Brentwood Wastewater Collection System Master Plan

April 9, 2015
Hazen and Sawyer • Local office in MetroCenter

800 EMPLOYEES
500 ENGINEERS

OFFICE LOCATIONS
- Regional Office
- Branch Office

SINCE 1951
Hazen and Sawyer has focused on two things: providing safe drinking water and controlling water pollution.

NASHVILLE OFFICE
545 Mainstream Drive
Suite 320
Nashville, TN 37228
(615) 783-1515
*New Office Location

FIRM SUMMARY
Legal Entity: Hazen and Sawyer, DPC
Type of Business: Design Professional Corporation
State of Incorporation: New York
Website: www.hazenandsawyer.com
Hazen and Sawyer Project Team

• Scott Woodard, P.E. – Project Principal
• Michael Orr, P.E. – Project Manager
• Ryan Dean – Collection System Hydraulic Model
• Saya Qualls, P.E. – Technical/Regulatory Support
• Other local support staff
Purpose of the Master Plan

• Develop a comprehensive short-term and long-term plan for maintenance and development of Brentwood’s wastewater collection system
  • Assure rate payer funds are used in cost-effective manner to maximize benefit and reduce impact on business and residents
Master Planning Elements
Wastewater Collection System

• **Evaluate** existing performance and capacity of collection system
• **Identify** projected short-term and long-term collection system capacity needs based on predicted growth patterns and other drivers
• **Evaluate** alternatives to address needs
• **Identify** short and long term improvements to address capacity issues; when feasible, projects constructed today should address future capacity needs
• **Prioritize** projects
• **Develop** Capital Improvement Plan for implementation

Utilize guidance of EPA, TDEC, WEF and other industry organizations
Master Plan Methodology

• Hydraulic Model Development (completed)
• Data Collection and Analysis
• Develop Future Flow Conditions
• Baseline and Future Conditions Analysis
• Capital Improvements Plan
• Master Plan Report
Master Plan Methodology
Hydraulic Model Development (completed)

• InfoWorks model developed utilizing GIS, sewer record drawings, previous studies, field investigation, survey and other sources
• Model calibrated for both dry weather and wet weather flows
• Model overview
Brentwood’s Wastewater Collection System Model

- +2,000 manholes
- +1,200 subcatchments
- 12 pump stations
- Real-time controls at Brentwood Pump Station
- Pipe size between 2 and 30-inch
Wastewater Collection System Model Development

• Modeling Goals and Objectives
  • Evaluation of existing system
  • Capital planning
  • Optimize operations with better understanding

• Modeling Software

• Typical Modeling Elements
  • Nodes
  • Conduits
  • Subcatchments
  • Pump Stations and Force Mains
Wastewater Collection System Model
Flow Meters and Rain Gauges

• Rain gauge data
  • Identify periods of dry weather and wet weather events
  • Characterize rainfall events based on return intervals

• Evaluation of meter data
  • Dry weather flows and per capita flows
  • Rain dependent inflow and infiltration
  • Groundwater infiltration
Master Plan Methodology
Data Collection and Analysis

- InfoWorks hydraulic model
- Past planning reports and studies
- Population growth patterns and projections
- Hydraulic analyses
- Staff knowledge
- Various other sources of relevant data/information
Master Plan Methodology
Develop Future Flow Conditions

• Flow projections by sewershed (workshop)
  • Service boundaries
  • Population projections
  • Development/redevelopment potential
  • Land use

• Planning horizons
  • 2020 (5-year)
  • 2030 (15-year)
  • Ultimate
Master Plan Methodology
Baseline and Future Conditions Analysis

• Condition Analysis
  • Baseline (current) dry weather conditions
  • Baseline (current) 2-year, 24-hour design storm
  • Future Planning Horizons (5, 15, ultimate) dry weather
  • Future Planning Horizons (5, 15, ultimate) 2-year, 24-hour design storm

• Identify
  • SSOs, surcharging lines, hydraulic deficiencies
  • PS performance, other system characteristics

• Design Criteria will be established

• Three workshops during this task – modeling results and design criteria
Master Plan Methodology
Capital Improvements Plan

• Improvements will likely include optimization of existing infrastructure and new infrastructure (workshop)
• Prioritized list of collection system improvements will be developed (workshop)
• Improvement cost estimates
• Improvements grouped and sequenced to minimize disruption and impact
• Schedule for implementation
Master Plan Methodology
Master Plan Report

• Summary of all master planning tasks (workshop)
• Final recommended CIP for short-term and long-term improvements
• Scheduled completion by December 2015
Questions/Discussion