

Project Progress – May, 2021

Boudreau Pump Station (near Chatham)

Site:

The Boudreau pump station is located west of the city of Chatham-Kent. It services approximately 340 acres of land in row crop production. Two fields are systematically tiled and drain via two channels.



These deliver mostly tile water to the pump station, where it is pumped from the municipal Deary drain to Jeanette's Creek which discharges into the Thames River.

The soils vary from a Brookston clay to a silt clay loam. Soil P readings are moderate to high (20 to 47 ppm) and the soils have high organic matter (4.7 to 7.6 per cent).

The [Lower Thames Valley Conservation Authority](#) (LTVCA) has monitored this site under the Great Lakes Agricultural Stewardship Initiative (GLASI)

since 2016. Water quantity and quality data is available.

Partners:

LTVCA, Waterloo Biofilter, Thames River PRC

Research description:

[Waterloo Biofilter](#) is the technology provider. The Waterloo EC-P™ system is based on electro-chemistry to coagulate dissolved P followed by a foam filter to support biological digestion. The electro-chemistry will transform dissolved P into particulate for the digestion phase.

The system was commissioned in October 2019.

Measurements:

Water samples were analyzed for total and ortho phosphorus, turbidity and pH. Total P recovered was calculated based on before and after treatment sampling.

Results and conclusions:

In late 2019 the site suffered a dyke breach on the edge of Jeanette Creek preventing the safe operation of the treatment system. By mid-spring 2020, the site was re-opened and the test continued. The Waterloo biofilter system uses a combination of electrolysis followed by biological digestion.

The system was designed to treat 40,000 liters per day. In the dry season, the runoff water phosphorus concentrations were very low. A decision was made at that time to spike the water inflow into the system to assess treatment capacity at various P concentrations.

The test period was completed in early December 2020 at the request of Chatham-Kent Drainage Supervisor. This provided sufficient time to move out the container while the land was frozen and restore the edge of bank before spring. The test results were very positive as both a 40% reduction in total phosphorus and ortho-P was achieved. Other lessons learned for scaling up to 100,000 litres per day included the elimination of a prefiltration tank to settle suspended particles enabling a larger tank configuration to treat more water. This system proves suitable for both municipal use in lagoons and at municipal drain pump stations.

Technology was de-commissioned in December, 2020 after successful testing. Among the conclusions are:

- Waterloo EC-P technology is suitable for low phosphorus - high dissolved oxygen environments
- Good potential for phosphorus removal from surface waters
- High levels of reactive and dissolved phosphorus removal
- No impairment to background water quality
- Low energy requirements
- System operates successfully year-round
- System withstands periods of no-flow
- Silt in source water can be managed
- Potential for P-recovery as a resource (specifically fertilizer for crops)

Details on measurements can be found [here](#).