Filtration Sand Filters

Number	5
Hydraulic Loading at	
Design Flow, gpm/ft ²	5

UltraViolet Disinfection

Number of Channels	2
Design Flow	
per Channel, MGD	15.0

Plant Effluent Quality Requirements

Carbonaceous Biochemical	
Oxygen Demand CBOD, mg/l	9
Suspended Solids SS, mg/l	10
Phosphorus P, mg/l	1



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