

PARCC Side Clean Water Plant

Plainfield • Alpine • Rockford • Cannon • Courtland



Welcome to the PARCC Side Clean Water Plant. After 10 years of planning, design, and construction, the PARCC Side Clean Water Plant began receiving flow from its member communities in December of 2008. Using bioreactors, membrane filters, and ultraviolet disinfection, it produces clean water for discharge to the Grand River. This state-of-the-art facility serves as a model for intergovernmental cooperation. I would like to thank the elected and appointed officials from the Townships of Alpine, Cannon, Courtland, Plainfield, and the City of Rockford who helped make this facility a reality.

– Michael Young, NKSA Chairman





1 Headworks

The wastewater enters the plant through the Headworks Building, where:

- A meter measures the amount of incoming flow.
- An automatic sampler collects samples for analysis.
- Two comminutors grind the solids. Grit and sand are removed in the Grit Chamber. All particles larger than 1.5 millimeters are removed by screens.



2 Bioreactors

Three bioreactor tanks – each holding about 1,500,000 gallons – are used to grow microorganisms, which consume the organic material in the wastewater and multiply quickly. These bacteria are known as biosolids. The wastewater is cycled through these tanks four times to convert as much organic material to biosolids as possible.

The first zone of each bioreactor is low in oxygen to remove nitrogen and control the pH level. The other three zones are aerated (adding oxygen to the mix), creating an aerobic environment to encourage bacterial growth and ammonia removal.



3 Membrane Filters

The wastewater is then pumped into one of five membrane tanks, each of which can hold about 45,000 gallons. The membranes are 7-foot-long hollow fibers, containing fine pores. Each pore is .04 microns wide or smaller – thousands of times smaller than a human hair. There are over 6.2 million membrane fibers in the PARCC Side treatment process.

A pump draws the water through the membranes, leaving the biosolids and any other debris behind. The clean water moves to UV Disinfection.

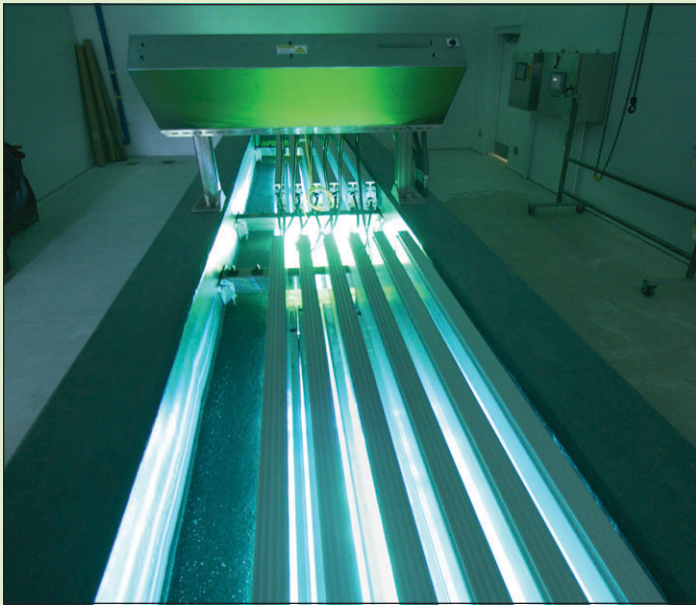
About 95% of the biosolids flow back to the bioreactors, where the bacteria decompose more wastewater and keep the process going. The other 5% of the biosolids are pumped to the Biosolids Holding Tanks.



4 Biosolids Processing

The biosolids are pumped into two 700,000-gallon holding tanks, where they settle and thicken. The water from the tops of the tanks is drained back to the beginning of the treatment process. The biosolids are then pressed in a screw press, which forces more water out of the biosolids.

The thickened biosolids are then delivered to a landfill, where they help the landfill waste decompose faster. This decomposition gives off methane, which is used to generate electricity.



5 Ultraviolet (UV) Disinfection

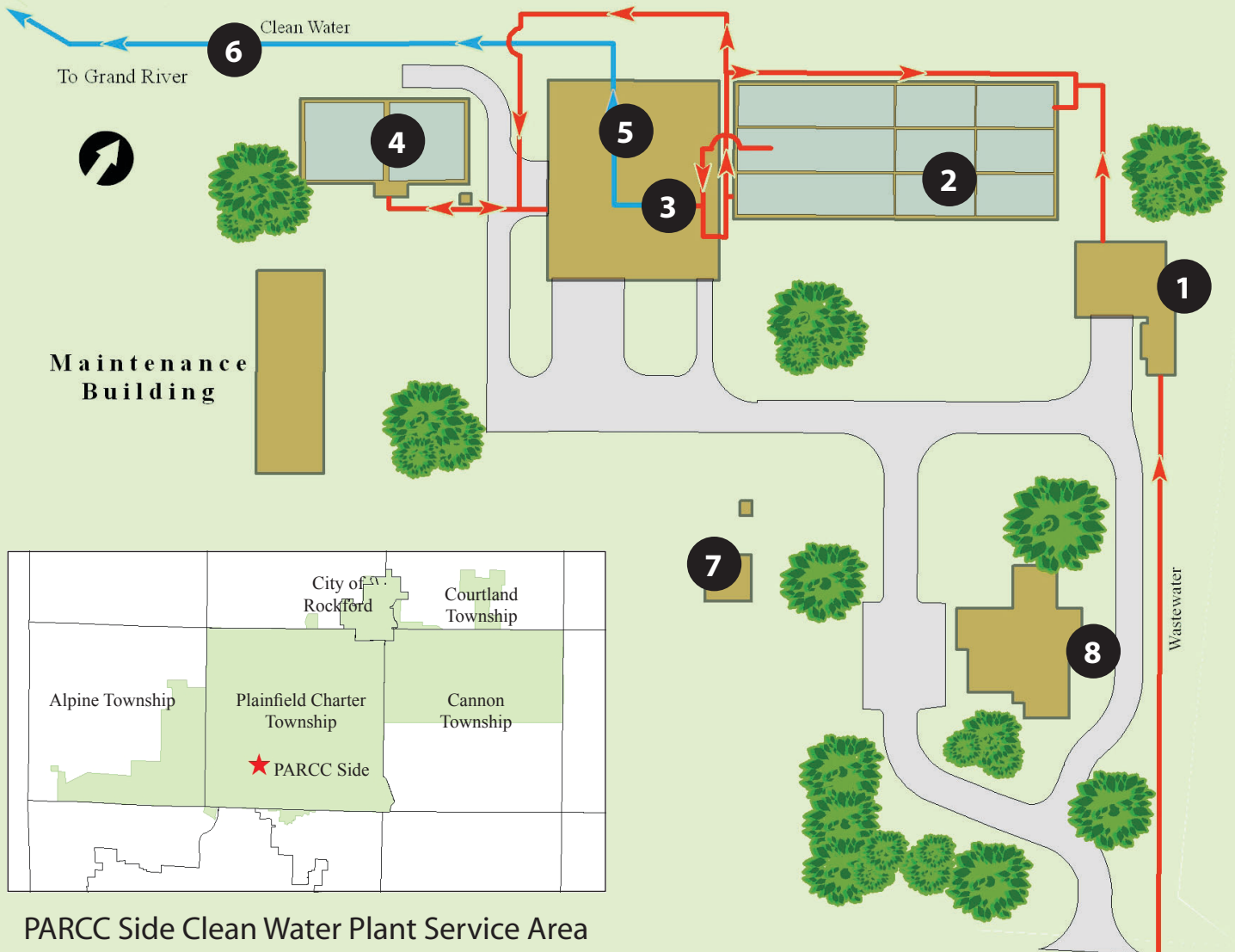
The water from the membranes passes through ultraviolet radiation, which disinfects it. The radiation is designed to deactivate any organisms remaining in the water.



6 Clean Water Discharge

The clean water is discharged into the Grand River. The discharged water is tested daily to make sure it meets all required environmental standards.

The PARCC Side plant processes, on average, about 4,000,000 gallons of wastewater every day. It is equipped to process an average flow of 6,000,000 gallons per day.





7 Air Treatment System

The air treatment system uses a biofilter to treat the air from the Headworks Building and the Solids Handling Area. Bacteria in the biofilter consume the odor-causing agents, removing odors before the air is discharged into the environment.

Each minute, the system treats 15,000 cubic feet of air; that's enough to fill a room 43 feet long, 43 feet wide, and 8 feet tall.



8 Administration Building

The Administration Building houses:

- Offices for North Kent Sewer Authority staff.
- A laboratory for testing incoming wastewater and the clean water discharged to the Grand River.
- Conference/class rooms.
- Lockers and showers for plant staff.

Interesting PARCC Side Facts

- There are over 6.2 million membrane fibers in the PARCC Side treatment process. Laid end-to-end they would stretch 7,600 miles; that's almost 1/3 of the Earth's circumference.
- The total volume of all tanks at PARCC Side is 7,250,000 gallons – the volume of 11 Olympic-sized swimming pools.
- The smallest pump at PARCC Side can pump five gallons/hour; the largest pump can pump over 1,000,000 gallons/hour.
- Building PARCC Side required 13,500 cubic yards of concrete, weighing over 54,000,000 lbs. The concrete is reinforced with 3,300,000 lbs. of steel.



The **North Kent Sewer Authority** would like to thank:

Prein&Newhof

Consulting Engineer

**GE Water & Process
Technologies**

Membrane Supplier



Contractor