GLWA Board of Directors Meeting
November 18, 2021

June and July 2021 Post Event Analysis - Recommendations
Agenda

1) Review of the Investigation and Findings
2) Recommendations
   1) Short Term
   2) Medium Term
   3) Long Term
3) Local Systems and Private Property
4) Key Takeaways and Most Impactful Actions
5) Questions
Review of the Investigation & Findings

Wade Trim’s Investigative Work
Focus: Entire GLWA Collection System
- Conducted a regional system-wide storm response investigation and event reconstruction
- Interviewed operations, maintenance and supervisory personnel
- Collected, reviewed, analyzed, and trended literally millions of data points
- Modeled, analyzed, and compared the as-operated and as-designed regional system responses

Brown and Caldwell’s Investigative Work
Focus: Power and Pumping for East Side Collection System
  Conners Creek, Freud, Fairview and Bluehill Pump Stations
- Conducted Pump Station Power Vulnerability Assessments
- Post Event Data Acquisition/Analyses
- Electrical Testing Coordination
- Power Load Analyses
Conducted Pump Station Operations Assessments
- Rain Event Operations Data Analyses
- GLWA Staff Interviews and Field Investigations
- Sewer Condition Assessments
- Wet Weather Event Observations and Troubleshooting
Review of the Investigation & Findings

Wade Trim’s Primary Finding
The intensity and magnitude of rainfall that occurred on June 25-26, 2021 significantly exceeded the design level for the collection and treatment system and was the primary cause of water-in-basements.

Brown and Caldwell’s Primary Finding
Power supply reliability and quality are significant on-going vulnerabilities to the operations of Freud Pump Station and Bluehill Pump Station and the timing of PLD/DTE power supply conversion was a critical factor in the number of pumps available at Freud PS during the June event and at Bluehill PS in the July event.
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Recommendations

**Short Term (2022)**

a) Complete Conversion of Power Supply for Freud & Bluehill Pump Stations  
b) Update In-System Storage Devices and Level Sensor Programs  
c) Conduct Member Partner Discussions of Fox Creek Enclosure & Local System Improvements  
d) Increase Staffing and Update Standard Operating Procedures  
e) Initiate Study of Measures for Flood Relief and High River Levels and Seek Grant Funding

**Medium Term (2023-2025)**

a) Evaluate Other Pump Stations for Flood Mitigation Improvements  
b) Evaluate Power and Pumping Requirements and Redundancy System-Wide  
c) Evaluate Measures to Reduce Sediment Deposition in Conner Sewer  
d) Continue to Improve System Management Through Staffing and Training  
e) Add Grant Funded Flood Mitigation and High River Level Projects to the CIP

**Long Term (Post 2025)**

a) Complete the Freud and Conners Creek Pump Station Improvements

Preliminary, subject to further investigation and analysis
a) GLWA should work with PLD and DTE to accelerate, to the extent possible, the conversion of the Freud and Bluehill Pump Stations' power supply from PLD to DTE. This will greatly improve both power supply reliability and power quality, which have hindered the ability to pump as intended.
b) GLWA should evaluate its programs related to the In-System Storage Devices and Level Sensors to ensure that the programs includes the following:

• Additional devices and instruments to improve system operations.
• Increased staffing to address the maintenance and calibration for the additional devices and instruments.
• After event operational reviews
• Operability in extreme events.
Short Term - Member Partner Discussions

c) GLWA should conduct Member Partner discussions:
   • Fox Creek Enclosure -- with Wayne County and GLWA’s east side Member Partners that are tributary to the Fox Creek Enclosure aimed at brainstorming solutions regarding the capacity limitations in the Fox Creek Enclosure.
   • Local Systems -- with Member Partners aimed at brainstorming and information sharing regarding local system improvements and modifications related to prevention of water in basements.
GLWA should improve its system management through:

- Increased number of operations and maintenance Team Members.
- Development of Standard Operating Procedures (SOPs) for extreme wet weather events and circumstances.
- Implementation of a more robust training program that includes system-wide operations and emergency response.
- Augmentation of after-event analyses to include more events, more analytical tools, and more diverse operations and maintenance team member participation.
- Improve emergency and regular communication regarding system operations.
Short Term - Initiate Flood Relief Study

e) GLWA should study the effects of exceedingly intense and/or large rain events (climate change) on its wastewater system. Specifically, GLWA should evaluate the costs and benefits of the following:

- Flood relief projects that would mitigate impacts of large rainfall events.
- Actions necessary to mitigate detrimental impact on the system due to rising river levels.

GLWA should seek grant funding for this type of study and/or the projects that are recommended as a result of it.
a) GLWA should evaluate its other pump stations to determine if flood mitigation measures could be implemented, including emergency overflow options, additional instrumentation and/or new emergency operational protocols.
Medium Term - Evaluate Power & Pumping

b) GLWA should perform a comprehensive review of external power supply, internal power capabilities and flexibility, and firm capacities and operational targets, for all the following system-wide critical operational elements:

- Pump Stations
- CSO Treatment Facilities
- In-System Storage Devices
- Valve Remote Sites
Medium Term - Reduce Sediment Deposition

c) GLWA should evaluate the possibility of making structural or other engineering modifications to minimize the accumulation of sediment deposition in the Conner Creek triple barrel that is downstream of the forebay.
Medium Term - Continue Staffing & SOPs

d) GLWA should continue to improve its system management through:

• Increased number of operations and maintenance Team Members.
• Development of SOPs for extreme wet weather events and circumstances.
• Implementation of a more robust training program that includes system-wide operations and emergency response.
• Augmentation of after-event analyses to include more events, more analytical tools, and more diverse operations and maintenance team member participation.
• Improve emergency and regular communication regarding system operations.
Medium Term - Add Flood Projects to CIP

e) GLWA should study the effects of exceedingly intense and/or large rain events (climate change) on its wastewater system. Specifically, GLWA should evaluate the costs and benefits of the following:

- Flood relief projects that would mitigate impacts of large rainfall events
- Actions necessary to mitigate detrimental impact on the system due to rising river levels.

If funding is available, add projects to the GLWA Capital Improvement Plan.
Long Term - Complete Pump Station Upgrades

a) To the extent possible, GLWA should accelerate the completion of the Conners Creek and Freud Pump Stations improvements with a focus on:
- Improving operational flexibility, including providing the ability to start storm pumps earlier and better manage in-system storage capacity.
- Improving maintainability, including providing the ability to test storm pumps during dry weather.
- Improving power resilience by providing robust power -supply, -distribution, and -standby systems to handle emergency scenarios .
- Providing emergency flood relief discharge capabilities.
- Consider providing additional emergency flood control pumping capacity and dewatering capabilities.
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Local Systems and Private Property

It is important to note that the regional system works in conjunction with the local systems and the private property sewer assets. The pipes are all connected and if one element of the system is not functioning or not prepared for extreme weather, flooding can and will occur.

**Local Systems**
Many local systems may have experienced similar exacerbating circumstances as GLWA. Additionally, local systems are prone to sewer misalignments, obstructed lateral sewers, inflow and infiltration, and competition for capacity in the local and regional systems.

**Private Property**
On private property the sewer leads (from the home to the local sewer) are prone to misalignments, obstructions due to root intrusion, clogged drains within the house, and downspouts which connect the roof drainage directly to the sewer lead, which may cause the pipes to become overwhelmed and back up into basements.
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Key Takeaways and Most Impactful Actions

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**Medium Term (2023-2025)**

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**Long Term (Post 2025)**

a) Complete the Freud and Conners Creek Pump Station Improvements
Key Takeaways and Most Impactful Actions

Short Term (2022)

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Long Term (Post 2025)

a) **Complete the Freud and Conners Creek Pump Station Improvements**
Thank you,

Questions?