

REDUCED
SEWER
OVERFLOWS

REPLACED
AGING
ASSETS

IMPROVED
WATER
QUALITY

Phase 1 *accomplishments*

THE CONSENT DECREE IS A JUDICIALLY ENFORCEABLE CONTRACT BETWEEN U.S. EPA, HAMILTON COUNTY AND THE CITY OF CINCINNATI TO CONSTRUCT \$3 BILLION IN INFRASTRUCTURE IMPROVEMENTS TO REDUCE AND/OR ELIMINATE SEWER OVERFLOWS.

In 2019, the Metropolitan Sewer District of Greater Cincinnati (MSD) will complete its first phase of Consent Decree work ("Phase 1") totaling \$1 billion through construction of 133 discrete projects, collection system allowances, Sewer Backup (SBU) Response program, engineering evaluations, and planning/design for the next round of projects.

6 Billion Gallons of overflow reduction achieved through multiple concurrent approaches during Phase 1, involving:

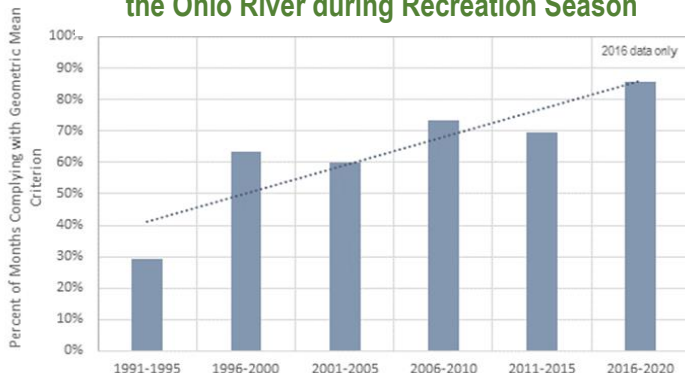
- **Construction** of new sanitary and storm sewers,
- **Improvements** to existing wastewater treatment plants,
- **Installation** of new wet weather treatment facilities,
- **Elimination** of outdated pump stations,
- **Offloading** stormwater from the combined sewer system, &
- **Redirecting** wet weather to sewers having available capacity ("smart sewers").

MSD will continue to evaluate more affordable and effective approaches for eliminating remaining sewer overflows.

BEING DELIVERED UNDER THE ORIGINAL ESTIMATE
The Phase 1 Program budget is trending at \$1.011 billion in 2006 dollars which is below the \$1.14 billion original estimated cost.



Demonstrated Water Quality Improvements in the Ohio River during Recreation Season



Note: In 2013, ORSANCO expanded monitoring to April - October and changed the geometric standard to a 90-day evaluation period. For this analysis, all months with data were used but the geometric standard evaluation period was kept at 30 days, consistent with EPA's Recreational Water Quality Criteria.

Improved Water Quality

Water quality in our local streams, including the Mill Creek, is steadily improving! MSD is partnering with the Midwest Biodiversity Institute to monitor water quality and aquatic habits in the Mill Creek, Little Miami, and Ohio rivers. In 2016, the vast majority of reaches in the Mill Creek achieved full or partial attainment with water quality criteria. Eighteen fish species can now be found in the Mill Creek, with 9 new species including smallmouth bass for the first time.

Better Infrastructure & Technology

The Phase 1 program upgraded several components of the sewer system to increase its useful life, thereby improving reliability and significantly reducing overflows.

INNOVATION IN ACTION



Collection System Improvements

- Constructed 87 miles of sewers & lined 72 miles of sewers
- Developed industry-leading, risk-based prioritization tool for capital needs
- Evaluated more than 47,000 building sewers with Duke Energy



Treatment Plant & Pump Station Improvements

- 145 projects constructed to improve all 7 major treatment plants
- 45 Pump Stations eliminated or upgraded
- More wet weather flows received at treatment plants



Watershed Management Improvements

- New wet weather facilities constructed (i.e., Werk & Westbourne EHRT)
- "Smart Sewers" initiated with over 600 sensors installed
- Green Infrastructure opportunities explored & under review



Neighborhood Improvements

- Constructed 75 assessment projects to eliminate 703 septic systems
- Lick Run Greenway cornerstone project for overflow mitigation



Sewer Backup Prevention Program

- Approx. 916 properties have been protected by MSD's SBUPP Program
- MSD has spent \$100,217,900 on cleaning, damage claims and prevention
- Starting in 2012, MSD began a proactive program to identify and inspect building laterals in the public ROW, installing 7000 cleanouts.

SMART SEWERS our lowest cost reduction strategy; optimizes use and effectiveness of existing infrastructure to reduce overflows

DAYLIGHTED STREAMS create economic and social benefits for the community

WATER QUALITY TOOLS demonstrate measurable benefits to area streams and rivers

INTEGRATED SOURCE CONTROL solutions to address Sewer Backup hotspots

DESIGN PROCESSES review alternatives and innovations that realized actual project savings

DNA SOURCE TRACKING enables targeting for cost effective remedies

Overflows Reduced

Since 2004, approximately:

- 44 sanitary sewer overflows (SSOs) eliminated or controlled (including 17 of the most active), with 51 remaining
- 40 pump station overflows (PSOs) eliminated (22) or upgraded (18), with 22 remaining
- 146 combined sewer overflows (CSOs) controlled, with 201 remaining

In total, 158 SSOs and 69 PSOs that have been eliminated/controlled over the past several decades.

Phase 1 has reduced sewer overflows by 6 billion gallons per year

Watershed	Wet Weather Inflow (MG/year)	Overflow (MG/year)	Underflow (MG/year)	Percent Control
Little Miami River	3,684	1,469	2,216	60%
Mill Creek	12,470	5,370	7,170	57%
Muddy Creek	2,580	1,525	1,055	41%
Total 2017	18,734	8,364	10,440	55%
Total 2006	24,831	14,412	10,644	42%