



City of Newark - Long Term Control Plan Phase II

Plan Review with Ohio EPA

AGENDA

1. Past and Current Projects

2. Overview of System

3. Plan Approach

4. Recommended Plan

5. EPA Comments

6. Next Steps

1. Past and Current Projects

- **LTCP Phase I** projects constructed by 2015:
 - Elimination of 5 CSOs (1006, 1007, 1018, 1030, 1031)
 - CSO Upgrades (1008 and 1013)
 - Backflow Prevention at CSO Outfalls (1012, 1017, 1013, 1014, 1021, 1022)
 - Conveyance Upgrades (54" Licking River Interceptor, 2x 48" Raccoon Creek Interceptor)
 - High Rate Treatment Facility

- **LTCP Phase II** commenced March 2015:
 - Characterization of the Collection System
 - Development of CSO control alternatives to address 27 remaining CSOs:
 - 90% Capture ◦ 99% Capture ◦ 1 Event
 - 95% Capture ◦ 4 Events ◦ 100% Capture
 - Develop Recommended Alternative and Implementation Schedule
 - LTCP Phase II report submitted to Ohio EPA by December 31, 2016

Current Construction

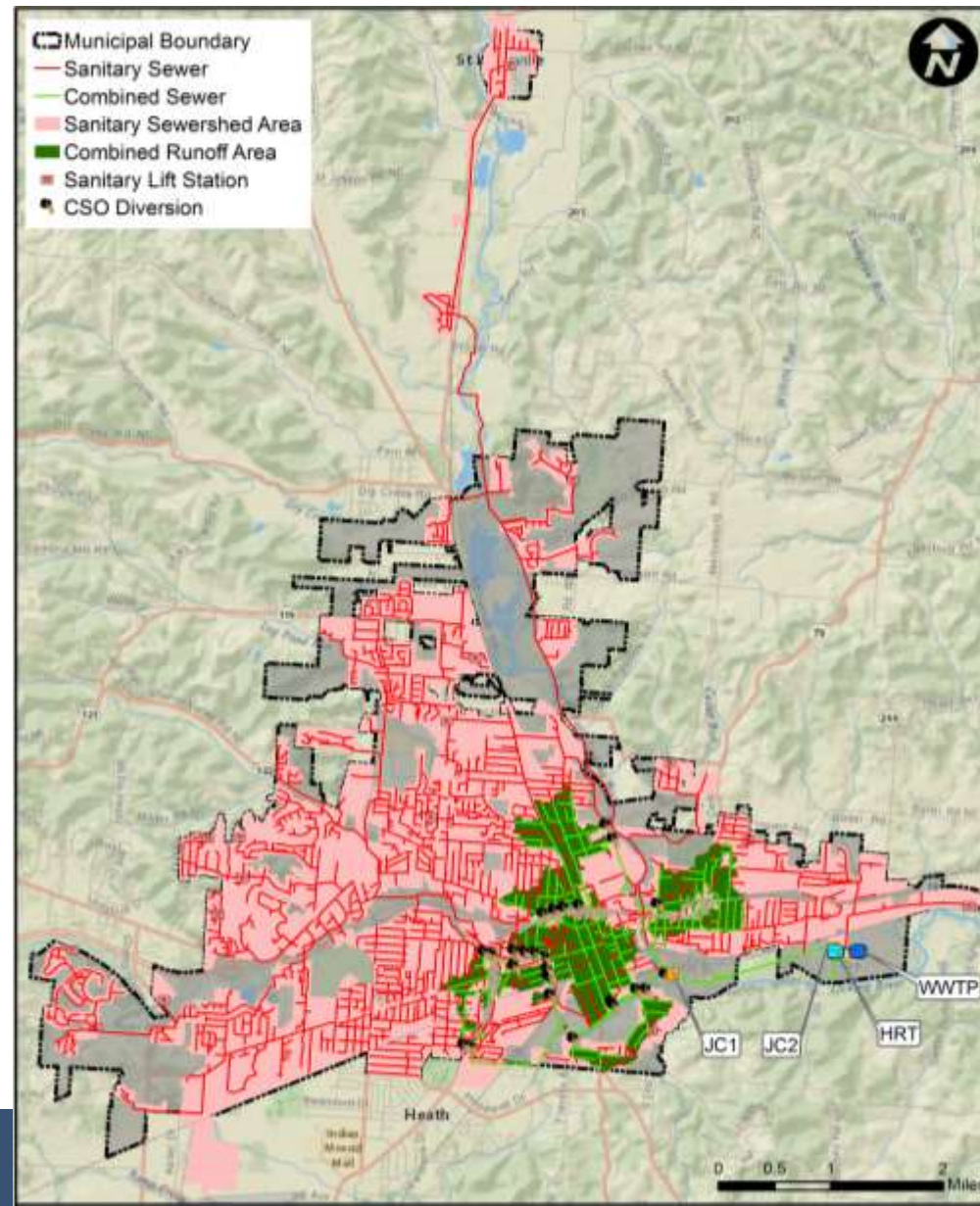
- **Downtown Renovation:**

- Objective:
 - CSO reduction (1005, 1013)
 - Improve vital aging infrastructure
- Components:
 - Storm separation
 - New utilities (storm, sanitary, water)
 - Green infrastructure
- Anticipated Completion:
 - 2018

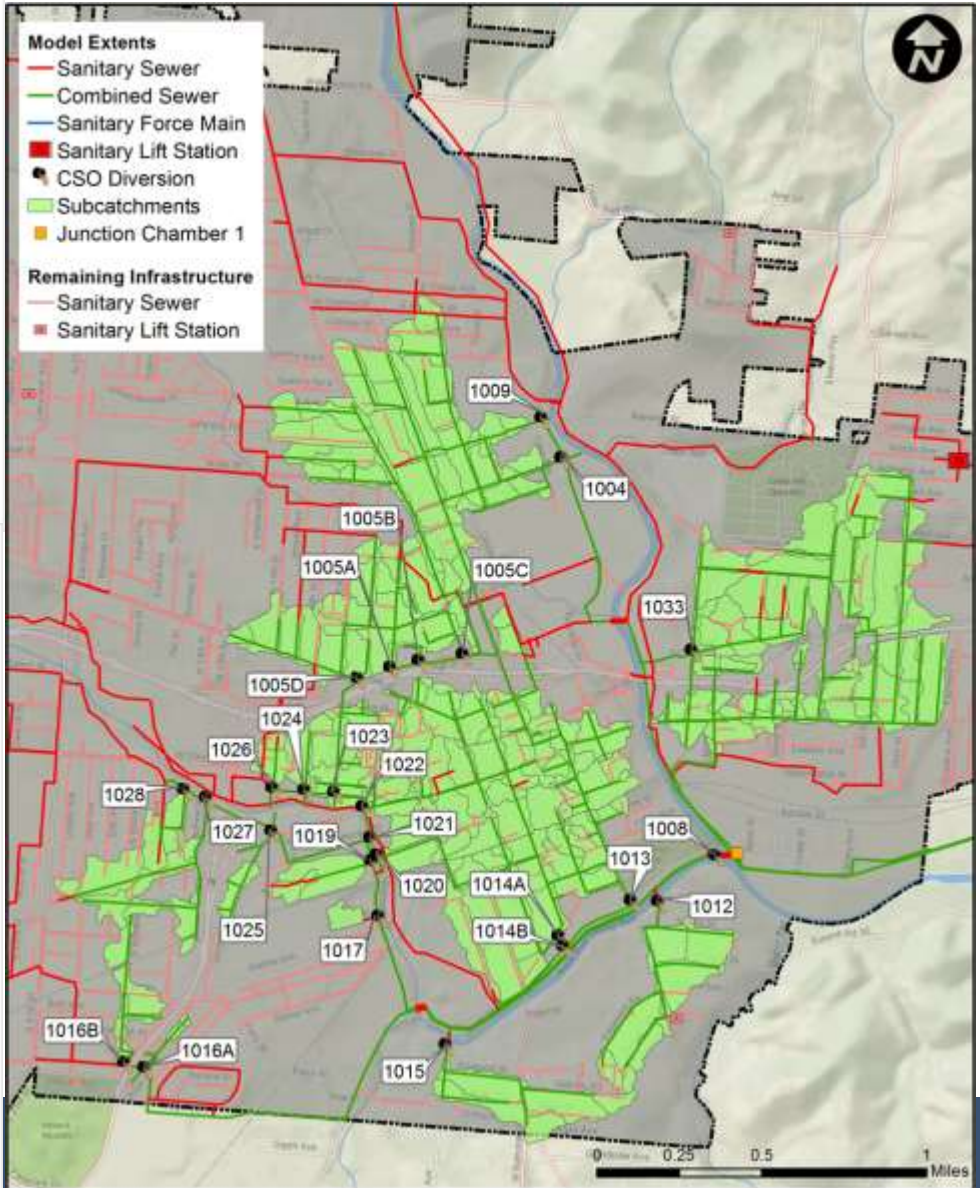
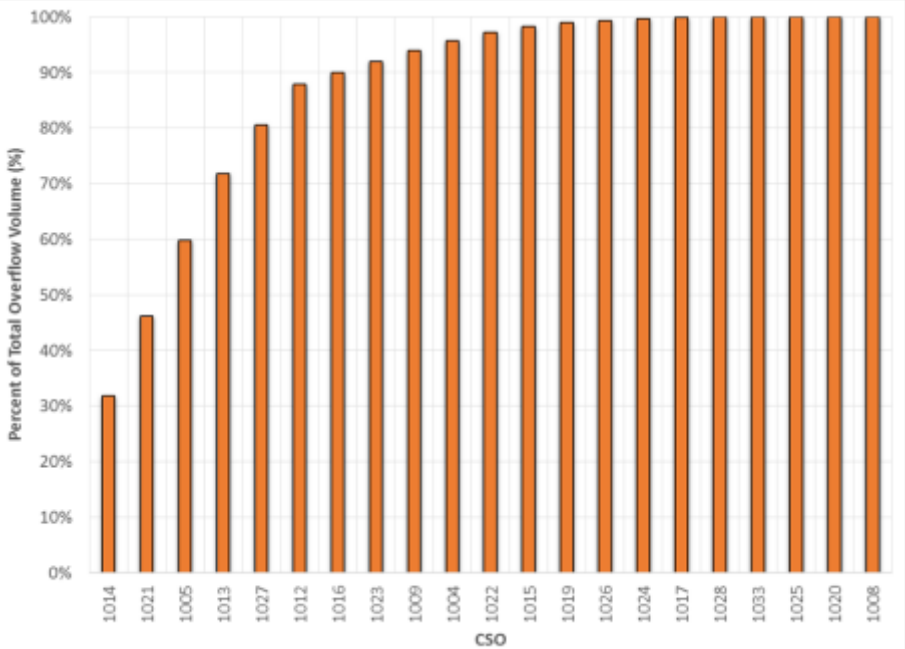
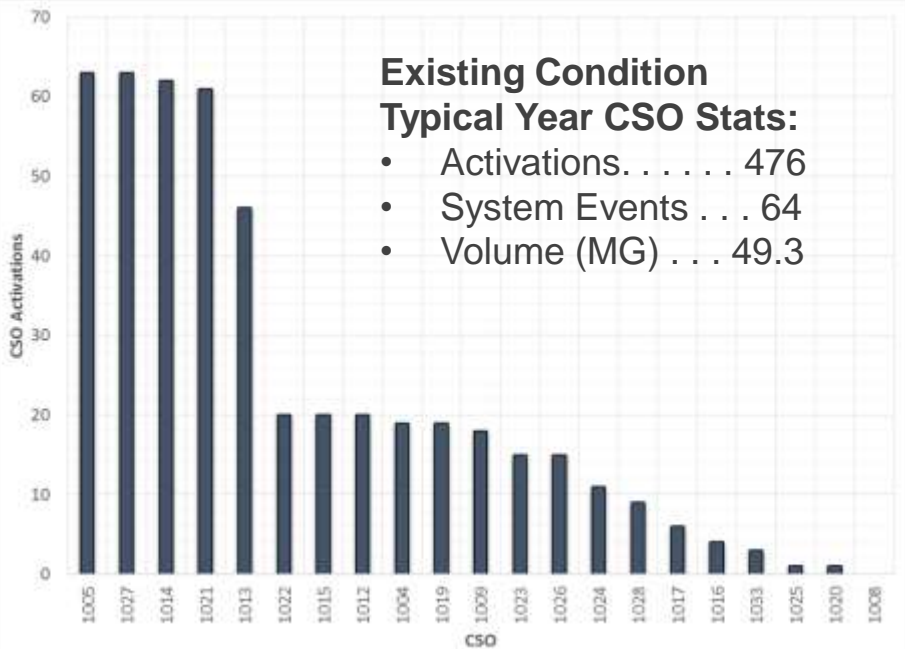


2. Overview of System

- Serviced Area:
 - Service Area: 9,000 AC
 - Combined Area: 1,183 AC
- Sewers:
 - 220 miles
 - 18% by length are combined sewers
 - Gravity range: 6" – 54"
- Siphons: 10 locations
- CSOs: 27 diversions (22 outfalls)
- Lift Stations: 17
- Treatment:
 - WWTP
 - HRT

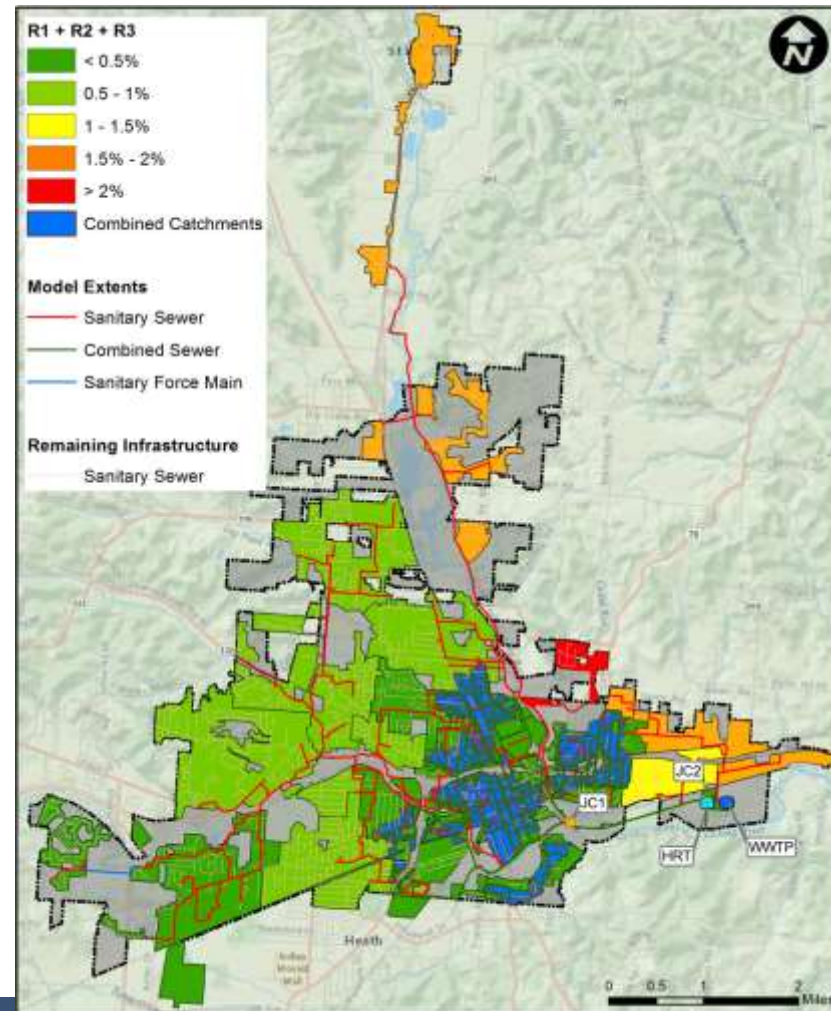


CSO Assessment



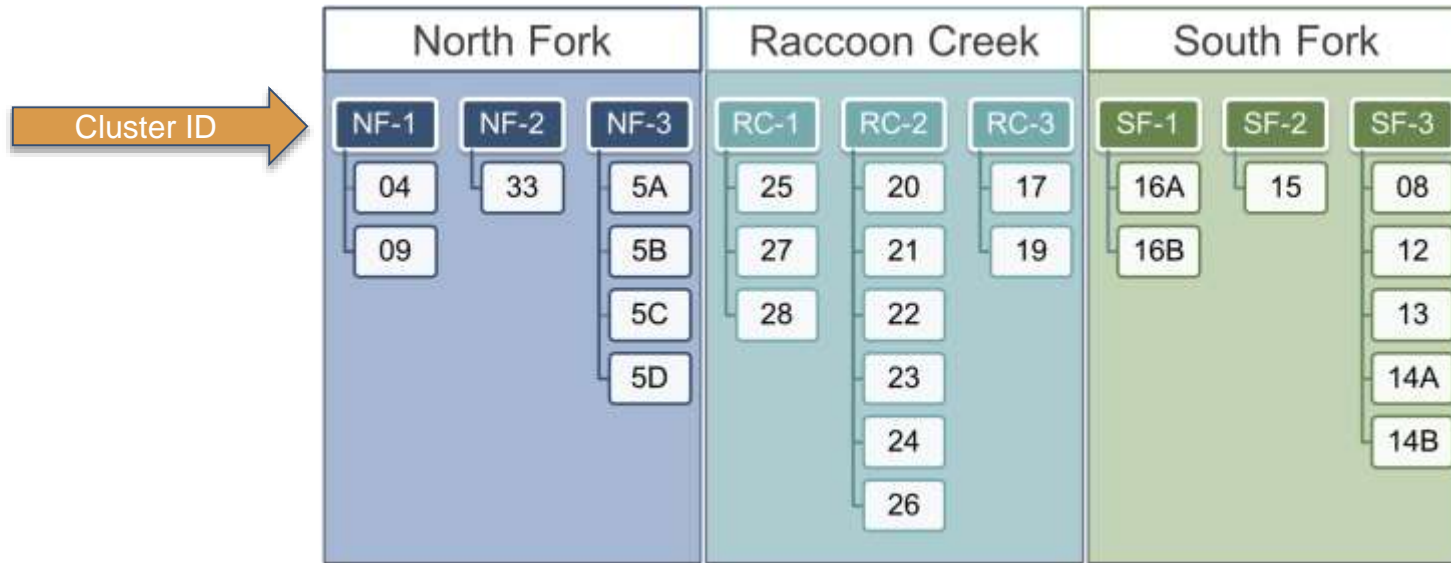
3. Plan Approach

- Start with Base Condition
- Identify and Investigate Control strategies:
 - Optimization
 - Conveyance (strategic upsizing and utilize sanitary)
 - Storage (regional and local)
 - Inflow Reduction (Separation and Green Infrastructure)
- Develop Strategy Matrix for each CSO



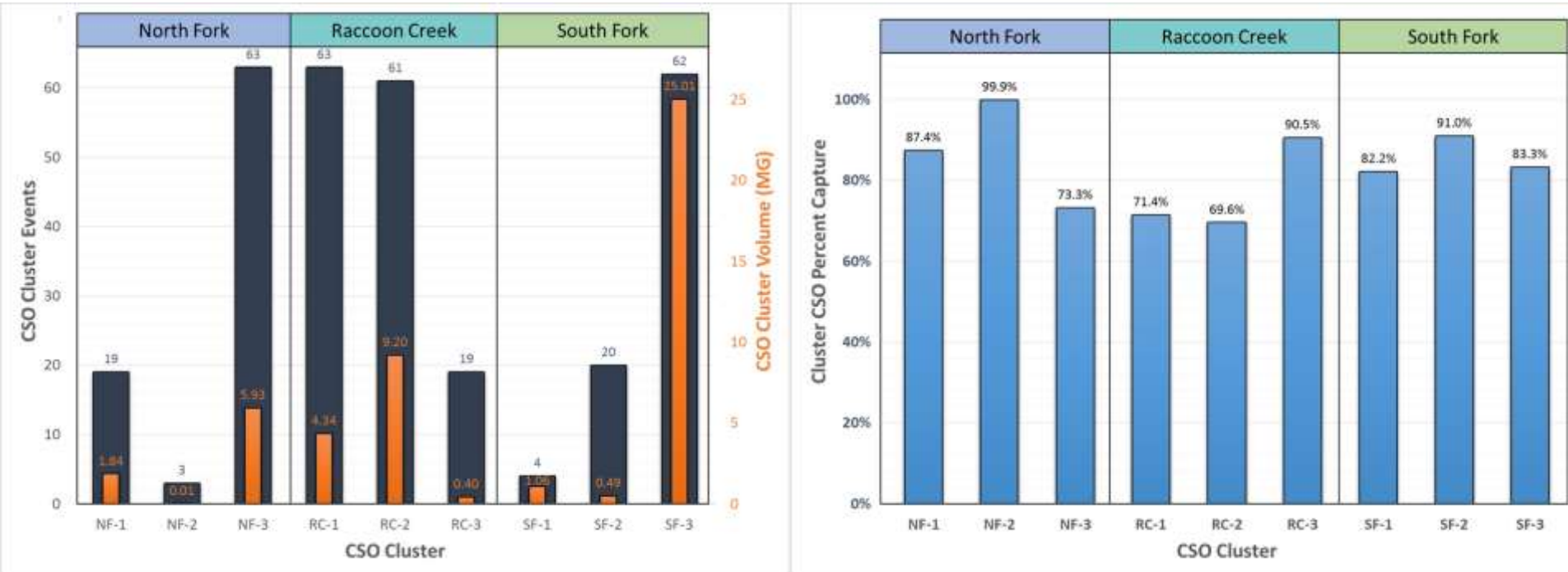
Approach to Meet CSO Control Goals

- CSO Clusters:
 - Group CSOs by receiving stream and hydraulic conductivity



- Develop CSO control alternatives as specified in NPDES to meet:
 - 90% Capture
 - 95% Capture
 - 99% Capture
 - 4 Events
 - 1 Event
 - 100% Capture

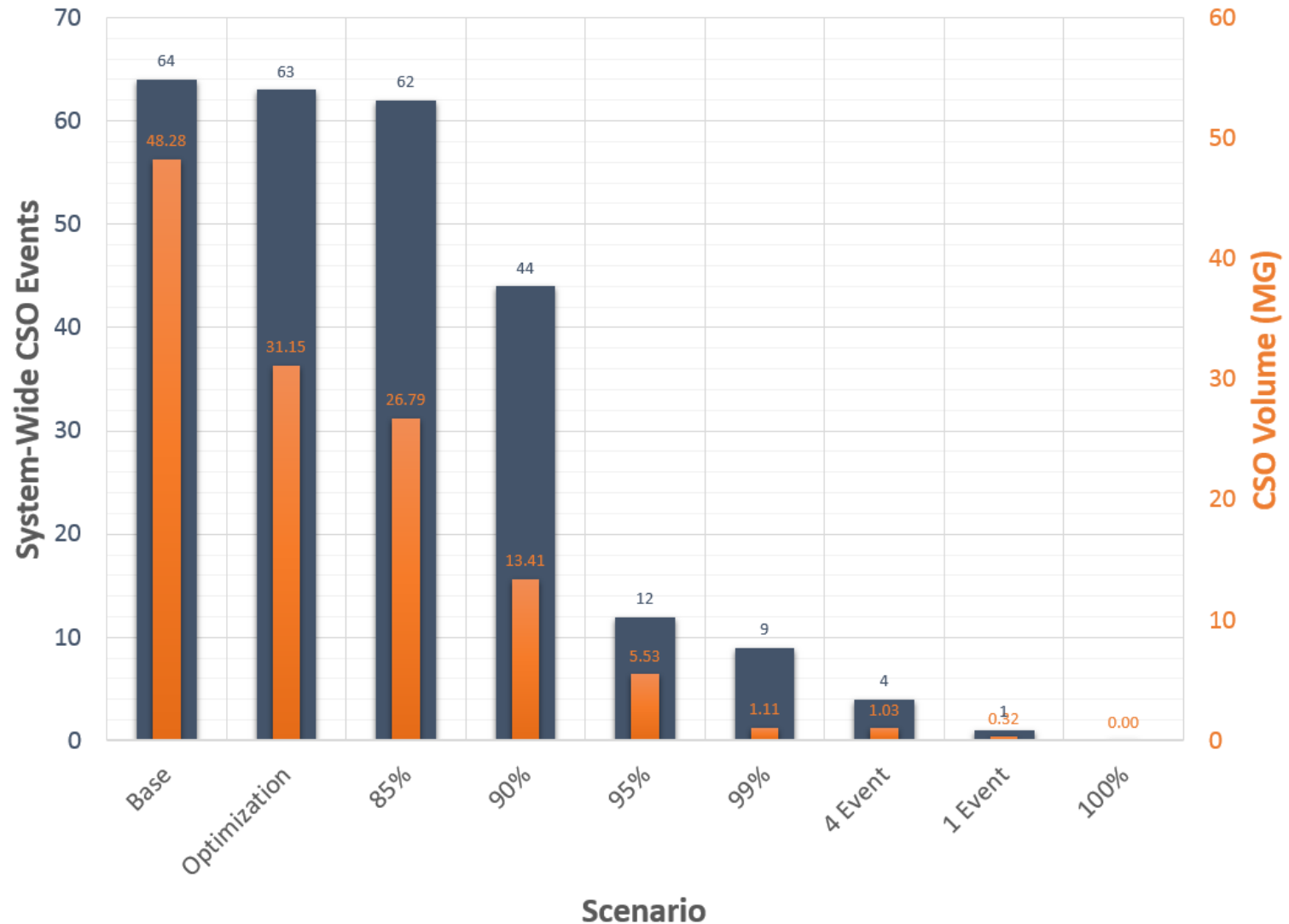
Base Conditions: Typical Year Performance



Typical Year CSO Stats:

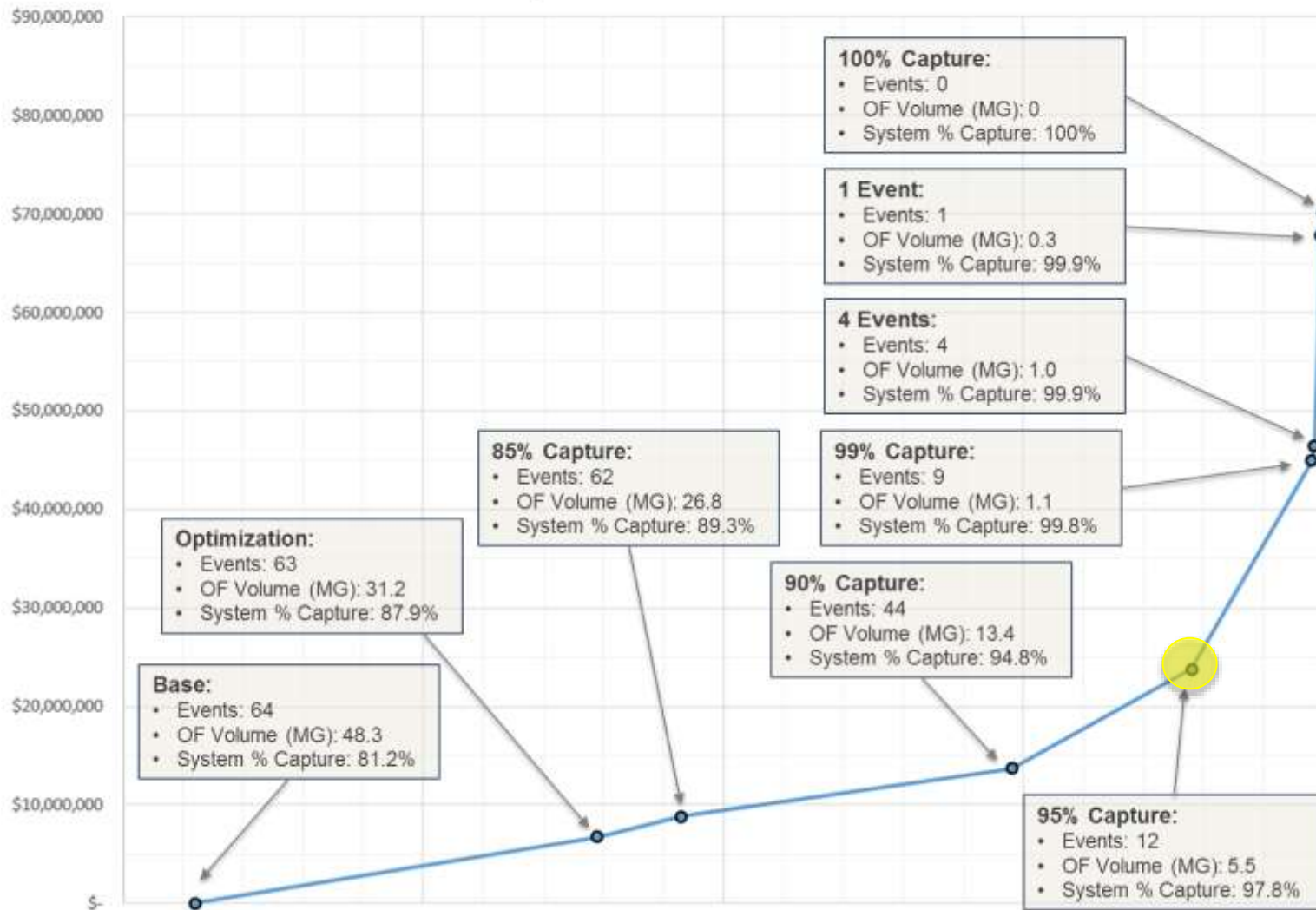
- CSO Activations 476
- CSO System Events . . . 64
- CSO Volume (MG) . . . 48.3
- System % Capture . . . 81.2%

Selecting Level of CSO Control



Selecting Level of CSO Control

Project Cost vs Level of Service



Addressing Aging Vital Infrastructure

Assumptions:

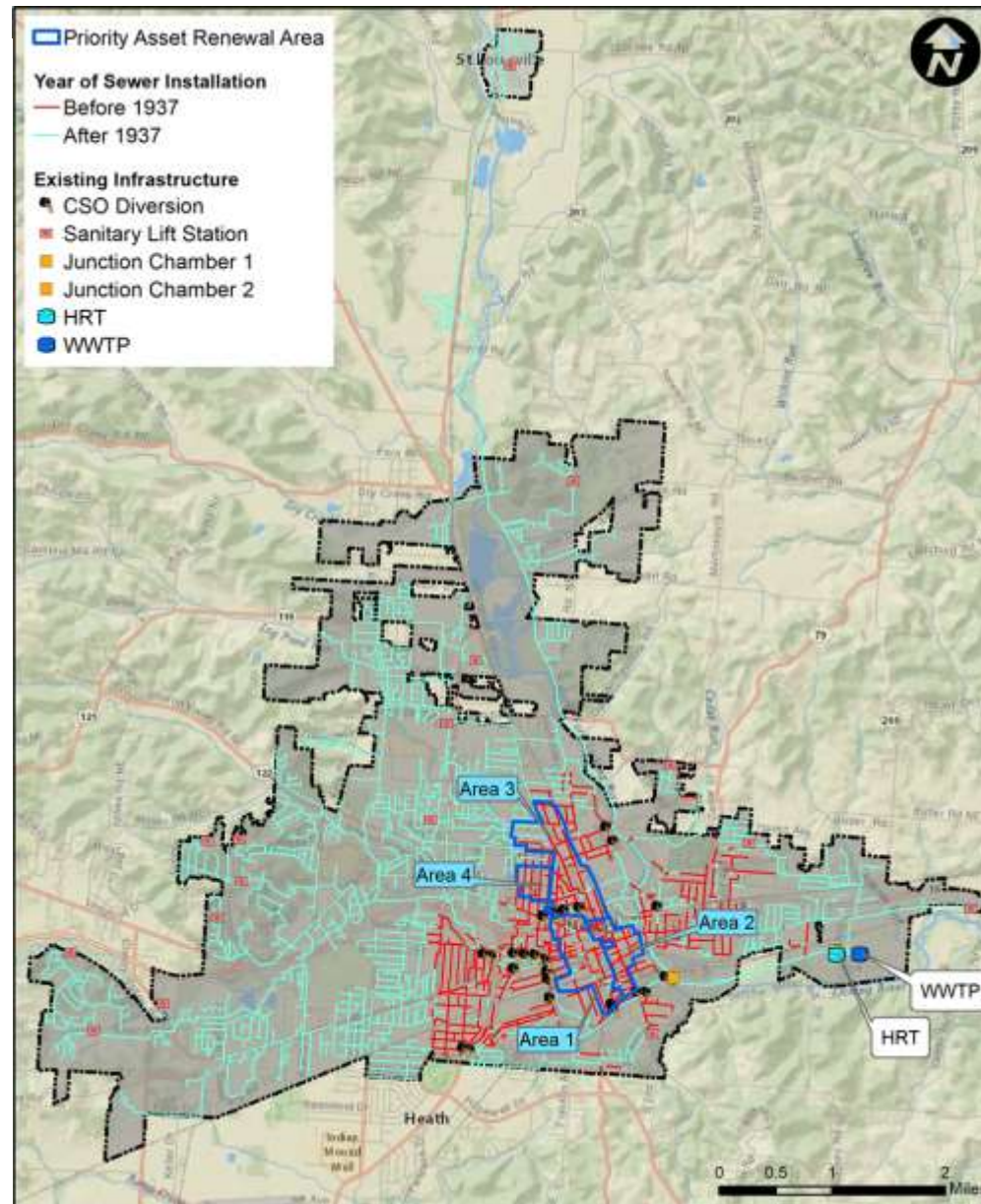
- 100-year useful life
- 20-year planning horizon

R&R Forecast:

- ~ 275,000 LF of sewer forecasted for R&R
- ~ 23.6% of sewer system (by length)
- ~ 1.2% renewal per year (by length)

Identify Priority Areas:

- Vital aging sewer
- Trunk sewers in most need of repair
- Maintenance issues
- Past occurrences of surface flooding or WIB
- Expand downtown renovation to realize full benefits at CSO 1005 and 1013



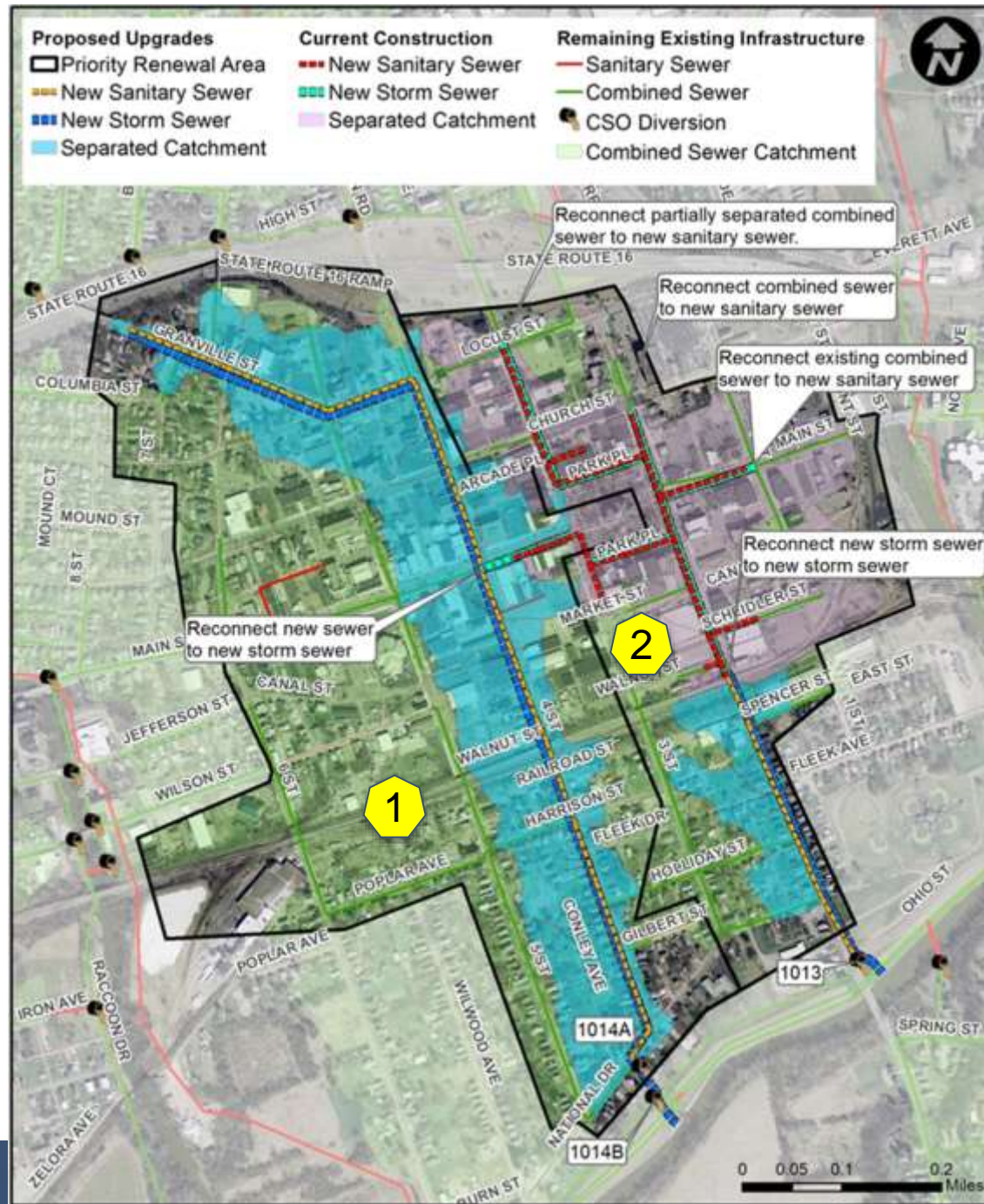
Priority Areas

Priority Area 1 (CSO 1014A):

- Replace Brick Sewer in conjunction with sewer separation:
 - New Storm Sewer
 - New Sanitary Sewer
 - Green Infrastructure
 - Reconnect new storm sewer connection (Downtown Phase I) from combined sewer to new storm

Priority Area 2 (CSO 1013):

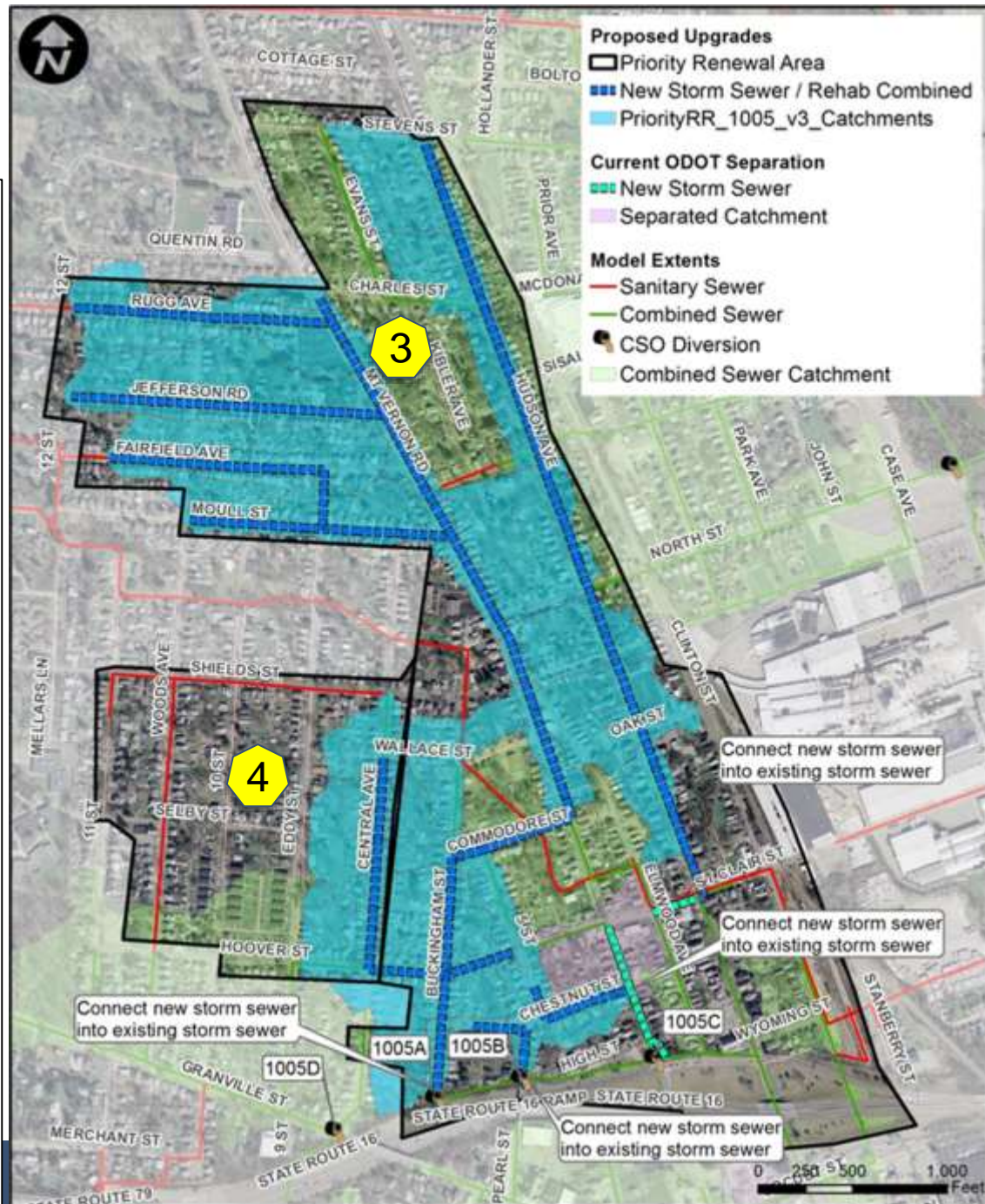
- Replace Brick Sewer in conjunction with sewer separation:
 - New Storm Sewer
 - New Sanitary Sewer
 - Green Infrastructure
 - Reconnect new storm sewer connections (Downtown Phase I) from new sanitary to new storm



Priority Areas

Priority Area 3 & 4 (CSOs 1013, 1005A, 1005B, 1005C):

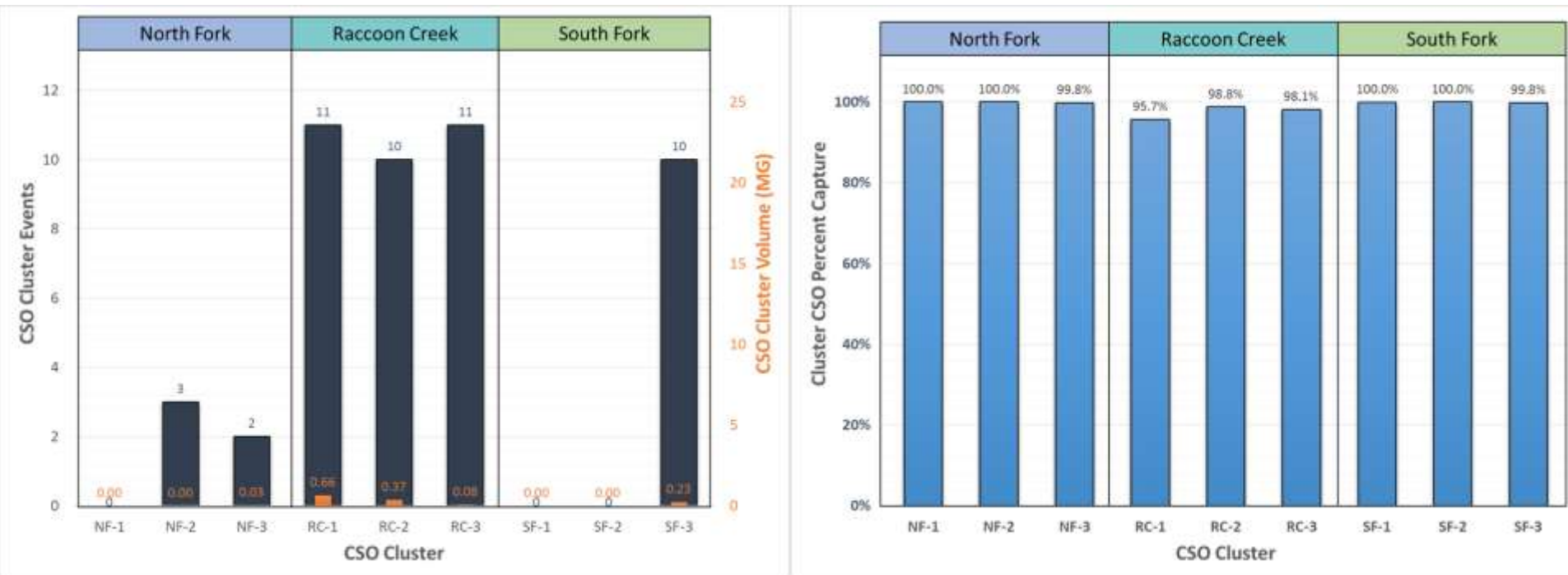
- Sewer Separation:
 - New Storm Sewer
 - Rehabilitate combined sewer
 - Green Infrastructure



4. Recommended Plan

CSO Cluster	CSO	Summary of LTCP Phase II Recommended Projects		
Optimization	Multiple	Operational Optimization: <ul style="list-style-type: none"> Junction Chamber 2; Wet Weather Pump Station; HRT, EQ Basin, and WWTP. 	Interceptor Siphon Optimization: <ul style="list-style-type: none"> Confluence Siphons; Raccoon Creek Siphons; Western Avenue Siphons; CSO 1021 15-inch Interceptor. 	CSO Optimization: <ul style="list-style-type: none"> Raising of diversion at multiple CSOs; See Section 5.4.3.
NF-1	1004 / 1009	<ul style="list-style-type: none"> Decrease peak decant discharge rate from the Owens Corning SBR to the combined sewer; Construct 0.25 MG CSO 1004/1009 Storage Tank adjacent to CSO 1004. 		
NF-3	1005A/B/C	<ul style="list-style-type: none"> Asset Renewal Priority Area 4: <ul style="list-style-type: none"> Separate 30.3 acres of combined area and install 1,566 SF of Green Infrastructure; Install separate storm sewers and rehab partially separated combined sewer. Upsize CSO 1005 A/B/C Interceptor from 8" to 15" (from Buckingham Street to Hudson Avenue). 		
RC-1	1027	<ul style="list-style-type: none"> Upsize CSO 1028/1027 Interceptor from 12/15" to 18" (from Fulton Avenue to 11th Street); Modify CSO 1027 Diversion (Weir block raise and underflow orifice opening). 		
RC-2	1021	<ul style="list-style-type: none"> Construct CSO 1021 relief sewer to 48" Old Raccoon Creek Sanitary Interceptor and raise diversion ramp. 		
	1023	<ul style="list-style-type: none"> Construct CSO 1023 relief sewer to 48" Old Raccoon Creek Sanitary Interceptor and raise diversion outfall pipe; Separate 3.6 acres of combined area and install 300 SF of Green Infrastructure in conjunction with CSO 1023 relief; Install storm sewer and rehab separated combined sewer. 		
RC-3	1019	<ul style="list-style-type: none"> Separate 17.9 acres combined area and install 805 SF of Green Infrastructure; Install storm sewer and rehab separated combined sewer; Modify CSO 1019 Diversion (Weir raise and underflow orifice opening). 		
SF-2	1015	<ul style="list-style-type: none"> Install new 18" CSO 1015 underflow siphon and raise CSO 1015 diversion weir. 		
SF-3	1012	<ul style="list-style-type: none"> Install new 18" CSO 1012 underflow siphon and raise CSO 1012 diversion weir. 		
	1013	<ul style="list-style-type: none"> Asset Renewal Priority Area 2 and 3: <ul style="list-style-type: none"> Replace 48" brick sewer with new sanitary sewer. Separate 82.9 acres of combined area and install 4,707 SF of Green Infrastructure; Install storm sewer and rehab partially separated combined sewer. 		
	1014A	<ul style="list-style-type: none"> Asset Renewal Priority Area 1: <ul style="list-style-type: none"> Replace 36" and 48" brick sewer with new sanitary sewer. Separate 51.1 acres of combined area and install 3,076 SF of Green Infrastructure; Install storm sewer. Upsize CSO 1014A underflow sewer from 12/15" to 30" (from CSO to 48" Raccoon Creek Combined Interceptor); 		
	1014B	<ul style="list-style-type: none"> Upsize CSO 1014B underflow sewer from 12" to 24" (from CSO to new 30" underflow sewer from CSO 1014A). 		

Typical Year CSO Assessment



TY CSO	Base Condition	Recommended Plan
System Events	63	11
Volume (MG)	48.3	1.4
System % Capture	81.2%	99.3%

Estimated Construction Costs

CSO Cluster	CSO	Capital Cost (\$)
NF-1	1004, 1009	\$ 2,751,000
NF-2	1033	\$ -
NF-3	1005A, 1005B, 1005C, 1005D	\$ 3,936,000
RC-1	1025, 1027, 1028	\$ 929,000
RC-2	1020, 1021, 1022, 1023, 1024, 1026	\$ 627,000
RC-3	1017, 1019	\$ 819,000
SF-1	1016A, 1016B	\$ 40,000
SF-2	1015	\$ 268,000
SF-3	1008, 1012, 1013, 1014A, 1014B	\$ 22,643,000
Interceptor Optimization	-	\$ 852,000
Operational Optimization	-	\$ 3,000,000
Subtotal		\$ 35,865,000
Engineering, Permitting, Insurance, Bonding (@30%)		\$ 10,760,000
Contingency (@40%)		\$ 14,346,000
Total		\$ 60,971,000

Financial Capability Assessment

- **Residential Indicator (RI):**

Total annual wastewater & CSO control cost (per household) as % of median household income

- CPH = \$845
- MHI = \$36,679
- **RI = 2.3%**
- **High impact on rate payers**

Financial Impact	Residential Indicator
Low	Less than 1% of MHI
Mid-Range	1-2% of MHI
High	Greater than 2% of MHI

Source: EPA 1997 CSO – Final Guidance for FCA and Schedule Development

- **Municipal Financial Capability:**

Indicators to assess financial capability

- **Average Score = 2**
- **Mid-range FCA score**

Financial Strength Indicators	Value	Indicator Rating	Score
DEBT			
Bond Rating (GO Bonds)	A+	Strong	3
Net Debt as percent of Full Market Value	2.7%	Mid-Range	2
SOCIOECONOMIC			
Unemployment Rate	4.4%	Mid-Range	2
Median Household Income	\$36,936	Low	1
FINANCIAL MANAGEMENT			
Property Tax Revenue as Percent of Value	2.7%	Mid-Range	2
Property Tax Collection Rate	-	-	-
Average Score			2

Source: EPA 1997 CSO – Final Guidance for FCA and Schedule Development

Financial Capability Assessment

- Financial Capability Matrix (combining RI and FCA):**

Under conventional compliance schedule financial burden would be classified as high using EPA 1997 Guidance

Permittee Financial Capability Indicators Average Score	Residential Indicator (Cost Per Household as a Percentage of MHI)		
	Low (Below 1 Percent)	Mid-Range (Between 1 and 2 Percent)	High (Above 2.0 Percent)
Weak Below 1.5	Medium Burden	High Burden	High Burden
Mid-Range Between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

- Supplemental Household Income Information:**

- Since household incomes in Newark are skewed, the MHI does not accurately indicated LTCP affordability.
- Using quintile data (upper limit), indicates the LTCP would pose high burden for over 40% of the City's population.

Income Level	2015 RI
MHI	2.3
1st Quintile	5.4
2nd Quintile	2.9
Third Quintile	1.8
Fourth Quintile	1.1

Implementation Schedule

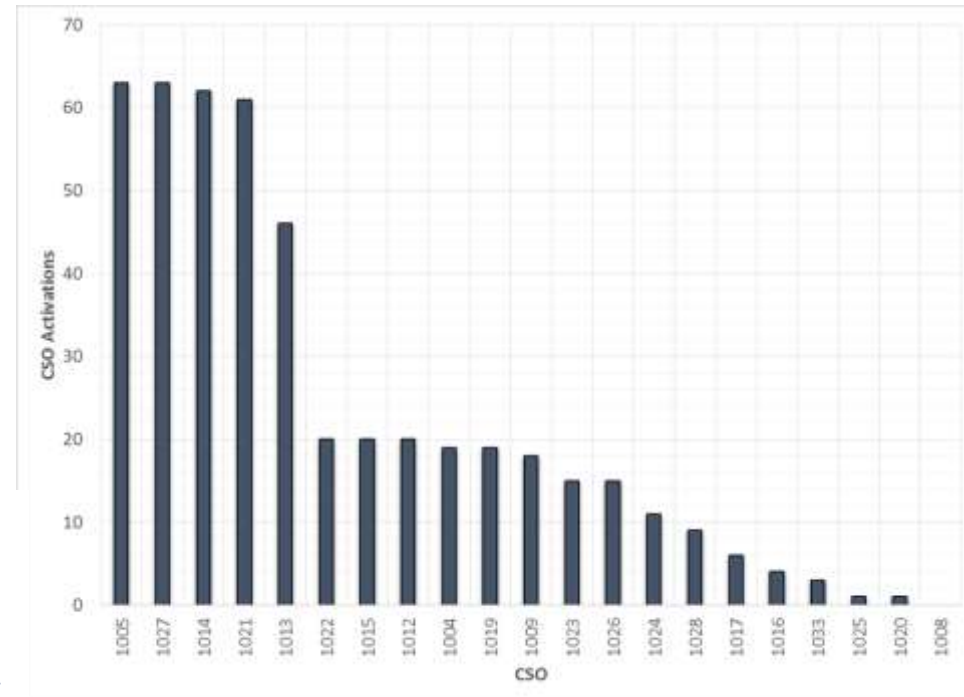
- NPDES specifies LTCP II project construction be completed by January 1, 2025
- FCA shows recommended alternative is not affordable within specified time frame
- Proposed to take a prioritized, phased, and integrated approach:
 - Consistent with US EPA's FCA Framework for Municipal CWA Requirements memo (November 24, 2014).
 - Projects prioritized based on current needs, priority areas, and affordability
 - Phased approach includes plans to be provided in 5-year increments
 - Provides opportunity to refine project details over time since benefits may be dependent on others
- Dynamic rate model will be needed to determine timing based on affordability

Prioritization of Projects

- **Factors impacting prioritization:**
 - Asset Renewal (Priority Areas 1, 2, 3, and 4)
 - CSOs
 - Failing Infrastructure
 - Surface Flooding
 - Water In Basement
 - Water Quality
 - Sensitive Areas
 - Project Dependencies
 - Economy of Scale
 - Affordability

CSO Priority Factor:

- Tier 1: Top 5 most active CSO (in terms of activations);
- Tier 2: Top 6-10 most active CSO (in terms of activations);
- Tier 3: Top 11-15 most active CSO (in terms of activations).



Prioritization of Projects

Order	Project	Priority Factor
1	Operational Optimization: <ul style="list-style-type: none"> Junction Chamber 2, Wet Weather Pump Station, HRT, EQ Basin, WWTP 	Operational Optimization
2	Interceptor Siphon Optimization: <ul style="list-style-type: none"> Confluence Siphons Raccoon Creek Siphons Western Avenue Siphons Upsize CSO 1021 interceptor (15-inch to 24-inch) 	CSO Control (Multiple Tiers) Hydraulic Restriction
3	CSO Optimization: <ul style="list-style-type: none"> Weir, pipe, diversion raises 	CSO Control (Multiple Tiers)
4a	Priority Area 1 Upgrades (CSO 1014A): <ul style="list-style-type: none"> Replacement of brick sewer Storm Separation Green Infrastructure 	Infrastructure prone to failure Priority Asset Renewal CSO Control (Tier 1) ¹
4b	CSO 1014 A/B Upgrades: <ul style="list-style-type: none"> Upsize underflow pipe from 12/15-inch to 30-inch 	CSO Control (Tier 1) ¹ Priority Asset Renewal Hydraulic Restriction
5	CSO 1021 Upgrades: <ul style="list-style-type: none"> Relief to Existing 48-inch Sanitary Interceptor 	CSO Control (Tier 1) ¹ Hydraulic Restriction
6	Priority Area 2 Upgrades (CSO 1013): <ul style="list-style-type: none"> Replacement of brick sewer Storm Separation Green Infrastructure 	Infrastructure prone to failure Priority Asset Renewal CSO Control
7	CSO 1027 Upgrades: <ul style="list-style-type: none"> Upsize interceptor from 12/15-inch to 18-inch Modification of CSO diversion 	CSO Control (Tier 1) ¹ Asset Renewal Hydraulic Restriction
8	Owens Corning SBR: <ul style="list-style-type: none"> Reduce Decant Peak Discharge Rate 	CSO Control (Tier 2) ² Surface Flooding

9a	Priority Area 4 Upgrades (CSO 1005 A/B/C): <ul style="list-style-type: none"> Combined Sewer Rehabilitation Storm Separation Green Infrastructure 	CSO Control (Tier 1) ¹ Priority Asset Renewal Surface Flooding
9b	CSO 1005 A/B/C Upgrades: <ul style="list-style-type: none"> Upsize underflow interceptor from 8 to 15-inch 	CSO Control (Tier 1) ¹ Priority Asset Renewal Hydraulic Restriction
10	Priority Area 3 Upgrades (CSO 1013): <ul style="list-style-type: none"> Combined Sewer Rehabilitation Storm Separation Green Infrastructure Reconnect all combined sewer connections in <i>Downtown Renovation Phase I</i> area to new sanitary sewer (currently routed to new storm sewer) 	CSO Control (Tier 1) ¹ Priority Asset Renewal Surface Flooding / WIB
11	CSO 1015 Upgrades: <ul style="list-style-type: none"> Additional 18-inch CSO siphon CSO diversion weir raise 	CSO Control (Tier 2) ² Hydraulic Restriction
12	CSO 1012 Upgrades: <ul style="list-style-type: none"> Additional 18-inch CSO siphon CSO diversion weir raise 	CSO Control (Tier 2) ² Hydraulic Restriction
13	CSO 1019 Upgrades: <ul style="list-style-type: none"> Combined Sewer Rehabilitation Storm Separation Green Infrastructure Modification of CSO diversion 	CSO Control (Tier 2) ² Asset Renewal
14	CSO 1004/1009 Upgrades: <ul style="list-style-type: none"> 0.25 MG CSO storage tank 	CSO Control (Tier 2) ²
15	CSO 1023 Upgrades: <ul style="list-style-type: none"> Relief to Existing 48-inch Sanitary Sewer 	CSO Control (Tier 3) ³

- CSO Control (Tier 1) = Top 5 most active CSO (in terms of activations) in base condition.
- CSO Control (Tier 2) = Top 6-10 most active CSO (in terms of activations) in base condition.
- CSO Control (Tier 3) = Top 11-15 most active CSO (in terms of activations) in base condition.

5. EPA Comments

Dated February 21, 2017:

1. In earlier versions of the Combined Sewer Overflow Long Term Control Plan, the City of Newark facilitated public input in a variety of ways. Public Notification to ensure that the public receives adequate notification of CSO occurrences, CSO impacts, and updates to the Long-Term Control Plan (LTCP) are central to progress in reducing and eliminating combined sewer overflows (CSOs). As we understand, Newark maintains a webpage with information regarding CSOs, the LTCP, and related projects. A “CSO hotline” and e-mail notification system are made available for CSO warnings. Warnings are issued for rain events of 0.25 inches or more. It is not specifically stated in the Phase II LTCP that public input was evaluated as part of plan preparation as required in Part I.C.B.1.b of the NPDES Permit (p. 42-43).

EPA Comments Continued

2. There is no antidegradation addendum included in the Phase II LTCP as required in Part I.C.B.2.e of the NPDES permit (p. 47).

3. While there is a generalized ranking of priorities in the preferred Integrated Plan Alternative, there are no specific dates given for operational optimization, CSO optimization, and implementation of other Integrated Plan Alternatives (e.g., sewer rehabilitation, weir and siphon changes, storage basin construction, etc.) as required in Part I.C.B.2.e of the NPDES permit (p. 47).

EPA Comments Continued

4. Comment on financial capability analysis.
 - a. The city is using the number of residential accounts (17,168) rather than the number of households (19,740 based on the ACS). Number of accounts does not accurately represent households and can artificially inflate the RI.
 - b. Using the number of households (~19,800) the CPH drops from \$845 to \$729 (2.3% to 1.99% of MHI). Recalculated quintiles are as follows:

1st Q 4.7% 2nd Q 2.5% 3rd Q 1.5% 4th Q 0.9%

These quintiles are still somewhat high, but much closer to “medium burden.”
 - c. Financial capability indicators seemed well reasoned and in the middle of the “Mid-range.”
 - d. We have some questions about the residential factor. 80% seems high compared to other communities. Are these numbers based on flow or bill payments? The factor should be based on flow.
 - e. A 20-year schedule should be appropriate.

EPA Comments Continued

5. The integrated plan option does not include all 6 elements of an integrated plan as noted in the USEPA Integrated Municipal Stormwater and Wastewater Planning Approach Framework (see attached memo), particularly the public interaction portion.

DRAFT