



10.0 Recommended CSO Long Term Control Plan

The objective of this section is to present the prioritized projects included in the CSO LTCP for the City of Zanesville. The recommended plan as set forth herein is designed to address the control objectives described in Section 7.0 and includes the plan elements as outlined in Section 8.0.

10.1 CSO LTCP Program Principles

The recommended CSO LTCP program is based on the following principles:

- The CSO LTCP program developed provides the best combination of projects to provide benefits, while meeting requirements of the Clean Water Act and CSO Policy;
- Community Standards are a prime consideration in determining projects;
- Complete separation is the recommended technology;
- Maintain reasonable affordable rates for customers; and,
- The program is a balance of cost, benefits and affordability.

10.2 Water Resource Summary

The following presents a brief summary of the area water resources:

- The Muskingum River currently does not attain the Ohio Water Quality Standards for bacteria.
- Boundary flows and bacteria levels in the river are above standards before reaching the Zanesville area. Given bacteria levels in the receiving stream are greatly influenced by upstream sources, Ohio EPA should consider the need for a TMDL for bacteria to achieve WQS for bacteria.
- Removal of all CSOs in the Zanesville system would have, at this time, minimal influence on the Muskingum River achieving attainment.
- CSO discharges do not cause or contribute to non-attainment of the designated use.
- Stormwater represents a more significant source of pollutants than CSOs.

10.3 CSO LTCP Plan Summary

As discussed in Sections 7.0 and 8.0, Ohio EPA and the City of Zanesville have determined that complete sewer separation is the accepted method of control for the City's CSO discharges. The recommended approach to implementing CSO controls in the City of Zanesville is based on the following projects, which have been scheduled to integrate with the City's budget and debt service obligations:

- Sewer Separation of R15 and R30 – already completed.
- Nine Minimum Controls - implemented
- Treatment plant expansion - tentatively scheduled for completion in 2009.
- Sewer Separation of R13, R17 and R19 construction scheduled for 2009.
- Southend Sewer Rehabilitation – construction scheduled from 2007 through 2011.



RECOMMENDED CSO LONG TERM CONTROL PLAN

- Sewer Separation of R2, R4, R5, R7, R8, R9, R10, R11, and R18, - scheduled for initiation by the end of 2013.
- Sewer Separation of R3, R6, R12, R14, and R26 – scheduled for initiation by the end of 2017.

Projects currently underway including the WWTP expansion, Southend Sewer Rehabilitation projects, high water protection, and the separation of R13, R17 and R19 should allow the City to achieve approximately 85% of overall system-wide volumetric control by 2010. Complete separation of the remaining combined sewer areas can then be scheduled for two construction projects starting in 2013 and 2017, as planned to coincide with the retirement of existing wastewater project loans. Some portions of this schedule may be revised to allow the City to integrate sewer separation with other City projects such as street paving and urban renewal projects or as funding becomes available.

10.4 Nine Minimum Controls

The City is presently involved with on-going programs that have had, and will continue to have, an impact on CSOs and wet weather flows reaching the WWTP. The City's NMC program is documented in the 2005 CSO Operational Plan. In addition to the NMC initiatives, continued efforts aimed at the identification and remediation of rainfall-derived infiltration and inflow sources into the collection system on a system-wide basis are recommended. Under this program, downspouts, driveway drains, area drains, cross-connections and other inflow sources, which are identified through a continuing program of smoke and dye testing, will be removed and/or disconnected. In the long term, this program will reduce wet weather inflow/infiltration volume and provide additional reserve capacity for combined flows within affected interceptors.

The City has a five-year, \$4.1 million program, *Southend Sewer Rehabilitation*, associated with inflow and infiltration reduction. This program in combination with sewer separation in combined areas will continue to reduce the amount of wet weather inflow and infiltration into the local collection system.

The City also has an ongoing CSO and Flow Monitoring program to report CSO monitoring and sampling results on a rotating basis. The City will continue this program to characterize CSO performance and flow conditions at key locations in the collection system as the CSO LTCP program and other flow management/control programs are implemented.

10.5 Treatment Plant Expansion

The City is currently expanding the wastewater treatment plant to an average design flow of 11 MGD and a peak hourly flow of 36.2 MGD through secondary treatment and disinfection. All flows in excess of 27 MGD up to 36.2 MGD would receive preliminary and primary treatment, and bypassed directly to disinfection and blended with secondary effluent prior to discharge. This will allow a higher proportion of wet weather flows to be treated resulting in a reduction in CSO volumes. Furthermore, the increased wet weather capacity will under typical year conditions, remove the backwater conditions that exist in the Main Interceptor system that contributes to an increase in CSO volumes.

The total cost of the plant expansion is estimated to be \$27.8 million. The first phase of the plant expansion started in 2005, with all improvements scheduled to be completed by 2009. Following construction completion, stress testing should be conducted to verify sustainable peak capacity.



10.6 Collection System Improvements

10.6.1 High Water Protection

One CSO outfall is potentially affected by high water levels in the Muskingum and Licking Rivers. It is recommended that the high water protection improvements, consisting of an in-pipe back flow control device, be provided at R21 at a cost of \$27,000. This improvement will assist with system optimization by maintaining interception of sanitary/combined flows during elevated river stages and provide the additional benefits of floatables and odor control.

10.6.2 Complete Sewer Separation

Complete Sewer Separation provides the greatest degree of volumetric control and ensures that all sanitary flow receives treatment. Additionally, sewer separation projects can be prioritized to address critical system needs and then be scheduled to coincide with various infrastructure improvements such as roadway re-surfacing and other revitalization projects or when funding becomes available. Sewer separation also offers the advantage of infrastructure replacement and renewal.

It is proposed that sewer separation projects be developed for all combined sewer service areas. Separation projects currently in progress include CSOs R13, R17 and R19 which are anticipated to result in the elimination of these CSO outfalls. Complete separation of the remaining combined sewer areas can then be scheduled starting in 2013 and 2017, as the City's existing debt service is retired. Upon completion of the 2017 project, it is expected that the City will have a city-wide Sanitary Sewer System and a Storm Sewer System. In the interim, combined sewer overflows (in-system relief points) would remain in strategic locations to ensure that the new sanitary sewer system has sufficient capacity to prevent surcharging, overflows, and water-in-basement (WIB) problems. During this period, the City could conduct a monitoring study supplemented with smoke and dye testing to ensure that all stormwater has been routed to the storm sewers and all sanitary connections have been routed to the sanitary sewers. Areas still subject to infiltration and inflow (I/I) issues would be studied and remedied through an ongoing program to eliminate I/I prior to a final reclassification of the sanitary sewer system. The ongoing monitoring program will ensure proper operation of the Sanitary Sewer System prior to removal of the last remaining in-system relief points. This approach will afford protection from overflows and/or WIB before any potential reclassification of the Sanitary Sewer System. Once the sanitary sewer system capacity is verified, the system will be deemed as separated.

Table 10.1 presents a summary of sewer separation projects with associated costs as determined in Section 8.0. The estimated cost of complete sewer separation is \$39.958 (\$67.758 – \$27.8) million dollars. The project costs to upgrade the City's wastewater collection and treatment system to provide a separate sanitary sewer system is \$67,758,000, and these costs are identified on Tables 10.2, 10.3, and 10.4. The project costs identified in this plan are inclusive of planning, design, administration, construction and contingencies. Some projects and costs may change based on actual field conditions encountered during preliminary design, unanticipated soil conditions and/or property acquisition issues.



Table 10.1 Sewer Separation Projects

Regulator	Estimated Cost of Separation (\$)	Contingency (\$)	Total Project Cost (\$)
R13 ¹	\$1,534,000	\$767,000	\$2,301,000
R17 ¹	\$168,000	\$84,000	\$252,000
R19 ¹	\$340,000	\$170,000	\$510,000
R2	\$339,000	\$170,000	\$509,000
R4	\$365,000	\$183,000	\$548,000
R6	\$1,398,000	\$699,000	\$2,097,000
R9	\$387,000	\$194,000	\$581,000
R5	\$566,000	\$283,000	\$849,000
R3	\$3,622,000	\$1,811,000	\$5,433,000
R8	\$346,000	\$173,000	\$519,000
R10	\$639,000	\$320,000	\$959,000
R7	\$493,000	\$247,000	\$740,000
R21	\$5,790,000	\$2,895,000	\$8,712,000
R11	\$284,000	\$142,000	\$426,000
R18	\$560,000	\$280,000	\$840,000
R12	\$2,321,000	\$1,161,000	\$3,482,000
R14	\$3,829,000	\$1,915,000	\$5,744,000
R26	\$889,000	\$445,000	\$1,344,000
Southend Sewer Rehabilitation	n/a	n/a	\$4,112,000
Total Estimated Cost			\$39,958,000

Note:
1. Existing City of Zanesville Sewer Separation Projects.

10.7 CSO LTCP Program Implementation

The program proposed is premised on the following information:

- Continued implementation of NMCs contained in the 2005 CSO Operation Plan;
- Projects scheduled to coordinate with the City's debt retirement schedule and therefore control the rate of increased demand on financial resources;
- Coordination of work with other City and utility improvements; and
- Eventual elimination of CSO discharges.

Tables 10.2 through 10.4 outline the CSO LTCP implementation schedule and costs. It should be noted that the costs shown include full-width street paving as a part of restoration. Therefore, some portions of these projects may be constructed ahead of or slightly behind schedule so that



RECOMMENDED CSO LONG TERM CONTROL PLAN

they can be coordinated with other street paving, renewal, and improvement projects. This may allow the City to use additional funding sources and/or minimize its expenditures.

Table 10.2 Cycle 1 – 2007 to 2011

Program	Description	Cost
WWTP Expansion	<ul style="list-style-type: none"> Completion of WWTP expansion to provide peak wet weather capacity of 36.2 MGD (Phase 1 & Phase 2) 	\$27,800,000
Sewer Separation	<ul style="list-style-type: none"> R17 service area separation and CSO elimination 	\$252,000
Sewer Separation	<ul style="list-style-type: none"> R19 service area sewer separation and CSO elimination 	\$510,000
Sewer Separation	<ul style="list-style-type: none"> R13 service area sewer (Pete's Alley/Roosevelt Ave.) separation and CSO elimination 	\$2,301,000
High Water Protection	<ul style="list-style-type: none"> R21 in-line high water protection 	\$27,000
Southend Sewer Rehabilitation	<ul style="list-style-type: none"> Removal or Rainfall Derived Inflow/infiltration (RDII). 5-year program. 	\$4,112,000
Cycle 1 Total (2007 – 2011)		\$35,002,000

Table 10.3. Cycle 2 – 2013 to 2015

Program	Description	Cost
Sewer Separation	<ul style="list-style-type: none"> R2 service area sewer separation 	\$509,000
Sewer Separation	<ul style="list-style-type: none"> R4 service area sewer separation 	\$548,000
Sewer Separation	<ul style="list-style-type: none"> R5 service area sewer separation 	\$849,000
Sewer Separation	<ul style="list-style-type: none"> R7 service area sewer separation 	\$740,000
Sewer Separation	<ul style="list-style-type: none"> R8 service area sewer separation 	\$519,000
Sewer Separation	<ul style="list-style-type: none"> R9 service area sewer separation 	\$581,000
Sewer Separation	<ul style="list-style-type: none"> R10 service area sewer separation 	\$959,000
Sewer Separation	<ul style="list-style-type: none"> R11 service area sewer separation 	\$426,000
Sewer Separation	<ul style="list-style-type: none"> R18 service area sewer separation 	\$840,000
Cycle 2 Total (2013 – 2015)		\$5,971,000

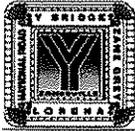


RECOMMENDED CSO LONG TERM CONTROL PLAN

Table 10.4 Cycle 3 – 2017 to 2020

Program	Description	Cost
Sewer Separation	• R3 service area sewer separation	\$5,433,000
Sewer Separation	• R6 service area sewer separation	\$2,097,000
Sewer Separation	• R12 service area sewer separation	\$3,482,000
Sewer Separation	• R14 service area sewer separation	\$5,744,000
Sewer Separation	• R21 service area sewer separation	\$8,685,000
Sewer Separation	• R26 service area sewer separation	\$1,344,000
Cycle 3 Total (2017 – 2020)		\$26,785,000

Figure 10.1 illustrates the configuration of the storm and sanitary sewers once the sewer separation projects have been completed. As shown in the figure, the existing sanitary lateral connections will need to be plugged at the old combined sewer. Then these sanitary laterals will be directed into the new sanitary sewer. Downspouts that were previously connected to the sanitary lateral will be turned out onto the ground or directed into the old combined sewer via a new storm lateral.



10.8 Implementation Plan Summary

The CSO LTCP program is designed with the goal separated sewer systems by the year 2020. The program consists of a combination of initiatives associated with the following:

- Expansion of the WWTP;
- Sewer Separation as the selected CSO control technology; and,
- Reduction in RDII through sanitary sewer rehabilitation in separate sanitary areas.
- Flow meters would be installed at key locations to monitor flows in the sanitary sewer system.

The Implementation Plan is founded on the following:

- Re-assessment of program as part of setting the next cycle's program priorities;
- The ability to advance or retard projects in the overall program to take advantage of other municipal or utility improvements (i.e. roadwork, water main, stormwater, etc.); and
- Affordability – the City financial capability (including debt service obligations) must be considered in setting program priorities.

Following the first cycle of implementing the CSO LTCP the City will likely achieve 85% system-wide volumetric control. During the following two cycles, the City will continue with a systematic approach to sewer separation and elimination of the remaining CSOs.

The implementation of CSO controls will improve local water quality. However, CSO controls alone will not improve water quality to allow the local receiving streams to achieve compliance with bacteria Water Quality Standards because of other non-point stormwater sources.

Complete Separation

