

# **Impact of Dam Failures on City Utilities**

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**Patrick Frazee, Director of Wastewater Services**

**07/27/2020**



# Impact of Dam Failures Report

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On May 19<sup>th</sup>, 2020 both the Edenville and Sanford Lake dams failed.

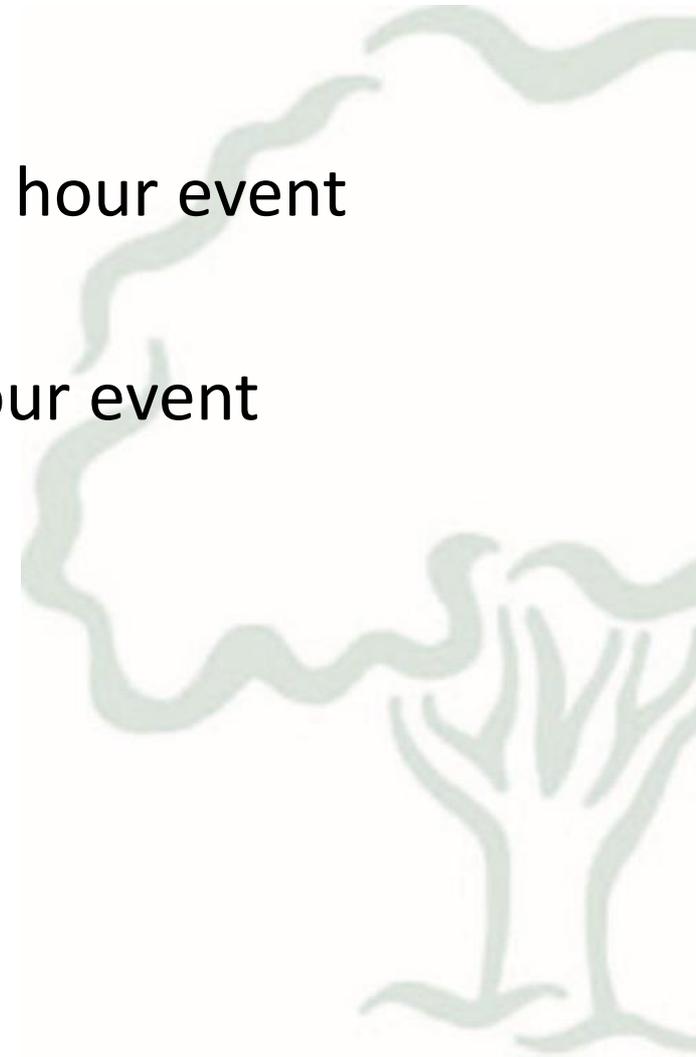
As a result the USGS river level gauge recorded a 500 year water level on the Tittabawassee River.



# Levels of Service for the storm water and sanitary systems.

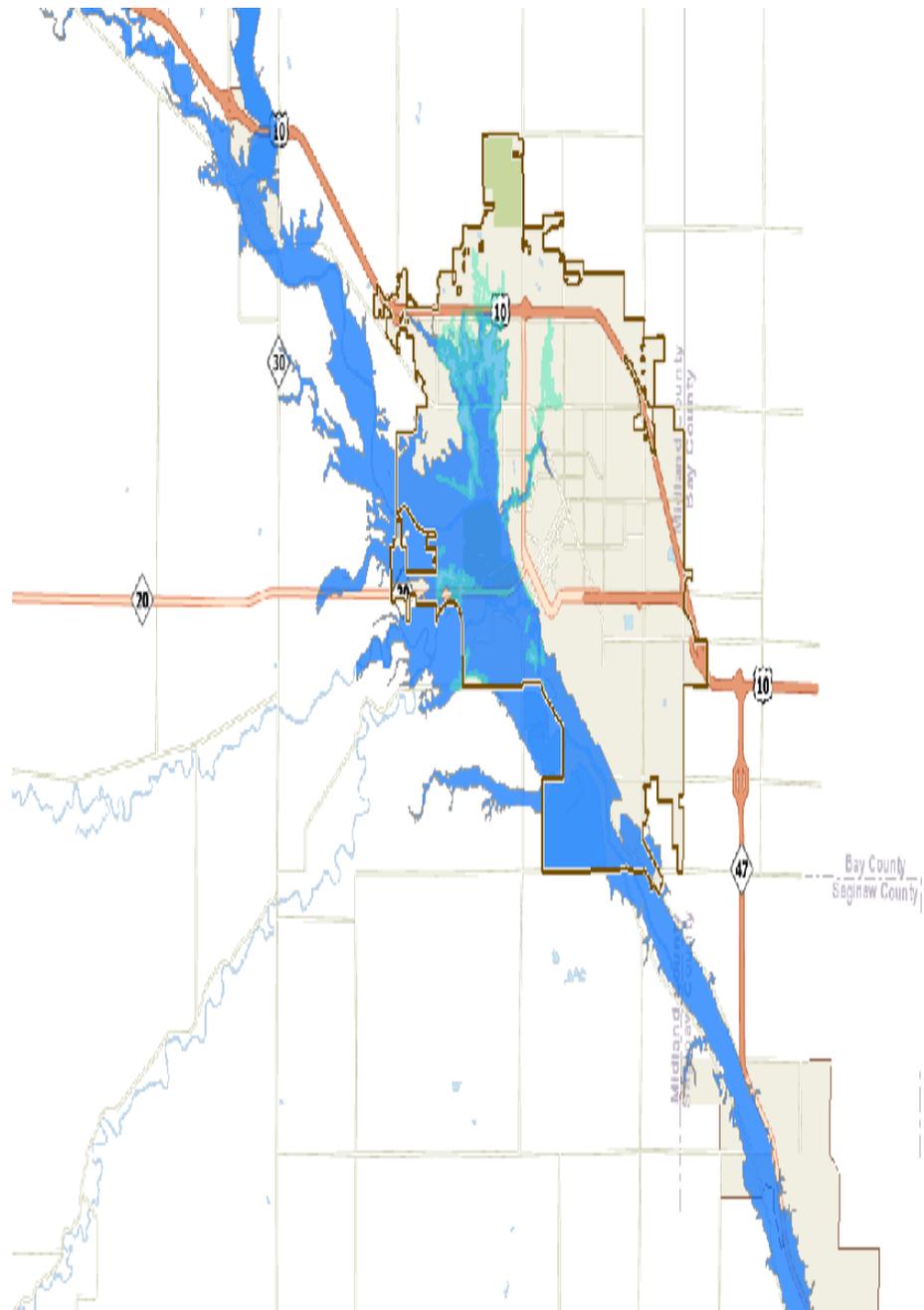
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- Storm water system at a 10 year/24 hour event
  - Sanitary sewer at a 25 year/24 hour event



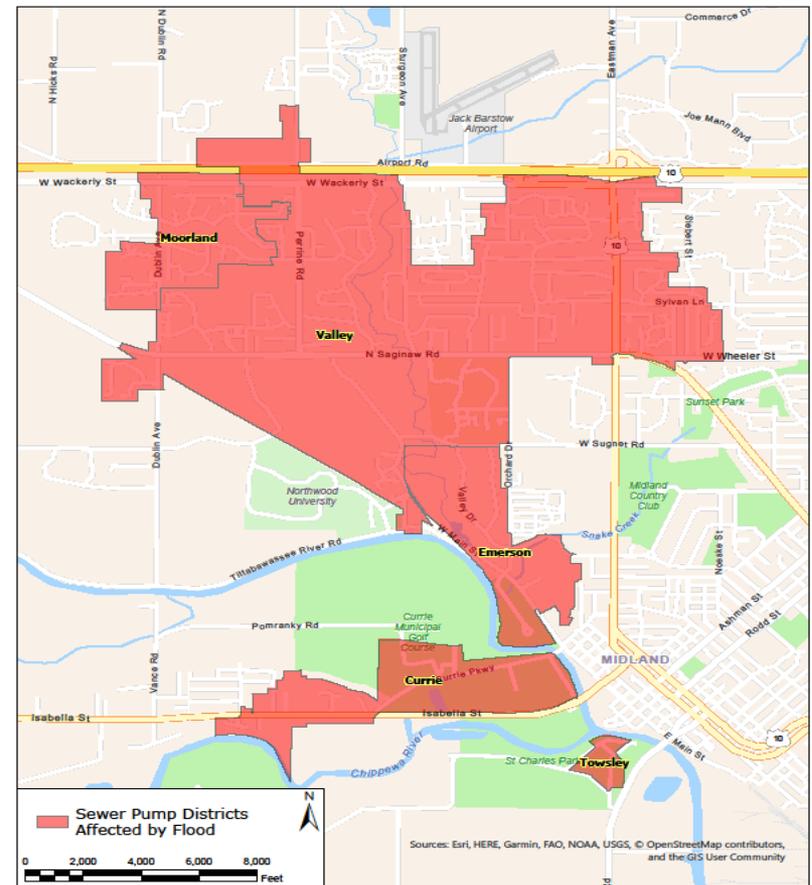
# Dam Failure Exercise

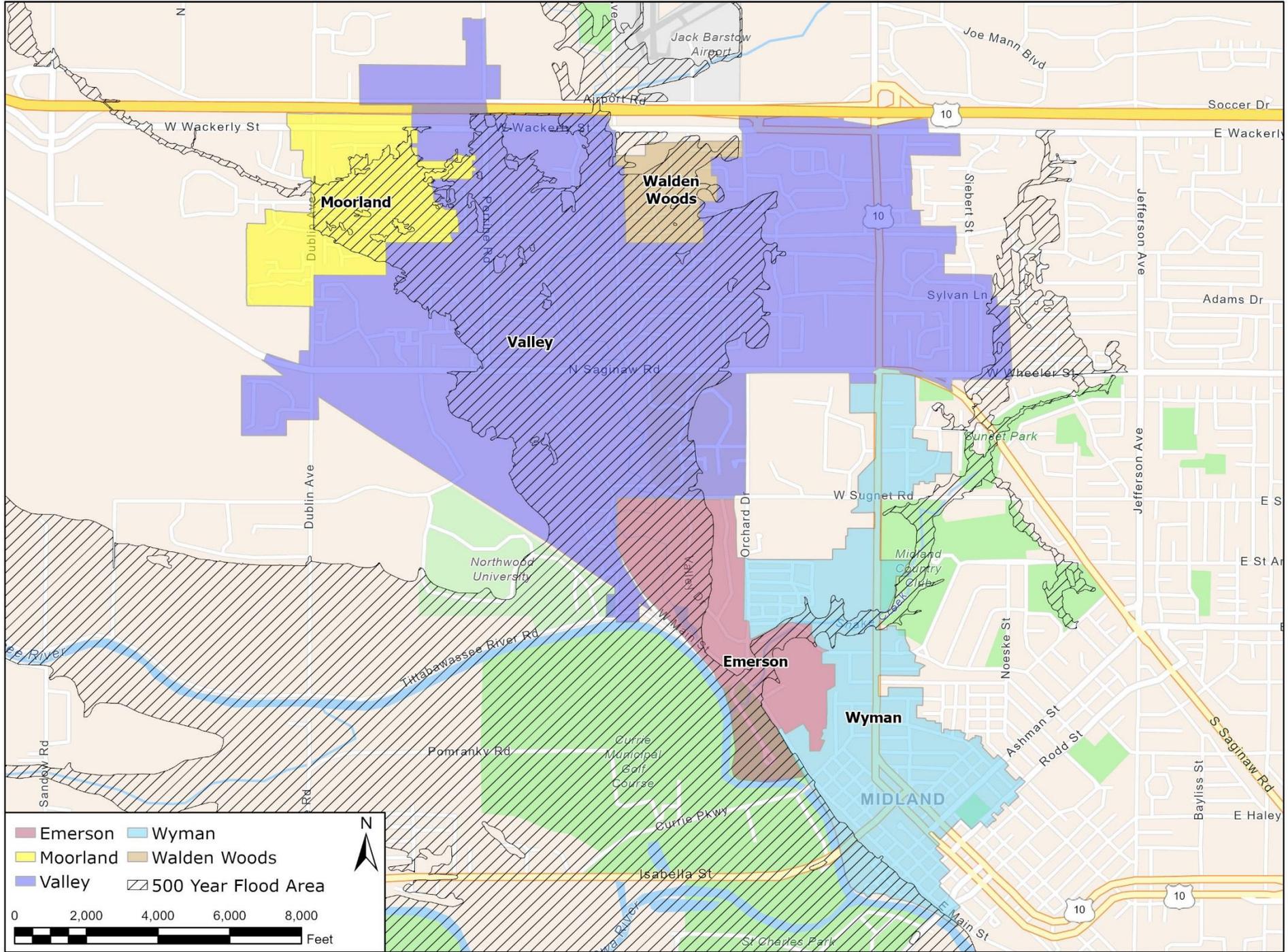
- In August of 2019 City Staff participated in a Dam Failure Exercise



# Dam Failure Exercise

- Utilities response plan was created, that included shutting down sanitary sewer pump stations that would be under water.





 Emerson	 Wyman
 Moorland	 Walden Woods
 Valley	 500 Year Flood Area

0 2,000 4,000 6,000 8,000 Feet

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# Dam Failure Exercise

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- Two important immediate issues that staff would have to contend with:
  1. Hydraulic failure
  2. Mechanical failure

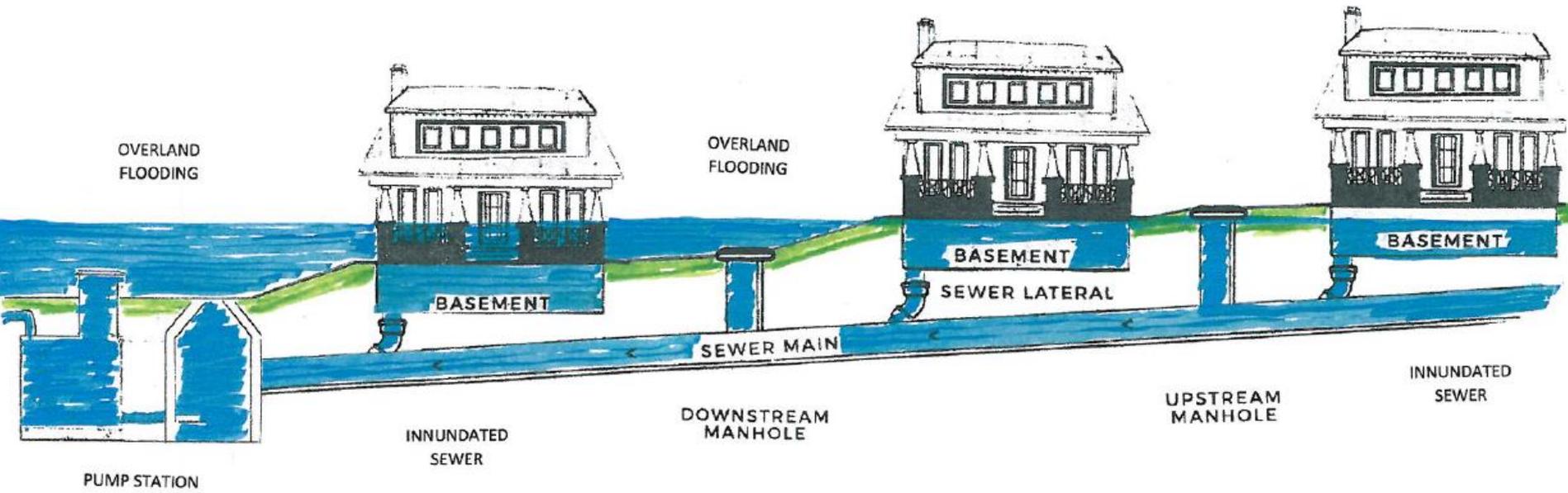
# Dam Failure Exercise

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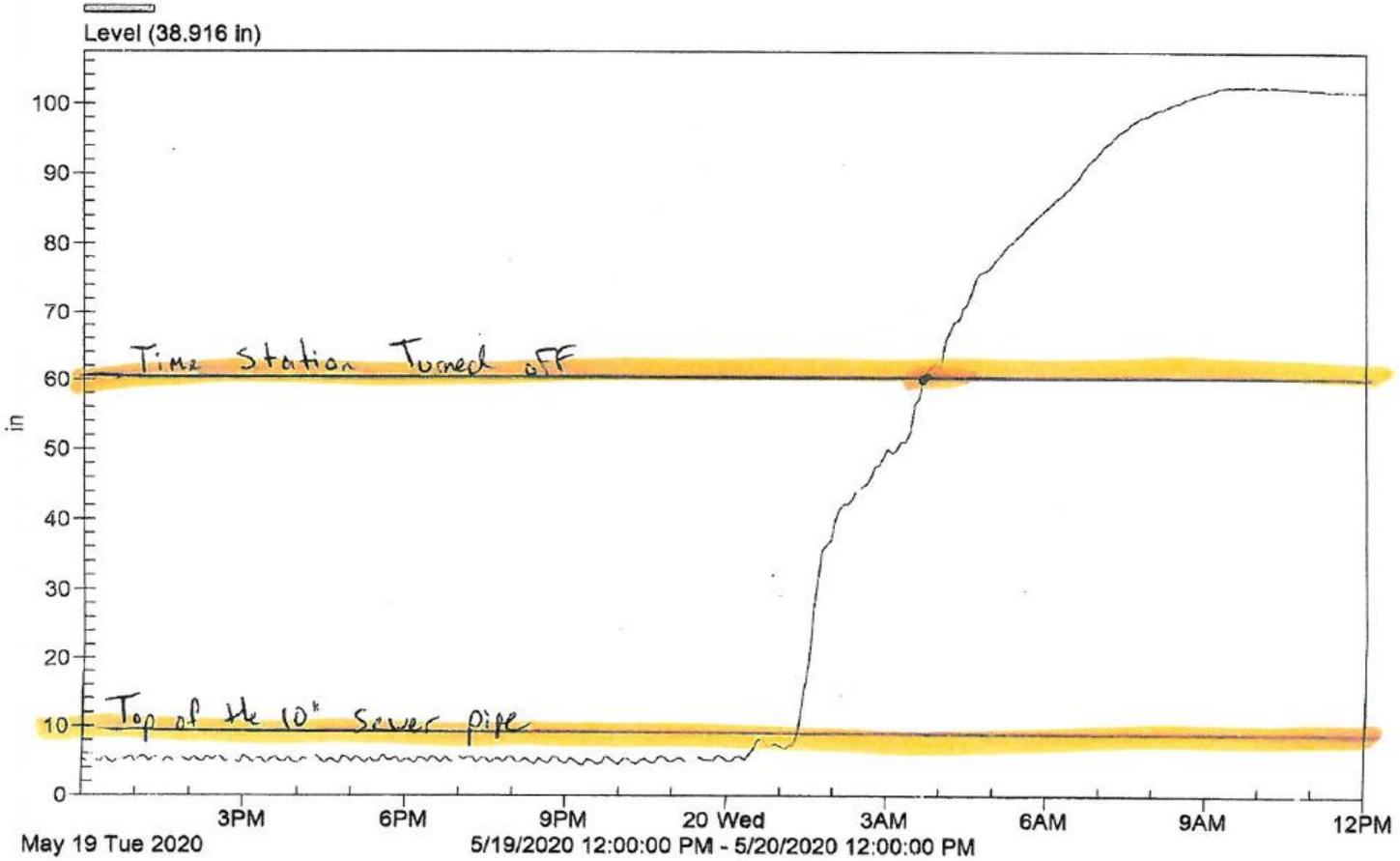
- Two long term issues Staff wanted to address:

1. Service to the hospital
2. Restoration time for service

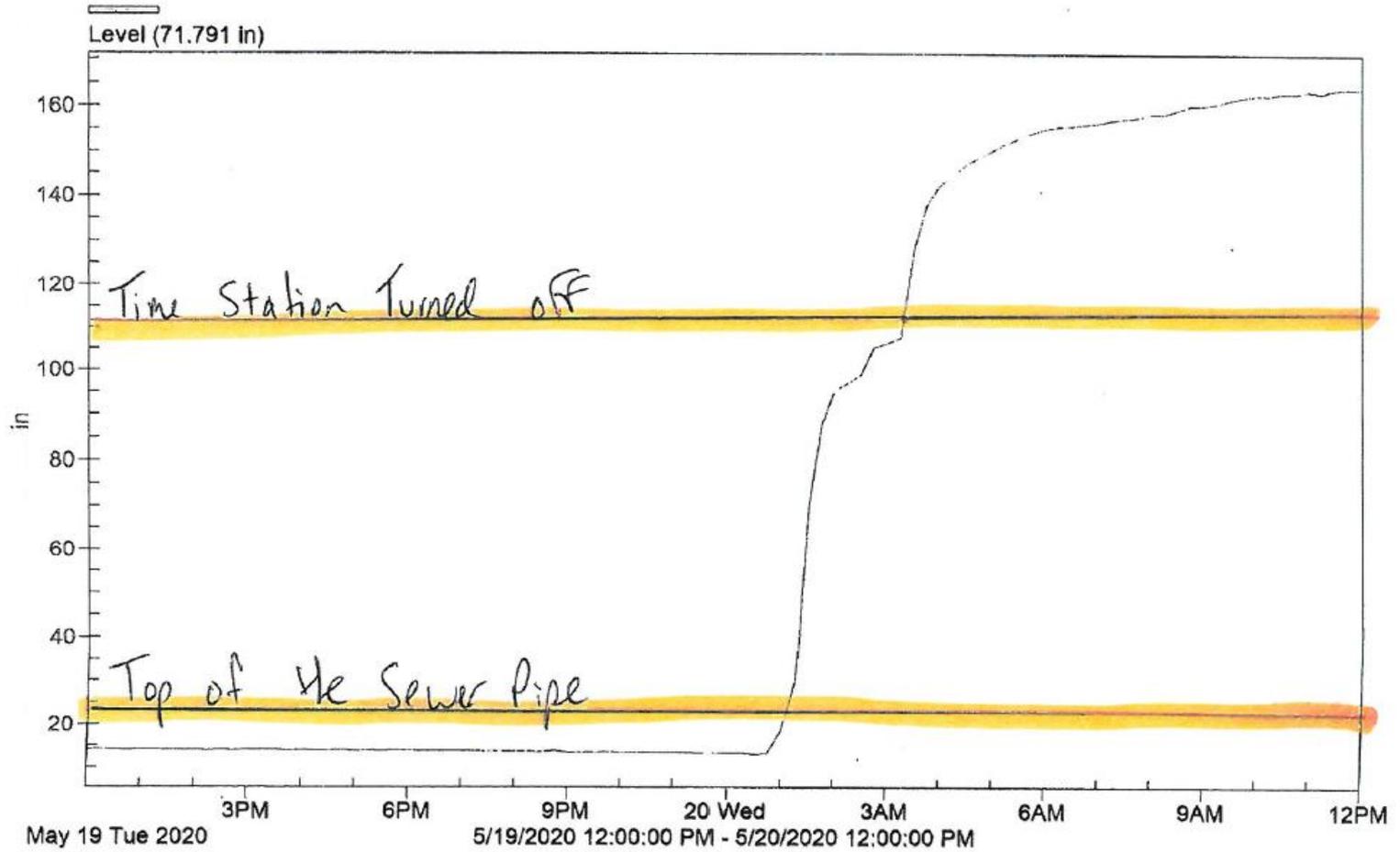
CATASTROPHIC FLOODING  
500 YEAR FLOOD EQUIVALENT



5408 Sturgeon  
Flowlink 5



2608 St Marys-2  
Flowlink 5



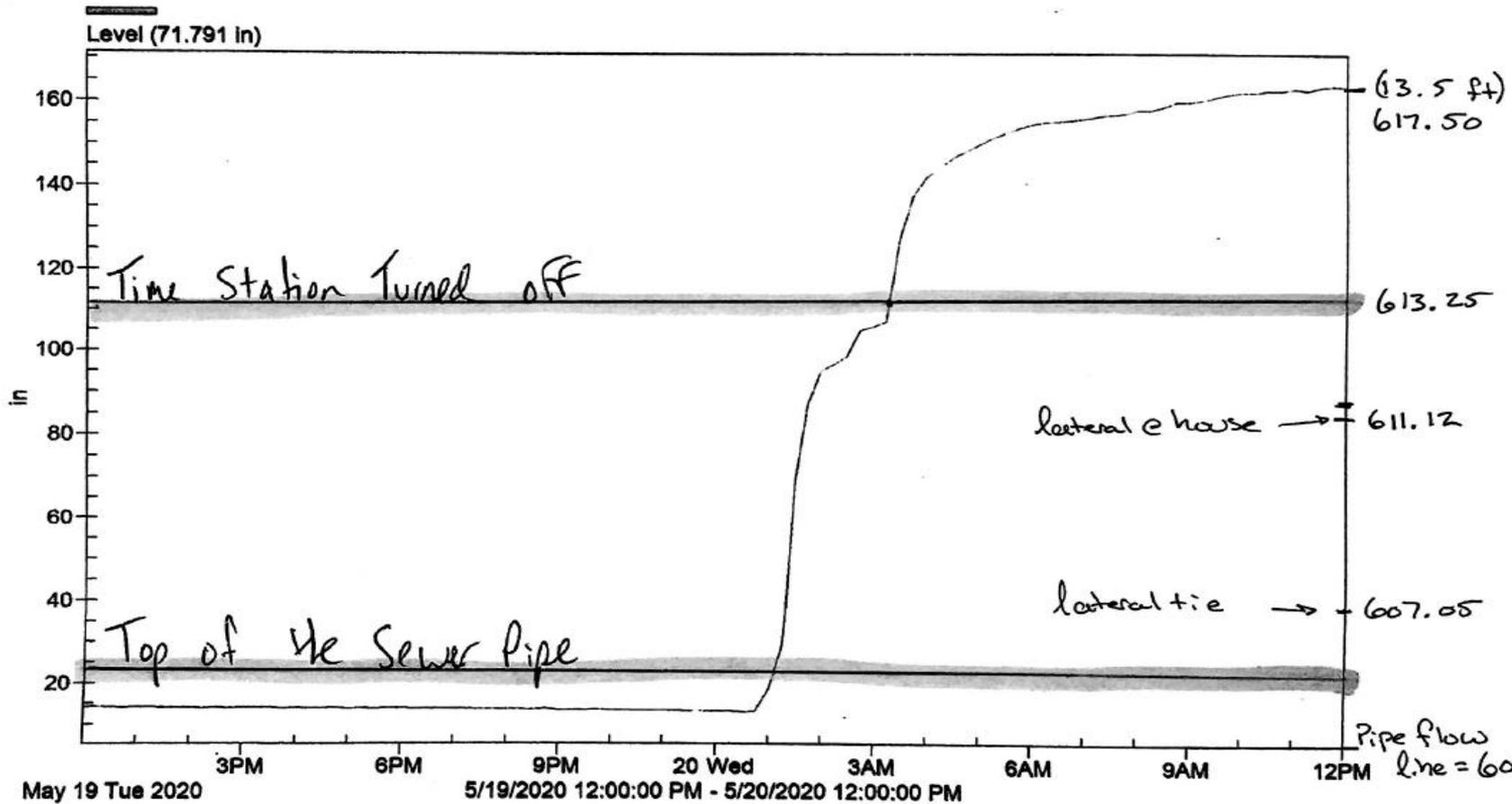
Elevations are City Datum

Top of pavement = 619.81

Sewer Card lists tie elevation = 607.05

### 2608 St Marys-2

Flowlink 5



July 2, 2020

# Valley Street Pump Station



# Valley Street Pumping Station



# Valley Street Pumping Station

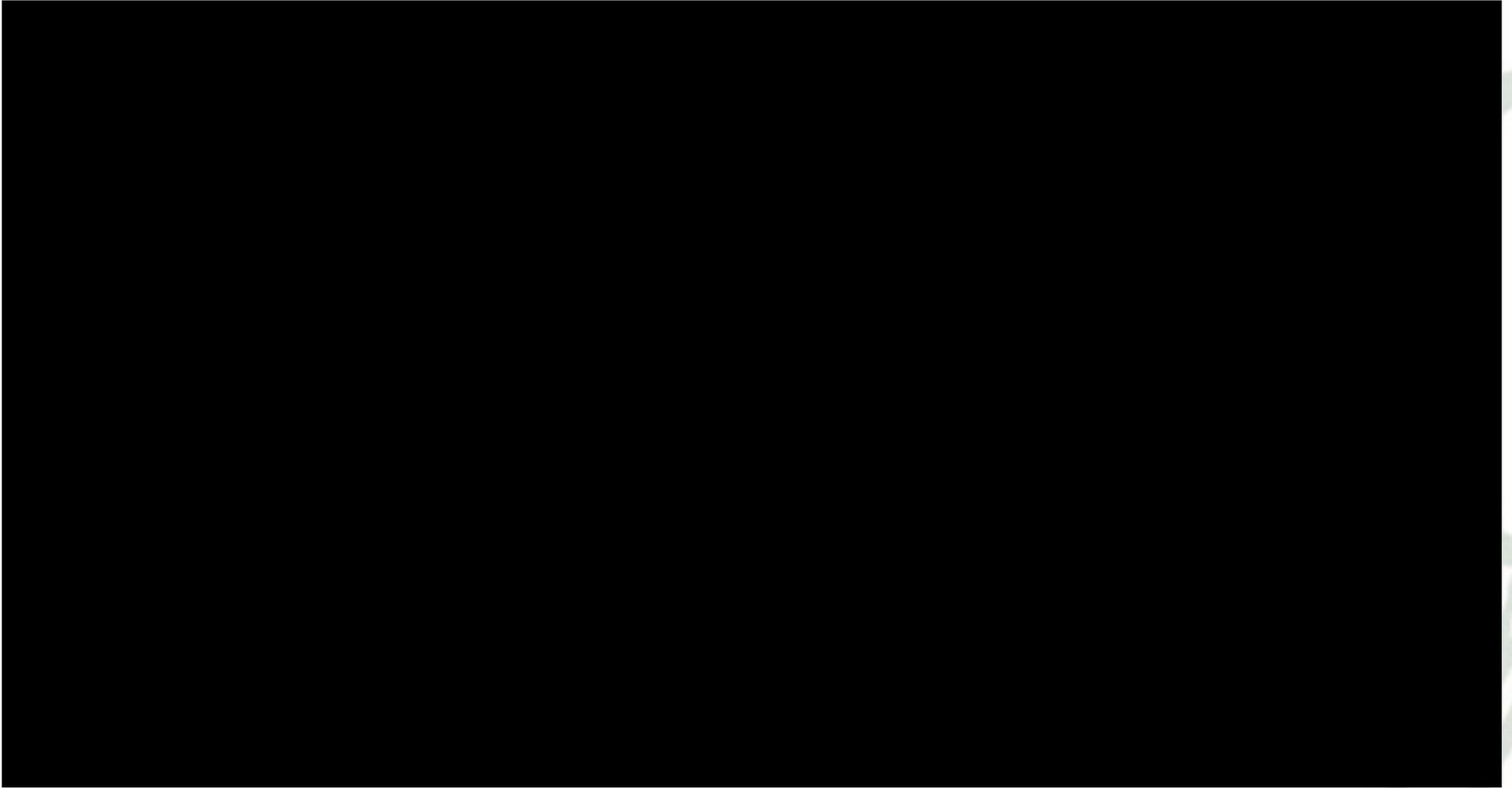


# Valley Street Pumping Station



# Moorland Street Pump Station

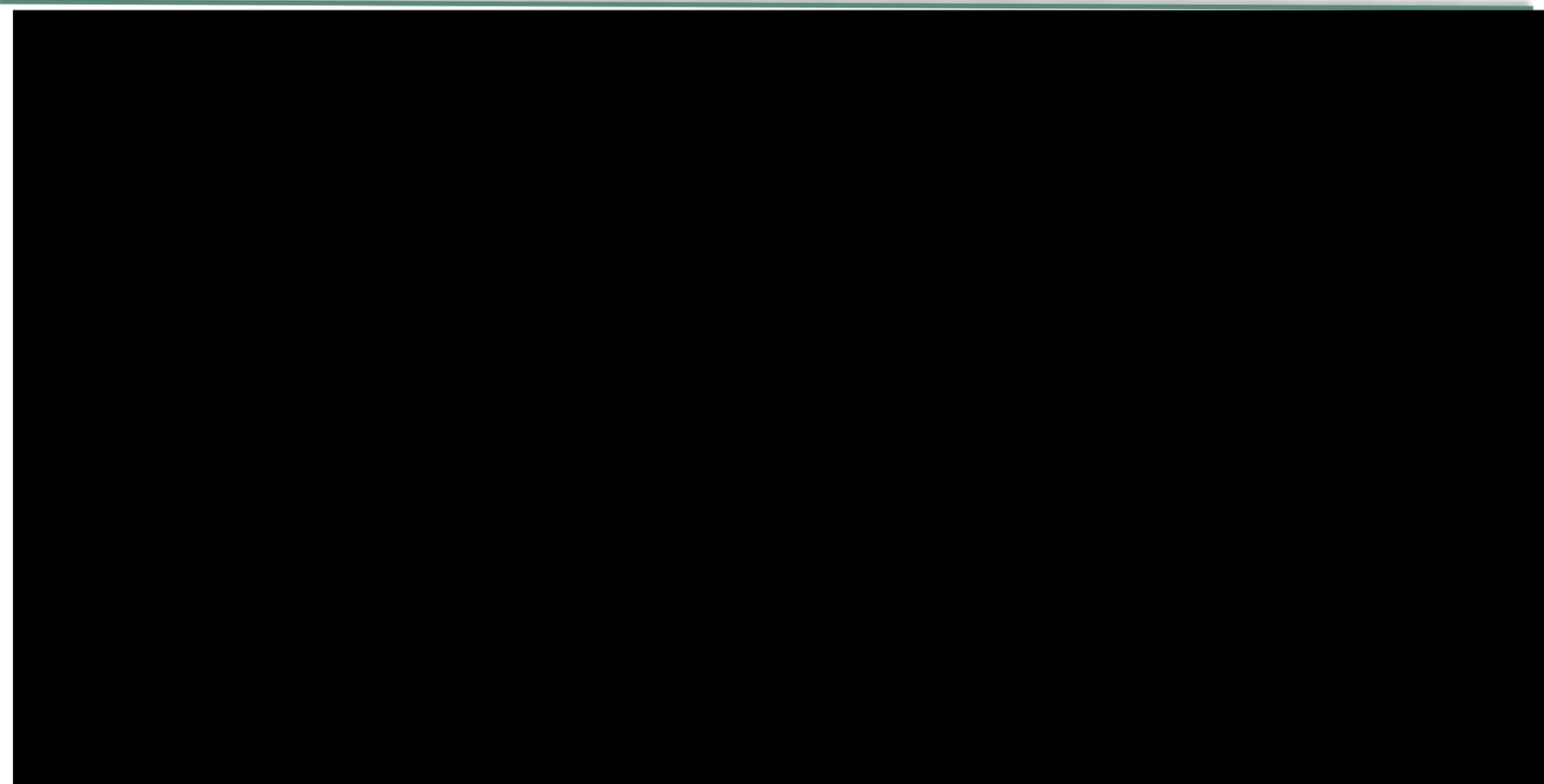
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# Moorland Street Pump Station



# Emerson Pump Station



# Wyman Street Pump Station



# Wyman Street Pump Station



# Wyman Street Pump Station



# Pump Station Summary

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- Numerous pump stations were either partially or completely overtaken by flood waters.
- The plan to shut down electrical equipment before failure was successful, as service to all City residents was restored within 48 hours of the flood waters receding.

# Assessing the River after the Dams

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- **Would our current river assessment procedures still be accurate?**
- **How much would the river levels now fluctuate with rain?**
- **How fast will the river rise with rain fall?**
- **Will rainfall to the North have a greater impact on us?**

# Assessing the River After the Dam Failures

- Installed rain gauges in Sanford, Edenville, Beaverton and Secord Dam.
- Rain gauge notification – gauges are programmed to text/email staff when rainfall occurs.



[1hr rain scan alert] ACTIVATED at 07/19/20 09:15:00 status updated at 07/19/20 09:15:00  
Alert Sent at 07/19/20 09:46:47

**Subject: Edenville RG.1hr rain scan alert: New Priority Alarm**

Alert Active: Alert [Edenville RG].  
[1hr rain scan alert] ACTIVATED at 07/19/20 09:00:00 status updated at 07/19/20 09:00:00  
Alert Sent at 07/19/20 10:01:54

**Subject: Edenville RG.4hr rain scan alert: New Priority Alarm**

Alert Active: Alert [Edenville RG].  
[4hr rain scan alert] ACTIVATED at

# Assessing the River After the Dams

River level gauges and cameras – river level gauges installed in Midland, Sanford and Edenville.

Data usage to give real time river assessments and also to help build new river assessment SOP.



# Conclusion

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- **Questions or comments**

