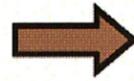


## City of Port Washington Wastewater Treatment Facilities



450 North Lake Street  
Port Washington, WI 53074  
Phone 262-284-5051  
Fax 262-284-5798  
Email [pwwwtp@yahoo.com](mailto:pwwwtp@yahoo.com)





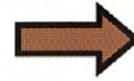
**Raw Wastewater**

Raw wastewater consists of water discharged from residences, commercial establishments and industries.



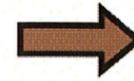
**Raw Wastewater Screw Pumps**

54 inch Screw Pumps are capable of moving 6.2 MGD each. They lift the wastewater 18 feet to begin the treatment process.



**Bar Screens**

The purpose is to remove all objects greater than 1/2 inch in size, ie. Rags, stones, paper, plastics, etc. This material is transported to a land fill.



**Grit Removal**

(2) Induced vortex grit removal units remove the inorganic waste, such as sand, egg shells, and coffee grounds, then send the thickened material to the grit classifier. This material is land-filled.



**Aeration Basins**

Flow is divided between (3) basins to treat the wastewater with a plug flow design. Step feeding is also possible. The organics in the wastewater are food for the micro-organisms. Air is supplied to the basins for mixing, and provides oxygen to the micro-organisms.



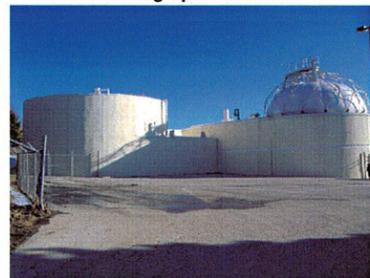
**Final Clarifiers**

Activated sludge flows to the final clarifiers, where it is allowed to settle to the bottom. Clear water flows over the top of the weirs and onto the next step in the process.



**Thickened Waste Activated Sludge**

Thickened sludge from the belt thickener is fed to the anaerobic digesters, where it is metabolized and stabilized by anaerobic bacteria. These bacteria perform best at body temperature of 98 degrees and the sludge is kept in the digester for about 30 days. A byproduct of this process is methane gas, which is stored and ultimately used as an energy source for heating the sludge to provide a self-sustaining operation.



**Secondary Digester Gas Storage**

Digested sludge and methane gas are temporarily stored before the sludge is thickened and gas burned for heat recovery.



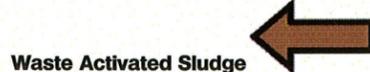
**Sludge Thickener**

Secondary anaerobic sludge is fed across the gravity belt thickener to remove excess water and increase the solids to 4%-6% before it is stored. Polymer is used to assist water removal.



**Sludge Thickener**

Waste activated sludge is fed across a gravity belt thickener to remove water from the sludge, while increasing the solids content to 3%-4%. Polymer aids the separation of water. After separating the water the thickened sludge is pumped to the primary anaerobic digester.

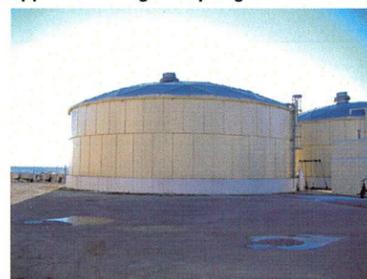


**Waste Activated Sludge**

A small amount of return activated sludge is removed each day to maintain a balance of microorganisms in the aeration basins for optimal treatment of the wastewater.

**Sludge Storage Tanks**

(2) Sludge storage tanks each have a capacity of 760,000 gallons, and are used for long-term storage, so the plant has enough time to operate before field application begins (spring and fall).



**Agricultural Land**

Sludge is spread/injected onto land for use as a soil amendment and fertilizer by local farmers.



**Return Activated Sludge**

The settled activated sludge is pumped from the bottom of the final clarifiers to the head of the aeration basins, where micro-organisms can perform their job once again on the organic waste.

**Final Effluent Reuse**

Final effluent is reused in the plant for various plant operations, to limit the amount of city tap water the plant would otherwise need to purchase.

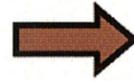
**Final Effluent**

The final effluent leaves the treatment plant through a 36 inch pipe that discharges into the Port Washington Harbor and back into Lake Michigan.



**UV Disinfection**

Clear water from the final clarifiers passes through ultraviolet light channels. The ultraviolet light destroys harmful bacteria, pathogens and viruses.



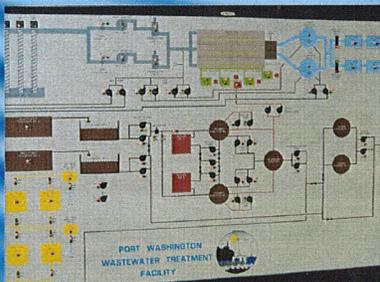


### Laboratory

The lab provides this treatment facility with the ability to Analyze the wastewater for DNR parameters. In addition, it provides plant personnel with information for process control.

### Plant Instrumentation

From the control room, the plant operations are continuously monitored and controlled by a series of PLC's that are tied into the main monitoring control computer. The system allows operators instantaneous information on plant function and can aid in the modifications to process control.



### Plant Design Parameters

Plant new in 1992  
Estimated cost of \$11,434,00

### Flow million Gallons per Day (mgd)

Average daily	3.10mgd
Maximum 24hr	9.30mgd
2010 daily	1.22mgd

### BOD, lb/day

Average	4,315
Maximum daily	9,709
2010 daily	2,168

### SS, lb/day

Average	5,386
Maximum daily	16,158
2010 daily	1,954

### Phosphorus, lb/day

Average	166
Maximum daily	416
2010 daily	55

### DNR effluent limits

BOD&SS monthly	30mg/l
BOD&SS weekly	45mg/l
Phosphorus monthly	1mg/l

### Plant Staffing

1 Superintendent  
4 operators