WET WEATHER STAKEHOLDER TEAM

Agenda

Wet Weather Team
Stakeholder Group Agenda
June 28, 2018
5:30 p.m. – 8:00 p.m.

6/26/18 PM DRAFT

5:15	Dinner served
5:30 – 5:45	Welcome & Intro, Special Recognition *Clay Kelly, Strand Associates*
5:45 – 6:00	IOAP Update - Overall Status *John Loechle, MSD Engineering Technical Services Director*
6:00 – 6:20	MSD Update *Tony Parrott, MSD Executive Director*
6:20 – 6:45	Louisville's Stormwater Story *Tom Owen – Local Historian with University of Louisville Archives and Special Collections*
6:45 - 6:50	Stormwater Discussion Introduction *Angela Akridge, MSD Chief Engineer*
6:50 – 7:40	Critical Drivers for Louisville's Stormwater Program *Clay Kelly*
7:40 – 7:45	Observer Comments, Wrap-up and Adjourn *Clay Kelly*

Meeting Summary

Meeting Summary
Wet Weather Team Stakeholder Group Meeting
June 28, 2018
MSD Main Office, Louisville

The Wet Weather Team (WWT) Stakeholders, chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on June 28, 2018, at MSD's main office. The objectives of the meeting were to:

- Provide a Consent Decree Integrated Overflow Abatement Plan (IOAP) update,
- Review the history of stormwater management in Louisville, and
- Develop drivers for Louisville's future stormwater program.

Welcome

Clay Kelly of Strand Associates opened the meeting by welcoming the members and reviewing the meeting objectives, agenda, and basic ground rules.

Clay recognized stakeholders Gina O'Brien and Marty Storch who both recently left the WWT. Clay also recognized Gary Swanson for his many years of service in support of MSD, and especially the WWT.

Clay then welcomed a new member of the WWT, Jeff O'Brien, and an invited guest, Eric Friedlander.

IOAP Update

John Loechle, MSD Engineering Technical Services Director, opened the presentation by explaining that in lieu of a detailed status update on each of the projects, he would provide highlights from key projects that are underway. Detailed updates for specific projects are provided in the handouts but would not be discussed unless a stakeholder had a question.

John began by sharing all of the projects related to the combined Sewer Overflow (CSO) Long-Term Control Plan have either been completed or are in the construction phase. He then detailed the specifics of three projects that have been completed since the last WWT meeting:

1. Camp Taylor Sanitary Sewer Replacement.
2. Logan CSO Basin and Interceptor.
3. Clifton Heights Force Main Extension Project.

The Camp Taylor project installed approximately 62,000 feet of new sewers and addressed issues with the property service connection at over 1,100 homes and businesses. This project involved a significant restoration effort in order to return the roads, sidewalks, driveways, yards, etc. to acceptable conditions after construction was complete. In many cases the restoration left the area in better condition than it was prior to construction.

The Logan CSO Basin and Interceptor included a 16.7-million-gallon storage basin and over 10,000 feet of new sewer ranging in size from 24 inch to 96 inch in diameter. The basin is in service and performing well. John noted that the cleaning system in the basin is functioning better than expected. The property has been transferred to the Louisville Metro Housing Authority who is overseeing the property and future installation of new amenities for the neighborhood.

The Clifton Heights Force Main Extension involved almost 4,500 feet of 20-inch pipe installed in an urban setting and required the force main to be installed on the side of a bridge in order to cross Beargrass Creek.

The last project John highlighted was the Waterway Protection Tunnel. The project has been awarded and the contractor is already well underway with construction. The tunnel boring machine is currently being re-manufactured while the contractor is constructing the access shafts to lower the machine into place.

MSD Update

Tony Parrott, MSD Executive Director, began his portion of the meeting with a summary of MSD's response to the February 2018 flooding. The flood required an all-hands-on-deck approach from MSD and the response strained staff, facilities, and resources to their limit. He shared pictures of areas flooded throughout Louisville and noted that MSD helped build an access road to allow a neighborhood to evacuate the rising waters. The strain of the event caused pumps at several of the flood pumping stations to fail and the costs to repair them will be significant. In all, over 80 billion gallons of water were pumped out of Louisville.

A stakeholder asked if there were any issues in the Park DuValle neighborhood. Tony responded that there were some issues in that area and that many were related to the need to implement the Critical Repair and Reinvestment Plan (CRRP) that was developed last year. He added that the area has been added to MSD's list of "hot spots", meaning that staff will monitor the area more frequently prior to and during heavy rain events as well as take preventative measure to mitigate the impact. MSD hosted a public meeting to discuss these issues with the neighborhood and explain the limits of what MSD could do. The stakeholder follow-up with a question about the difficulty some residents were having with getting insurance claims paid and if there was anything MSD could do or was doing to help them. David Johnson, MSD Development and Stormwater Services Director, responded that MSD could provide assistance with filing claims and seeing them resolved through a third party.

Tony then updated the WWT on the Ohio River Interceptor (ORI) Rehabilitation on Main Street. Tony reminded the WWT that the ORI is one of Louisville's most critical sewer pipes as it carries 40 percent of all the wastewater generated in Jefferson County. The ORI was built in 1958 and experienced a cave in near the intersection of East Main Street and Hancock Street in August 2017. As a result of that cave in, the entire ORI was inspected with advanced laser technology to assess the condition of the pipe. The inspection identified an area between 4th and 7th Streets where the thickness of the concrete pipe had eroded from 15 inches to 3 to 5 inches and what concrete was there was of an unknown condition. In order to protect the public, several blocks of parking lanes on the south side of Main Street were closed as a collapse of the pipe would likely cause a collapse of the street along that parking lane.

MSD has identified a method to restore the pipe to a like-new condition using a PVC liner system. While not ideal, it will buy MSD time. Tony reminded the WWT that the CRRP had money budgeted to proactively addresses issues exactly like this. The cost to implement this repair is expected to be $20 million.

Louisville's Stormwater Story

Clay introduced Tom Owen as a local historian and archivist with the University of Louisville Archives and Special Collections and explained that Tom would provide the WWT with some historical perspective on stormwater and stormwater management in Louisville. Tom opened by reminding the WWT that Louisville is over 240 years old and that most of the City is located downhill from somewhere. The combination of topography and climate (which produces a lot of rain) means that stormwater has been an issue since the City's founding.

Small, stagnant ponds formed throughout the area and led to disease in the summer. The outbreaks included small pox in 1817 and yellow fever in 1822. The City's competitors labeled Louisville "The Graveyard of the West". Eventually City leaders got permission to start a lottery and raised $60,000 to drain ponds and other pockets of standing water.

As the City continued to grow, creeks were increasingly used as open sewers. For example, the Middle and South Forks of Beargrass Creek served as the Butchertown area's sewer resulting in blood and grease floating

down stream into downtown. As a result, the Beargrass Creek Cut-off was constructed and moved the confluence between the Creek and the Ohio River to the east of downtown.

The City began to expand to the south with new farms but farmers had issues with the soil not draining properly. The area that now encompasses the airport, fairgrounds, Ford, UPS, and west Okalona area was once known as the "Wet Woods". It was a huge swampy area that could not be used as productive land directly adjacent to a growing city with a need for agricultural areas to support it. To address this issue, huge ditches were constructed to drain the "Wet Woods" and create arable and developable land. There were side effects though including flooding, which the area still experiences today.

This process continued for years and spread. Areas were ditched to divert water to the Ohio River in order to create farms. By World War II, the same approach was used to create neighborhoods and homes, and along the way the landscape was changed to being much more impervious, which created even more stormwater runoff.

Tom concluded by saying that the problems we are facing today are similar to the problems previous generations of Louisvillians faced. What changes are the drivers and solutions to these problems. In closing, Tom shared a headline from a 1954 Courier-Journal article "Drainage is Jefferson County's Number One Priority".

Stormwater Discussion Introduction

Angela Akridge, MSD Chief Engineer, thanked Tom for the introduction to stormwater and then transitioned the meeting from a historical perspective to today and tomorrow's conditions. Angela emphasized that there were problems in the past that needed solutions, but that those solutions have yielded unintended consequences. CSOs, SSOs, channelized or piped streams, homes in the floodplain, flooding, and non-point source pollution are all by-products of the solutions implemented to deal with pressing problems in the past, most notably disease, sustainment, and expansion.

Angela continued by explaining that these problems will continue to worsen as a result of aging infrastructure, increased frequency of extreme storms, and emergencies taking priority away from other issues (and at a higher cost as seen with the ORI repair). Compounding the issues are that the solutions to these problems have constraints. For example, there is no budget to develop an up-to-date stormwater master plan without getting a rate increase over 6.9 percent or waiting until 2024 when the Consent Decree is complete. Additionally, the solutions are not "shovel ready" and will take time to develop the estimated $2 billion worth of designs that are necessary.

In the meantime, MSD is exploring the ripple effect of stormwater, identifying what today's stormwater drivers are, developing informed prioritization, engaging stakeholders and the community, and developing an approach to stormwater planning. MSD wants to be ready to hit the ground running, whether its because of a rate increase or its 2024, Angela explained.

Angela closed by explaining the ripple effect. During or after a flood there are obvious damages caused directly by the stormwater, but there are other effects that can have an even greater impact to our community. For example, flooded roadways may be blocked, which prevents an employee from getting to work or a business from opening, which results in lost wages and revenues. Or perhaps a car is lost in the flood and now an employee cannot get to work. They will not earn any money and may lose their job. The impact of a flood on materials and supplies moving freely, employers, employees, and others ripples out from the initial flood and impacts a much larger part of our community.

Critical Drivers for Louisville's Stormwater Program: Understanding the Ripple Effect

Clay opened the discussion by explaining that MSD is seeking to know the stormwater drivers from the WWT members' perspective. There were no constraints on the cost, the size, location, etc. of the driver or what it might take to address it. Clay went on to explain that MSD and its team had spent several hours over the last few weeks identifying drivers to help populate the list and to jumpstart the discussion. MSD is asking the WWT to verify the ones MSD has identified as well as identify new ones. Clay and Angela both stressed that this was a very preliminary effort and there would be more opportunities in the future to revise.

The WWT stakeholders were then asked to write down the two or three drivers they thought were important. Once all of the drivers had been collected, Clay and Ted Grossardt of Vox Populi facilitated the organization of the drivers into categories or headings by posting the new ideas alongside the previously developed list on a large display board. Several stakeholders encouraged MSD to develop a plan that focused on individuals and not just the business interests of the City. There was significant discussion regarding the identified drivers and how those topics are categorized and grouped.

Clay then asked if the WWT felt comfortable applying some weighting or prioritization to the categories at this point or would they prefer to wait for a future meeting. The stakeholders preferred to wait until later so they would have more time to consider the drivers and categories. Clay closed the meeting by thanking the attendees and said that the MSD team would take the work the WWT had done and send it to them for consideration and comment so that at the next meeting preliminary weighting could be done.

Observer Comments, Wrap-Up, and Adjourn

There were no comments from the observers.

Meeting Materials

- Agenda for the June 28, 2018 WWT Stakeholder Group Meeting
- Copy of the presentation slides – IOAP Update; MSD Update; Stormwater Discussion Introduction; Critical Drivers for Louisville Stormwater Program

Meeting Participants

Wet Weather Team Stakeholders (Present)

Steve Barger, Labor (retired)
Stuart Benson, Louisville Metro Council, District 20
Billy Doelker, Key Homes
Arnita Gadson, West Jefferson County community Task Force
David James, Louisville Metro Council, District 6
Rick Johnstone, Deputy Mayor, Louisville Metro Mayor's Office (retired)
Kurt Mason, USDA Natural Resources Conservation Service
Jeff O'Brian, Louisville Metro Government, Director of Louisville Forward
Rocky Pusateri, Elite Built Homes
Lisa Santos, Irish Hill Neighborhood Association
Tina Ward-Pugh, Louisville Metro Government, Resilience and Community Services

Wet Weather Team Guest (Present)

Eric Friedlander, Louisville Metro Government, Chief Resilience Office

Wet Weather Team Stakeholders (Not Present)

Susan Barto, Mayor of Lyndon
Mark French, University of Louisville Speed School of Engineering
Tom Herman, retired from Zeon Chemicals
Maria Koetter, Louisville Metro Government, Director of Sustainability
Bruce Scott, Kentucky Waterways Alliance (retired)
David Tollerud, University of Louisville, School of Public Health and Information Sciences (retired)
David Wicks, Get Outdoors KY; Jefferson County Public Schools (retired)

Wet Weather Team MSD Personnel (Present)

Tony Parrott, MSD Executive Director
Angela Akridge, MSD Chief Engineer
John Loechle, MSD Engineering Technical Services Director

Technical Support

Clay Kelly, Strand Associates
Paul Maron, Strand Associates

Meeting Observers

Colette Easter, MSD
Bill Sanders, Heritage Engineering
David Johnson, MSD
Stephanie Laughlin, MSD
Wes Syndor, MSD
Steve McKinley, SCM Engineers
Ted Grossardt, Vox Populi

Handouts

No Meeting Handouts

Presentations

Wet Weather Team Meeting IOAP Update

June 28, 2018

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Agenda

- Projects Completed
  - Camp Taylor Sanitary Sewer Replacement
  - Logan CSO Basin
  - Clifton Heights Force Main Extension
- Waterway Protection Tunnel
- Construction Projects (See Hand Outs)
  - Rowan Street Pump Station and CSO Diversions
  - Clifton Heights CSO Basin
  - Southwestern Parkway CSO Basin
  - I-64 & Grinstead CSO Basin
  - Portland CSO Basin

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Projects Completed since August 2017

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Camp Taylor Sanitary Sewer Replacement –
Area 1A
Area 1B
Area 2A
Area 2B & 4

Substantial Completion: December 15, 2017

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Camp Taylor Sanitary Sewer Replacement Projects for Areas 1A, 1B, 2A, 2B & 4

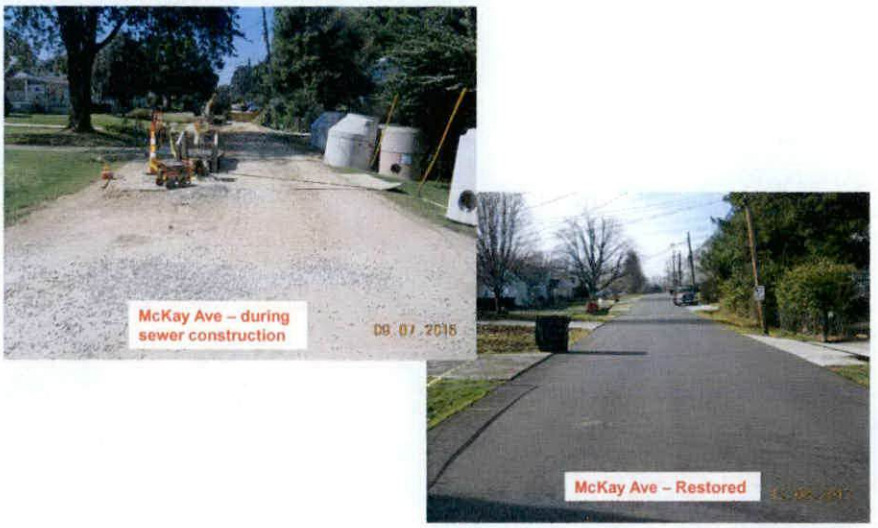
- Area 1A
  - 21,000 ft of new MSD sewers
  - 426 houses/businesses
  - $9.4 million construction cost
- Area 1B
  - 8,000 ft of new MSD sewers
  - 110 houses
  - $3 million construction cost
- Area 2A
  - 17,000 ft of new MSD sewers
  - 346 houses/businesses
  - $10 million construction cost
- Area 2B & 4
  - 16,000 ft of new MSD sewers
  - 234 houses/businesses
  - $8.1 million construction cost

Camp Taylor SSR

Private Property Sewer – During Installation

Private Property Sewer -- Complete

Camp Taylor SSR Projects



Camp Taylor SSR - Completed and Restored Areas

Logan CSO Basin and Interceptor

Substantial Completion: December 20, 2017

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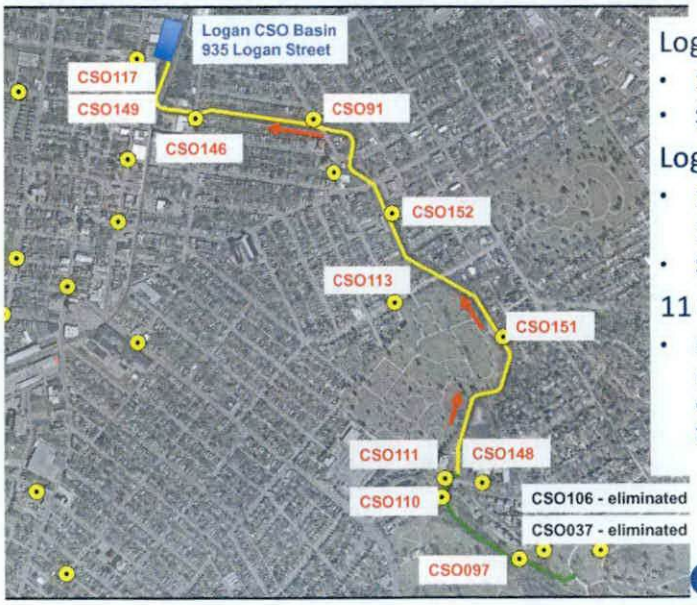
Logan CSO Basin and Interceptor - Overview



Logan CSO Basin

- 16.7 MG
- $50 million

Logan Interceptor

- 10,000 feet of 24" – 96" sewer
- $32 million

11 CSOs

- Level of Control is reduced to eight overflows each in a typical year

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Logan CSO Basin

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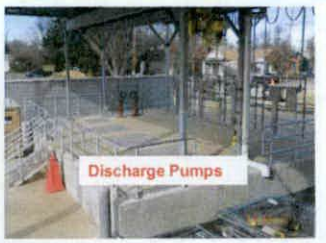
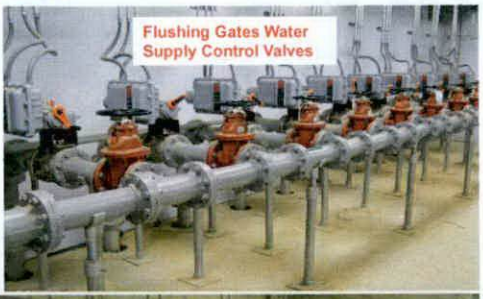
Logan CSO Basin



Logan CSO Basin

Logan CSO Basin



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Clifton Heights Force Main Extension Project

Completed May 2018

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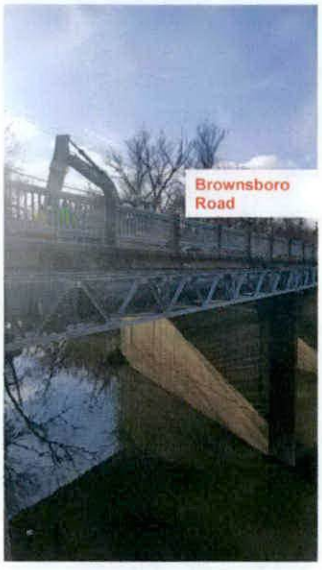
Clifton Heights Force Main Extension



- 20 inch forcemain discharge pipe from Clifton Basin
  - 4,450 linear feet of 20 inch pipe installed
  - $3.04 million construction cost

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Waterway Protection Tunnel:

(formally know as the "Ohio River Tunnel")

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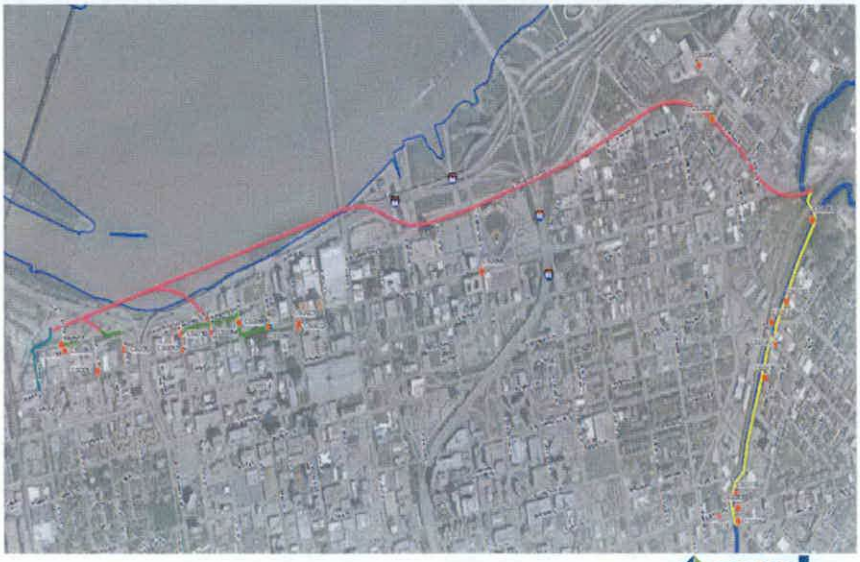
Waterway Protection Tunnel – Project



Waterway Protection Tunnel

- Contract Amount: $108,374,100.00
  - Shea Traylor JV
- Consent Decree Deadline: December 31, 2020
- Contract Substantial Completion: July 26, 2020
- Contract Final Completion: October 26, 2020
- Percent Complete (by Time): 26%
- Percent Complete (by Budget): 26%
- Construction Schedule
  - Pump Station & Working Shafts are approximately 170 feet deep
  - Retrieval Shaft secant pile installation is approximately 40% complete
  - Tunnel boring machine is scheduled to begin arriving in September 2018.

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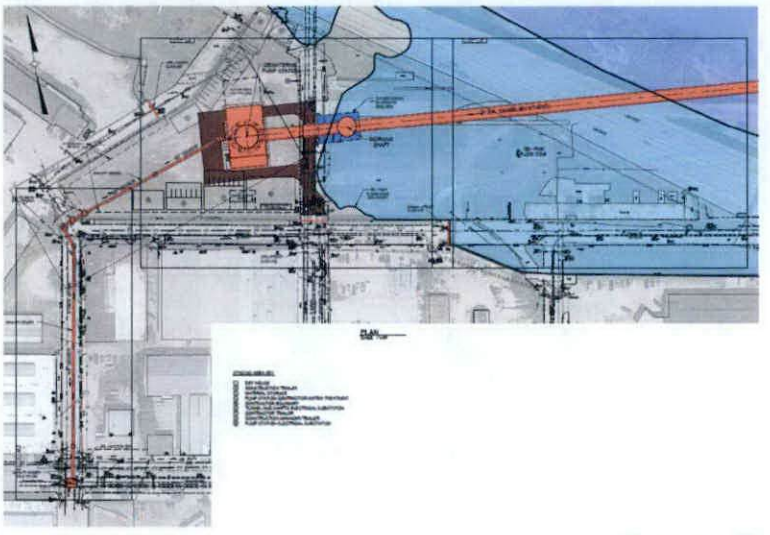
Overall Site Plan



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Waterway Protection Tunnel

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Waterway Protection Tunnel

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Waterway Protection Tunnel

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Waterway Protection Tunnel

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Hand Outs

Construction Projects

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Rowan Pump Station

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Rowan Pump Station: Design Criteria

- Submersible Wet Well
  - 5 MGD minimum capacity at high wetwell
  - 50 MGD maximum capacity at low wetwell
  - 50-foot diameter
  - 200-foot depth
  - 10 submersible pumps (3,500 gpm each)
  - 2 grit pumps (1,000 gpm each)
  - 12-inch pump discharge pipes to collection trough
  - 60 inch gravity sewer to ORI

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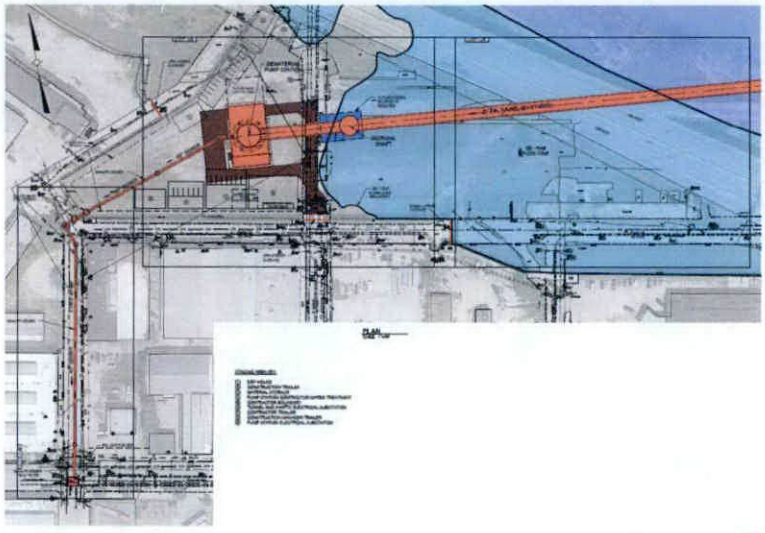
Rowan Pump Station – Overall Site Plan



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Lexington and Payne CSO Interceptor – Project Alignment

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Lexington and Payne CSO Interceptor: Project Facts

- Sewer line to capture overflows from nine (9) existing CSOs and convey that flow to the tunnel
- Interceptor will be below the concrete channel of South Fork Beargrass Creek
- Approximately 5,000 linear feet in length
  - From E Broadway to E Main Street
  - Pipe size ranging from 36-inch to 102-inch

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Downtown CSO Interceptor

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Downtown CSO Interceptor – Project Alignment

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Downtown CSO Interceptor: Project Facts

- Sewer line to capture overflows from twelve (12) existing CSOs and convey that flow to the tunnel
- Approximately 2,000 linear feet in length
- Pipe size ranging from 12-inch to 60-inch
- Street Impacts
  - Rowan Street between 10th & 13th Streets
  - Washington Street between 6th & 8th Streets
  - 6th Street between Main & Washington Streets
  - Main Street between 5th & 6th Streets

Story and Main Connector – Project Alignment

Story and Main Connector: Project Facts

- Sewer line to capture overflows from two (2) existing CSOs and convey that flow to the tunnel
- Approximately 200 linear feet in length
  - Near the intersection of Franklin Street and Buchanan Street
  - Pipe size: 48-inch

Ohio River Tunnel – Construction Schedule

Milestone	Ohio River Tunnel	Rowan Pump Station	Lexington & Payne CSO Interceptor	Downtown CSO Interceptor
Advertisement	May 25, 2017	Nov. 6, 2017	May 1, 2017	Aug. 1, 2017
MSD Board Award	Aug. 28, 2017	Jan. 22, 2018	July 24, 2017	Oct. 23, 2017
Construction Start	Sept. 13, 2017	Feb. 6, 2018	Aug. 8, 2017	Nov. 6, 2017
Substantial Completion	May 20, 2020	Aug. 14, 2020	May 28, 2019	Oct. 31, 2019
Consent Decree Deadline	Dec. 31, 2020	Dec. 31, 2020	Dec. 31, 2020	Dec. 31, 2020

Clifton Heights CSO Basin

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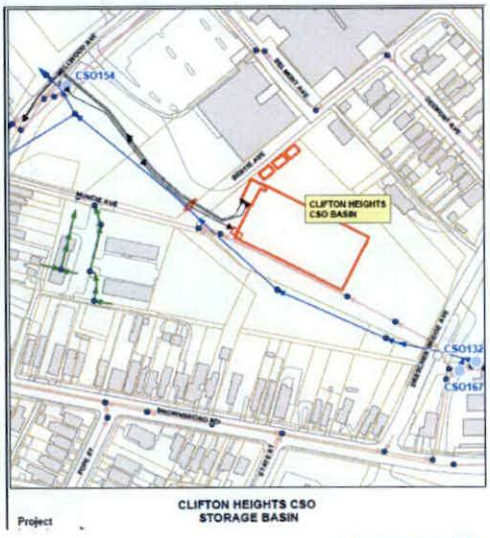
Clifton Heights CSO Basin

- Clifton Basin storage volume is 7 Million Gallons
- Basin will be underground and covered
- Addresses five (5) CSOs: 154, 132, 167, 088, and 131
- Level of Control (per Typical Year) is four



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Clifton Heights CSO Basin

- Contract Amount: $26,075,150
  - MAC Construction
- Consent Decree Deadline: December 31, 2018
- Contract Substantial Completion: December 1, 2018
- Percent Complete (by Time): 79%
- Percent Complete (by Budget): 85%
- Construction updates
  - Basin concrete work : complete
  - Wet well and valve vault concrete: 90% complete
  - Junction Structure: 50% complete
  - Control Building, generator pad, odor control: 5% complete

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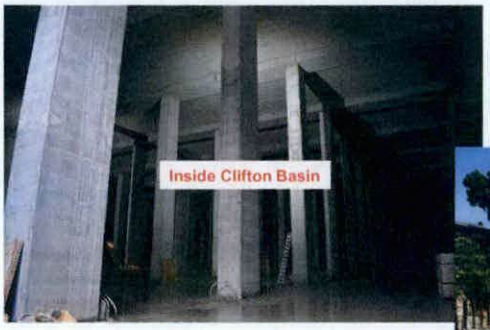
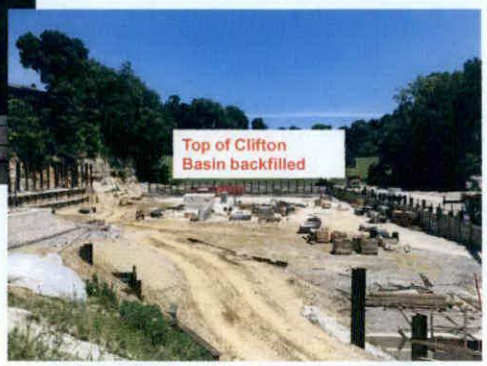
Clifton Heights CSO Basin - Update





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Central Relief Drain Overflow Mitigation

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Central Relief Drain Overflow Mitigation

- Contract Amount: $543,660
  - EZ Construction Co., Inc.
- Consent Decree Deadline: December 31, 2018
- Contract Substantial Completion: August 31, 2018
- Work Complete 38%
- Construction tasks
  - CSO 200 Relocation: In Progress
  - Bending Weir Installation: Submittals Reviewed
  - Adjustable Weir Plate Installation: Waiting on Resubmittal

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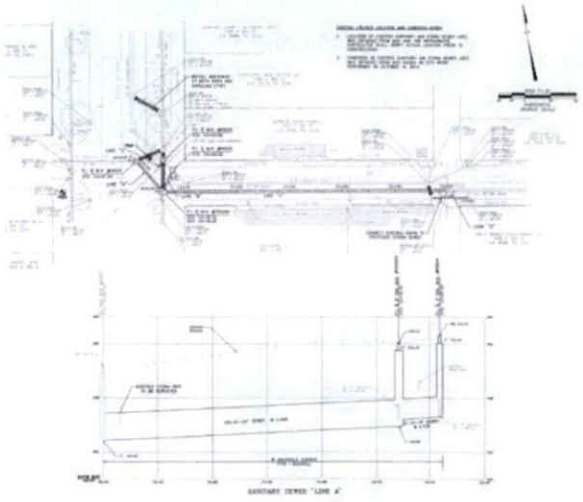
Project Locations

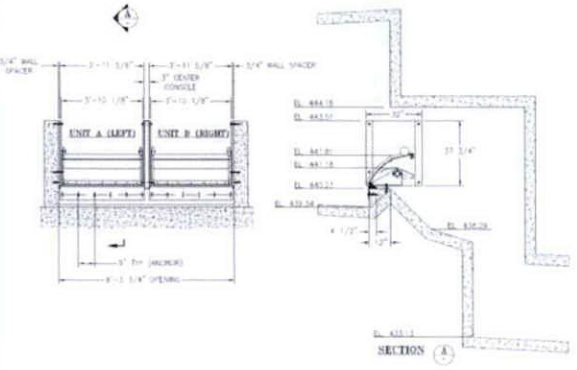
CSO 200 Relocation



- Construction in Progress
- Combined Sewer Flow is being redirected to a portion of the combined system with greater capacity

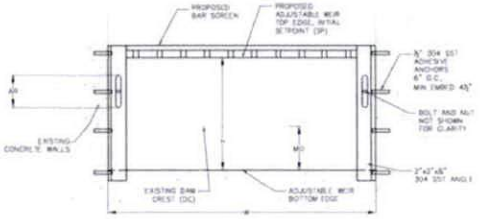
Central Relief Drain - Bending Weirs

- These allow more flow to be conveyed to the Treatment Centers without overflows.
- They can bend over during large storms to reduce upstream surcharging

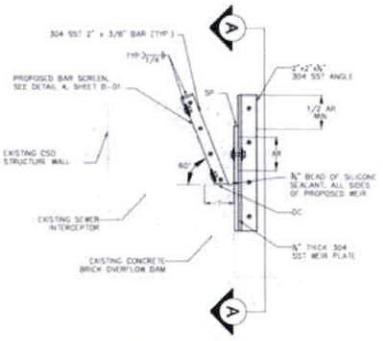


Central Relief Drain – Adjustable Weir Plates

- At CSOs that did not need a large increase in weir elevation an adjustable weir plate is more economical
- The adjustability will allow the weir elevations to be adjusted if post construction MSD sees higher frequency at some CSOs than the level of control.



SECTION A-A
NOT TO SCALE



ADJUSTABLE WEIR SIDE VIEW
CSOs 195, 196, 198, 199, 201 & 202
NOT TO SCALE

Southwestern Parkway CSO Basin

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Project Summary

- Basin storage volume is 20 Million Gallons
- Basin will be underground and covered
  - Within the Great Lawn of Shawnee Park
- Addresses three (3) CSO locations: 104, 105 and 189
- Level of Control (per Typical Year) is eight
- Consent Decree Deadline: June 30, 2019

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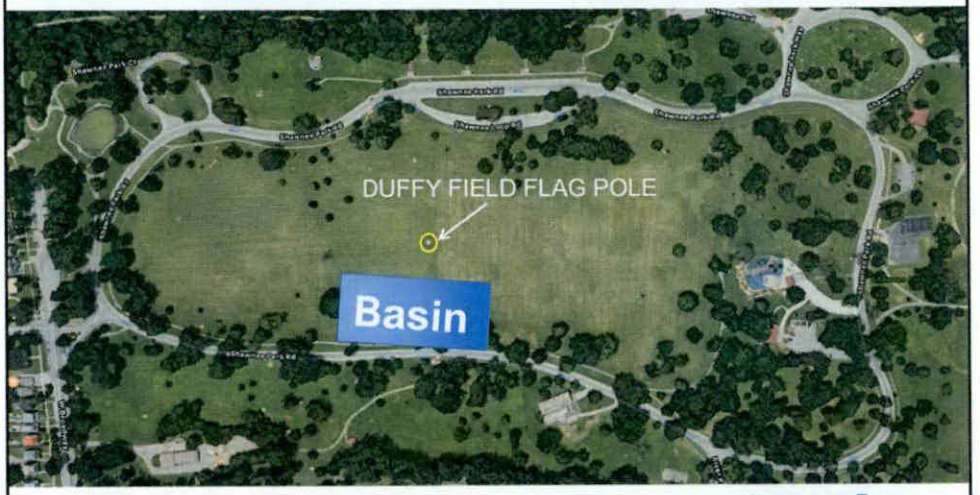
Basin Location

- 480' x 207.5'
- Average 55 ft total depth
- Average soil cover of 12 ft



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Renderings

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Renderings

Southwestern Pkwy CSO Basin

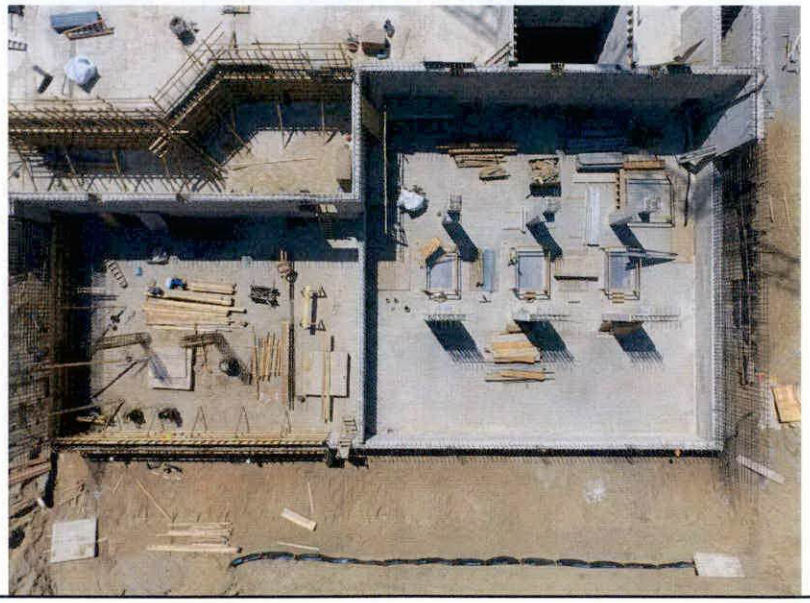
- Contract Amount: $73,220,985.33
  - Ulliman Schutte Construction
- Consent Decree Deadline: June 30, 2019
- Contract Substantially Operational: April 1, 2019*
- Projected Substantially Operational: April 1, 2019
- Percent Complete (by Time): 55%
- Percent Complete (by Budget): 52%
- Construction updates:
  - Basin walls and slabs: 100% complete
  - Basin columns: 90% complete
  - Basin roof: 50% complete
  - Ancillary structures: 40% complete

Basin and Pump Station/Operations Building

Southwestern Pkwy CSO Basin

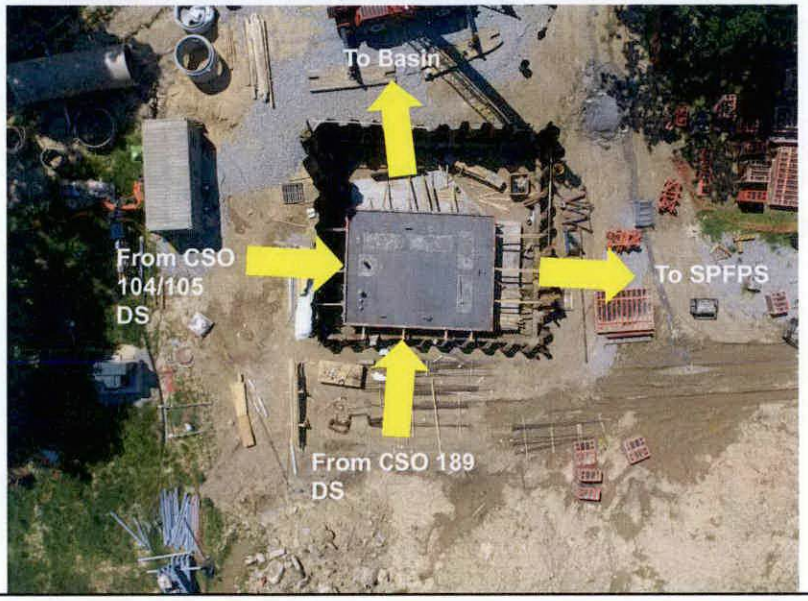
Pump Station/Operations Building

Southwestern Pkwy CSO Basin



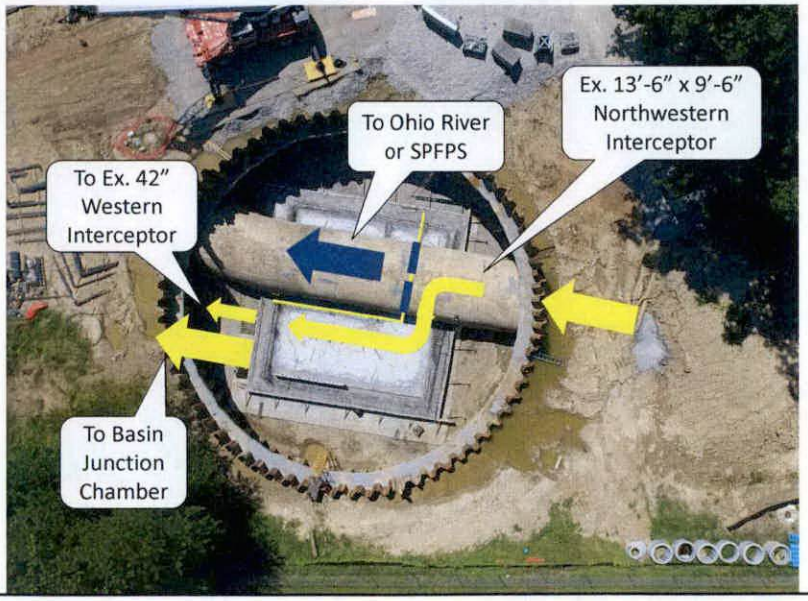
Basin Junction Chamber

Southwestern Pkwy CSO Basin



CSO 189 Diversion Structure

Southwestern Pkwy CSO Basin



I-64 & Grinstead CSO Basin

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Safe, clean waterways

Project Summary

- Basin storage volume is 8.5 Million Gallons
- Basin will be underground and covered
- Addresses three (3) CSO locations: 125, 127 and 166
- Level of Control (per Typical Year) is zero
- Consent Decree Deadline: December 31, 2020

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I-64 and Grinstead CSO Basin

- Contract Amount: $23,165,364.41
  - Thieneman Construction, Inc.
- Consent Decree Deadline: December 31, 2020
- Contract Substantial Operational: September 16, 2019
- Contract Substantial Completion: December 15, 2019
- Percent Complete (by Time): 38%
- Percent Complete (by Budget): 18%
- Construction Updates:
  - Basin excavation: 80% complete

ERS East Wall Failure – May 2018

I-64 and Grinstead CSO Basin

Portland CSO Basin

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Safe, clean waterways

Portland CSO Basin

- Contract Amount: $27,674,649.78
  - Dugan & Meyers LLC
- Consent Decree Deadline: December 31, 2019
- Contract Substantially Operational: May 17, 2019
- Contract Substantial Completion: July 16, 2019
- Percent Complete (by Time): 52%
- Percent Complete (by Budget): 52%
- Construction Schedule
  - Project is approximately 40 days ahead of schedule
  - Basin slab is approximately 70% complete
  - Basin walls are approximately 10% complete

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Portland CSO Basin

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Portland CSO Basin

msd

Portland CSO Basin – 34th Street Diversion

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