Project WIN

Waterway Improvements Now

CLEAN, GREEN, GROWING COMMUNITY

Meeting Objectives

Information To Assist in Your Understanding

- Our sewer overflow challenges
- The path to resolving these challenges
- Little things can make a BIG Difference

PROJECT WIN
Waterway Improvements Now

Project WIN Public Outreach

Public Meetings Plus Many Other Approaches

- Four rounds of public meetings
  - April & May 2007 - Introduced Consent Decree and Project WIN
  - Oct, Nov, & Dec 2007 -Presented Project WIN update and related rate increase
  - May 2008 - Described preliminary projects and potential facility locations
  - Nov 2008 - Presents draft Integrated Overflow Abatement Plan
- Outreach also includes other public meetings, newspaper articles, radio and TV news stories, print and electronic advertising

CLEAN, GREEN, GROWING COMMUNITY

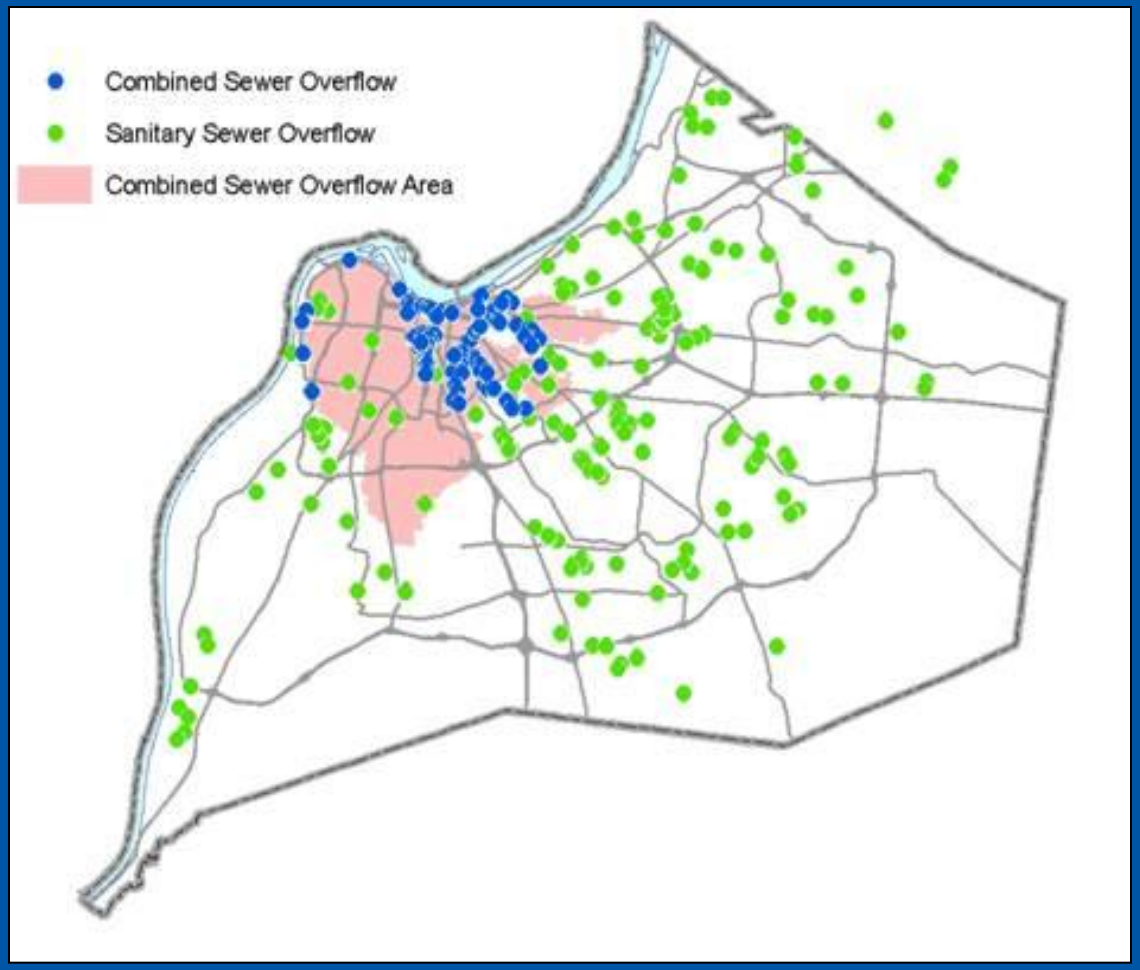
MSD's Consent Decree
EPA Enforcement Action

- Alleged violations of Clean Water Act

- Discharge Abatement Plans
  - Reduce and control CSOs in conformance with the CSO Policy by December 31, 2020

  - Eliminate unauthorized discharges from sanitary sewer system and combined sewer system by December 31, 2024

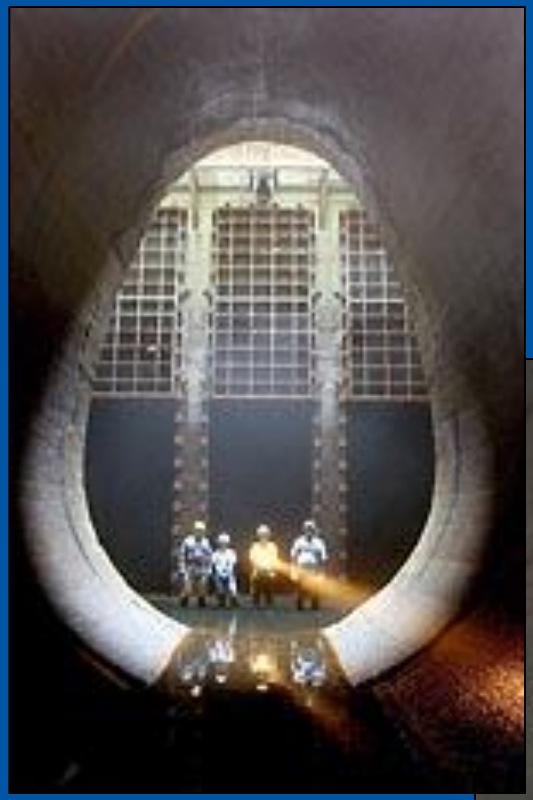
Overflow Issues County-Wide



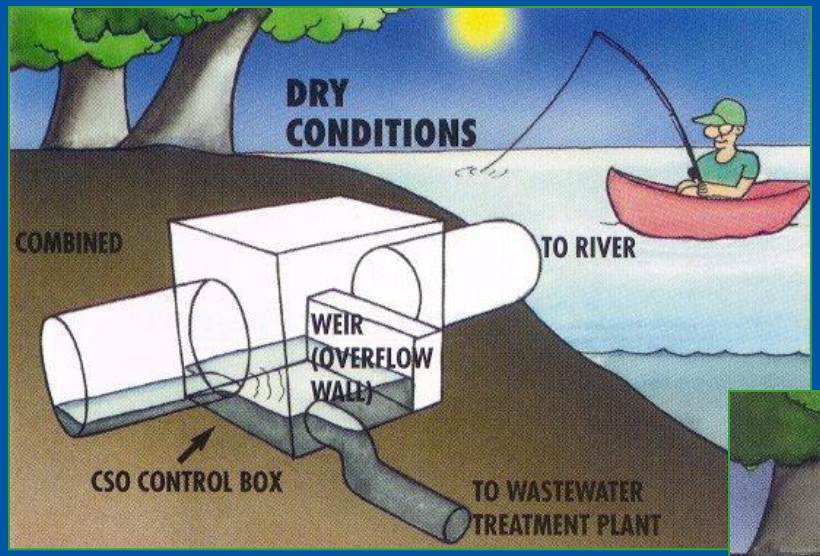
Sewer overflows occur county-wide

Combined Sewer Overflows (CSOs)

Located Mainly Inside the Watterson Expressway

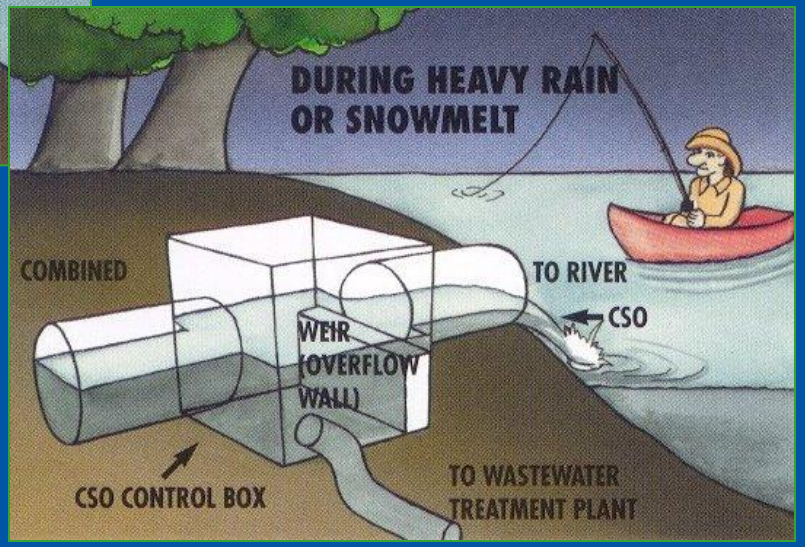


Combined Sewer Overflows (CSOs)



An overflow from MSD's combined sewer system :

1. Not allowed in dry weather, permitted in wet weather
2. May get to a stream or be contained on the ground



Dry weather - illegal
Wet weather – permitted

Sanitary Sewer Overflows (SSOs)

Located Across the County

PROJECT WIN
Waterway Improvements Now

Consent Decree Response Components
Since August 22, 2005

Capital Project Planning and Implementation

- Early Action Projects (complete)
- Discharge Abatement Plans (complete)
  - ✓ Interim Long Term Control Plan (LTCP) Update
  - ✓ Updated Sanitary Sewer Overflow Plan
  - ✓ Interim Sanitary Sewer Discharge Plan
  - ✓ Integrated Overflow Abatement Plan (IOAP) - December 31, 2008

On-going Operational Modifications

- Expanded Sewer Overflow Response Protocol (SORP)
- Capacity Management Operations and Maintenance Program (CMOM)
- Continued Improvement to “Nine Minimum Controls” (NMC) Activities

Integrated Overflow Abatement Plan (IOAP)
Successful Outcomes

CSOs are permitted discharges in wet weather, managed to avoid receiving stream water quality degradation

Design Strategy:

- Abatement targets in CSO Policy
- Achieve current water quality standards, or show discharges do not cause or contribute to exceedences

** Per CSO Policy, this approach may require a temporary waiver or suspension of standards during wet weather

SSOs and dry weather CSOs are unauthorized discharges and must be eliminated

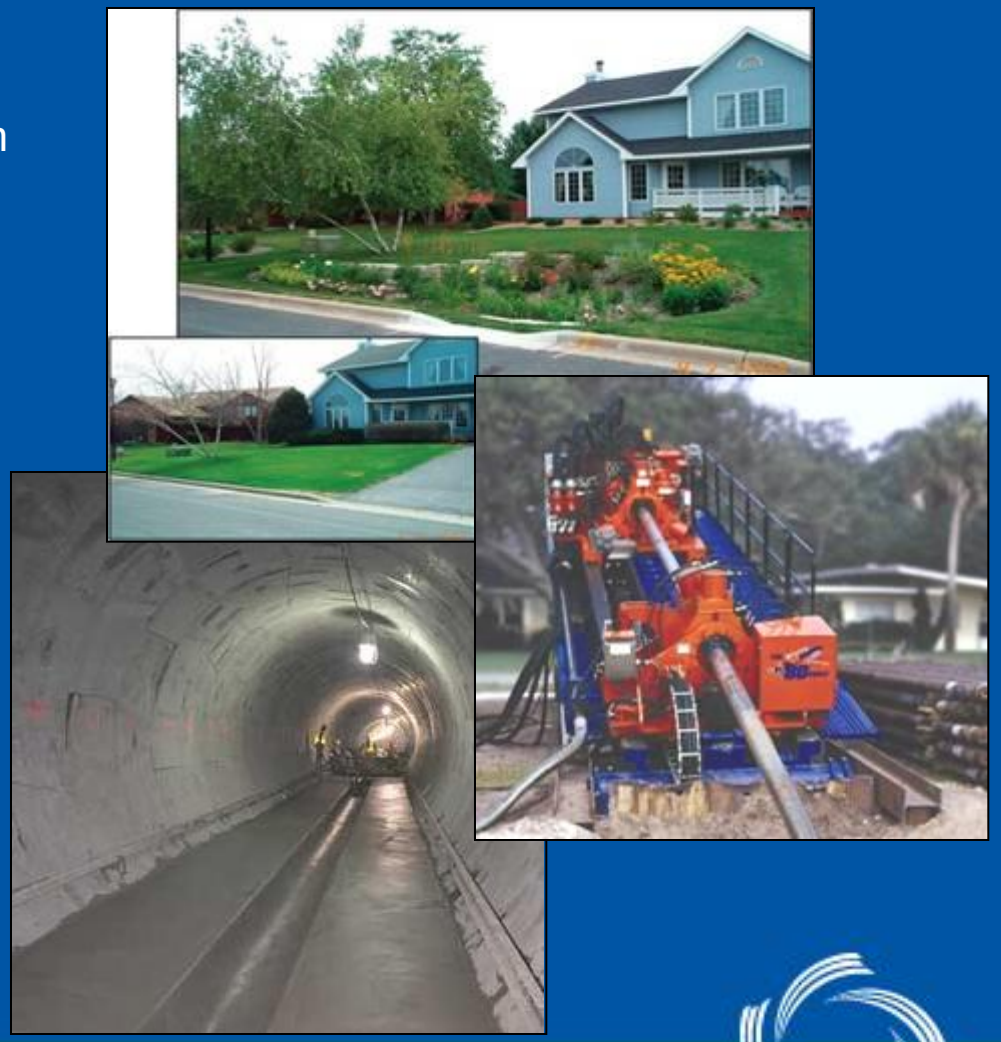
Design Strategy:

- "design storm" level of protection is community decision (within reason)
- Level of protection selected for site-specific locations by benefit/cost evaluation
- 1.82-inch, 3-hour "cloudburst" storm proposed as minimum level of protection (50% probability of occurrence in any year, same level of protection as Atlanta, Cincinnati, Knoxville)

IOAP "Tool Kit"

- Source Control
  - Infiltration and inflow (I&I) reduction
  - Combined sewer separation
  - Green infrastructure
- Storage
- Conveyance/Transport
- Treatment

Application of specific approaches driven by values analysis and site-specific considerations in structured decision process



Overflow Abatement Strategy

Guiding Principles

- Maximize use of existing facilities
- Consistency with previous land use and wastewater master planning documents
- Front-end consideration of source control and green infrastructure
- Gray infrastructure right-sized
- Adaptive management implementation approach based on monitoring and evaluation efforts

Stakeholders Group

Engaged Community Leaders

- 20 members from diverse backgrounds
- 21 meetings over 2 years
- Meetings lasted 5 hours each
- Provided guidance on key decisions

Structured Decision Process

Protecting Community Values

Broad-based group of community stakeholders identified and prioritized values

Public Health Enhancement	**Environmental Justice/Equity**
Regulatory Performance	**Economic Vitality**
Environmental Enhancement	**Financial Stewardship**
Asset Protection	**Financial Equity**
Eco-friendly Solutions	**Customer Satisfaction**
Education	

Values selection and prioritization validated at public meetings

Values Check
How Does This Apply to My Family?

Children should be able to play safely in our waterways

Public Health Enhancement	**Environmental Justice/Equity**
Regulatory Performance	**Economic Vitality**
Environmental Enhancement	**Financial Stewardship**
Asset Protection	**Financial Equity**
Eco-friendly Solutions	**Customer Satisfaction**
Education	

Values Check

How Does This Apply to My Family?

Recreational activities such as fishing and boating should be available

Public Health Enhancement	**Environmental Justice/Equity**
Regulatory Performance	**Economic Vitality**
Environmental Enhancement	**Financial Stewardship**
Asset Protection	**Financial Equity**
Eco-friendly Solutions	**Customer Satisfaction**
Education	

Values Check
How Does This Apply to My Family?

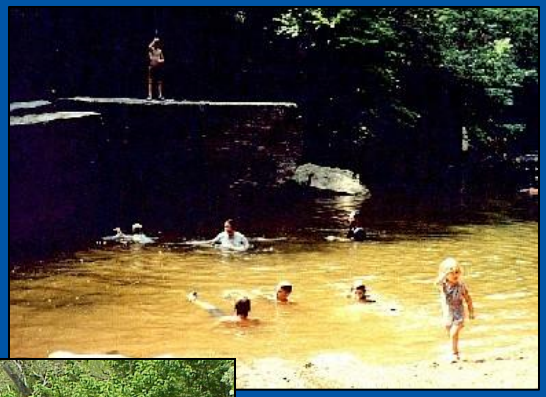
Sewer service should be affordable to all customers

Public Health Enhancement	**Environmental Justice/Equity**
Regulatory Performance	**Economic Vitality**
Environmental Enhancement	**Financial Stewardship**
Asset Protection	**Financial Equity**
Eco-friendly Solutions	**Customer Satisfaction**
Education	

Structured Decision Process

Values-Based Benefit/Cost Analysis

- Overflow abatement control options developed and evaluated based on managing risks to these values
- "Benefits" determine how well the proposed solution manages the risks to these values
- Benefit/cost analysis utilization
  - site-specific abatement approaches (ie, technology)
  - site-specific levels of protection, within established boundary conditions
  - priority of implementation



Benefit/Cost Analysis

Transparent and Auditable Process

Untreated CSO Average Annual Overflow Volume (AAOV)		75 MG+ AAOV	45 - 74MG AAOV	20 - 44 MG AAOV	5 - 19 MG AAOV	>0 - 4 MG AAOV	No discharge	Environmental impacts of CSO discharges are directly related to the volume of untreated overflow discharged. Reduction in overflow volume is therefore the most direct way of measuring positive impacts of CSO control. Since travel times are relatively short during wet weather in both the BGC watersheds and in the Ohio River through Jefferson County, there is no significant die-off of pathogens or in-stream treatment of conventional pollutants. Environmental impacts of pollutants are therefore cumulative, and not tied to any individual discharge location (except the the upper most discharge in the watershed). Total overflow volumes will be used to represent environmental impacts, with a smaller range of flows for Beargrass Creek, given its smaller size, and the smaller size of the CSOs that discharge to it.	CSO discharge volumes will be determined from the hydraulic models of the CSS, during the "typical year" rainfall		
Untreated CSO Average Annual Overflow Volume (AAOV)		200 MG+ AAOV	75 - 199 MG AAOV	30 - 74 MG AAOV	5 - 29 MG AAOV	>0 - 4 MG AAOV	No discharge				
		Most Severe Impact				Least Impact	No Impact				
		5	4	3	2	1	0	Assumptions	Base Case Score	Alternative Score	Total Score
Most Likely	5	25	20	15	10	5	0	Base Score: AAOV = 17MG for 54 events	10		10
	4	20	16	12	8		0				0
	3	15	12	9	6	3	0				0
	2	10	8	6	4	2	0				0
Least Likely	1	5	4	3	2	1	0	Alternative Score:AAOV=0		0	0
Not Possible	0	0	0	0	0	0	0	Total Score			10

First cut resulted in suite of preferred abatement alternatives that address every CSO and every capacity-related SSO

Level of Control

Analyzed for Each Project

ProjectID	Receiving Water	ProjectType	TPW Benefit/Cost Ratio 0 OF/Year	TPW Benefit/Cost Ratio 2 OF/Year	TPW Benefit/Cost Ratio 4 OF/Year	TPW Benefit/Cost Ratio 8 OF/Year
L_MI_MF_127_M_09B_B_A	Middle Fork BGC	Offline Storage	35.2	31.99	37.13	38.75
L_MI_MF_140_S_08_A_A	Middle Fork BGC	Sewer Separation	30.95	30.95	30.95	30.95
L_MU_MF_154_M_09B_B_A	Muddy Fork BGC	Offline Storage	26.66	29.12	30.39	31.93
L_OR_MF_015_M_13_B_B	Ohio River	ILS /w Treatment	2.23	2.83	5.54	9.3
L_OR_MF_019_S_13_B_A	Ohio River	ILS /w Offline Storage	8.48	8.85	10.44	10.5
L_OR_MF_020_S_09B_B_A	Ohio River	Offline Storage	35	31.39	29.6	70.83
L_OR_MF_058_S_08_A_A	Ohio River	Sewer Separation	87.24	87.24	87.24	87.24
L_OR_MF_105_M_13_B_A	Ohio River	ILS /w Offline Storage	30.62	28.41	28.85	22.72
L_OR_MF_155_M_09B_B_B	Ohio River	Offline Storage	31.08	26.46	34.56	31.82
L_OR_MF_172_S_09B_B_A	Ohio River	Offline Storage	80.63	51.34	52.69	56.18
L_OR_MF_190_S_09B_B_A	Ohio River	Offline Storage	36.98	34.17	31.48	41.49
L_OR_MF_211_M_13_B_A	Ohio River	ILS /w Offline Storage	28.98	28.39	28.57	37.24
L_SO_MF_083_M_09B_B_A	South Fork BGC	Offline Storage	45.76	42.66	49.72	50.71
L_SO_MF_092_M_09B_B_D	South Fork BGC	Offline Storage	38.05	47.44	44.87	48.1
L_SO_MF_093_S_08_A_A	South Fork BGC	Sewer Separation	70.49	70.49	70.49	70.49
L_SO_MF_097_M_09B_B_D	South Fork BGC	Offline Storage	68.39	72.86	87.45	90.95
L_SO_MF_130_S_09B_B_A	South Fork BGC	Offline Storage	48.1	35.53	43.14	65.94

Benefit/Cost applied to level of control sizing for both CSO and SSO preferred abatement alternatives

CSO Long Term Control Plan (LTCP) Program

- **19 Gray Infrastructure Projects**
  - 4 Sewer Separations
  - 13 Storage basins
  - Replacement and expansion of Nightingale Pump Station
  - 1 High-Rate Wet Weather Treatment Facility
- **Green Infrastructure Projects – 17% of Gray Program**
  - Demonstration projects
    - Bioswale/biofiltration
    - Rain garden
    - Pervious alleys
    - Infiltration dry wells and sink holes
- **9 Flood Pump Station Projects** - to abate dry weather overflows

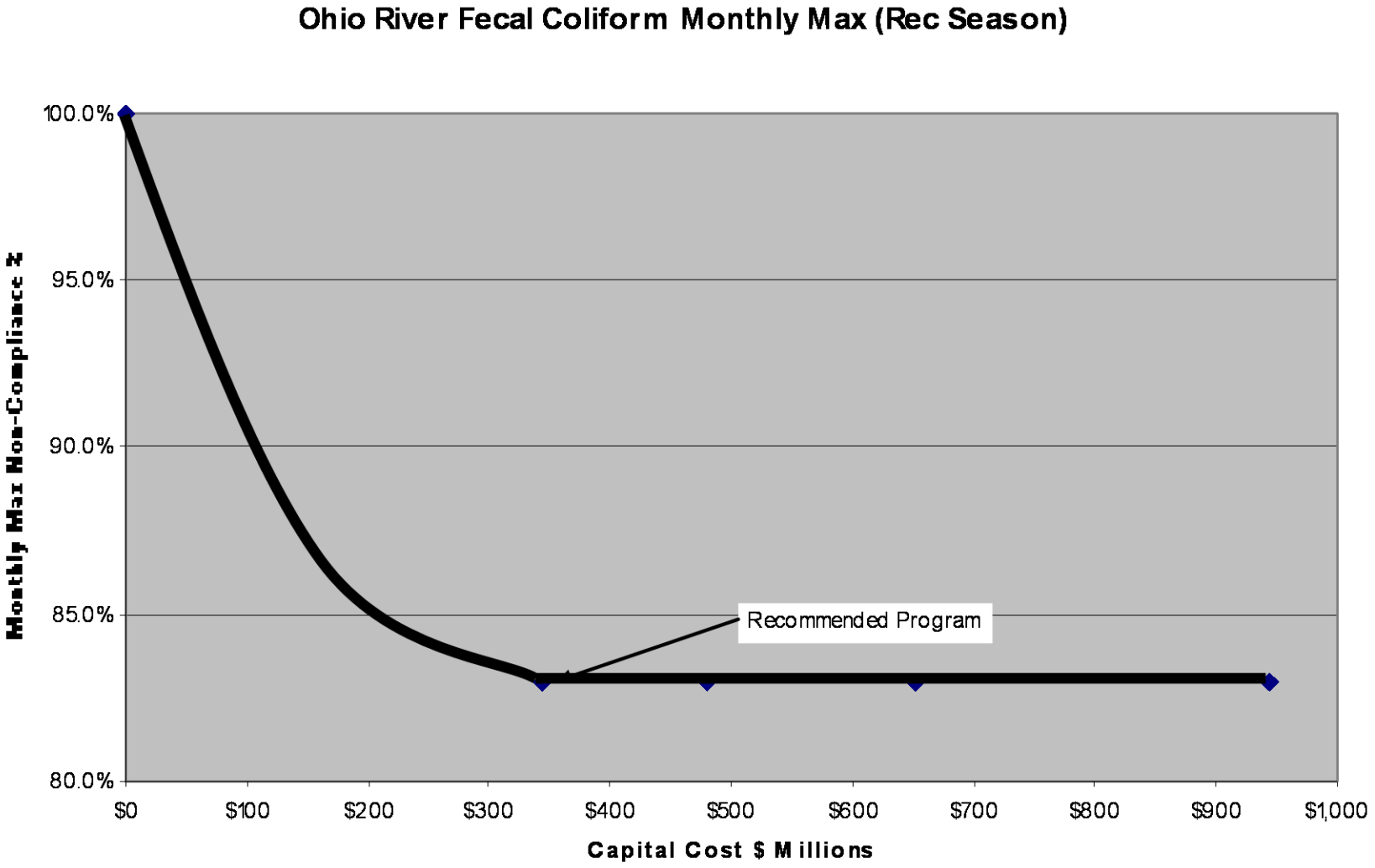
LTCP Source Control Investments

Front-Loaded to Maximize Gray Reductions

- $47M Green Infrastructure Program
- $40 M budgeted for first 6 years
- Annual program includes demonstration projects, subsidies, and incentives
- Program includes line items for:
  - Downspout disconnects, rain gardens, rain barrels
  - Green roofs
  - Green streets & dry wells
  - Pervious pavement
  - Urban reforestation
- Adaptive management allows greater investment based on demonstrated performance

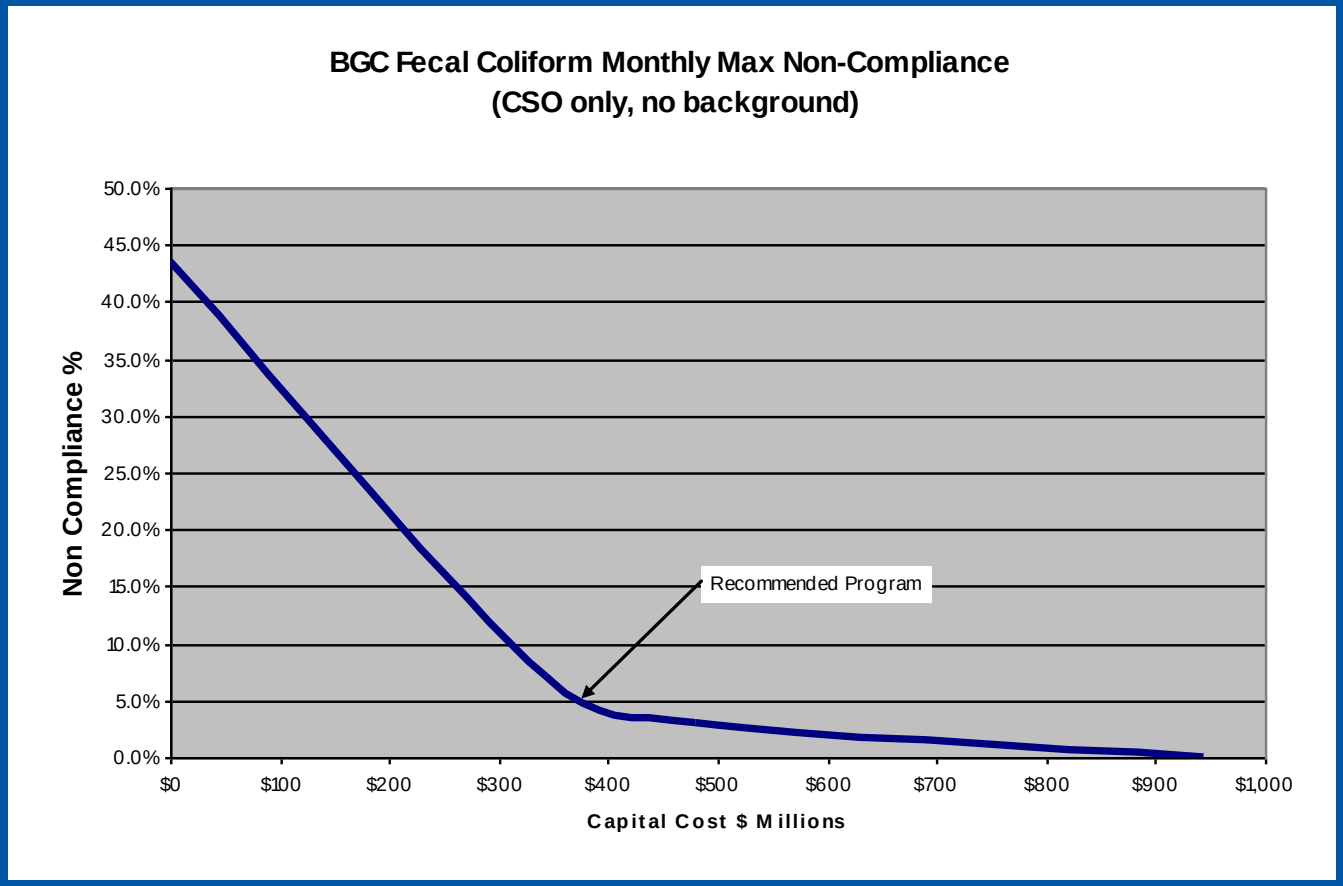
Green Roof

Green "Pervious" Alley



Knee of the Curve Using Program Costs

Remaining CSOs Have Minor Impact on Beargrass Creek Water Quality



Sanitary Sewer Discharge Plan (SSDP) Program

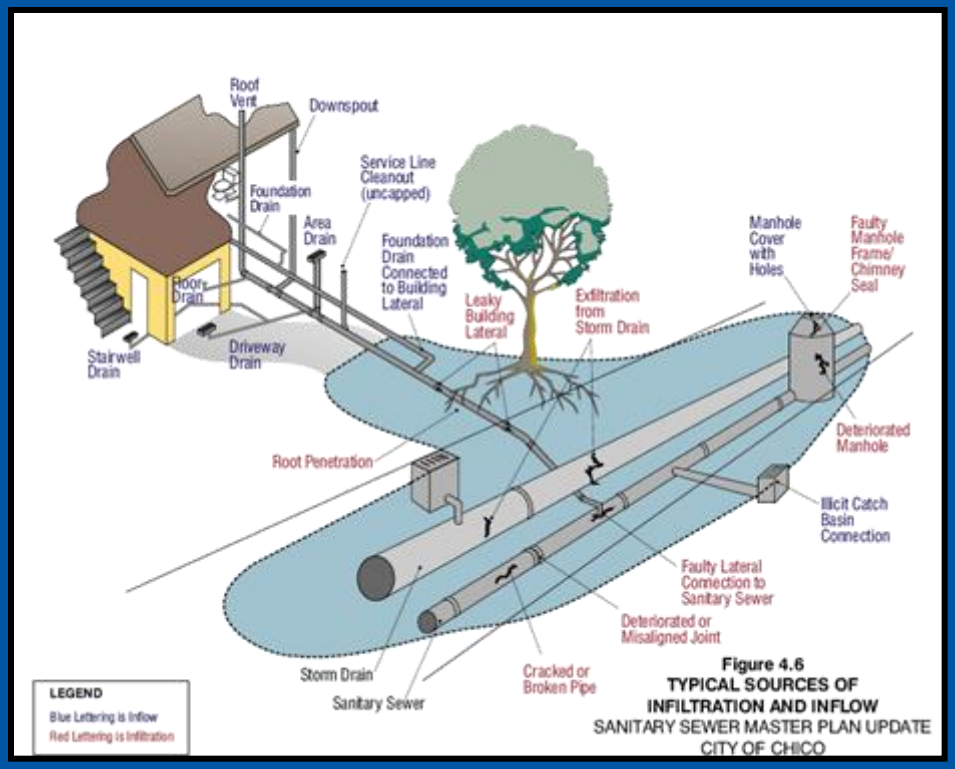
- Gray infrastructure Program (includes ISSDP)
  - 16 conveyance capacity
  - 19 storage basins
  - 10 pump station upgrades or expansions
  - 1 wastewater treatment expansion
- Source control program – 15% of Gray Program (I/I removal & pipe rehab)

SSDP Source Control Investments

Front-Loaded to Maximize Gray Reductions

I/I Reduction Program

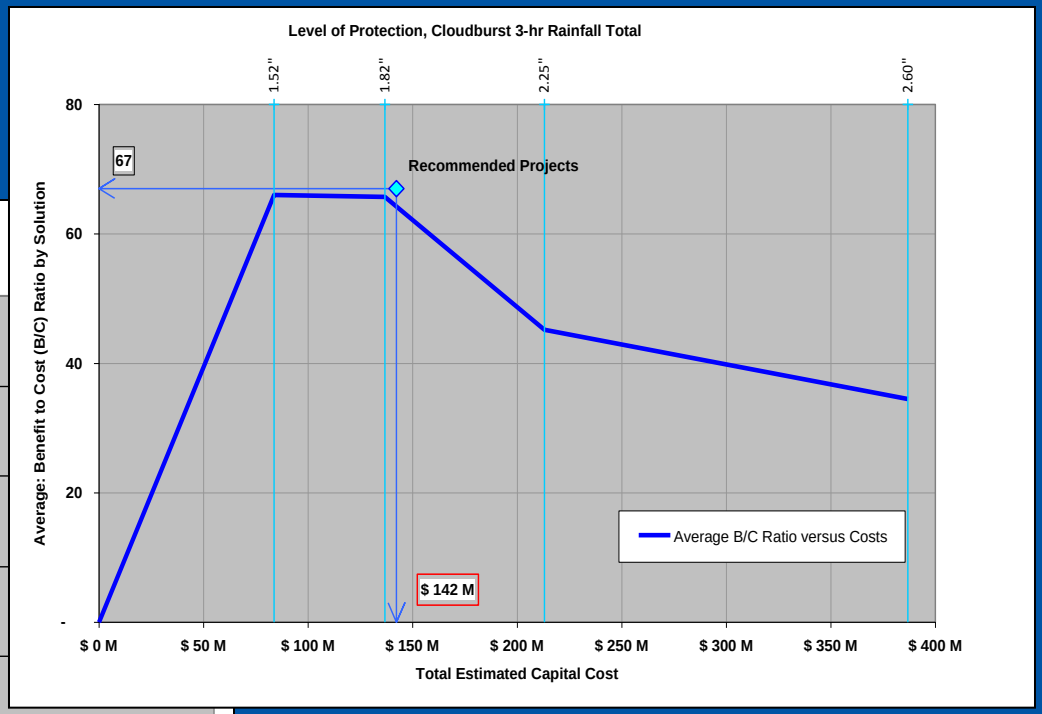
- Sewer & manhole rehab
- Property service connection repair
- Private property program essential to program success

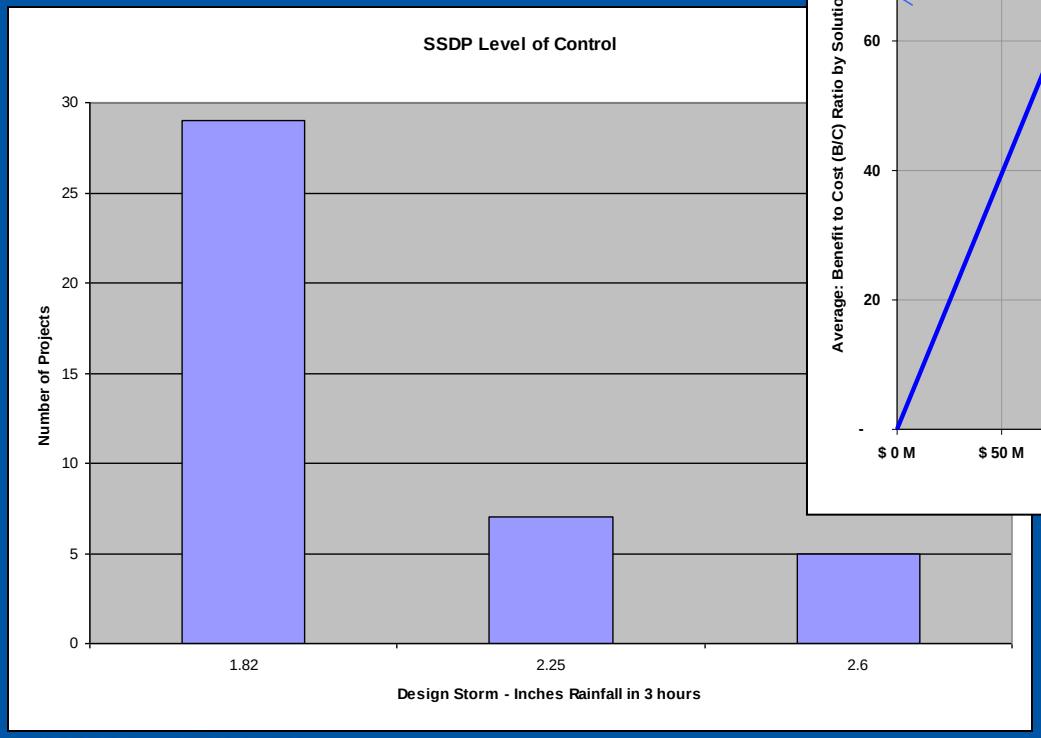


Adaptive Management Allows Greater Savings Based on Demonstrated Performance

SSDP Level of Control

Primarily Determined by Benefit Cost Analysis





IOAP Program Overview

- **CSO controls** achieve approximately 95% wet weather capture. This level of control complies with EPA's CSO Policy; remaining overflows do not cause water quality standards violations
- **SSO controls** eliminate all documented and suspected SSOs up to at least a 1.82 in "cloudburst" storm, removing an average of 290 MG of overflow volume per year (average of 2005 – 2007). This level of SSO control accepted elsewhere in EPA Region 4
- **72 projects** across the county include conveyance, storage, treatment, I/I reduction, green infrastructure and pump station modifications

IOAP Program Benefits
Regulatory Performance

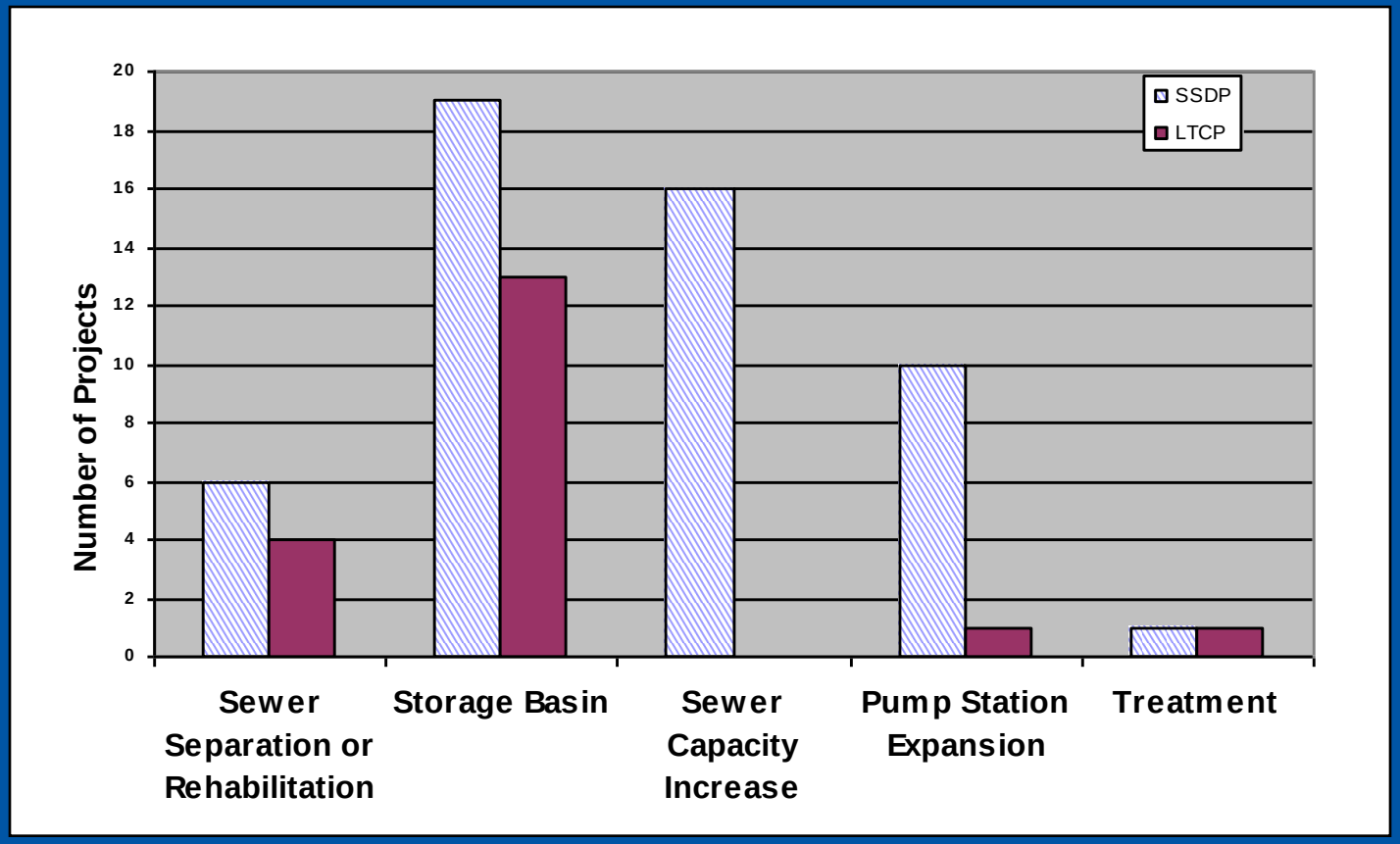
Combined Sewer Plan

- 95% wet weather capture complies with EPA “presumptive approach” for CSO control
- 95% wet weather capture supported by “knee of the curve” evaluation
- Remaining CSOs alone (no background sources) do not cause significant WQ standards violations, complying with EPA “demonstrative approach”

Sanitary Sewer Plan

- Elimination of 167 documented SSOs
- Elimination of blending practice
- Elimination of several small WWTPs

Projects Include Diverse Technology Solutions



Program Schedule

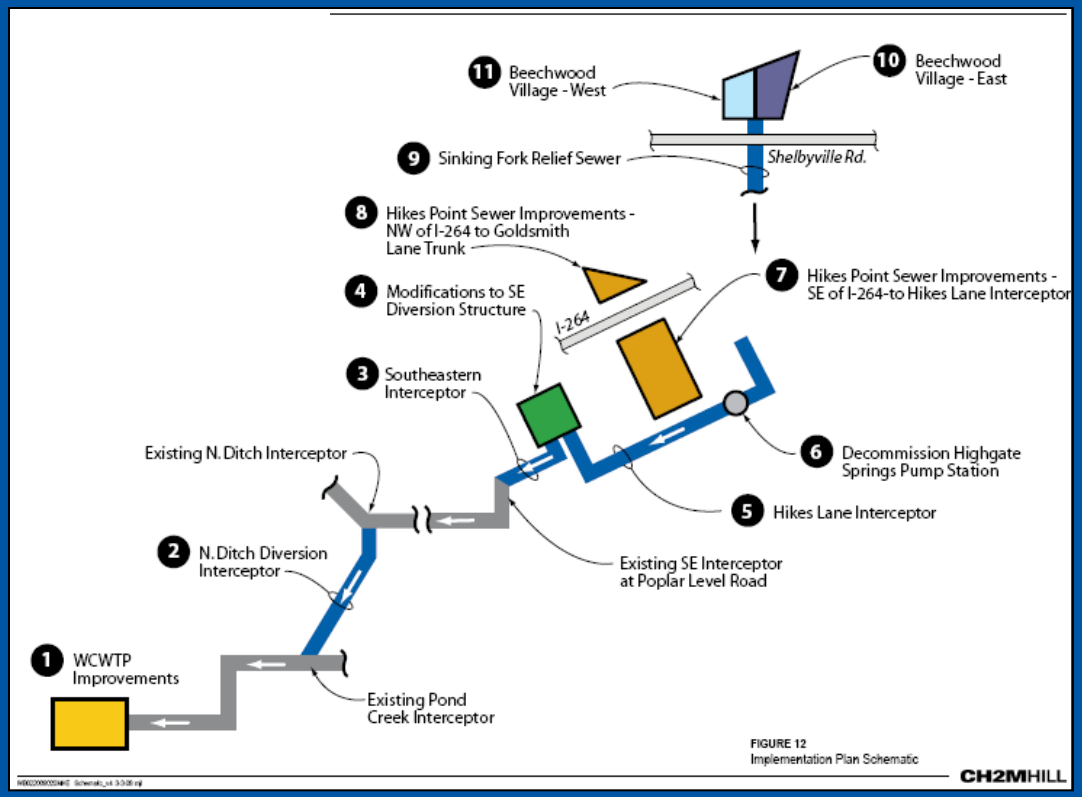
Meets All Consent Decree Milestones

- Beechwood Village & Southeast Diversion SSOs – December 31, 2011
  - Beechwood Village Sewer Reconstruction
  - Sinking Fork Interceptor Relief
  - Northern Ditch Diversion Interceptor
  - DRGWQTC Wet Weather Treatment
- Highgate Springs Pump Station & Hikes Point Area SSOs – December 31, 2013
  - Hikes Lane Interceptor
  - SED Gate Modifications with Southeast Interceptor Relief
- LTCP Projects All Complete by December 31, 2020
- SSDP Projects All Complete by December 31, 2024

Schedule Sequencing

Determined by Benefit/Cost and Other Factors

- Consent Decree milestones highest priority
- Enabling projects sequenced as needed
- Source control and green infrastructure front-end loaded to allow performance demonstration
- Benefit/Cost rank ordered the remaining projects
- Cash flow leveling set final schedule positions



IOAP Program Costs

- **$673 M** - Total program capital costs (2008 dollars)
  - **$324 M** LTCP program
  - **$349 M** SSDP program (includes ISSDP)
- **$843 M** - Total program costs (escalated construction dollars based on schedule)

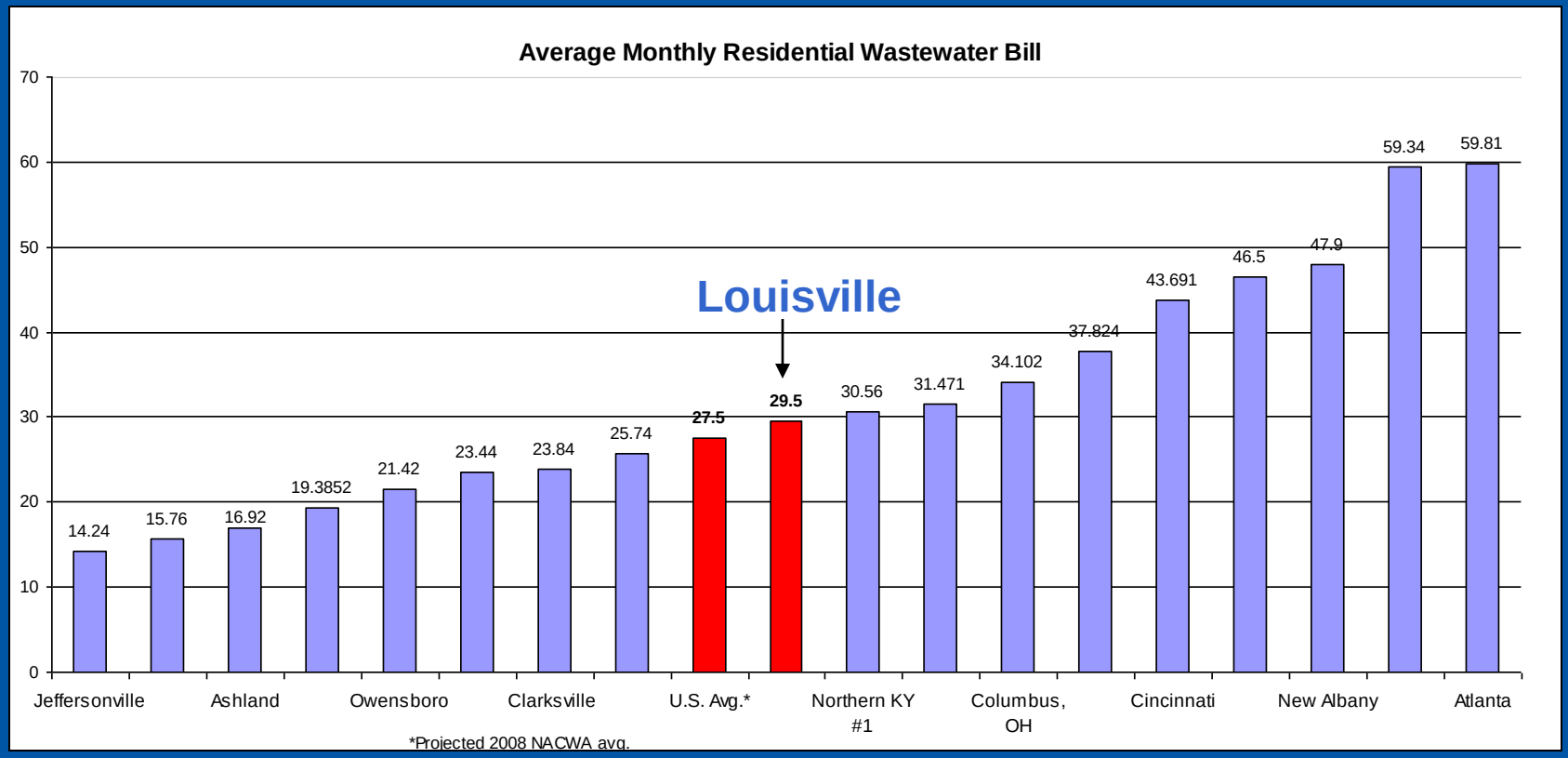
Consent Decree Response Funding
The Money Comes From All of Us

Funding

- Rates and fees must pay operating costs, debt service, and adequately maintain MSD bond rating
- Community ability to pay must consider follow-on programs
- Preliminary program estimates appear to be within community ability to pay
- Rates and fees must allow for continued economic development

MSD's Current Rates

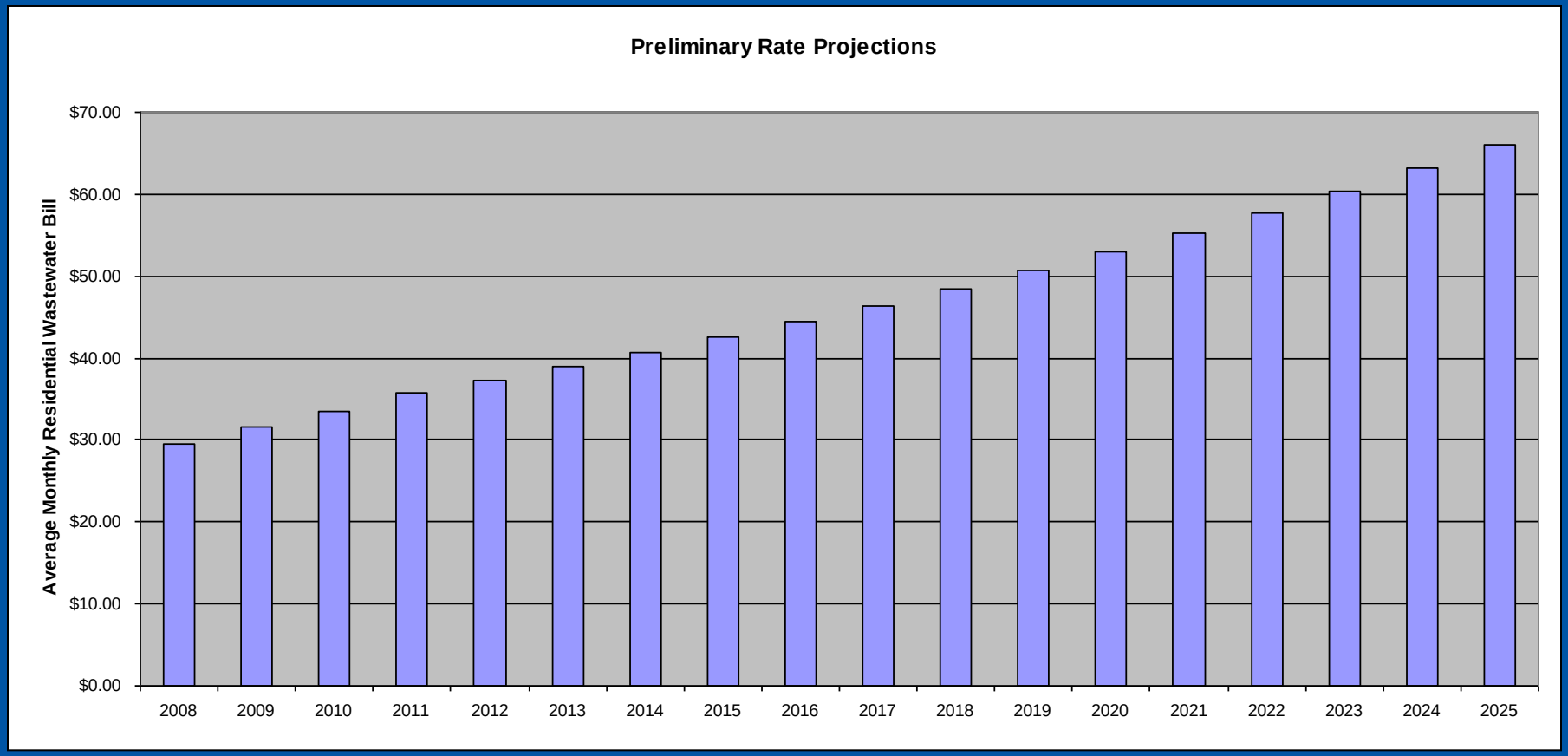
Near National Average



Assumes other agencies face similar inflation and regulatory pressure

Preliminary Rate Projections

Expected to Remain Near the National Average



Consent Decree Response Must Consider Economic Vitality

- Strong local economy sustains affordability of solution
- Solutions consider future development based on land use plan
- Continued development requires MSD to implement wet weather flow reduction
  - 3:1 offset of wet weather flows
  - Approach based on Knoxville's Capacity Assurance Program
  - Fee structure under consideration by MSD Board
  - MSD will track flow reduction "credits" to ensure appropriate geographic location of flow offsets

In Summary
Consent Decree Response Principles

- Approach shaped by community values and direct engagement
- Community partnerships essential to program success
  - Green infrastructure
  - Private Property I&I Control
- Wide range of approaches considered, evaluated through benefit/cost approach
- Adaptive management allows right-sizing as program successes are identified
- Program costs must be affordable to community, and allow continued economic growth

Stakeholders Group

Memo of Support

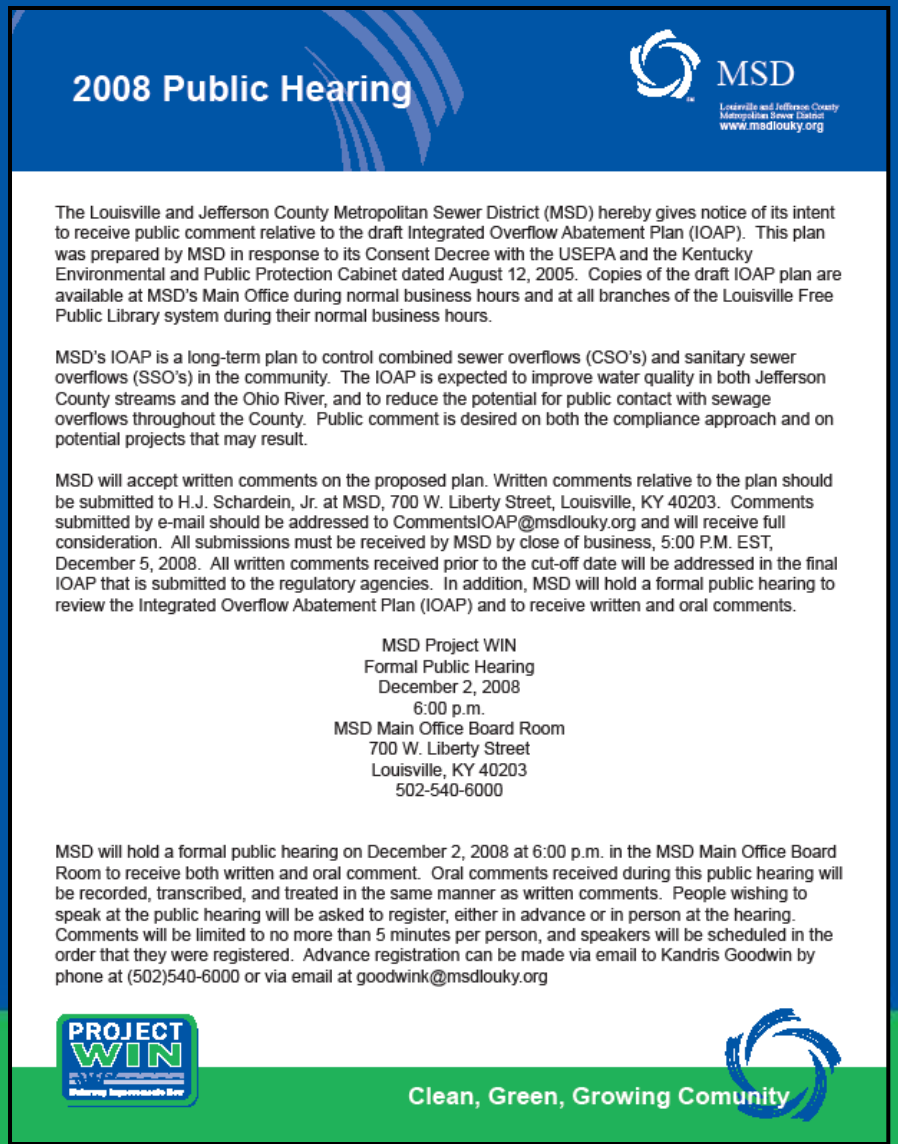
- Unanimous support of IOAP Vision
- Stakeholder support memo and IOAP Vision will be included in the final report

Submission of Final IOAP
December 31, 2008

Public Comments

- Public review and comment period open now
- IOAP draft report posted to webpage and in libraries
- Public hearing scheduled for December 2 at MSD Main Office, comments will be recorded and transcribed
- Other comments must be submitted in writing or via email and must be received by 5 PM on December 5

commentsIOAP@msdlouky.org



2008 Public Hearing

MSD
Louisville and Jefferson County Metropolitan Sewer District
www.msdlouky.org

The Louisville and Jefferson County Metropolitan Sewer District (MSD) hereby gives notice of its intent to receive public comment relative to the draft Integrated Overflow Abatement Plan (IOAP). This plan was prepared by MSD in response to its Consent Decree with the USEPA and the Kentucky Environmental and Public Protection Cabinet dated August 12, 2005. Copies of the draft IOAP plan are available at MSD's Main Office during normal business hours and at all branches of the Louisville Free Public Library system during their normal business hours.

MSD's IOAP is a long-term plan to control combined sewer overflows (CSO's) and sanitary sewer overflows (SSO's) in the community. The IOAP is expected to improve water quality in both Jefferson County streams and the Ohio River, and to reduce the potential for public contact with sewage overflows throughout the County. Public comment is desired on both the compliance approach and on potential projects that may result.

MSD will accept written comments on the proposed plan. Written comments relative to the plan should be submitted to H.J. Schardein, Jr. at MSD, 700 W. Liberty Street, Louisville, KY 40203. Comments submitted by e-mail should be addressed to CommentsIOAP@msdlouky.org and will receive full consideration. All submissions must be received by MSD by close of business, 5:00 P.M. EST, December 5, 2008. All written comments received prior to the cut-off date will be addressed in the final IOAP that is submitted to the regulatory agencies. In addition, MSD will hold a formal public hearing to review the Integrated Overflow Abatement Plan (IOAP) and to receive written and oral comments.

MSD Project WIN
Formal Public Hearing
December 2, 2008
6:00 p.m.
MSD Main Office Board Room
700 W. Liberty Street
Louisville, KY 40203
502-540-6000

MSD will hold a formal public hearing on December 2, 2008 at 6:00 p.m. in the MSD Main Office Board Room to receive both written and oral comment. Oral comments received during this public hearing will be recorded, transcribed, and treated in the same manner as written comments. People wishing to speak at the public hearing will be asked to register, either in advance or in person at the hearing. Comments will be limited to no more than 5 minutes per person, and speakers will be scheduled in the order that they were registered. Advance registration can be made via email to Kandris Goodwin by phone at (502)540-6000 or via email at goodwink@msdlouky.org

PROJECT WIN Waterway Improvements Now

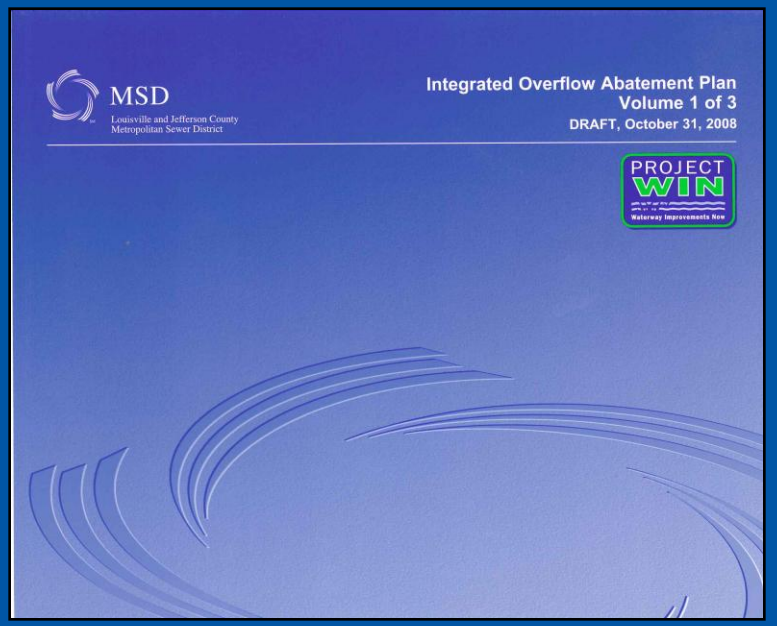
Clean, Green, Growing Comunity

PROJECT WIN Waterway Improvements Now

Submission of Final IOAP Report
December 31, 2008

Final Submission

- Prepare responsiveness summary for comments received
- Board action at December Board Meeting
- Submit to regulators before December 31



CLEAN, GREEN, GROWING COMMUNITY

What You Can Do To Help

Dispose of grease properly

- Do not dump it down the drain!!!!

Put grease in metal container

Grease accumulates in pipes

What You Can Do To Help

- Capture rain to use for watering your gardens and landscaping
  - Rain barrels
  - Rain gardens
- Plant trees and native vegetation

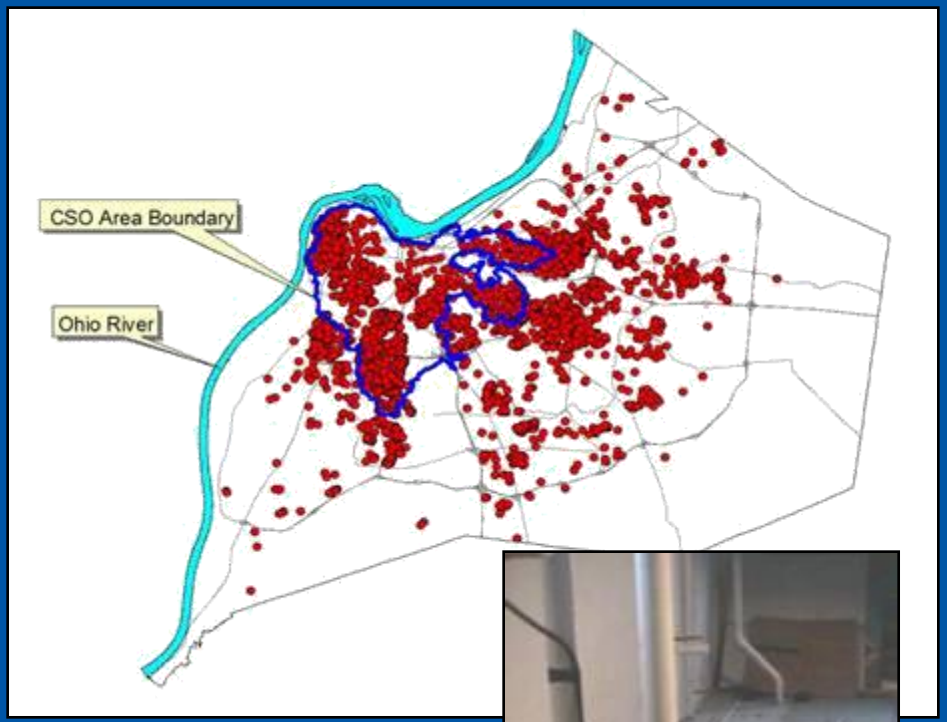
What You Can Do To Help!!

Fix private sewer laterals that connect buildings to the main sewer

"leaky laterals"

What You Can Do To Help

Disconnect sump pumps and downspouts from the sewer system



Plumbing Modification Program

587-0603

PROJECT WIN
Waterway Improvements Now

What You Can Do To Help!!

Conserve water during and after rain storms

- Only use dishwashers and washing machines if absolutely necessary during these times to put less water in the sewers
- Only run full loads

Reduce flow to drainage system

- Wash automobiles on grassy areas instead of the pavement OR take to a car wash facility
- Don’t water the lawn or garden prior to rain events

What You Can Do To Help!!

- Learn about Project WIN
- Provide input into program development
- Support the community-wide program over the coming years

Explore the website

www.msdlouky.org/projectwin

Send comments on the plan to

commentsIOAP@msdlouky.org

Click on this symbol