WESTERLY CSO FACILITIES PLAN

FACILITIES PLAN OVERVIEW

The Northeast Ohio Regional Sewer District (NEORSD) is completing a $4.0 million study of the Westerly combined sewer area. The study area is outlined on the map on the cover of this newsletter. The goal of the study is to develop a facilities plan for sewer system improvements that will reduce pollution levels, particularly bacteria, in our local rivers and Lake Erie; meet Ohio EPA requirements for control of combined sewer overflows (CSOs); and enhance water quality in these receiving waters. The facilities plan process, which has involved extensive data collection, development of CSO control options, evaluation of numerous alternative technologies, and public involvement, is complete. The result is the recommended CSO control plan that is described on pages 4 and 5 of this newsletter. The plan of improvements includes new sewers, storage facilities and increased treatment capacity.

WESTERLY DISTRICT FINDINGS

Information collected during the study was analyzed to determine what portion of the combined sewer flow is processed, or treated, and what portion overflows to waterways through CSOs. The studies found that during a typical year approximately 46% of the CSO volume is processed at the District’s CSO treatment facility (CSOTF) located adjacent to the Westerly Wastewater Treatment Plant (WWTP). The remaining CSO volume is discharged untreated to waterways through 24 CSO outfalls. Five “inactive” CSOs were found, from which there is no overflow during a typical year. These are CSOs 066, 069, 071, 077, and 084, which are shown on the map on the cover of this newsletter. Two of these five inactive CSOs are located near Edgewater State Park. Also, 95% of the total untreated CSO volume is discharged to the Cuyahoga River, where the majority comes from a single location, the Walworth Run CSO outfall (CSO 080). Located on University Road just south of Scranton Road, this outfall contributes approximately 80% of the total CSO volume to the Cuyahoga River from the Westerly District.

<table>
<thead>
<tr>
<th>Receiving Water</th>
<th>Annual CSO Volume (MG – Million Gallons)</th>
<th>Number of Permitted CSO Outfalls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuyahoga River</td>
<td>395MG</td>
<td></td>
</tr>
<tr>
<td>Lake Erie</td>
<td>355MG*</td>
<td></td>
</tr>
<tr>
<td>Rocky River</td>
<td>17MG</td>
<td></td>
</tr>
<tr>
<td>Big Creek</td>
<td>4.5MG</td>
<td></td>
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</tbody>
</table>

*Represents treated volume at the District’s CSO Treatment Facility.

Inactive CSO outfall.
CSO REGULATIONS

The United States Environmental Protection Agency (USEPA) and the Ohio EPA enforce regulations that require the District to develop a long-term CSO control plan that will reduce wet weather CSO discharges to Lake Erie and local creeks and rivers. The regulations provide two options for developing the CSO control plan: the Presumption Approach or the Demonstration Approach (see box at right). The District has pursued the presumption approach for the Westerly District, and has developed a CSO control plan that limits the number of overflows to four or less per year at each CSO.

EVALUATION OF CSO CONTROLS

Development of the long-term CSO control plan has consisted of a series of carefully planned steps intended to ensure the selection of a cost-effective plan to control CSOs. The process began with the identification of potential CSO control solutions (see box at right). The potential solutions were evaluated against the specific problems found at each of the 25 CSO outfalls in the Westerly District. Some of the solutions were found to be inappropriate for certain CSO outfalls, and were not considered further. For the remaining solutions that may work for each outfall, a tabulation of the costs, benefits and impacts of the potential solutions was prepared. The tabulation was used to rank the effectiveness of each solution for each CSO based on a consistent set of evaluation criteria (see below). This process was continued until cost effective, system-wide CSO control solutions were identified. Cost-benefit curves, like the one shown at right, were developed to determine the optimal point of CSO investment. The recommended CSO control plan, which is described on pages 4 and 5 of this newsletter, meets the CSO control goal of four overflows or less per year at each CSO. It also balances the overall cost with environmental, operation, and performance criteria.

Evaluation Criteria

- Economic (cost)
- Environmental Impact
- Implementation
- Constructibility
- Operability
- Performance

Potential CSO Control Solutions

- Sewer separation
  - New storm sewers
  - Downspout disconnection
- Treatment
  - Treatment plant expansion
  - New treatment facilities at outfalls
- System optimization
  - Automated in-pipe storage
  - New relief sewers
- Storage
  - Tunnel and conveyance conduits
  - Storage tanks at outfalls

CSO Control Targets

Presumption Approach: This approach presumes that the CSO control plan will achieve compliance with Ohio EPA water quality standards (WQS) if CSOs are limited to four or less per year, or 85% of the total annual CSO volume is captured or eliminated.

Demonstration Approach: This approach requires that a detailed assessment of the impact of the CSO control plan on receiving waters be performed. The assessment must demonstrate that the CSO control plan results in compliance with Ohio EPA WQS.
The long-term CSO control plan proposed for the Westerly District service area is comprised of various projects. With implementation of this plan, it is estimated that over 360 million gallons of additional CSO volume will be captured for treatment.

Westerly District CSOs to the Rocky River and Big Creek required minimal control. A major Westerly District facility, the Northwest Interceptor, is located largely in the Rocky River tributary area and will serve as the primary collector for excess Rocky River CSO. Since limited storage capacity is available in the existing sewer system servicing the Big Creek tributary area, additional storage will be provided. Excess wet weather flow will be routed to a new underground storage facility and returned by gravity to the collection system, as capacity becomes available.

For Westerly District CSOs discharging to Lake Erie, an expansion of the District's existing Combined Sewer Overflow Treatment Facility (CSOTF) has been recommended. This expansion is necessary to ensure that all but four CSO events per year receive "primary treatment." The primary treatment process allows for the settling of CSO solids (and associated pollutants) prior to the discharge of the treated CSO flows to Lake Erie. The CSOTF expansion will allow the facility to meet engineering design standards for primary treatment.

Finally, controlling Westerly District CSOs to the Cuyahoga River requires controlling approximately 300 million gallons of CSO on an annual basis. Projects designed to optimize the existing combined sewer system, such as combined sewer regulator modifications and a pump station upgrade, will be undertaken to minimize CSO discharges. However, even after implementation of these system optimization projects, a large volume of CSO still needs to be controlled. Various CSO control solutions were evaluated to achieve the most beneficial and cost-effective solution. Study results determined that control of the remaining Cuyahoga River CSOs would best be accomplished with new storage facilities. CSOs will be collected and stored in underground tanks or tunnels during wet weather. The stored CSO flows will then be routed to the District's Westerly WWTP for treatment. The Westerly District CSO control plan will comply with CSO requirements, improve water quality in area receiving waters, and provide the best fit with current District facility operations. The estimated cost of the proposed plan is $126 million.

Flow Routing: Excessive wastewater and storm water flows in the Rocky River area will be re-routed into the Northwest Interceptor, which is a large District interceptor sewer which can carry additional flow.

Expansion of the Combined Sewer Overflow Treatment Facility (CSOTF): The CSOTF located at the Westerly WWTP will be improved so that additional wet weather flow can be processed.

Storage Facilities: New underground tanks (like the one shown below) and larger pipes will be installed to temporarily store CSO during wet weather periods. The stored volume will then be returned to the sewer system for treatment at the Westerly WWTP and CSOTF.

New Storage and Conveyance Tunnels: New tunnels will be constructed to transport and temporarily store CSO. The tunnels will collect CSO from problem areas in the existing sewer system and deliver it to the Westerly WWTP.

Regulator Modifications (shown in red): Regulators are structures in the combined sewer system which allow combined sewers to overflow to streams or rivers during wet weather. Certain combined sewer regulators will be modified to control CSO volumes more efficiently, and to limit overflows to four times per year or less.

LEGEND
- Westerly District Boundary
- Separate Sanitary Sewer Area
- Combined Sewer Area
- Regulator Modification
- Storage Facility
- Conveyance Tunnel
- Storage Tunnel
- Flow Rerouting
- Sewer Separation

Mary Street Pumping Station: The pumping station located on Mary Street near West 3rd Street will be improved so that more wet weather flow can be pumped uphill into the interceptor sewers, reducing overflows to the Cuyahoga River.
OVERALL CSO PROGRAM

The NEORSD CSO program also includes similar studies in other combined sewer areas. A CSO study in the Mill Creek area was completed in 1996. CSO-related studies in the Easterly and Doan Brook planning areas are ongoing, with study completion in each area expected by mid-2000. A CSO study in the Southerly planning area will begin in 2000, with study completion anticipated by 2002.

The design and construction of "early action projects" to minimize CSO discharges is occurring at various locations across the District's service area. In the Mill Creek planning area, a 20-foot diameter CSO storage tunnel is under construction. In the Easterly and Southerly planning areas, netting facilities are being built at certain CSO outfalls to prevent the discharge of floatable materials (i.e. litter) to Lake Erie and the Cuyahoga River. In the Westerly and Easterly planning areas, facilities are being built to prevent the backup of Cuyahoga River water into the combined sewer system. Each of these construction projects is being built to minimize the impacts of CSOs on receiving water quality. Questions regarding the District's CSO program can be directed to Frank Greenland at (216) 881-6600.

For information about the Westerly Facilities Plan, or to secure a speaker regarding this project, please contact:
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