

**EDWARD FARRAR UTILITY DISTRICT
WASTEWATER
POST JULY 2023 FLOOD
TREATMENT PLANT ASSESSMENT
WASHINGTON COUNTY,
VERMONT**

**NPDES PERMIT NUMBER VT0100463
STATE OF VERMONT PERMIT NUMBER 3-1160**

September 21, 2023

This report was prepared based on observations made during July 19, 2023 site visit by Heather Collins, VT DEC, WSMD, WWMP in conjunction with Army Corps of Engineers and US EPA Region 1 representatives.

REPORT LIMITATIONS

This report was prepared from visual observations and operator conversations during site visits. No testing of equipment or measuring of components was performed.

MAIN PLANT

FACILITY DESCRIPTION

The treatment plant is a lagoon system with a design flow is 510,000 GPD and capacity of 1.02 MGD. Wastewater from a 12 inch force main is pumped to an influent well and is gravity fed to three lagoons operating in series, then through tertiary treatment (CoMag) comprised of three reaction tanks, one mag drum, and one CoMag clarifier for phosphorus reduction. Sodium Hypochlorite (chlorination) and polymer are added. Treated effluent is discharged to the Winooski River. Solids are stored in two 82,000 gallon tanks, dewatered by decanting and applied to drying beds prior to removal off site. The operator stated incoming flows range from approximately 150,000 GPD (gallons per day) to 200,000 GPD on average. Flow for the past 24 hours has been approximately 600,000 GPD but had been much higher during the heavy rain event.

OBSERVATIONS

The facility received minimal damage as a result of the flooding event due to the constant pumping of flood water via sump pumps. As of July 15, 2023 the plant was providing full treatment. On the day of the assessment the plant was fully operational and providing full treatment.

During the heavy flow event, a portable Godwin pump (550 gallons per minute) was on site from a neighboring municipality (Stowe). The pump was in operation for three days pumping lagoon wastewater over the bank to a field which drains to the river. Additionally 3 and 4 inch trash pumps as well as a 4 inch siphon were used. Flood water did not overflow the lagoon system but there was slight evidence of erosion at the toe of the lagoon slope.

PUMP STATIONS

MAIN PUMP STATION

FACILITY DESCRIPTION

The facility is wet pit/dry pit style wastewater pump station with a cast in place concrete wet well and with two Yeomans dry pit submersible pumps and a sump pump. The control panel is on the first floor of the building with pumps on the basement level. PLC communications are made via radio frequency signal to Main WWTF.

OBSERVATIONS

The main pump station at 34 Main Street was submerged in approximately 2 feet of water. Although pumps were running at the time of the assessment, they are showing evidence of being damaged. Damage to the flow meter is also suspected since the flow readings do not appear to be capturing actual flows. This could be indicative of a damaged pump, possibly from flood related debris (sand and silt) entering the station and passing through the pump and/or the flow meter has also been damaged.

WATERBURY ICE RINK PUMP STATION

FACILITY DESCRIPTION

The facility is wet pit style wastewater pump station with a precast concrete wet well pit containing two submersible grinder pumps. The control panel is mounted above grade next to the pit. This pump station has a local visual and audible alarm system only.

OBSERVATIONS

The ice rink pump station was fully submerged during the flooding. An appreciable amount of grit and sediment from the collection system was likely conveyed into the wet well. Subsequently, pump performance should be checked for accelerated wear. Replace or recondition.

LINCOLN STREET AND GRANDVIEW HEIGHTS PUMP STATIONS

FACILITY DESCRIPTION

These facilities are wet pit style submersible grinder stations with precast concrete wet wells containing two pumps at Lincoln St and one pump at Grandview Heights. The control panels are mounted above grade next to the pits. These pump stations have local visual

and audible alarm systems only.

OBSERVATIONS

The Grandview Heights pump station was not subjected to flood water. The Lincoln Street pump station had water to the base of the wet well structure causing grit and sediment from the collection system to be conveyed into the wet wells. Subsequently, pump performance should be checked for accelerated wear and should be replaced or reconditioned.

COLLECTION SYSTEM

FACILITY DESCRIPTION

The collection system is 9 miles long consisting of varying sizes of piping with 260 manholes. There are 4 water crossings, 1 above bridge mounted, and 3 under water. The above water crossing is approximately 150 feet long 8 inch ductile iron pipe. One below water crossing is approximately 150 feet long 8 inch AC pipe. Another below water crossing is approximately 150 feet long 8 inch HDPE pipe. The last below water crossing is approximately 100 feet long 15 inch AC pipe.

OBSERVATIONS

Overall, the collection system received large amounts of grit/silt/debris.

RECOMMENDATIONS

SHORT TERM

- The portable Godwin pump was a huge benefit in preventing the primary lagoon from overflowing. The facility should consider purchasing a properly sized portable pump to prevent the lagoon from overflowing as well as have the ability to pump water from the low lying clarifier area.
- Complete replacement or professional rehabilitation of all electrical and mechanical equipment and instrumentation below the high-water mark at the pumpstations. Evaluate all pump station pumps for future efficiency as well as calibrate the flow meter in order to properly calculate actual flows.
- An appreciable amount of grit and sediment was likely conveyed into the plant. Lagoon sludge and sediment depths should be also checked and compared to

pre-flood measurements. Excess buildup of solids should be removed.

- Jetting and camera inspection of low-lying collection system areas as the collection system received an appreciable amount of grit/silt/debris. Camera inspections should be explored to ascertain collection system damages.
- Have Reduced Pressure Zone Backflow Preventers (RPZBP) at the facility inspected and tested to ensure they are properly functioning.

LONG TERM

Long term recommendations to potentially mitigate future flooding impacts include:

- The clarifiers are in a low lying area designed for gravity flow from the lagoon. However, wastewater is being pumped and not gravity flowing from the lagoon, so the facility would benefit from elevating the clarifiers to avoid future flooding.
- Controls for pump stations should be elevated above flood stage.
- Evaluate if crossover piping from Lagoons are adequately sized to allow for hydraulic balancing. Larger crossover pipes, multiple pipes and/or pumps should be considered.
- High flows may exceed the working capacity of chemical pumps. Additional pumps should be provided to deliver process and disinfection chemicals during high flows. Larger day tanks and supplies of chemicals on hand may be needed.
- Outfall pipes should have valves or duckbills to prevent river water from backing into plant components.
- Consider portable or fixed pumps to discharge effluent if gravity flow is no longer possible.

PHOTOS



1- Water from Lagoon 1 Being Pumped By Godwin Pump Into Adjacent Field During the Flood Event (Photo courtesy of Chief Operator Matt Jones)



2- Same Field in Photo 1 Above After Flood Waters Receded July 19, 2023



3- View of Lagoon 1



4- View of Lagoon Showing High Water Mark at Bottom of the Platform



5- Erosion Near Berm of Lagoon 3



6- View of Backside of Lagoon 1 Prior to Installing the Godwin Pump During the Flood Event (Photo Courtesy of Chief Operator Matt Jones)



7- View of Backside of Lagoon 1 After Flood Waters Had Receded July 19,2023. Fill Material Was Added During the Flood Event to Prevent the Lagoon from Overflowing



8- Godwin Pump Used to Pump Down Lagoon 1 During the Flood Event



9- Main Street Pump Station Basement Level. High Water Mark Was Approximately Feet, But Water Had Leaked Down from Upper Levels and Was in Contact With Upper Portions of the Pumps



10- Main Street Pump Station Basement Level. Showing Silt on Top of Piping from Leaking Down from Upper Levels



11- Main Street Pump Station Exterior. Showing Damaged Electrical Components in the Process of Being Removed.