

Wastewater Response and Recovery

Michelle Kolb

Direct Discharge Section Supervisor
Wastewater Management Program
Watershed Management Division
Department of Environmental Conservation

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Summary of Damages to Wastewater Treatment Plants from July 2023 Flooding.
Bold Facilities had similar damage during December 2023 flood.

Impact	Damage	Facilities
High	Facility Flooded	Johnson (not as bad as July) Ludlow Hardwick
High	River Crossing Line Break from Debris in River	Johnson Burlington Springfield
Medium	Flooding or Overflowing Pump Stations	Middlebury Johnson Orleans Barre City Hardwick Waterbury Barton Bethel Richmond Fair Haven Jeffersonville Johnson Montpelier
Medium	Line Break in Collection System	Ludlow Marshfield Cabot

Summary of Damages to Wastewater Treatment Plants from July 2023 Flooding.
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Impact	Damage	Facilities
Medium-Low	Operate in "Storm Mode" - Reduction of Treatment Due to High Flows	Middlebury Barre City Waterbury Barton Bridgewater Brandon Randolph Quechee Cabot Richmond Poultney Plainfield Montpelier
Low	River Water Backing Up into Facility Through Outfall	Montpelier Orleans Plainfield Wallingford
Low	Equipment Malfunction from Overuse During Flood	Woodstock

Johnson



Control Room - Blue arrow points to high water mark



Generator - Remaining floodwater and silt on top



Programmable Logic Controller, white line at top is high water mark

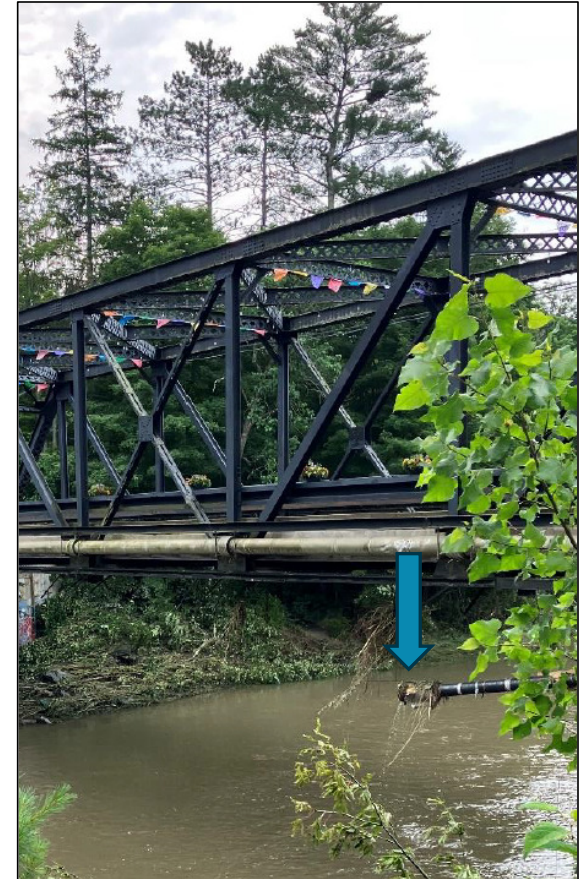
Johnson



Floodwater in Ultraviolet Disinfection Chamber



River Road West Pump Station completed in 2022 - water levels were over the control panel



Sewer River Crossing – Blue arrow points to line break

Ludlow



Entrance to Wastewater Treatment Facility



Flood Debris in Oxidation Ditch



Flood Debris at Chlorine Disinfection Contact Chamber

Ludlow



Generator built above
current 500-year flood mark



Broken 15" sewer line
going into facility



Headworks and control buildings

Hardwick



Motor Control Center – Blue arrow points to high water mark



Flood Waters at Facility Buildings
Slope to left is the lagoon



Influent pumps in basement

Waterbury



Lagoon 1 beginning to flood



Water from Lagoon 1 being pumped into adjacent field during flood



Same field after flood waters receded

Barton

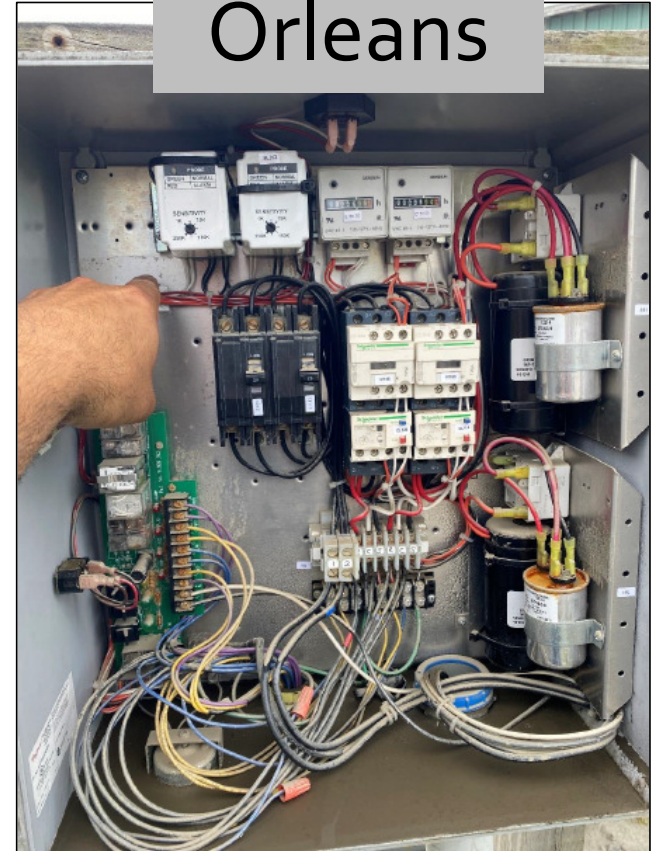


Lagoon overflowed into outfall building. Blue arrow shows high water mark above destroyed flow meter



Main Pump Station – water levels rose to overflow pipe

Orleans

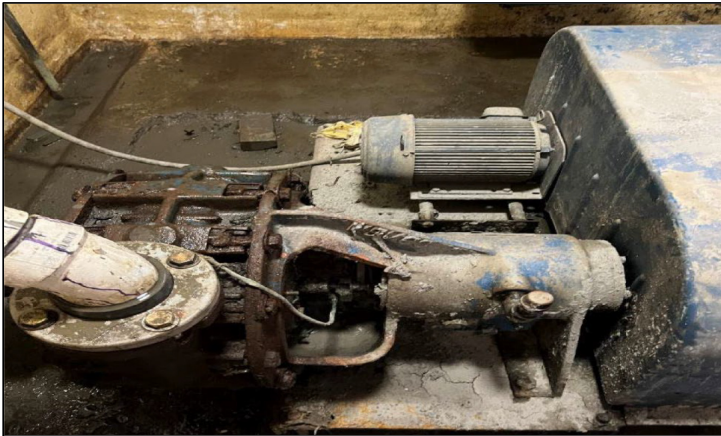


Blanchard Oil Pump Station Control Panel – finger pointing to high water mark

Barre City

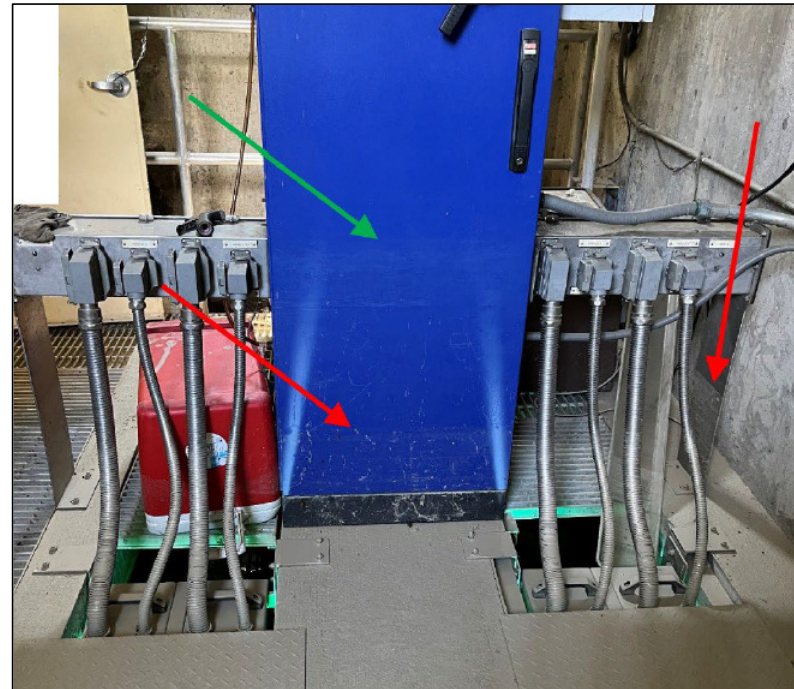


Primary Clarifiers – overflowed during flood



Grit pump – submerged during flood

Plainfield



UV System – recent high water marks in red, historical high water mark in green

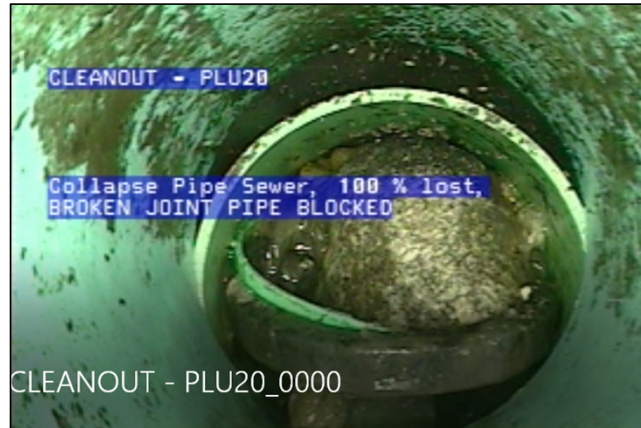
Recommendations to Prevent/Reduce Future Flood Damage

- Install valves or duckbills to prevent river water from backing into facility.
- Install flood doors and flood barriers at windows.
- Electrical controls to be elevated above flood stage.
- Replace non-submersible pumps with submersible.
- Reduce infiltration/inflow into collection system.
- Have backup pumps and blowers and keep maintained and operational.
- Additional/back-up disinfection pumps that are maintained and kept operational for emergency use.
- Have portable or fixed pumps to discharge effluent if gravity flow is not possible during flood.
- Have backup and/or spare parts for key equipment.
- Replace river crossing with depressed sewer/siphon type crossing, if possible.
- Add additional protection of line at river crossing.
- Post-flood, inspect repair and remove debris that entered system from breaks caused by flood.
- Routine cleaning, inspection and repair of collection systems.

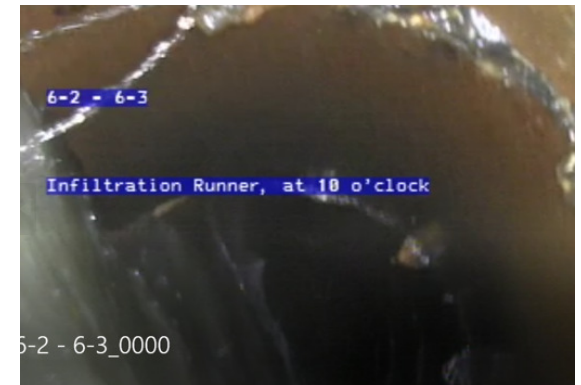
Post Flood Collection System Inspections



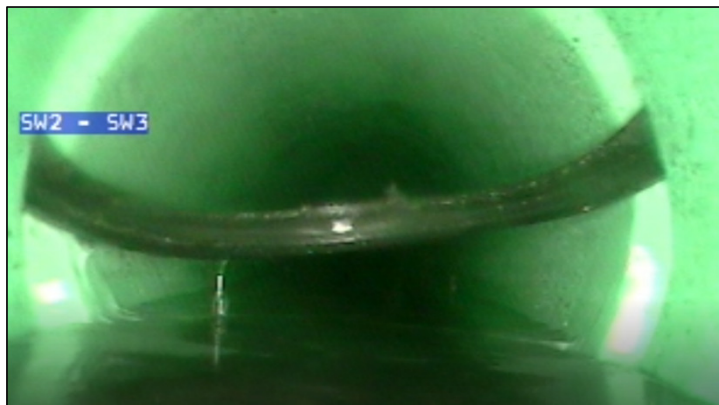
Johnson – blockage in pipe washed in from river during flood at line break



Ludlow – collapsed pipe and large rock washed in during break in line causing blockage



Barre – leak in pipe joint showing infiltration of groundwater



Cabot – broken seal where line was quickly repaired during flood



Hardwick – hole in pipe showing infiltration of groundwater