



Haverhill

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Water/Wastewater Division
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April 30, 2019

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Water Technical Unit (SEW)
P.O. Box 8127
Boston, MA 02114-0032

Massachusetts Department of Environmental Protection
Northeast Regional Office
Bureau of Resource Protection
205B Lowell Street
Wilmington, MA 01887-2972

Subject: City of Haverhill NPDES Permit # MA0101621
Infiltration and Inflow Report 2018

In accordance with the City of Haverhill's NPDES Permit # MA0101621, Part I.F.3, we are providing this summary report of actions taken to minimize infiltration and inflow (I/I) during the calendar year 2018.

Inspection and Maintenance Activities Conducted and Corrective Actions Taken in 2018

The following activities and out-of-pocket expenditures were conducted in 2018. Not all expenditures for I/I related activities are included in this report because they are part of the wastewater operation and maintenance budget and are not tracked separately as I/I expenditures.

- Mission Communication Alarms have been installed at seven of Haverhill's sewer lift stations. This allows the staff to monitor data from these lift stations and to see if there are any increased pumping rates. Pump runtimes vs. rainfall charts are analyzed to determine if there is an increase in runtimes during rain events. The City spent \$28,249 installing these Mission Communications Alarms in 2018. After analyzing data from Missions, there does not appear to be increases in runtimes during rain events.
- In response to increased flow to the wastewater treatment plant, crews investigated and found inflow from the Little River entering a failed flap gate at the Marginal Pumping Station flowing over the Middle Siphon Weir into the sewer interceptor. To prevent river water from entering in the future, the flap gate at Marginal Pumping Station will be periodically inspected to ensure it is closed.
- Monitored influent flow to the wastewater treatment plant for an increase due to inflow and responded accordingly.
- The Marsh Avenue sewer rehabilitation project, which includes lining 2,255 feet of sewer main, lining 36 sewer laterals/connections, rehab and sealing of 13 manholes, and a sewer spot repair, began in October 2018 and is expected to be completed in June 2019. See attached map "Marsh Ave Sewer Rehab and Repair".

- During the end of 2018 and beginning of 2019, the City cleaned and closed-circuit television (CCTV) inspected approximately 19,000 feet of sewer pipe in the area bounded by Lawrence Street, Kenoza Street, Main Street, and Marshland Street; along Kenoza Street up to Humphrey Street; and along Lake Avenue. Part of this sewer area included part of sewershed area 14 that could not be CCTV inspected during the first phase of the City's sewer system rehab and repair plan. Also, all protruding taps were cut in this area. The City spent a total of \$51,050 for CCTV's inspection, heavy cleaning, and tap cutting in this area. See attached map "2019 Sewer Rehab and Repair Project".

The City's engineering consultant reviewed the CCTV inspection video and prepared a technical memorandum that includes recommendations for rehab and repair in the inspected area. Bid documents are currently being prepared for the excavation rehab and repair that was recommended in the technical memorandum. The project is expected to be bid in the spring of 2019. The cost for the technical memorandum and design is \$60,600.

- In addition to the 19,000 feet of CCTV inspection work described above, the City completed CCTV inspection of 14,434 feet of a sewer and drain pipes in various areas throughout the City. These inspections cost \$69,000.
- The City has begun implementing a new Computerized Maintenance Management System (CMMS) (Utility Cloud) that is map-based and will help analyze areas in need of rehab. All CCTV data and videos will be kept in Utility Cloud. Pipe ratings will be linked to each sewer and drain segment. This will help the City with prioritizing areas of the City that need to be rehabbed. Also, City staff will be able to choose an asset on Utility Cloud's map to see all work orders that are associated with each asset.
- The City completed numerous spot repairs which have eliminated infiltration. Also, approximately 300 feet of sewer was replaced on Ashland Street for \$122,654 and approximately 250 feet of sewer was replaced on Locust Street for \$36,879.

Annual Average and Maximum Month I/I

The Annual Average I/I during dry weather days was 6.80 million gallons per day (MGD) for the entire collection system including combined and separated sewer areas. The Maximum Monthly I/I for a day without rain for 2018 was 15.09 MGD and occurred in November. Rainfall for the month of November was 10.41 inches compared with the November monthly average of 3.84 inches based on rainfall records dating back to 1895. It should also be noted that groundwater levels through December 2018 were exceptionally high.

Infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

No corrective actions were taken in 2018 as a result of Unauthorized Discharges

CCTV inspections of sewer lines that experienced a sanitary sewer overflow (SSO) were added to the procedures for follow-up on Sanitary Sewer Overflows (SSO). The City continues to develop an approach to include the CCTV pipe inspections (of sewer lines that experienced sanitary sewer overflows) into a new CMMS.


Areas Identified for I/I-Related Investigation/Action in 2019

The following activities are planned for 2019.

- Complete a portion of the gravity sewer inspection program in the Integrated LTCP and I/I Reduction Program. The City plans to CCTV inspect sewers and conduct MACP Level 2 inspections on sewer manholes for the Locke Street CSO catchment area. This includes CCTV of approximately 68,000 feet of sewer, smoke testing of approximately 81,000 feet of sewer, and MACP Level 2 inspections of approximately 620 manholes. The Locke Street area is shown on the map attached "Center Barrel-Locke Street Sewer Inspection".
- Final design drawings and bid specifications are expected to be completed for all excavation sewer rehab and repair in the area bounded by Lawrence Street, Kenoza Street, Main Street, and Marshland Street and along Kenoza Street and Lake Avenue. Construction of this project is expected to start in the summer of 2019 and estimated to cost approximately \$3 million.
- As part of the City's Phase III CSO Improvements projects, the City has included inspection of the sewer connected to and located near four of the City's CSOs. See attached map "CSO Improvements Project".
- The City will install Mission Communication Alarms at seven more lift stations. This will allow the City's staff to observe if there are any increases in pumping rates during rain events. Attached is a screen capture for the Clydedale Avenue Lift Station that has yet to show any variance in pumping rates.

If you require additional information, please contact Carrie Prescott at (978) 374-2382 or via email at cprescott@haverhillwater.com.

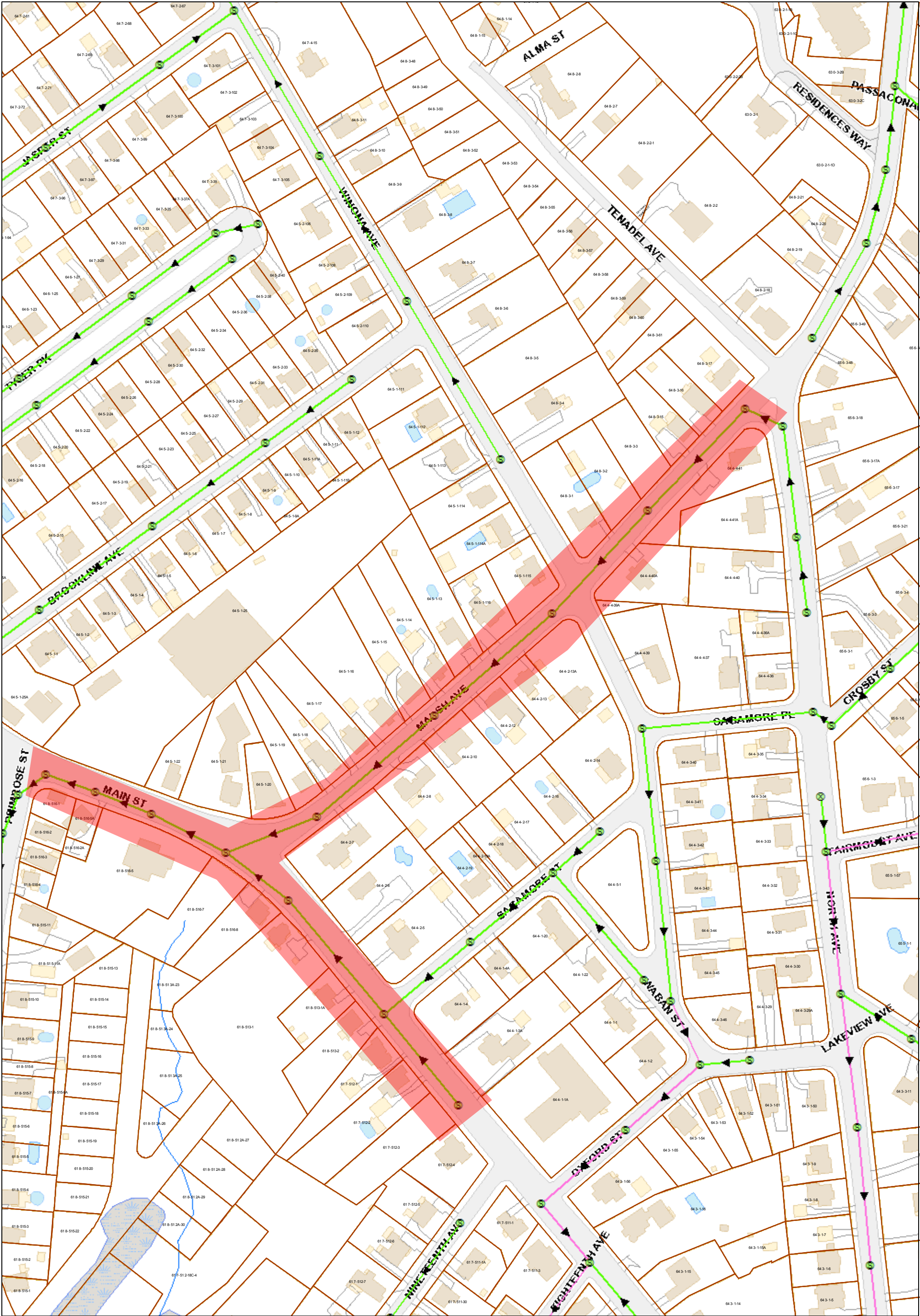
Sincerely,



Robert E. Ward
Deputy DPW Director

Enclosures: (1) Map showing Marsh Avenue Sewer Rehab and Repair Project area
(2) Map showing 2019 Sewer Rehab and Repair Project area
(3) Map showing Center Barrel-Locke Street Sewer Inspection area
(4) Map showing CSO Improvements Project area
(5) Runtime vs. Rainfall Graph for Clydedale Avenue Lift Station

cc: Michael K. Stankovich, Director of Public Works, mstankovich@cityofhaverhill.com
Carrie Prescott, Collection System Supervisor, cprescott@haverhillwater.com
Isaiah Lewis, WWTP Facility Manager, ilewis@haverhillwater.com



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Feet

City Of Haverhill, MA

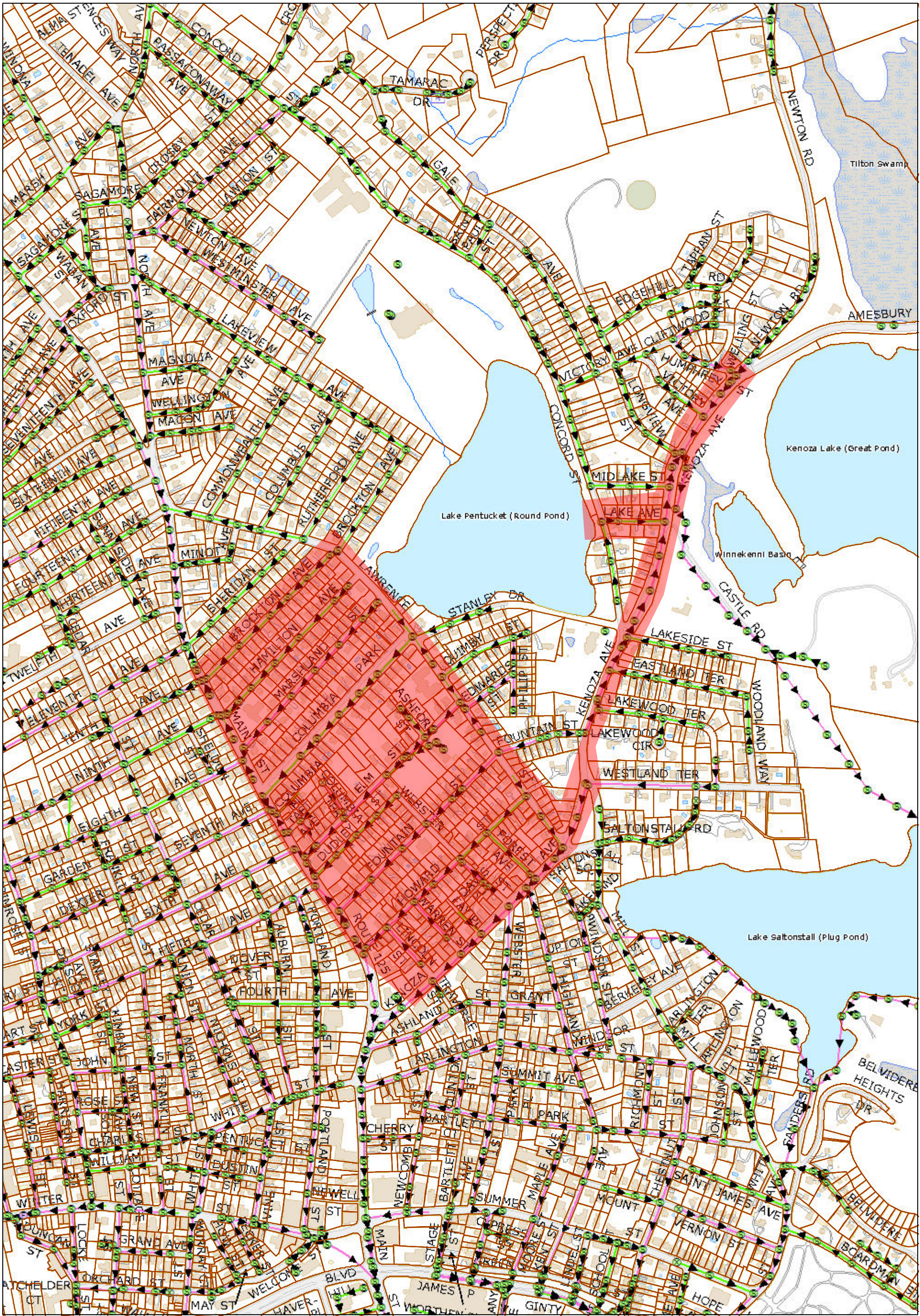
Engineering --- Division


Date produced: 4/15/2019

1 inch = 157 feet

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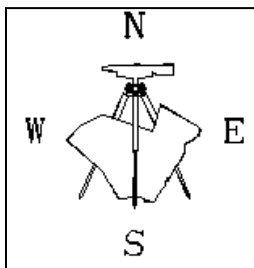
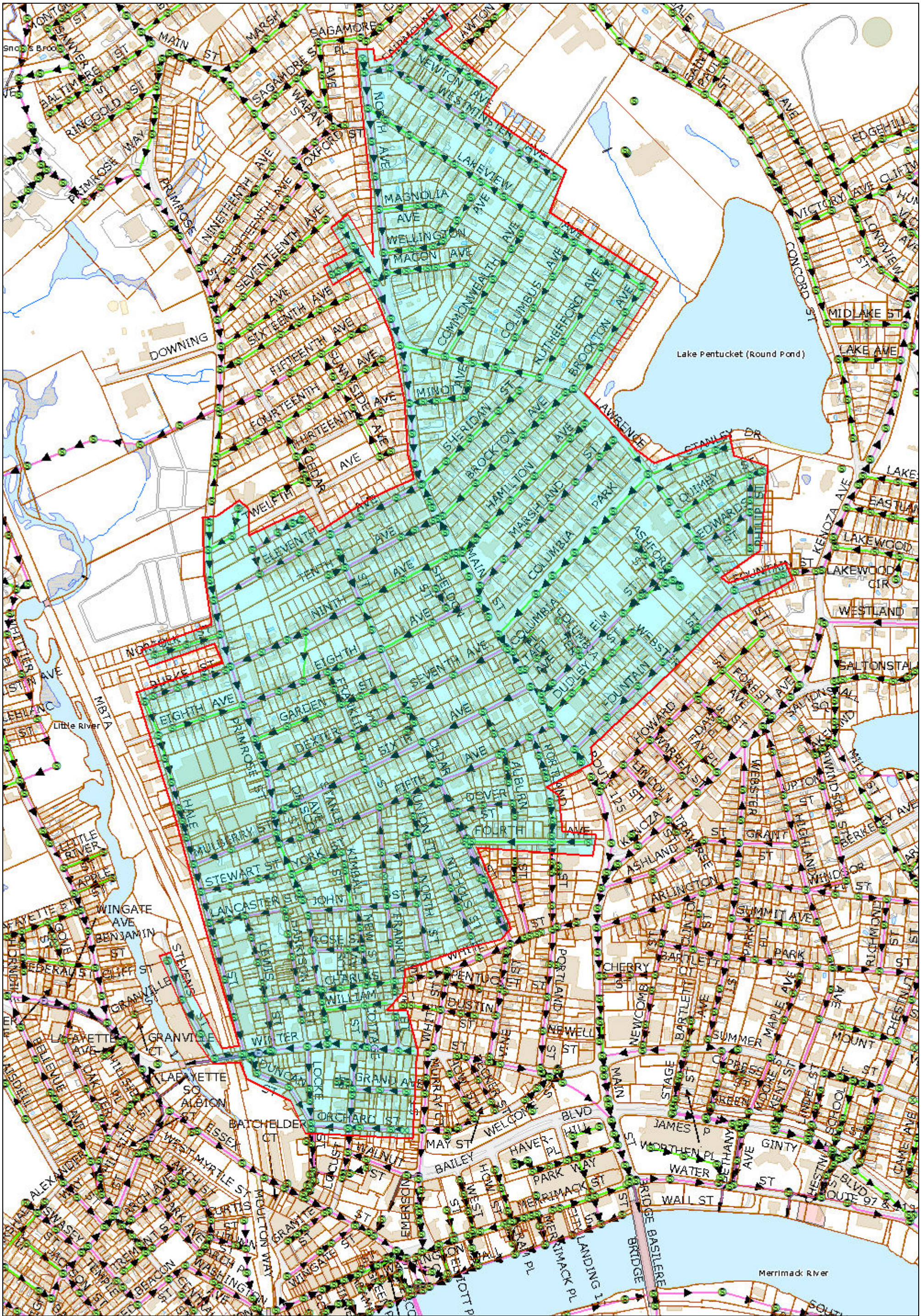
2019 Sewer Rehab and Repair Project

0 425 850 1,700 Feet

1 inch = 627 feet

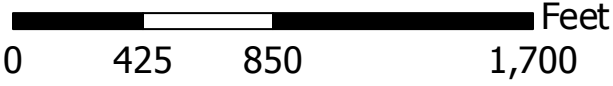


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Center Barrel-Locke St Sewer Inspection Project

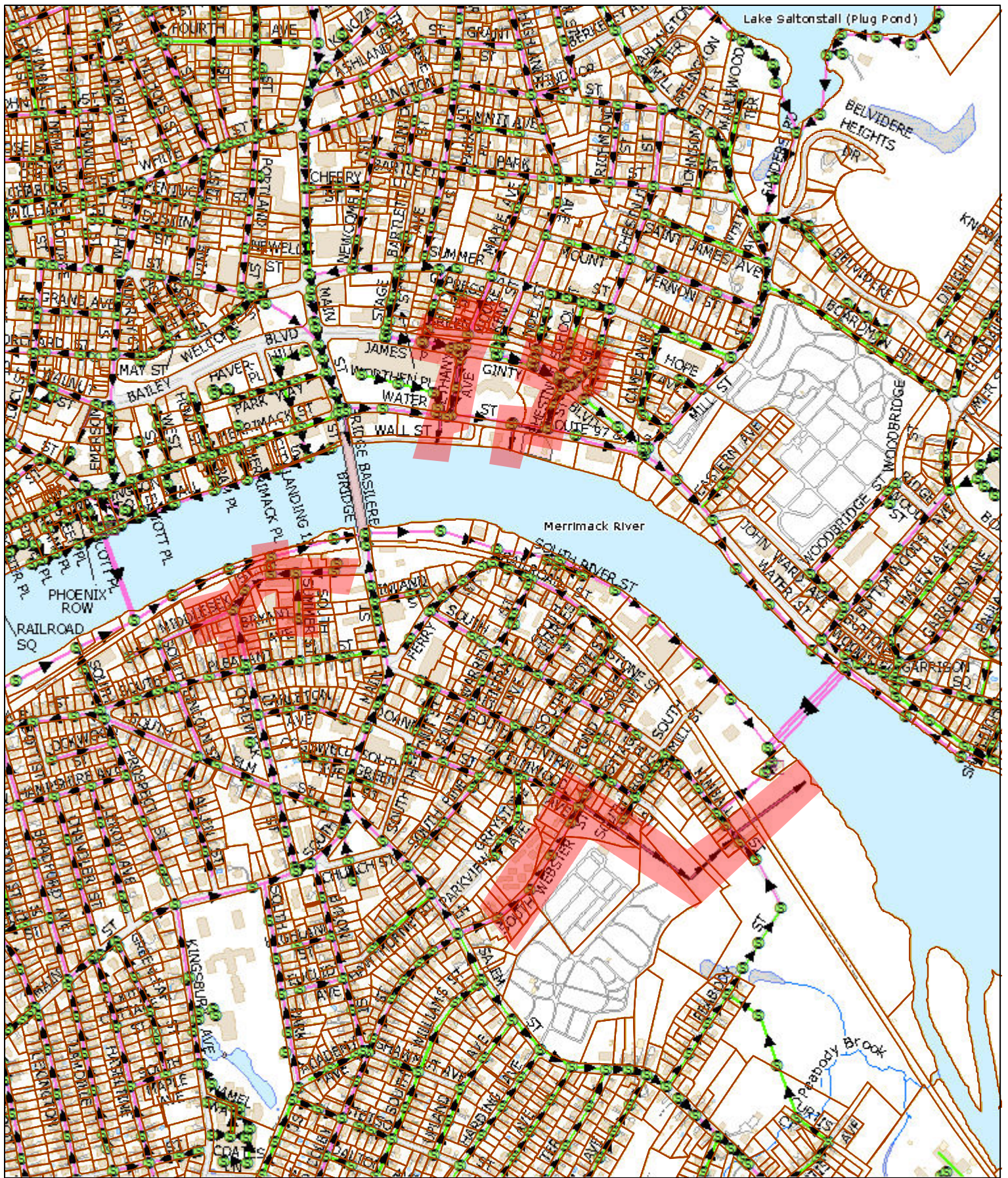
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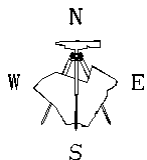
1 inch = 627 feet



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CSO Improvements Project



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0 550 1,100 2,200 Feet
1 inch = 826 feet



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Runtime vs. Rainfall Graph - Nov 2018

Clydedale Avenue

