Project Name: Hurricane Creek Pipe Improvements

MWS Project Number: 11-SC-0116

Last Updated: January 19, 2016

Project Scope

The Hurricane Creek Pipe Improvements project includes the design of parallel and/or replacement gravity sewers for approximately 12,100 linear feet of existing trunk sewer. The purpose of the upgrade is to provide additional capacity to convey existing and future flows during both dry weather and wet weather conditions, as established through the hydraulic modeling of the 2-year and 5-year design storms. Immediately upstream of this project, the sewer is owned by the City of La Vergne. A sewer upgrade project has been designed for the City of La Vergne's connecting sewer immediately upstream. The Hurricane Creek Pipe Improvements project begins at the point where the La Vergne sewer upgrade project ends and where ownership of the sewer transfers to MWS.

The upstream end of the project begins in an industrial area beside Bridgestone/Firestone. The existing gravity sewer continues northeasterly along Hurricane Creek in proximity to the CSX railroad and, after crossing Murfreesboro Pike, behind a residential area. The downstream terminus of this project is within the fenced area around the Hurricane Creek Pump Station. The existing gravity sewer route is inaccessible in places due to Hurricane Creek and its tributaries, overgrowth and standing water, and railroad spurs for the surrounding industries. See the Hurricane Creek Pipe Improvements Route Study, December 2015, for details about the existing project area.

See Background/Purpose and Reference Information for more information.

The project scope includes:

- Design of parallel or replacement gravity trunk sewer to convey required flow rates based on site constraints
- Site investigations, environmental and archeological investigations, linear surveying, and topographic surveying to support the design
- Geotechnical investigation to support the design of the trenchless crossings of the railroad(s), Murfreesboro Pike, and other locations as required
- Evaluation of the condition of the existing sewer (available closed-circuit television inspection data will be provided) to aid in the analysis and selection of improvement alternatives
- Design of rehabilitation of the existing sewer if segments will remain in service following the construction of the Hurricane Creek Pipe Improvements project
- Preparation of a bid package for the project
- Preparation of documents for permits and easement acquisition
- Assistance during bidding and construction phases
Location

The Hurricane Creek Pipe Improvements project is located in the southeastern portion of the Central Wastewater Treatment Plant’s (Central) service area. Sewer flows from La Vergne enter the Central system through the upstream portion of the project area. The project begins in Rutherford County at Firestone Parkway then follows along the border of Rutherford County and Davidson County to the Hurricane Creek Pump Station, which is located at 5404 Hickory Woods Drive.

The majority of the route of the existing sewer runs through an industrial area, paralleling Hurricane Creek and CSX railroad spurs. The existing sewer crosses a main railroad owned by CSX as well as Murfreesboro Pike (US 70S/41A). The downstream portion runs along the border of the Hickory Woods Estates neighborhood. The project is located in Council District 33, and a portion of the project in Rutherford County.

Background/Purpose

The existing trunk sewer was acquired by MWS in 1975 from the Radnor Utility District and, at that time, it terminated at a small treatment plant at the current HCPS site. The 1960s sewer and plant were constructed to serve the industrial developments around the new Interchange City area in Rutherford County including Bridgestone/Firestone. The Hurricane Creek Pipe Improvements project was originally identified through MWS’s Capacity Assurance Plan prior to the development of the Corrective Action Plan/Engineering Report (CAP/ER) but was incorporated into the CAP/ER to address the area’s anticipated growth. Following additional flow monitoring data collection and analysis, the project extents increased beyond what was indicated in the CAP/ER to that shown in the project extents schematic.

The City of La Vergne has a satellite sewer use agreement with MWS and has monitored locations where sewer flow enters the MWS system in this area. The existing sewer along Hurricane Creek conveys a portion of the sewer flow from La Vergne, and this project is required in order to meet anticipated projected sewer flows from both MWS and La Vergne.

For planning-level purposes, hydraulic modeling and analysis of the proposed improvements assumed that the existing sewers were replaced to increase capacity while retaining the existing piping layout and elevations. Assuming the existing piping layout and elevations, the required replacement gravity sewers include approximately 2,400 linear feet of 24-inch diameter pipe and 9,700 linear feet of 30-inch diameter pipe. These values were determined based on the need to accommodate the following flows:

<table>
<thead>
<tr>
<th>Pipe Name</th>
<th>Existing Flowrates, mgd</th>
<th>2030 Flowrate, mgd</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dry Weather Flow</td>
<td>Peak hourly flow from 2-yr design storm</td>
</tr>
<tr>
<td>183-07-004_183-07-003</td>
<td>0.7</td>
<td>3.5</td>
</tr>
<tr>
<td>183-07-001_183-03-005</td>
<td>1.0</td>
<td>6.2</td>
</tr>
<tr>
<td>175-16-013_175-16-001</td>
<td>1.7</td>
<td>9.1</td>
</tr>
<tr>
<td>176-09-003_176-09-002</td>
<td>3.1</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Note that flow restrictions from contributing sewers upstream and the Hurricane Creek Pump Station downstream have been removed for these evaluations.
Variations in design related to pipe diameters, slopes, or route are allowed provided the design flows listed in the above table may adequately be conveyed. Proposed designs will be confirmed by the Program Management Team using the hydraulic model. MWS prefers that, to the extent possible, the improvements remain in Davidson County, that the existing sewer be abandoned, and that future maintenance access of the improved system be considered as part of the design.

**Feasibility / Risk Assessment / Critical Path Items**

- Coordination with Tennessee Department of Transportation (TDOT). Because the existing and proposed sewers cross Murfreesboro Pike (a U.S. highway in the jurisdiction of TDOT), coordination with TDOT should occur early in the project.
- Coordination with Rutherford County and/or the City of La Vergne. Because portions of the existing sewer route lie within Rutherford County, additional coordination with the City of La Vergne and/or Rutherford County may be necessary. Note that MWS prefers that, to the extent possible, the improvements remain in Davidson County.
- Stream Crossings. The existing sewer route includes several stream crossings. The design of the improvements should consider maintenance requirements, MWS preferences, TDEC guidance, constructability, and permitability.
- Floodplain/Floodway. Many manholes along the existing sewer route lie within the 100-year floodplain and within the floodway. Early discussions with MWS Stormwater are recommended.
- Wetlands: Based upon information from the Tennessee Water Resources Agency and the United States Fish and Wildlife Service, the existing sewer route does not cross any wetlands. However, because standing water was observed during field visits, additional investigation is required to confirm the presence/absence of wetlands.
- Threatened/Endangered Species. Based upon information provided by the Tennessee Natural Heritage Program of the Tennessee Department of Environment and Conservation, part of the area along the existing route is a known location for the rare flowering plants Pyne’s Ground-plum and Limestone Blue Star. It is also anticipated that the area may contain the roosting habitat of endangered or threatened bats.
- Land/Easement Acquisition. Permanent easements are in place for the existing sewer. Depending on the route, additional permanent easement acquisition may be required, and temporary construction easements are expected.
- Coordination with property owners. Pipe replacement and restoration work in the affected properties will need to be coordinated with the property owners.
- Coordination with CSX Railroad. The existing sewer crosses a main CSX railroad as well as several railroad spurs. Coordination and permitting with CSX Railroad and possible private spur owners will be necessary.
- Proximity to force main. The 30-inch force main from the Hurricane Creek Pump Station is in close proximity to the existing gravity sewer for the portion north of the CSX railroad.
Permitting

The following permits were identified as likely to be required for this project; however, further evaluation of the need to acquire these permits (and any other permits not listed below) will be conducted by the Designer:

- NPDES Stormwater Construction Permit (TDEC, Metro, Rutherford County)
- Grading Permit (Metro, Rutherford County)
- Plans and specs approval/Authorization for Construction (TDEC)
- Erosion Prevention and Sediment Control – Inspection during Construction (TDEC, Metro, Rutherford County)
- Aquatic Resource Alteration Permit (ARAP) for Hurricane Creek and /or tributaries (TDEC)
- Post-construction submittal of Notice of Termination for the NPDES Stormwater Permit (TDEC)
- TDOT Right-of-Way encroachment and crossing permits
- Railroad Right-of-Way encroachment and crossing permits
- Section 10/404 Permit (USACOE may obviate the need for either)

Public Outreach Efforts

A public Communications Plan will be developed by the Program to facilitate communication with affected property owners. This effort will primarily be coordinated through the Program with assistance provided by the Designer on an as-needed basis.

Reference Information

The following reference materials are available and will be provided to the Designer at the Pre-Proposal Meeting:

- GIS data including, but not limited to, gravity sewers, manholes, parcels, and aerial photography
- Drawings for MWS Projects No. 75-S-007 and 73-S-53, the existing gravity sewer for this site.
- Drawings for MWS Project No. 84-SC-109, Hurricane Creek Pump Station and Force Main

The following reference materials will be provided to the Designer at the Design Kick-off Meeting:

- Closed-circuit television inspection data and defect coding following Pipeline Assessment & Certification Program standards
- Manhole inspection information

Map/Schematic

See the attached map with the extents of the existing gravity sewer requiring capacity improvements.
Pipe segment 176-09-003_176-09-002
Pipe segment 175-16-013_175-16-001
Pipe segment 183-07-001_183-03-005
Pipe segment 183-07-004_183-07-003

Legend
Pipe Diameter
- 24 inches
- 30 inches
Gravity Main diameter, in
- up to 8
- 9 - 15
- 16 - 24
- 25 - 36
- greater than 36
- Railroad

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Hurricane Creek Pipe Improvements