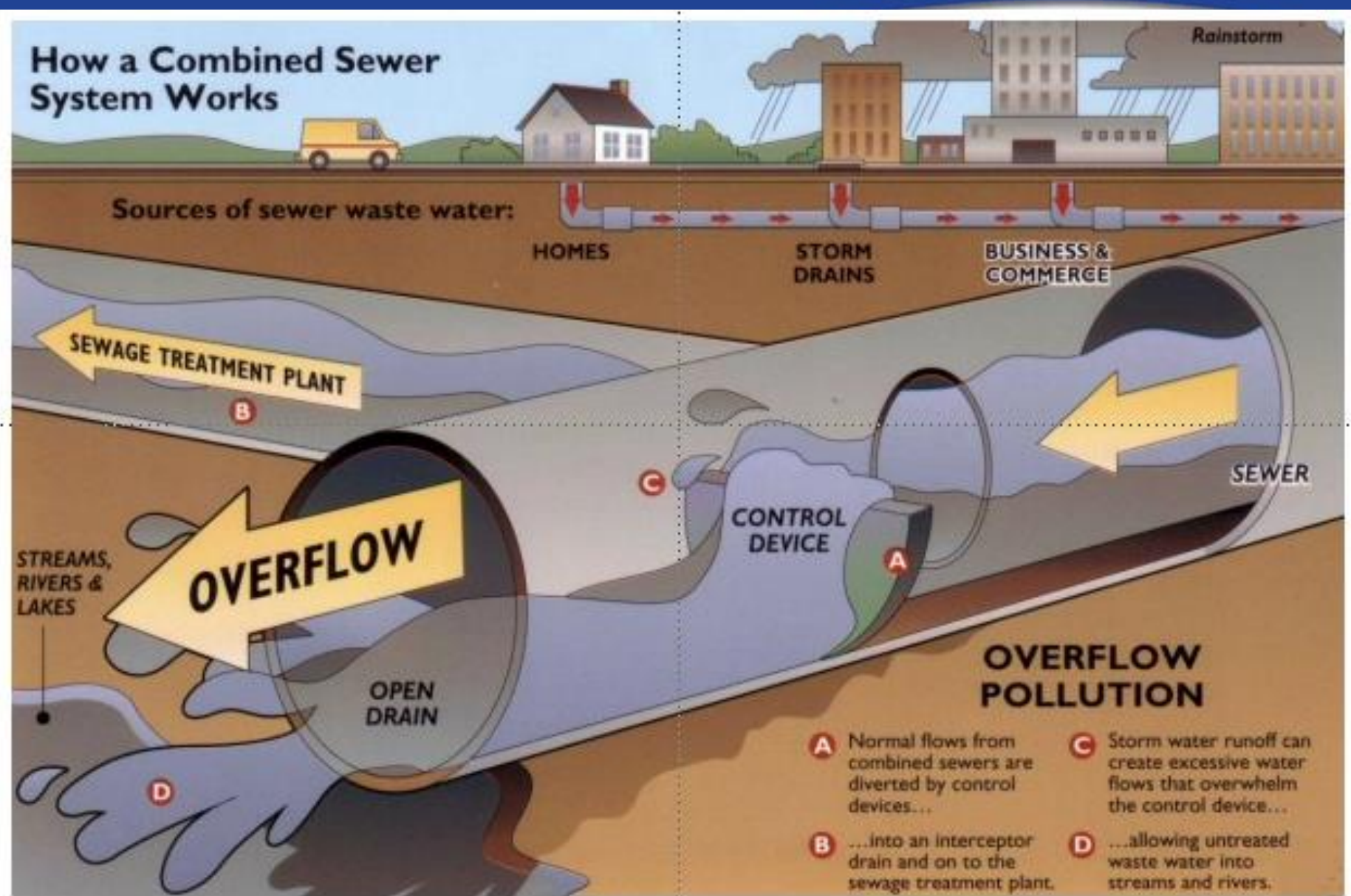


Infiltration/Inflow Removal and Sewer Rehabilitation Project Professional Services Request



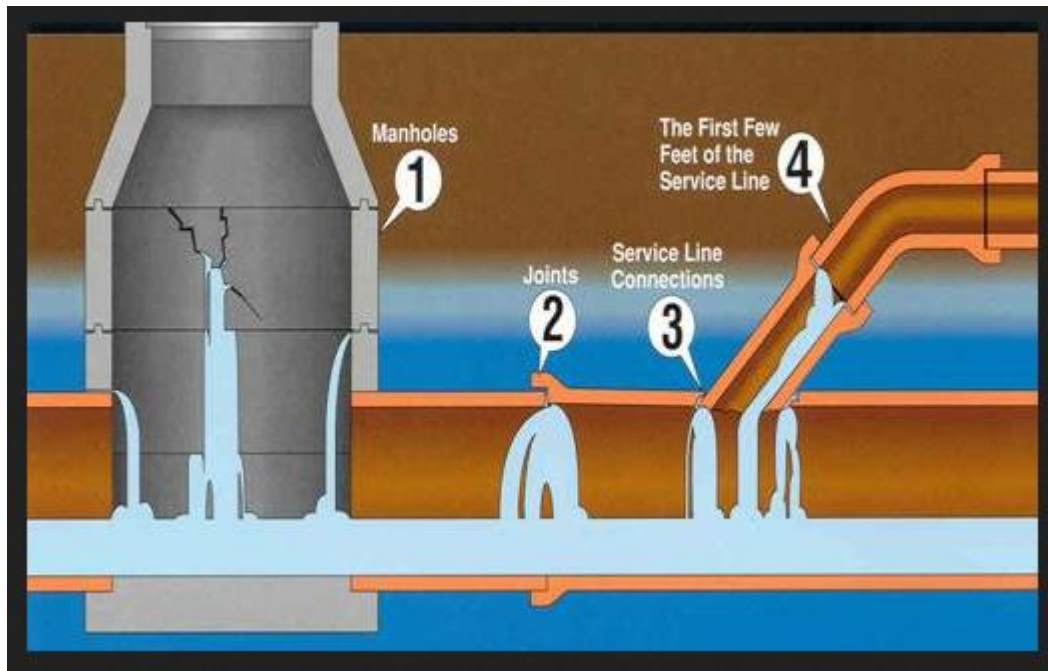
Infiltration/Inflow Removal and Sewer Rehabilitation Project

Professional Services Request

History of CSO Compliance Program & Related Projects

Sewer (and Water) Infrastructure Projects		
Year	Project	Brief Description
1999	Lakeview Area Water & Sewer Project	Lakeview Ave: Wallace Ave to Hilltop Rd, also Wallace Ave: Lakeview Ave to S. State Street
	Niles Area Water & Sewer Project	Niles Ave: Wolcott to Mohawk, also Wolcott, Pixley, Lewis, Greenwood, Mohawk areas
2000	CSO Separation - Lake Court Area	Lake Court, Main Street, S. State Street areas
	CSO Separation - Pixley Ave Area	Pixley Ave: Michigan Ave to Wolcott Ave
	CSO Separation - Port Street Area	Port Street: Court to Church, also Church: Port to Ship and work north of Court House
2001	Broad Street Reconstruction & Sewer Separation	Broad Street, Pearl Street, Wayne Street areas in the vicinity of Public Works
2002	Lakeview Avenue Roadway Reconstruction	Lakeview Ave: Wallace Ave to Main Street, also Madison: Lakeview Ave to S. State Street
2003	CSO Separation - Church, Court & Wayne Street Areas	Church: Ship to Harrison, Wayne: Broad to Harrison, Court: Broad to Hoyt, Harrison: Niles to Church, Broad: Court to Church
2004	CSO Interceptor Replacement	Kiwanis Park to Botham Avenue area
	CSO Separation Niles Ave	Niles Ave: Main Street to Winchester, Winchester: Main Street to S. State Street
	CSO Separation Pearl & Olive	Pearl Street: Langley Ave to Wayne Street, Olive Street: Pearl Street to Market Street
	CSO Separation Michigan & Harrison	Michigan Ave: Langley Ave to Hagar Ct., Harrison Ave: Langley Ave to Hagar Ct., Alley: connecting Michigan & Harrison
	Lions Park Drive Reconstruction	Lions Park Drive: Lions Park to Broad St, also Park St: Bridge to Lake St., Broad St: RR Tracks to Vine St, replace Vine St Lift Station
2005	CSO Interceptor Replacement (split season)	Kiwanis Park to Botham Avenue area
	Old Lakeshore Road Reconstruction	Old Lakeshore Road: Lakeshore Drive to Sunnybank Road
	Midway Avenue Reconstruction	Midway Avenue: Niles Avenue to S. State Street
2006	Lake Boulevard Reconstruction Project	Lake Boulevard: Main Street to Ship Street
2007	Lakeland Hospital Expansion & Utility Replacement	Morton Avenue: Botham Ave to Langley Ave then west to SJ River/Interceptor
	Morton & Highland Reconstruction Project	Morton Avenue: Van Brunt Ave to St. Joseph Drive; also West Highland Ave: St. Joseph Drive to west of Willa Ave
2008	2007 S2 Grant	Predominantly Flow Monitoring & Hydraulic Modeling
	Heppler Lift Station Removal Project	Eliminate Heppler Lift Station north of 211 Hilltop property. Connect to gravity main installed for Maytag Commercial Washer Lab
	Ship & State Street Reconstruction Project	Ship Street: Lake Boulevard to Main Street, State Street: Ship Street to Water Street, also Port Street: State Street west to alley
2009	Silver Beach Center Project	Broad Street: Lake Street to RR Tracks, Vine Street: Broad Street to Water Street, Lions Park Drive: Elm Street to Broad Street
	Ship & State Street Reconstruction Project (split season)	Ship Street: Lake Boulevard to Main Street, State Street: Ship Street to Water Street, also Port Street: State Street west to alley
	CSO Separation - Michigan Area	Michigan Ave: Morton Ave east to Dead End, Morton Ave: Harrison Ave to Wolcott Ave, Harrison Ave: Wayne Street to Morton Ave
2010	CSO Separation - Michigan Area (split season)	Michigan Ave: Morton Ave east to Dead End, Morton Ave: Harrison Ave to Wolcott Ave, Harrison Ave: Wayne Street to Morton Ave
	South State Street CSO Project	South State Street: Wallace Ave to Granada Ave, also Kingsley Ave: S. State Street to Niles Ave
2011	2011 S2 Grant	Planning/Design Services: 2012 & 2013 CSO Projects
	2012 CSO Project	Lane Dr: Mount Curve to Willa Dr, Pixley Ave: Myrtle Ave to Van Brunt Dr, Myrtle Ave: Pixley Ave east to Dead End, MH & Bolt Down Cover Replacements
	Lake Street Reconstruction Project	Lake Street: Elm Street to Broad Street, also Park Street: Lions Park Drive to Lake Street
2012	Napier Avenue Resurfacing Project	Napier Ave: Langley Ave to Niles Ave, also Willa Drive: Napier Ave to Kingsley Ave
	2013 CSO Project	Elm Street: Main St to State St, Roof drain disconnections in the downtown: Elm Street to Ship Street
	St. Joseph Drive Reconstruction Project	St. Joseph Drive: Niles Ave to ~ Willa Drive
2013	West Highland Reconstruction Project	West Highland Ave: Lakeview Ave to Veronica Drive
	2013 S2 Grant	Predominantly Flow Monitoring & Hydraulic Modeling (State ends S2 Grants - funding shifted to SAW Grants)
	Whirlpool Compass Fountain Drain Project	Disconnect WP Compass Fountain drain from sanitary (mandated by MDEQ pool permit); redirect to storm sewer per original plans
2014	Botham Avenue Reconstruction Project	Botham Ave: Niles Ave to Morton Ave
2015	2016 Sewer Improvements	Replace sewer under Southshore Development stormwater detention area
2016	2017 CSO Project	Replace Sewer in PW, CIPP Line Sewer under Southshore Development
	2017 Flow Monitoring & Modeling	Commenced July 2017, completed July 2018 - redeployed monitors in central interceptor (ongoing) to investigate Inflow & Infiltration
2017	Wallace Avenue Reconstruction Project	Wallace Avenue: Lakeshore Drive to South State Street, also Stadium Drive: Wallace Ave to SJHS entrance (water only)
	Flow Monitoring & Modeling	Continuation of Flow Monitoring & Modeling to determine if City should pursue I & I Removal Project
2018	Inflow & Infiltration Removal Project	Rehabilitation of manholes and several spot repairs on the central ravine sanitary sewer interceptor
2019	Flow Monitoring & Modeling	NPDES permit required flow monitoring & modeling - record rainfall, high Lake Michigan & groundwater levels exposed more infiltration issues in system
	Kingsley, Morton & Orchard Reconstruction Project	Replaced all sanitary sewer within project limits. Installed foundation drain connections to storm sewer within the right-of-way
2020	Complete I/I Mitigation Monitoring & Modeling Analysis	Complete I/I analysis - meet with EGLE, received approval to pursue I/I pilot project potentially extending schedule to complete storage
	Langley Avenue Reconstruction Project	Replaced all sanitary sewer within project limits. Installed foundation drain connections to storm sewer within the right-of-way

Infiltration/Inflow Removal and Sewer Rehabilitation Project Professional Services Request

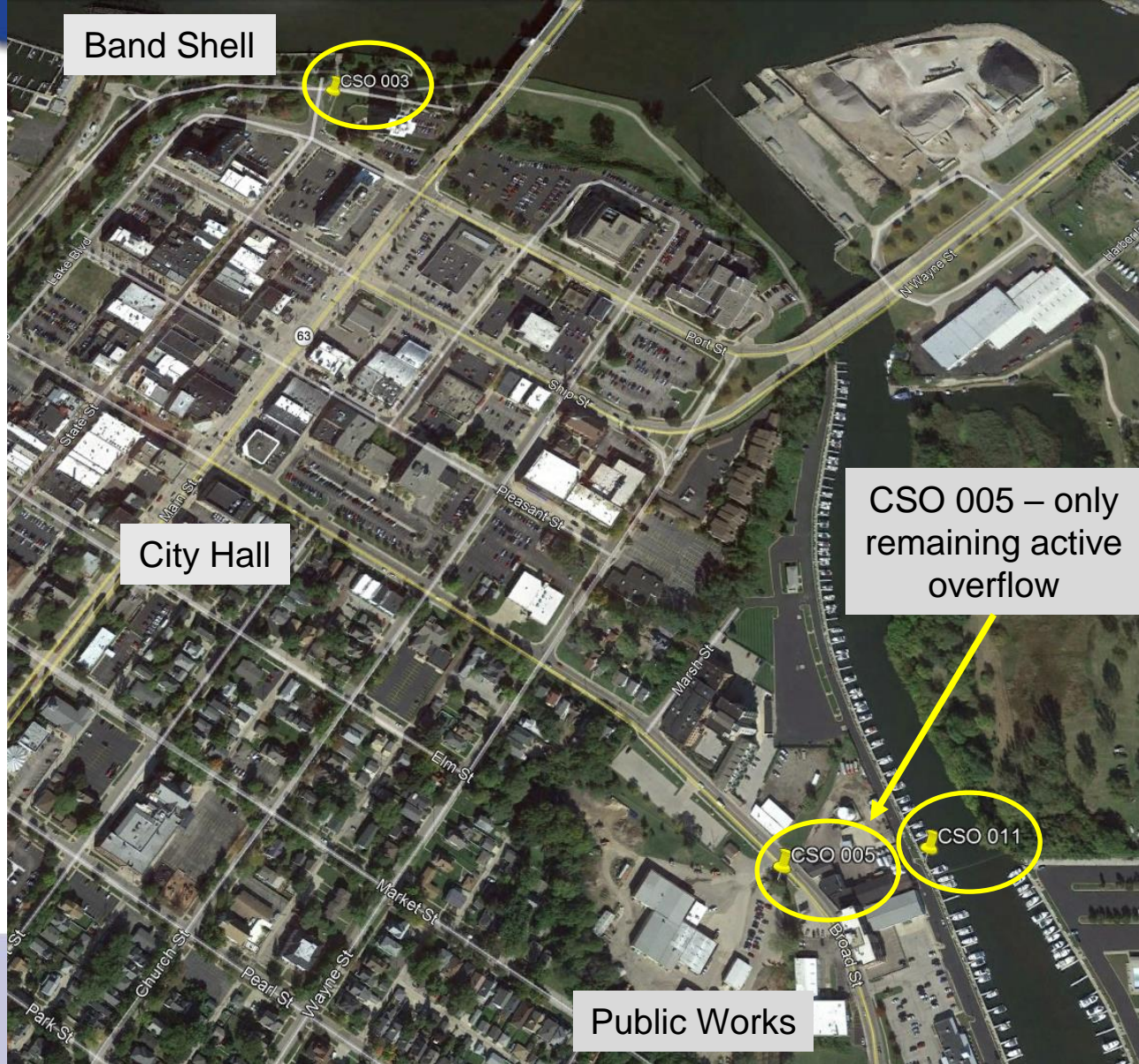


Common sources of infiltration



Example of infiltration
in a sewer pipe

Infiltration/Inflow Removal and Sewer Rehabilitation Project Professional Services Request

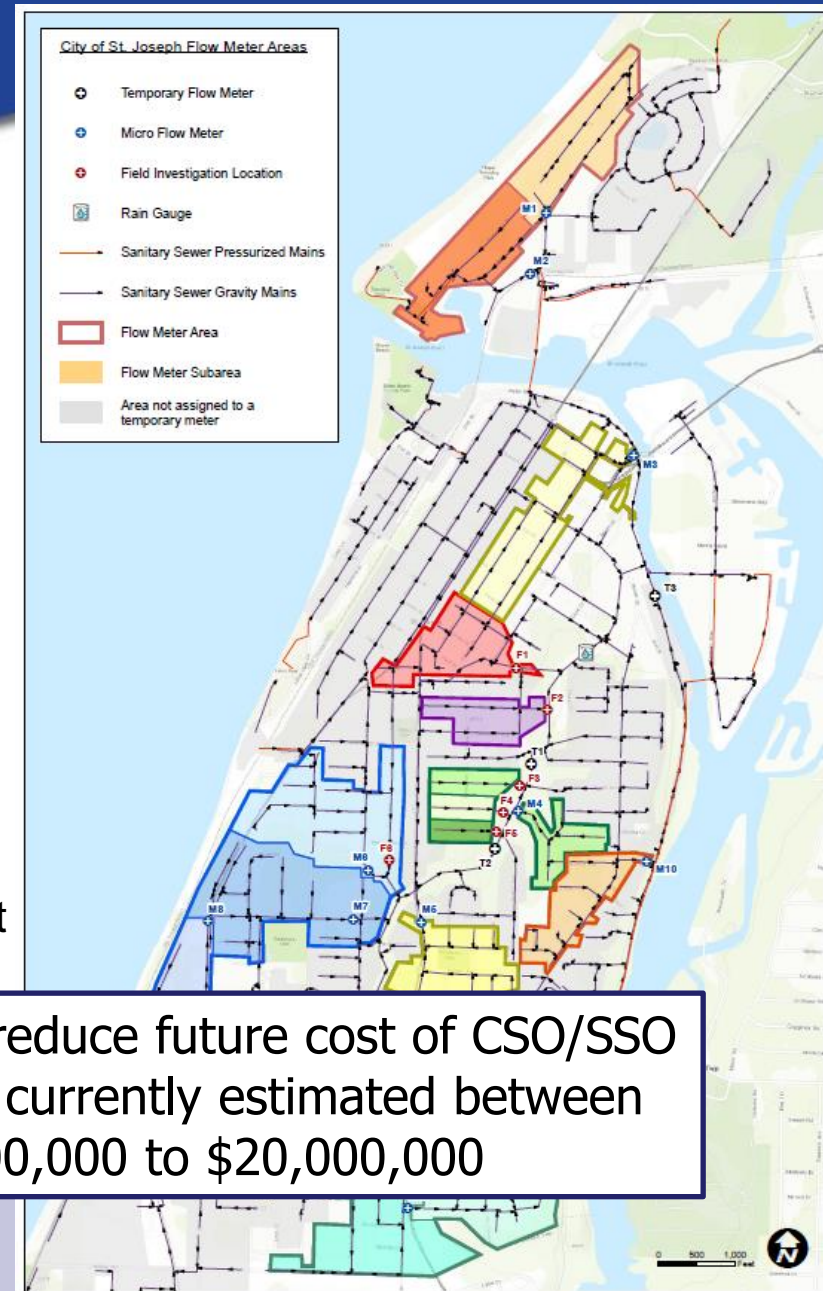


CSO 005 – only remaining active overflow

I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request

Infiltration/Inflow Monitoring and Modeling Analysis

- Temporary Flow Metering
- Micro Flow Metering
- Field Investigation where metering was not feasible
- Analyzed Flow and Rainfall Data
- Estimated I/I Removal using hydraulic model
- Determined if I/I Removal is cost effective
 - I/I Removal is cost effective when:
\$ I/I Removal \leq \$ Reduction in Storage Cost
- Conclusion: Yes - but results not as conclusive as desired, so the consulting team recommended pursuing a pilot I/I removal project



Ultimate goal: reduce future cost of CSO/SSO storage basin currently estimated between \$10,000,000 to \$20,000,000



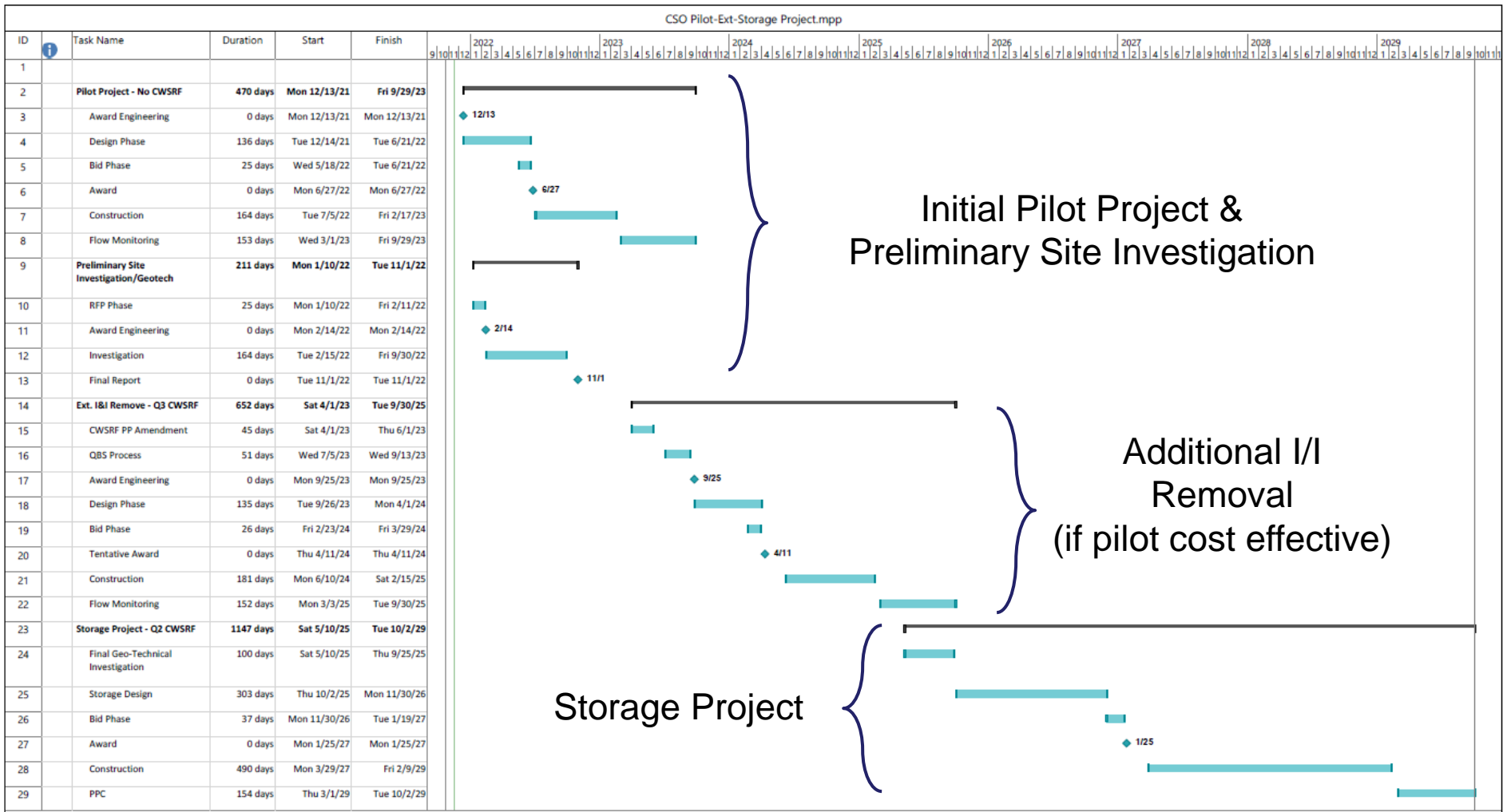
I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request

CSO Pilot-Ext-Storage Project.mpp

ID	Task Name	Duration	Start	Finish	2022												2023											
					10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
2	Pilot Project - No CWSRF	470 days	Mon 12/13/21	Fri 9/29/23	[Gantt bar spanning from 12/13/21 to 9/29/23]																							
3	Award Engineering	0 days	Mon 12/13/21	Mon 12/13/21	◆ 12/13																							
4	Design Phase	136 days	Tue 12/14/21	Tue 6/21/22	[Gantt bar from 12/14/21 to 6/21/22]																							
5	Bid Phase	25 days	Wed 5/18/22	Tue 6/21/22	[Gantt bar from 5/18/22 to 6/21/22]																							
6	Award	0 days	Mon 6/27/22	Mon 6/27/22	◆ 6/27																							
7	Construction	164 days	Tue 7/5/22	Fri 2/17/23	[Gantt bar from 7/5/22 to 2/17/23]																							
8	Flow Monitoring	153 days	Wed 3/1/23	Fri 9/29/23	[Gantt bar from 3/1/23 to 9/29/23]																							
9	Preliminary Site Investigation/Geotech	211 days	Mon 1/10/22	Tue 11/1/22	[Gantt bar from 1/10/22 to 11/1/22]																							
10	RFP Phase	25 days	Mon 1/10/22	Fri 2/11/22	[Gantt bar from 1/10/22 to 2/11/22]																							
11	Award Engineering	0 days	Mon 2/14/22	Mon 2/14/22	◆ 2/14																							
12	Investigation	164 days	Tue 2/15/22	Fri 9/30/22	[Gantt bar from 2/15/22 to 9/30/22]																							
13	Final Report	0 days	Tue 11/1/22	Tue 11/1/22	◆ 11/1																							



I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request



I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request

The I/I removal pilot project can be justified for multiple reasons.

- The sewer rehabilitation work that will be completed is needed, and included in the capital improvement plan created as part of the 2017 Stormwater, Asset Management and Wastewater (SAW) Grant.
- The City has not completed an I/I removal project in an isolated area, this will provide a very accurate assessment of the cost – benefit of the sewer rehabilitation work.
- It is in the best long-term interest of City rate payers because I/I removal results in a smaller storage basin, and the associated cost of treating the stored wastewater perpetually into the future.
- It will allow City staff and the consulting team to pursue recently approved, but not yet allocated, federal infrastructure funding to offset the cost of the storage basin.



I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request

St. Joseph Major Near Term Projects

1. Asset management (ongoing)
2. Lead service line replacement (ongoing)
3. Pump station rehabilitation
4. Pilot project (Area 9)
5. Annual sewer replacement
6. SSO basin construction



I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request



I/I Removal and Sewer Rehabilitation Pilot Project Professional Services Request

