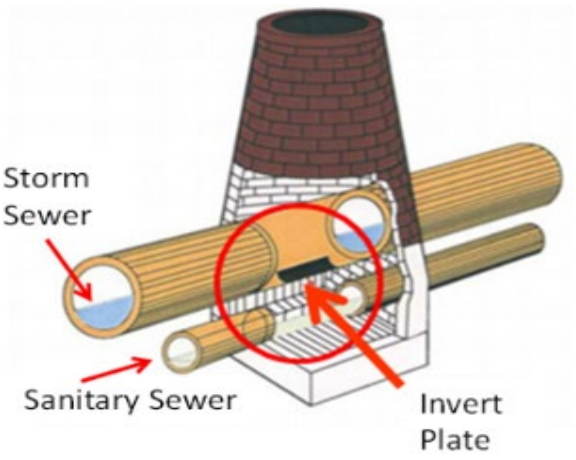
Sewer Type Definitions: to be used when describing the existing system

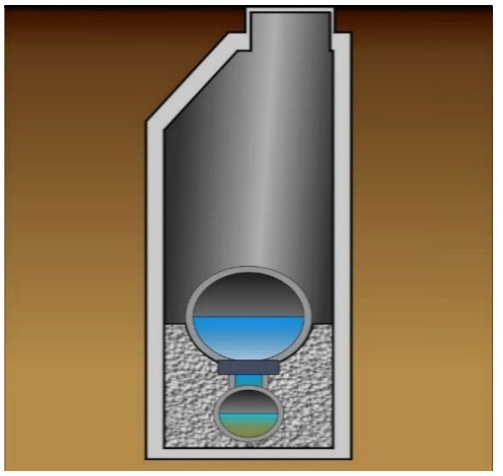
Common Trench

Both sanitary and storm sewers in the same trench, with the storm sewer either aligned on top of or next to the sanitary sewer. There are three types of Common Trench sewers.

Common Trench Over/Under

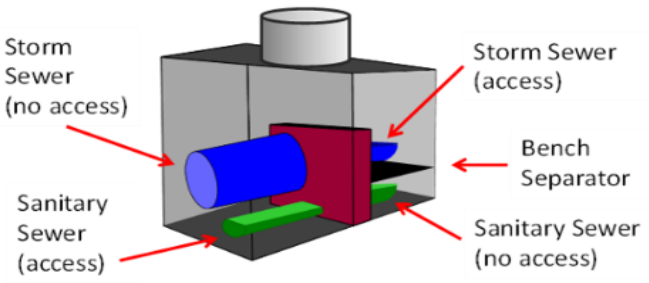
One manhole is used to access both the storm and the sanitary sewers, with a removal invert plate on the storm sewer to provide access to the sanitary sewer. Some invert plates are found to be damaged, displaced, or missing, resulting in a direct connection between the storm and sanitary sewers.

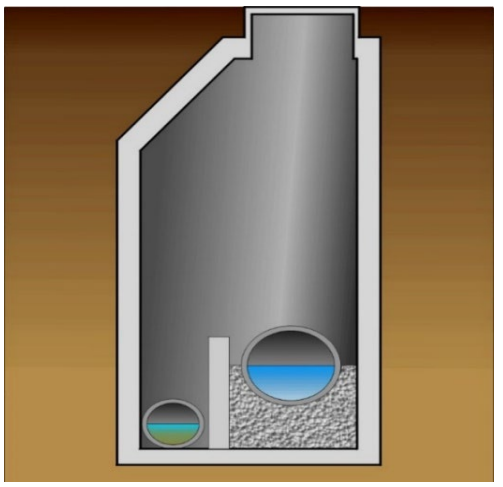




Common Trench Dividing Wall

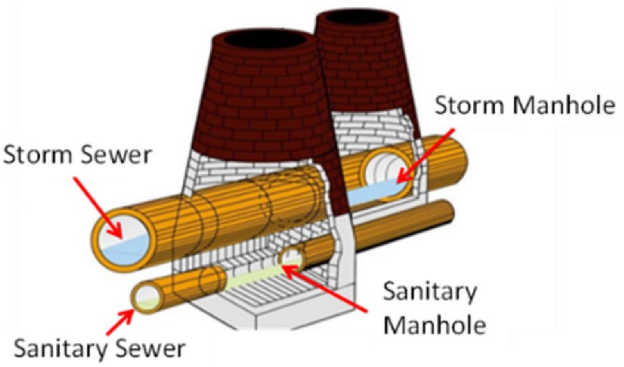
One manhole is used to access both the storm and sanitary sewers. A vertical wall separates the storm and sanitary sewer access openings, such that flow from one sewer to the other at the manhole requires overtopping the dividing wall.

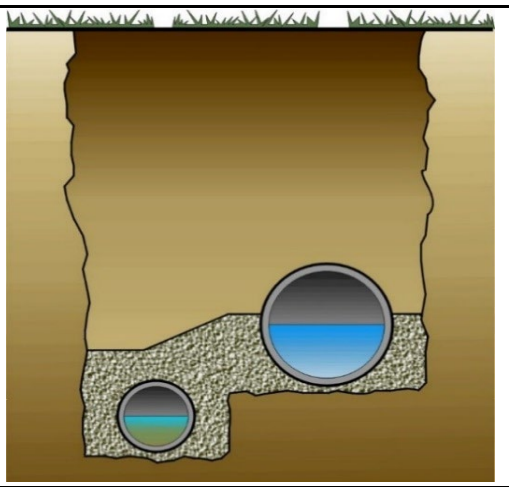




Common Trench Standard Manhole

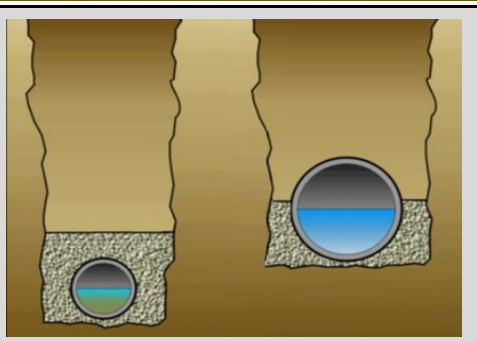
Two manholes are constructed to allow separate access to each sewer in the common trench, but with no direct connections between the sewers.





Separate Trench

Sanitary and storm sewers in different trenches with separate manholes.



Combined Sewer

A single sewer designed to receive and transport both sanitary sewage and stormwater runoff in the same pipe.

Home Sewage Treatment Systems (HSTS)

Individual domestic wastewater disposal systems often located in areas without public sanitary collection systems.

Northeast Ohio Regional Sewer District

Member Community Infrastructure Program
Rev. 3/3/2020

Project Performance Verification Technical Guidance

The District requests project performance verification to document how a MCIP project is performing. Performance verification may include pre- and post-construction flow monitoring or water quality sampling, and/or desktop or hydraulic/hydrologic modeling depending on the type of project. Table 1 details options for types of performance verification activities suggested for various MCIP project types. This guidance should be considered when developing a performance verification plan and project budget.

Table 1: Suggested Project Performance Verification by Project Type

	Flow Monitoring	RDII evaluation[1]	Dry Weather Water Quality Outfall Sampling	Notes/Comments
Combined Sewer Separation	X	X (post)	X	Post RDII will quantify any private property I/I contribution
Common Trench Sewer Lining or Separation	X	X		Pre- and post-construction flow monitoring and RDII analysis will show reductions in I/I within new/rehabilitated sanitary sewer.
Separate Trench Sewer Lining or Replacement	X	X		
Lateral Repair	X	X		
Private Property I/I Reduction	X	X		
HSTS Removal			X	Sampling will verify elimination of failing HSTS
Illicit Connection Removal			X	Sampling will verify elimination of illicit discharge
SSO/CSO Control[2]	X			Monitor for activations; can be level or flow monitoring
Relief Sewer/ Parallel Storage	X			Monitor existing sewer level

[1] Applicant is responsible for evaluating any potential downstream or upstream impacts of the proposed work on other users, or on the level of service of the infrastructure.

[2] Quantification of SSO/CSO volume and/or activation reduction assists in determining the benefit of the project.

Table 1 is not a complete list of all MCIP-eligible project types but is provided for guidance. Questions regarding project eligibility should be directed to a District Watershed Team Leader or discussed during a pre-application meeting. Other project performance verification activities may include dye or smoke testing, Closed-Circuit Televising (CCTV), and/or other methods depending on the project.

Costs relating to performance verification activities should be included in the proposal. Communities must detail their anticipated method(s) of performance verification and project schedule on the "Community Form" tab of this form. See the "Instructions" tab for more information.

The District will review project performance verification plans and may suggest additional or alternate locations for verification activities to fully capture the impact of the project. Performance verification activities will be the responsibility of the community to complete.

Flow Monitoring Guidelines

The objective of flow monitoring is to quantify the level of I/I reduction resulting from a sewer rehabilitation/replacement. For I/I reduction or elimination projects (including private property work), combined or common trench separation, and separate trench lining or replacement, the District will require pre- and post-construction flow monitoring and evaluation. Evaluation should include Rainfall-Derived Inflow and Infiltration (RDII) analysis that provides at a minimum the pre- and post-percentage (R-value) of rainfall that becomes I/I for each qualifying event. USEPA offers a free "SSOAP Toolbox" software which can be used for this analysis. Other available modeling tools may be used as desired by the member community.

A minimum four-week duration is recommended for both pre- and post-construction flow monitoring. Monitoring can end sooner if three storms that meet either of the following criteria are captured:

- Rain event meets or exceeds a depth of 0.2 inches AND an intensity of 0.25 inches/hour
- 24-hour rainfall is greater than 0.75 inches

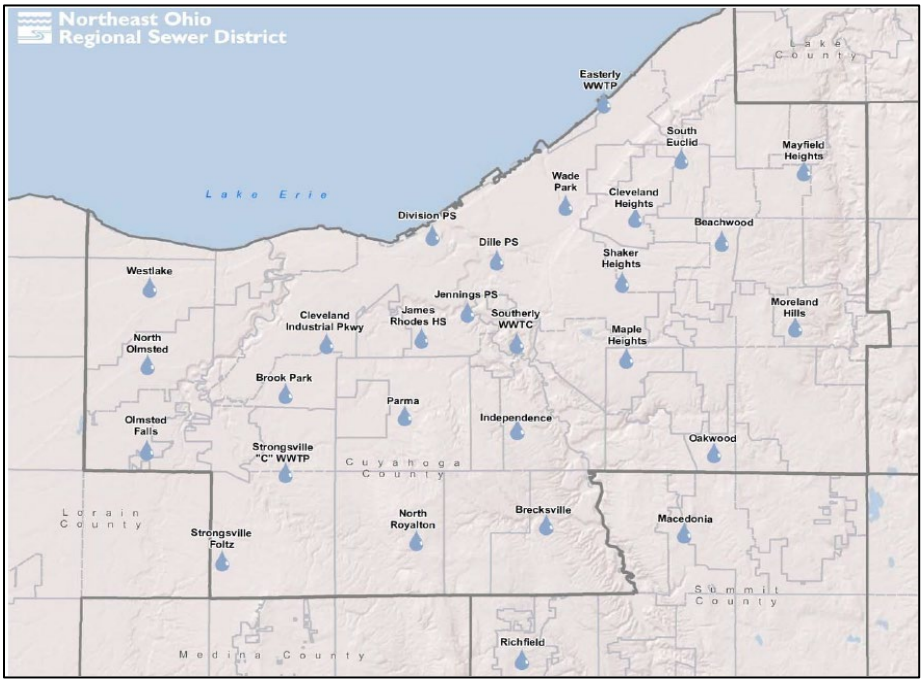
Data collected should include, but is not limited to: flow depth, velocity, and flow rate, recorded in 5-minute intervals. The community should identify any alternative monitoring plan in their proposal. The data collection over the monitoring periods should be continuous.

In the case where pre-construction flow monitoring has already been completed, the community should submit in their proposal the monitor locations and data collected or summary of findings for review by the District to support the scoring of the project.

In general, flow monitors should be placed to isolate flows within the MCIP project area. Pre- and post-construction monitoring should occur in the same locations. If requested, the District can provide assistance with the site selection of flow monitors and rain gauges.

The District owns and maintains a network of rain gauges that may be sufficient for the project's needs. The community should determine if additional temporary rain gauges are necessary for verification activities. Figure 1 shows the locations of District rain gauges. Rainfall data requests should be sent to Matt Fedak, Data Analyst with the NEORSD Systems Integration Department (fedakm@neorsd.org).

Figure 1: District Rain Gauge Locations



To view a larger Rain Gauge map, please visit the following link: http://arcg.is/10KTCr

Dry Weather Water Quality Outfall Sampling Guidelines

For projects focused on illicit discharge and HSTS elimination, or combined sewer separation, the District will require dry-weather water quality sampling. The objective of this sampling is to obtain data that quantifies the approximate pollutant load reduction resulting from the infrastructure improvement identified in the MCIP project proposal and/or verifies separation. Pre-construction sampling should indicate elevated pollutant levels. Post-construction performance verification should consist of sampling from the same locations used for pre-construction sampling, or representative location, as applicable. Dry weather sampling locations include end of pipe samples from illicit discharges or outfalls. Sampling events should occur on three different days for each identified outfall, in order to ensure a representative E. coli measurement.

Minimum Deliverables

The following deliverables should be submitted to the District throughout the verification process and can be included in quarterly progress updates.

For projects requiring flow monitoring:

- Site installation forms (PDF)
- Rain data, 5-minute intervals (.csv file)
- Raw and edited flow monitoring data, 5-minute intervals (.csv file)
- RDII-evaluation report/summary (PDF)

For projects requiring water quality sampling:

- Field sample collection report (PDF)
- Sample analysis results (PDF or Excel)