

Rainbow Creek Sanitary Sewer Repairs

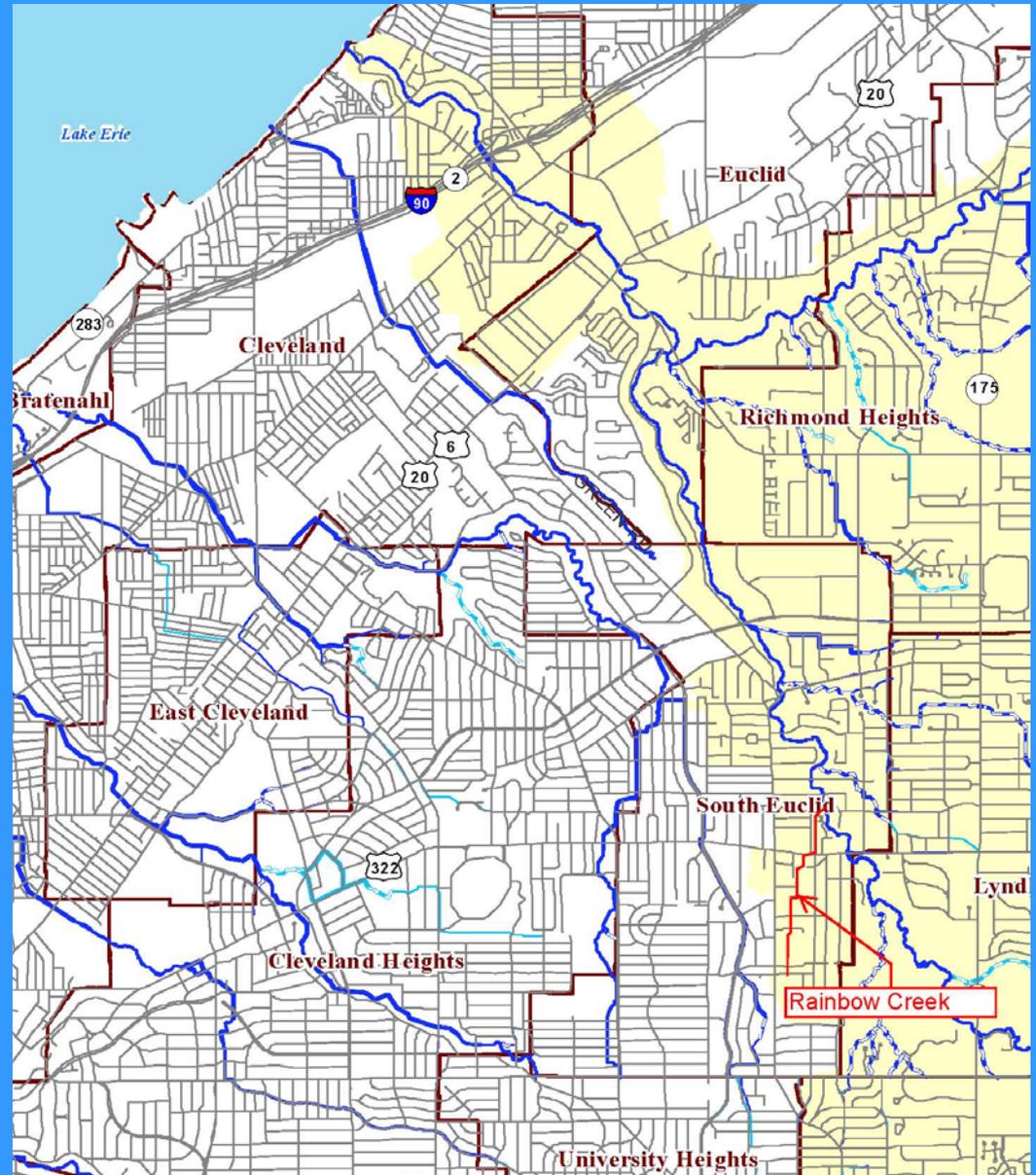
City of South Euclid

Problem: Raw Sewage Found in Euclid Creek

- Residents living near Euclid Creek on Liberty Road reported strong smell
- Investigated by NEORSD in 2008
 - Traced to open invert of in a combination storm/sanitary manhole located south of Mayfield Road
 - Ninety degree bends in the sanitary line at Mayfield Road frequently plugged, causing back-up into storm manhole upstream – and inflow

Problem: Raw Sewage Found in Euclid Creek

Rainbow Creek
– a forgotten tributary stream, completely enclosed by storm sewers

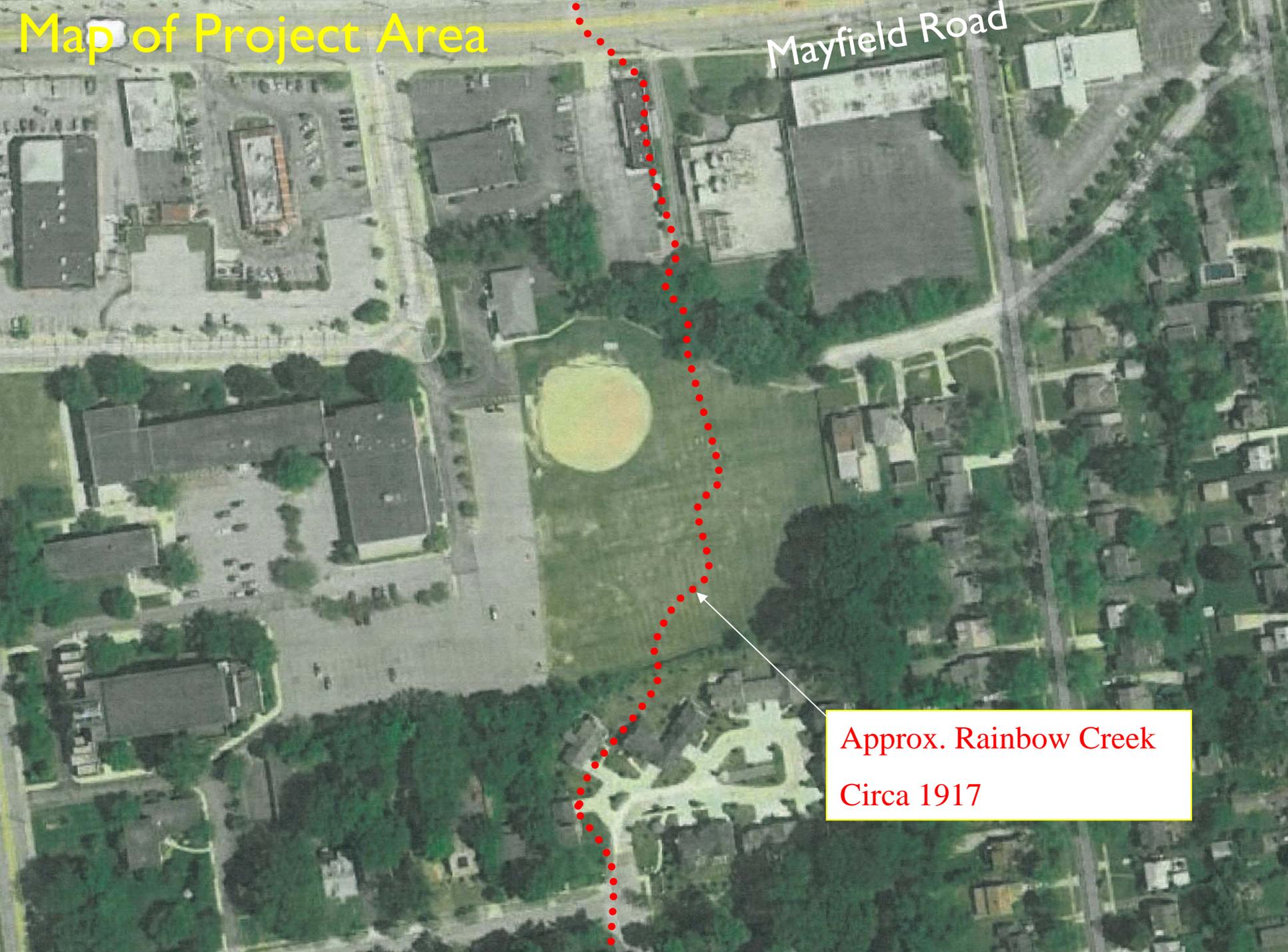


Background

- Rainbow Creek was enclosed by a 42 inch storm sewer before 1930
- Built in common trench over the sanitary sewer, along old creek bed
- Combined manholes used
- Creek bed filled in circa 1949 to create playing field for St. Gregory Church – manholes buried

Map of Project Area

Mayfield Road



Approx. Rainbow Creek
Circa 1917

The Cause: Sanitary Inflow

- NEORSD investigation pinpoints sanitary blockage and overflow into the 42" storm as the source of the problem
- City Service Department Assists

Sanitary Sewage Contamination to Euclid Creek via 60-inch Storm Sewer Outfall
August 29, 2008
Page 4



Figure 4: Collection system with sample locations.

Below are the locations and results of the samples analyzed for *E. coli*. The *E. coli* densities are in colony forming units per 100 mL.

| Sample Location | <i>E. coli</i> Density |
|---|------------------------|
| 1-Storm Sewer, 4546 Mayfield Road (downstream of sani blockage) | 249,000 |
| 2-Storm Sewer, 4478 Rushton Road (upstream of sani blockage) | 810 |
| 3-Euclid Creek, downstream from Liberty Road | 91,000 |
| 4-Euclid Creek, upstream of the 60-inch Storm Sewer Outfall | 1,717 |
| 5-60-inch Storm Sewer Outfall, upstream of 4564 Liberty Road | 219,000 |

This problem warrants immediate attention. The sanitary sewage entering Euclid Creek because of this blockage is not only detrimental to the aquatic community, but may also pose a health threat to area residents. Euclid Creek, downstream from the discharge, is grossly contaminated with sanitary debris and the substrate is covered with large mats of filamentous algal growth associated with sanitary sewage contamination. Figure 5 shows the impact from the discharge.

Outfall Location

- South Euclid has MOU with Board of Health for Dry Weather Sampling of Outfalls
- Problem found 1/2 mile north of source
- 2,915 lf of storm line, 19 manholes
- Another 3,600 feet to top of drainage area
- Drainage Area: 227 Acres



Comprehensive Outfall Database

Outfall Inventory Report

ECWB3170

General Location Information

Receiving Stream: Euclid Creek - West Branch
 Watershed: Lake Erie
 SubWater: Euclid Creek
 Community: South Euclid
 County: Cuyahoga

Parcel:
 State Plane N: 678653
 State Plane E: 2238032
 Latitude: 41.52528
 Longitude: -81.51549
 Elevation (ft): 962

General Location or Address:
 between Tellhurst Rd. & Liberty Rd.



Outfall Photograph

Land Use

- | | |
|---|---|
| <input type="checkbox"/> Industrial | <input type="checkbox"/> Open Space |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Industrial/Commercial |
| <input checked="" type="checkbox"/> Residential | <input type="checkbox"/> Residential/Commercial |
| <input type="checkbox"/> Commercial | <input type="checkbox"/> Residential/Agricultural |
| <input type="checkbox"/> Other | |

Storm Sewer Map Information

Outfall on Map: Yes No
 Outfall Located on (facing downstream):
 River Left

Pipe Characteristics

Pipe Shape:
 Circular Elliptical
 Egg Rectangular
 Other, describe:

Pipe Height (in): 48

Pipe Width (in):

Pipe Material:
 RCP PVC
 VCP Cast Iron
 CMP Other, describe:
 brick

Pipe Condition:
 Good Poor
 Fair N/A

Height from Invert to Stream Flow Level (ft): 3

Outfall Type/Ownership

Outfall Type: Public Storm - MS4



Location Map

Additional Detail

Comments

The Cause: Sanitary Inflow

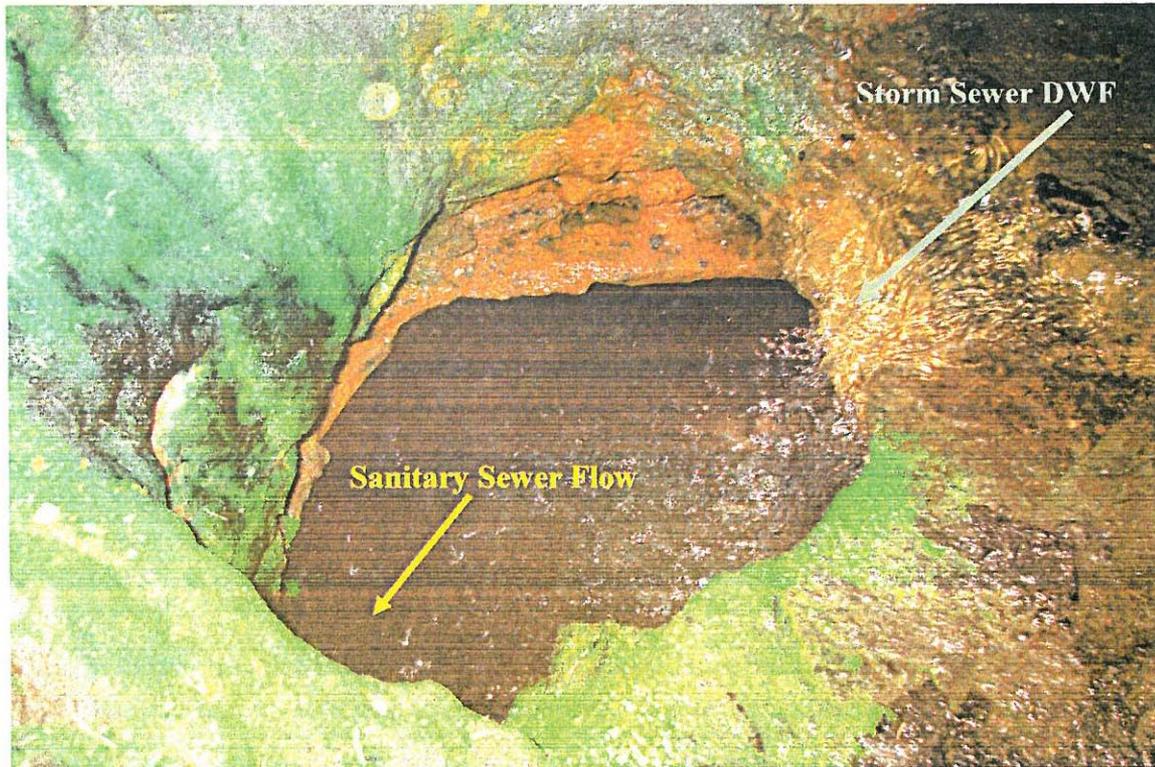


Figure 2: Storm DWF entering sanitary sewer through hole in the invert of the storm sewer.

Challenges

- Repairs Needed were out of the right-of-way:
 - Find Buried Manholes
 - Clean and Televiser
 - Lines Always Running Full or Plugged
 - Research or Acquire Easements
 - Minimize disruption
 - Existing Restaurant
 - School football field
 - Recent condominium development

Challenges



Located under restaurant drive,
near CEI substation

Manhole buried in overgrown,
steep hillside



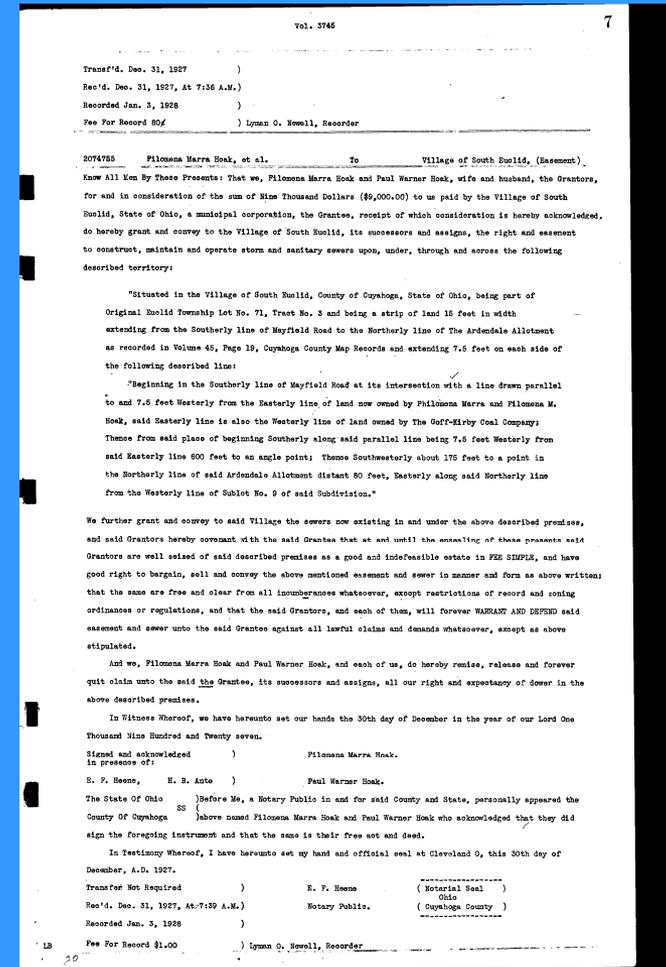
Located under ball field, and into
new condominium development

Challenges



Sewers built in over/under configuration made access a problem

Research on Recorder's website found original 15' easement documents recorded in 1927 –previously unknown to City



Scope of Project

- Eliminate Sanitary Inflows into an Existing 42” Storm, Including:
 - Installing New Sanitary Manholes for access and separation
 - New 8 inch Sanitary Sewer within existing easement
 - Point Repairs of Sanitary Sewer
 - CIPP lining of old Sanitary Sewer
 - Seal Existing Sanitary Manholes
 - Eliminate 90 degree bends at Mayfield Road

Map of Project Area

Mayfield Road

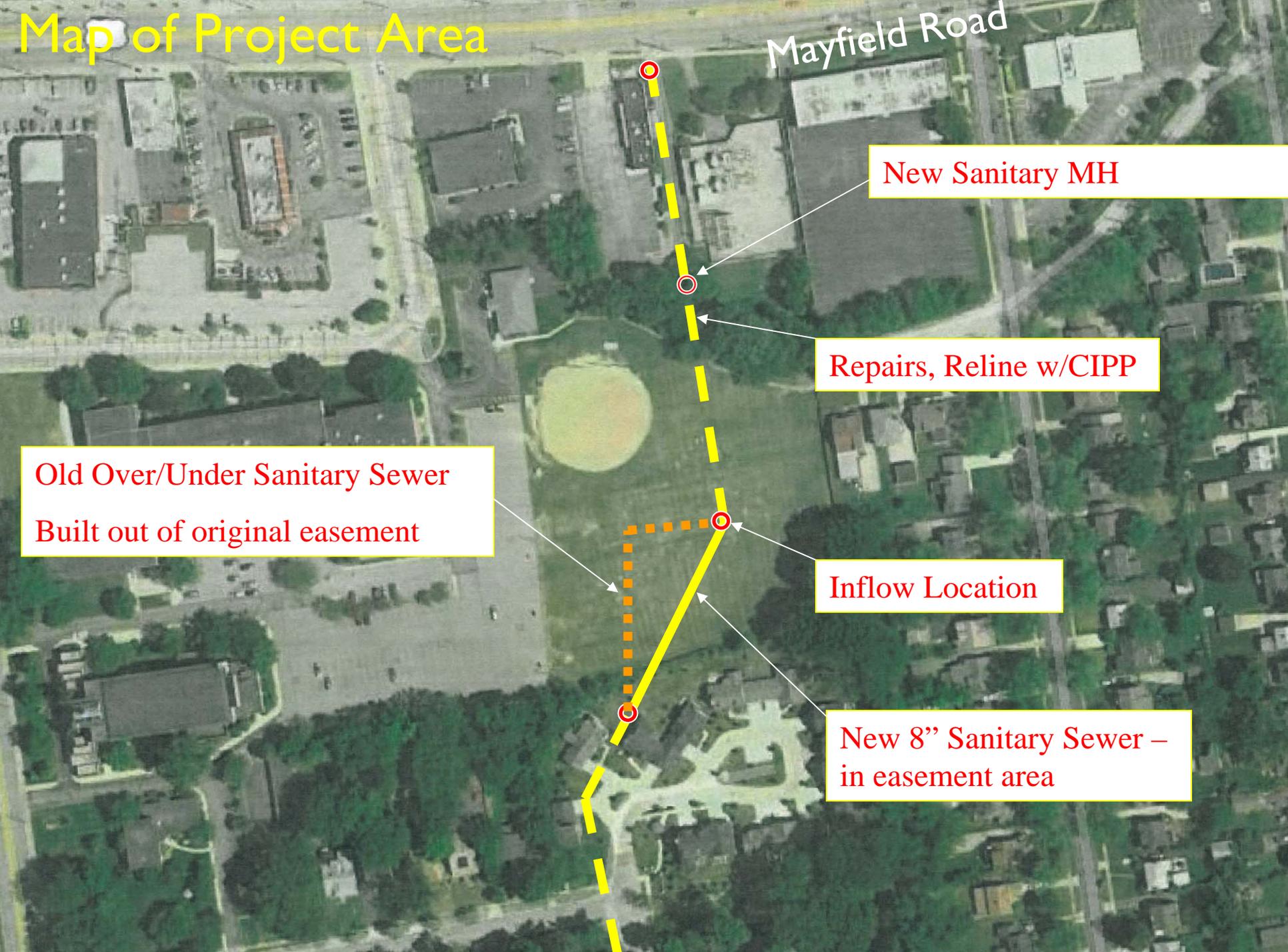
New Sanitary MH

Repairs, Reline w/CIPP

Old Over/Under Sanitary Sewer
Built out of original easement

Inflow Location

New 8" Sanitary Sewer –
in easement area



Project Funding

- Contract was awarded to Longo Sewer Construction: \$ 235,959
- DOPWIC Grant/ Loan: \$ 202,716
- City Flood Control Fund:
\$ 33,243 Plus
Engineering and Inspection

Contractor's Sequence of Operations

- October, 2010 Start Work
- Oct. to Dec. 2010: Point Repairs Made
- Oct. to Dec. 2010: New Manholes Installed
- Spring 2011 New 8 inch sanitary was installed
- May-June 2011 United Survey install CIPP lining on old lines remaining in service
- June, 2011 United Survey sealed existing sanitary manholes
- Project Substantially Completed June, 2011

Summary

- Tracing Illicit Discharge sources in large systems is a challenge – problems can manifest themselves far from the source
- NEORSD and BoH were instrumental in this case
- Research all sources – old topo, old plans, easement documents
- Use “institutional memory” in addition to your system maps -talk to your Sewer Department
- Repairs may be required far out of the right-of-way
- Use trenchless techniques where ever possible