

TOWN OF MEDFIELD
STORMWATER MANAGEMENT PLAN (SWMP)
PERMIT YEAR 2 (PY2) AMENDMENT
June 30, 2020

Sections 1.2 and 5.3 of the Town's SWMP (June 24, 2019) indicated that there were 426 outfalls in Medfield. Based on the PY1 and PY2 investigations, the Town has determined that 37 locations are actually "culverts" that are simple conveyance points (i.e. across driveway aprons). Therefore, the Town is now tracking 389 outfalls and 109 "culverts", for a total of 498 locations. The local GIS has been updated and the SWMP Amendment has been updated, including the number of outfalls by receiving water, and is posted to the local website (<https://www.town.medfield.net/1793/Storm-Water-Information>).

The Medfield Department of Parks and Recreation has developed the a standard set of Operation and Maintenance procedures. The procedures are amended to the SWMP Standard Operating Procedures (SOPs) provided in Appendix C.

TOWN OF MEDFIELD
ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PLAN
PERMIT YEAR 2 (PY2) AMENDMENT

June 30, 2020

Section 4.3.3.1 of the Town's IDDE Plan (June 24, 2019) indicated that there were 426 outfalls in Medfield. Based on the PY1 and PY2 investigations, the Town has determined that 37 locations are actually "culverts" that are simple conveyance points (i.e. across driveway aprons). Therefore, the Town is now tracking 389 outfalls and 109 "culverts", for a total of 498 locations. The local GIS has been updated and the SWMP Amendment has been updated, including the number of outfalls by receiving water, and is posted to the local website (<https://www.town.medfield.net/1793/Storm-Water-Information>).

Add the following section:

5.1.7 Inflow and Infiltration (I/I) Assessment

In conjunction with this IDDE Plan, the Town of Medfield will be undertaking an I/I assessment program to control the added flow to the Medfield Wastewater Treatment plant caused by surface water inflow and groundwater infiltration. The tools used to assess I/I (i.e. CCTV, smoke testing, dye testing, etc.) are the same tools used to assess IDDE. In addition, the I/I investigations are also capable of detecting where wastewater may be leaving the sewer system and finding its way into the drainage system or receiving waters. Therefore, the Town's goal will be to dovetail the IDDE investigations with their ongoing I/I work.

The next step in the I/I reduction program is to focus investigation efforts on the subareas with the highest rates of I/I - often coinciding with the priority IDDE catchment areas - in order to narrow down specific locations and/or sources of I/I. To maximize the funds available, field investigations within this scope of work will prioritize the subareas with the highest rate of infiltration.

The investigation program will identify locations of I/I and quantify specific extraneous flows. Data gathered during previous investigation efforts will also be reviewed and incorporated into the investigation program. As record documents from previous studies and rehabilitation efforts are reviewed, the investigation efforts and tasks within this scope of work may be rebalanced to optimize available funds.

A Sewer System Evaluation Services (SSES) technical memorandum will be provided that summarizes locations of defects causing I/I and recommendations to rehabilitate the affected sewers using trenchless or excavation means, including a cost estimate for rehabilitation, design, bidding and award, construction services, and other required items.

Phase 1 – Infiltration Field Investigation

Medfield will use local subcontractors to perform field investigation of the existing sanitary sewer system to obtain a more refined understanding of the sources of infiltration within the prioritized subarea. The following sub-tasks will be completed:

Flow Isolation

Medfield will hire a sewer inspection subcontractor to perform flow isolation. Flow Isolation work will be conducted on manhole to manhole segment basis (or not longer than 1,000 LF stretch). Work will be performed in sewer lines where groundwater has been determined to enter the sanitary sewer in significant quantities. Isolation of groundwater will be performed during the early morning hours (midnight to 6 am) when residential usage is at a minimum. Portable pipe weirs will be placed in the targeted sewer lines to measure the flow in segments of approximately 300 linear feet. The flow volume will be calculated in order to isolate the areas contributing significant infiltration. A final report will be provided which will include the street name, manhole identification, time of measurement, pipe sizes and flow measurements/weir readings for each line segment tested. Sewers with high infiltration rates (>4,000 gpd-idm per MassDEP I/I guidelines) will be recommended for CCTV inspection. All work will conform to applicable safety requirements.

CCTV Inspection

Medfield will hire a sewer inspection contractor to complete NASSCO PACP sewer inspections, or IDDE inspections as needed. Sewer segments meeting criteria for excessive infiltration may be scheduled for CCTV inspection. For the purposes of this scope, it is assumed that no more than 50% of the sewer segments subject to flow isolation will be budgeted for CCTV inspection.

CCTV inspection will be conducted during high groundwater season on each manhole to manhole segment or service. A closed-circuit “pan and tilt” television camera shall be utilized to observe and document the internal condition of the sewer lines. The television camera shall be moved through the sewer line at a prudent rate so that all pipe leaks and defects are observed and photographed. An observation log shall be kept for each sewer segment inspected. Information on each log shall include, at a minimum: date inspected, weather, condition, segment location, segment length, ground surface description, pipe size, pipe length and joint spacing. The town’s manhole numbering system shall be used to identify each line segment location. Reports will be PACP compliant and will be generated using WinCan software.

Sewer line cleaning services will be performed in order to increase visibility for the television inspections. Using a cleaning unit equipped with telescoping, rotating hose reels, high velocities of water will be directed against pipe walls to remove debris and grease build-up. Light cleaning will include up to two passes with the jet nozzle. The Town will provide a water supply (fire hydrant), access and rights of way to all openings, bypass pumping and flow diversion (if required). Adequate lay down space for equipment and a local site for disposal of pipe sediments will be provided by the Town.

Manhole Inspection

Medfield will hire a sewer inspection subcontractor to perform NASSCO MACP Level 1 manhole inspections. Manhole inspections will be performed in areas where flow isolation is conducted during

high groundwater season, unless otherwise directed, and where manholes can be accessed. A written log will be furnished for each manhole inspected. The manhole survey will document location, structural defects, I/I sources, size, depth, materials of construction, deposition of solids and other pertinent information. If manholes are observed to be depressed or can otherwise collect runoff, an estimate of the drainage area for that manhole shall be provided. Digital camera equipment will be used during manhole inspections to document defects that may be discovered during the investigations. A final report including detailed logs and color photos from the inspection will be delivered to the client. All data will also be presented in tabular format.

Phase 2 – Inflow Field Investigation

Medfield will use local subcontractors to perform field investigation of the existing sanitary sewer system to obtain a more refined understanding of the sources of inflow within the prioritized subareas. The following sub-tasks will be completed:

Smoke Testing

Smoke testing will be conducted during dry weather (i.e., 72 hours or more with less than 0.1 inch precipitation) and low groundwater levels in the prioritized sewer subareas: 7 and 1. In order to identify defects in the lines, non-toxic smoke will be forced into the sewer lines. Field crews will use smoke candles and/or liquid smoke in conjunction with high power blowers to identify cross connections. Breaks in the sewer will allow the smoke to escape. Smoke testing will identify inflow sources and most restrictive conditions within the sewer lines. A smoke testing record will be completed in the field for each line section tested. These records will include date/time, location, set-up manhole, segment length, site sketch, smoke test results, source address and source location. Photo documentation of positive results may be taken. A summary of site activities and findings will be provided in the form of a brief summary report.

Approximately one week in advance of smoke testing activities notification fliers will be distributed at all potentially impacted properties. Fliers will provide information about the smoke testing program including appropriate contact names. The flier will be approved by the Town prior to distribution. In addition to residents, the local fire department, police department, 911 operators, and Town personnel handling telephone inquiries will also be notified in advance of site work. Medfield will provide notification information for use by the Town on approved social media and Town website if desired.

Dye Testing

Areas testing positive for possible connection to the sanitary sewer with smoke testing will be recorded and may be scheduled for Rainfall Simulation utilizing dyed water flooding or tracing. For the purposes of this scope of work, no more than 8 days are estimated to be required for Rainfall Simulation.

Dyed water tracing and flooding will be conducted through the introduction of water, colored by a non-toxic dye, into a designated drainage structure. For dyed water tracing, no plugging will be conducted and observation of dyed water flow in the sanitary sewer downstream of the structure will verify connection to the sewer. For dyed water flooding, the drain or drain structure will be plugged and flow measurements will be taken before and after flooding at the sanitary sewer downstream of the structure to verify connection to the sewer and the volume of dyed water leakage into the sewer.

Phase 3 – SSES Technical Memorandum

As a result of the I/I field investigation efforts detailed above, a Draft SSES technical memorandum will be prepared by the Town. The technical memo will detail potential I/I sources and associated estimated quantities of inflow, cost effective analysis, and recommended future plan of action for system improvements in the separated sewer system area needed to achieve inflow reductions, and efforts to reduce IDDE where found.

Medfield will review and incorporate data gathered during the following previous investigations, Spring 2017 CCTV Inspection Report and CCTV footage prepared by EST, and Spring 2018 Sewer Manhole Inspection Reports prepared by EST. Medfield will also review record documents of studies and rehabilitation efforts previously completed by other consultants, as this information has been provided by the DPW. This information will be accounted for within the technical memorandum to identify pipeline structural defects indicative of I/I.

The technical memo will summarize condition assessments of the inspected sewer pipes and manholes, prepare recommendations for rehabilitation and opinion of probable costs to aid in the Town's Capital Improvement Plan, and will identify significant defects requiring immediate repair. Following one round of comments provided by the DPW on the Draft SSES technical memorandum, a Final SSES technical memorandum will be prepared.