

INTERIM REPORT

WASTEWATER COLLECTION SYSTEM

INFILTRATION & INFLOW STUDIES

In December 2006 Infiltration and Inflow (I/I) Studies were initiated on behalf of the Cohasset Sewer Commission by Coughlin Environmental Services, LLC (CES) of Stoneham, MA. Initial studies involved manhole investigations along the harbor sewers during the nighttime to detect tidally influenced infiltration and to measure salinity to detect direct salt water intrusion and inflow. The results of that effort indicated minimal tidal influence from Cohasset Cove. In the early spring of 2007, manhole flow monitoring was initiated at key locations within the wastewater collection system utilizing state of the art area/velocity recording devices. The flow monitors stayed in place during spring high groundwater and spring stormwater periods to allow the measurement of flows from the major interceptor sewers discharging to the Cohasset Wastewater Treatment Plant (WWTP). After sufficient data collection over several months, the flow monitors were relocated within the system to specifically identify high I/I influences. Summer monitoring was also conducted to establish dry weather flows. The flow monitors were reinstalled in the fall to continue wet weather monitoring and evaluate additional sewer reaches. Simultaneous with these field investigations, desk-top evaluation of rainfall and weather conditions were begun to allow statistical analysis of wet weather influences on extraneous flow generation. Desk-top evaluations were also performed on the nine municipal wastewater pump stations within the system to evaluate pump run-time data in relation to wet weather and dry weather conditions. Analysis of pump station data provided additional insight into the degree of I/I influences within each pump station's tributary sewer system. The plan on the back side of this Interim Report depicts the location of the nine pump stations, the WWTP and the nine sewer sub-basins analyzed during 2007. Utilizing these new data and comparing it to previous I/I investigation and remediation work conducted over the past decade, flow trends and extraneous flow were identified. The following is a summary of those findings and recommendations for both additional investigation and remediation work.

- Sub-basin #4 (Harbor Leg A) which includes Border Street, a James Brook crossing, portions of Summer Street and the sewer system southeast of the Mill Bridge had infiltration levels in excess of MADEP action levels (4000 gpd/inch/diameter/mile) and amounting to 5434 gpd/in/dia/mi. Additional nighttime video inspection and test and sealing is proposed for Border Street. Based upon previous remediation work, additional services may need testing and sealing to ensure watertightness.
- Sub-basin #3 (Harbor Leg B) which includes the Jacobs Meadow interceptor behind Elm Street, Elm Street, Margin Street, Stockbridge Street, Elm Court, and pressure sewers running up Atlantic, Howard Gleason and the Newtonville area had the highest infiltration rates approaching 14,000 gpd/in/dia/mi. In addition to these high infiltration rates, inflow was also believed to be significant based upon wet weather monitoring and an exceedingly high peak inflow rate experienced by the WWTP during Jacob's Meadow flooding events. A full test and seal program is proposed for the services within Jacobs Meadow and additional testing and sealing of mainline piping is also proposed. (Plans being developed.) Additional sewer service sealing is also proposed along Stockbridge, Margin and Elm Court based upon a review of previous video inspection reports and direct observations of wet weather flows. Flow isolation is proposed to specifically identify these other problem services.
- Inspect the gravity sewer system at the Deer Hill and Osgood School facilities during wet weather based upon high flow and long pump run-time data exhibited at the pump station.
- Video inspect the gravity sewers leading to the Smith Pump station based upon a significant increase in wet weather flows commencing after MBTA construction activity over the past two years.
- Repair a leaky manhole at the James Brook crossing behind Brook Street. (Work being scheduled.)
- Inspect each manhole for new deterioration and water staining and ensure that all manhole covers are provided manhole inserts. Target manholes for sealing.
- Video inspect all stream crossing and wetland crossing sewer pipes within the system.
- Conduct flow isolation along sewer reaches which exhibited high wet weather I/I impacts to identify additional leaky services. Conduct testing and sealing of problem services.
- Based upon wet weather flow monitoring data target sewer areas for home sump pump inspection.
- Continue spring flow monitoring further back into sewer collection system to identify additional I/I sources.
- Inspect, repair and/or replace existing watertight manholes and seal manhole/frame joints.