



Denham Watershed Fact Sheet

The Metropolitan Sewer District of Greater Cincinnati (MSD) is seeking the input of residents, property owners, businesses, schools and other organizations in North Fairmount, as well as portions of South Fairmount and Westwood, regarding potential major sewer improvements in the Denham watershed. This fact sheet provides an overview of the problem and potential solutions for making our rivers and streams cleaner and healthier.

What's the Issue?

When it rains, raw sewage – mixed with stormwater – overflows from our sewers into local rivers and streams and can also back up into basements.

The vast majority of overflows occur from combined sewers, which carry both sewage and stormwater in the same pipe. Combined sewers are typically located in the older areas of Cincinnati and Hamilton County.

When large amounts of stormwater enter combined sewers, these pipes – many built more than 100 years ago – are often filled beyond their capacity. To relieve pressure on the sewer line and prevent widespread flooding and sewage backups, combined sewers were designed to overflow directly into local waterways through outfalls known as combined sewer overflows or CSOs.

Hamilton County is among the top five locations in the nation for urban CSOs. Overflows occur as many as 105 times a year at some locations.



CSO 10 contributes about 249 million gallons of overflow a year and is the focus of stormwater runoff reduction projects in the Denham watershed.

What's the Solution?

To resolve this public health and environmental issue, MSD has embarked on the largest public works project in the history of our community to rebuild and improve our sewer system.

Called **Project Groundwork**, this multi-year and multi-billion dollar initiative includes hundreds of sewer improvements and stormwater control projects.

Federal and state regulators, including the U.S. EPA, Ohio EPA and the Ohio River Valley Water Sanitation Commission (ORSANCO), have mandated that MSD capture, treat, or remove at least 85% of the 14 billion gallons of annual overflows from combined sewers and eliminate all overflows – about 100 million gallons annually – from sanitary only sewers.

A Three-Pronged Approach

MSD seeks to reduce or eliminate sewage overflows by using three different strategies:

Storage and conveyance: constructing larger sewers to transport wastewater to treatment plants or large underground storage tunnels to capture excess wastewater.

Product Control: upgrading existing treatment plants to handle more wastewater or constructing enhanced high-rate treatment (EHRT) facilities to treat flows at the CSO outfall prior to discharge.

Source control: solutions that control the source of the overflow problem — stormwater. These solutions include controlling runoff from hillsides, removing streams from combined sewer system intakes, installing stormwater retention basins and using other controls such as pervious pavement or rainwater harvesting systems that prevent or delay stormwater from reaching combined sewers.

Focusing on Lower Mill Creek Watershed

The Lower Mill Creek watershed, which drains into the Mill Creek, contributes more than 7 billion gallons or >50% of the total overflows that occur annually from combined sewers in Hamilton County.

Under Project Groundwork, MSD must eliminate 2 billion gallons of CSOs from this watershed by 2018. The Lower Mill Creek watershed includes numerous smaller watersheds, including Denham.

Two Different Solutions

To achieve this goal, MSD is evaluating two different solutions to determine the best, most locally preferred solution to eliminate 1.6 million gallons of CSOs. Note: A reduction of 400 million gallons has already been achieved through other projects.

Default Solution (Tunnel): The regulator's default solution is a deep storage tunnel (about 30 feet in diameter and 1.2 miles long) beneath the Mill Creek. Excess flows would be captured and stored during rain events and then discharged to an enhanced high-rate treatment facility (EHRT).

Alternative Solutions: As part of the regulators' mandate, MSD has the opportunity to explore alternatives to the tunnel. One alternative is the use of sustainable infrastructure to control stormwater at the "source." These source control projects, such as separating combined sewers and installing stormwater retention basins, delay or prevent stormwater and natural drainage from reaching combined sewers, thus reducing overflows.

MSD must submit its preferred solution for reducing overflows in Lower Mill Creek to the regulators by December 2012.

Denham Watershed in Lower Mill Creek

The Denham watershed covers 2.1 square miles and includes portions of three Cincinnati neighborhoods: North Fairmount, South Fairmount and Westwood.

Every year, about 365 million gallons of combined sewage and stormwater overflow from five CSOs (CSOs 8, 10, 13, 14 and 530) in the Denham watershed. Less than 25% of the overflow volume is sewage — the rest comes from stormwater and what used to be natural stream flow.

CSO 10 (Denham Street Regulator) has the highest average annual overflow volume in the watershed (249 million gallons a year). CSO 10 is located on the west bank of Mill Creek near the intersection of Beekman Street and Denham Street. The CSO 10 sub-watershed is characterized by pocket residential areas and steep hillsides that comprise what used to be historic drainage corridors or streams to Mill Creek. In the early 1900s, these historic streams were placed in pipes along with the sanitary flows from the surrounding communities. This stream or stormwater component of the combined sewer system consumes the pipe capacity and contributes greatly to overflows at CSO 10.

Source Control Solutions in Denham

MSD is currently evaluating the use of source controls in the Denham watershed to reduce or eliminate overflows from CSO 10. Stormwater source controls manage runoff as closely as possible to where rain falls and also restore natural drainage

conditions, thereby separating or detaining its flow into the combined sewer. Source control is anticipated to be more cost effective than larger sewers and other storage and conveyance solutions while improving communities and providing water quality benefits.

In spring of 2009, MSD began evaluating a stream separation project that would divert or otherwise detain natural stream flow and stormwater from CSO 10. Currently, a 9-foot diameter combined sewer conveys stream and stormwater flows through the lower portions of North Fairmount, crossing Beekman Street and overflowing into Mill Creek each time the capacity of the 15-inch underdrain is exceeded. Much of this runoff flows through the now developed natural drainage corridors marked St. Leo Place and Baltimore Avenue. The proposed project endeavors to separate much of this stream and stormwater flow from the combined sewer and convey it directly to Mill Creek, thereby restoring drainage corridors as tributaries to Mill Creek while greatly reducing or eliminating combined sewer overflows at CSO 10.

Pilot Projects in Denham Watershed

In the near term, MSD is working with the Cincinnati Recreation Commission (CRC) to design and construct a segment of a new storm sewer system underneath the North Fairmount Spray Ground (a spray water park for local youths), located at Carl and Denham streets. This project will also include porous pavement for sidewalks and a circular amphitheatre pad. The spray park is anticipated to be completed in summer 2011. Ultimately, the new storm sewer segment under the spray ground will be extended west into the community and east toward Mill Creek to create a separate storm sewer network designed to reduce or eliminate overflows at CSO 10. MSD is exploring options to significantly reduce overflows and improve water quality while addressing some of the historical watershed issues observed by those most familiar with the area — the residents. The approach represents a holistic approach to tackling problems on the watershed scale.

Your Input

MSD will be seeking your input on potential sewer improvements in the Denham watershed. You will have opportunities to learn more, ask questions, and share your opinion or concerns.

Planning for the CSO 10 stream separation project is nearing completion, with much of the large-scale components of the overall remedy identified. Overall phasing of the project remains to be developed and MSD continues to evaluate the project and solicit input on proposed solutions that will position the watershed for the next 100 years.

Need More Information?

For more information contact:

David Russell, MSD, at (513) 557-5937

or email David.Russell@cincinnati-oh.gov