
FINAL SANITARY SEWER DISCHARGE PLAN (SSDP)

EXECUTIVE SUMMARY



BACKGROUND

On August 12, 2005, the Louisville and Jefferson County Metropolitan Sewer District (MSD) entered into a Consent Decree in Federal Court with the United States Environmental Protection Agency (EPA) and the Kentucky Environmental and Public Protection Cabinet. State government subsequently assigned all state responsibilities under the Consent Decree to the Kentucky Department of Environmental Protection (KDEP).

The Consent Decree was developed in response to an enforcement action taken by EPA and KDEP alleging violations of the Clean Water Act (CWA) primarily related to sewer overflows. One of the requirements of the Consent Decree is the development and submittal of a Final Sanitary Sewer Discharge Plan (Final SSDP).

On December 1, 2008, a draft Amended Consent Decree was released for public comment. The draft Amended Consent Decree addressed alleged violations of the CWA primarily related to wastewater treatment plant (WWTP) performance, record-keeping, and reporting. Public comment closes on the draft Amended Consent Decree on December 31, 2008. It is anticipated that the Amended Consent Decree will be finalized early in 2009.

The Consent Decree amendments were negotiated over several months, and the terms of the draft amendments were known to MSD during the final stages of development of this Integrated Overflow Abatement Plan (IOAP). For the purposes of the IOAP, except where specifically noted otherwise, the term "Consent Decree" will be understood to mean the draft Amended Consent Decree as it was published in the Federal Register on December 1, 2008. Any modifications made to the draft Amended Consent Decree as a result of public comment will be addressed in a revision to the IOAP that will be prepared not later than 60 days after the Amended Consent Decree is finalized, or 60 days after receipt of IOAP review comments from the appropriate regulatory agencies, whichever is later.

The Consent Decree requires the Final SSDP to include consideration of conventional and innovative or alternative solutions as part of the plan. The Final SSDP contains the long-term projects including schedules, milestones, and deadlines as required by the Consent Decree. The Final SSDP also includes the results of an evaluation of WWTP peak flow treatment capacity.

FINAL SANITARY SEWER DISCHARGE PLAN DOCUMENT ORGANIZATION

The Final SSDP is divided into the following four chapters.

Chapter 1 Final Sanitary Sewer Discharge Plan Introduction

This chapter provides the background for MSD's program and planning processes for addressing sanitary sewer overflows (SSOs). The following sections outline the details of the introduction.

Previous Studies Related to SSO Elimination

Historically, MSD has been very active in SSO elimination and addressing SSOs that are documented in studies and reports. Moreover, prior to the current effort, a full review was performed of previous studies and reports. The following plans and programs have significant importance in developing the Final SSDP:

- Updated Sanitary Sewer Overflow Program
- Capacity, Management, Operations and Maintenance Programs
- Sewer Overflow Response Protocol
- Interim Sanitary Sewer Discharge Plan

Following is an overview of each of the plans and programs.

Updated Sanitary Sewer Overflow Program (SSOP) – MSD submitted the SSOP on February 10, 2006 in accordance with the requirements of the Consent Decree. The SSOP defined the short-term action plan for SSO abatement activities that were continued during the development of the Final SSDP. MSD has completed all projects in accordance with the SSOP, managed the project completion certification process, and provided quarterly and annual reporting to EPA and KDEP in accordance with the Consent Decree.

Capacity, Management, Operations and Maintenance (CMOM) – MSD conducted a CMOM Self-Assessment in accordance with requirements of the Consent Decree. It was originally submitted to the EPA and KDEP on February 10, 2006, re-submitted on May 12, 2006, and approved on August 22, 2006. MSD's Operations Division is actively implementing the comprehensive CMOM program, and tracking activities and performance of the CMOM program. Based on this tracking, MSD provides quarterly and annual reporting to the EPA and KDEP in accordance with Consent Decree requirements.

Sewer Overflow Response Protocol (SORP) – MSD advanced the existing SORP program in accordance with requirements of the Consent Decree. MSD initially submitted the SORP to the EPA and KDEP on February 10, 2006 and received comments on March 13, 2006. MSD resubmitted the revised SORP on May 12, 2006, and received an approval letter for the SORP on August 22, 2006. MSD provided training on the modified SORP requirements and procedures to all staff. MSD continues to monitor SORP activities, and manage the SORP

reporting functions. As improvements to the program are identified, MSD develops an annual update to the SORP program. MSD's training department provides SORP training for personnel directly involved with overflow response activities, and an annual SORP overview training session for all MSD staff.

Interim Sanitary Sewer Discharge Plan (Interim SSDP) – MSD developed an Interim SSDP in accordance with the requirements of the Consent Decree. MSD initially submitted the Interim SSDP to the EPA and KDEP on September 28, 2007 and received comments on January 8, 2008. MSD resubmitted the revised Interim SSDP on March 7, 2008, and it was approved on July 24, 2008. The Interim SSDP defines the plan for eliminating SSOs in the Beechwood Village area, the Hikes Point area, the Highgate Springs Pump Station, and the Southeastern Diversion Structure. The projects defined by the Interim SSDP include approximately \$200 million in capital costs that will be expended over the next three to five years.

Planning Approach

The overall approach to SSO elimination planning is highly dependent on hydraulic models. Hydraulic models are the mathematical representations of a sewer system. They are used to characterize the existing sewer conditions, evaluate potential solutions, and determine the sizing of technically feasible alternatives for conveyance, storage, and/or treatment to relieve excess wet weather flows and eliminate SSOs. Benefit-cost models are used to establish the ratio of project costs to benefits based on parameters from the hydraulic models. Costs were based on extensive databases for similar projects. Benefits were based on a values-based risk management approach to SSO elimination. The project that eliminated SSOs with the best overall benefit-cost ratio was selected by MSD as the optimal solution for each area impacted by SSOs.

MSD developed the Hydraulic Sewer System Modeling Guideline Manual (Appendix 2.4.3, Volume 2) to define procedures to improve the detail, quality, and functionality of the sewer models while providing consistent model development criteria. MSD also developed a full set of modeling standards prior to any Final SSDP modeling. Standards included calibration standards, use of flow monitoring data, use of previous models, input and export standards, quality assurance / quality control (QA/QC) procedures, and modeling techniques for rainfall-derived inflow and infiltration (RDI/I) and pump facilities.

Chapter 2 System Characterization

This chapter provides an extensive analysis of MSD's SSO areas, flow monitoring, WWTPs and modeling processes. For the Final SSDP modeling, MSD considered two storm distributions: 1) the Natural Resources Conservation Service distribution and; 2) the National Oceanographic and Atmospheric Administration (NOAA) "short-duration precipitation," also known as the "cloudburst" distribution. Based on an analysis of over fifty years of historical weather patterns for Jefferson County, MSD determined that a three-hour, high-intensity cloudburst storm reflected the most appropriate storm pattern to use in SSO control evaluation. During system characterization, a suite of design conditions was analyzed. This allowed modelers the opportunity to validate models and determine the extent of various deficiencies, such as surcharging, at each level.

During solution optimization, the baseline storm was set at the 1.82-inch cloudburst storm level. This means the minimum level of protection will prevent SSOs during the 1.82-inch cloudburst storm. Once a solution had been identified for the baseline level, the solution was then simulated and analyzed at a 2.25-inch cloudburst level and, in some cases, a 2.60-inch cloudburst level to compare benefit-cost ratios for a modeled watershed branch.

During the evaluation, MSD assessed existing gravity sewer conditions, determined pump station capacity, consolidated past flow monitoring data, performed new flow monitoring specific to the Final SSDP modeling and maintained a rain gauge network. Other key items in the Final SSDP modeling process included:

Model Calibration and Validation – Model calibration is the process of comparing model predicted results to measured flow monitoring and rainfall data and to match pump station drawdown test results (measuring a pump’s ability to drawdown, or drop, in the pump station wetwell volume and the corresponding time). Once calibrated, the model is then “validated.” Model validation cross-checks the model performance against historical data sources, (namely known SSO locations and surcharged pipes).

Modeled Overflow Point (MOP) – After validation, the models were simulated again at the 1.82-inch cloudburst storm level to note any SSOs that were not associated with known locations. These SSOs were designated and targeted for field investigations. Based on these investigations, models were often re-validated.

Rainfall Derived Infiltration and Inflow (RDI/I) Reduction – RDI/I reduction was an integral part of every solution. MSD developed a method to determine practical and achievable RDI/I reduction for the entire MSD service area. To achieve the RDI/I reduction as outlined in the Final SSDP, MSD will execute an on-going I/I Program for systemic improvements in the collection system. During implementation of the Final SSDP, post-construction monitoring will be used to demonstrate the impacts of I/I improvements on RDI/I reduction.

Build-out Development – In preparing solutions, potential future development, or build-out, was considered. The build-out was applied as additional flow for areas that would drain by gravity upstream of known or suspected SSOs. It was limited to developable land and is consistent with growth planning documents for Louisville Metro.

Identification, validation, and characterization of SSOs are a continuous process. The calibrated models were validated against “initial” SSOs, those with recorded overflows at the beginning of the modeling process in the Fall of 2007. Initial modeling indicated MOPs at locations other than documented SSOs. These MOP locations received field investigation during two advantageous rainfall events in the Spring of 2008. Consequently, 15 locations were added as documented or suspected SSOs. After the addition of the MOPs, a total of 173 SSO locations were listed as validated SSOs within the MSD system and are considered for the Final SSDP solution projects.

Chapter 3 Development and Evaluation of Alternatives for SSO Elimination

This chapter describes the approach for developing alternative solutions to SSOs, and the process to evaluate both the costs and benefits of each alternative. The MSD Project Cost Estimating Tool and the Benefit-Cost Value Model, both developed specifically for the IOAP, were utilized for solution development. These tools were used to determine benefit scores, capital costs, long-term operation and maintenance (O&M) costs, and the benefit-cost ratio. The following summarizes the major steps in the solution development process:

- Models were calibrated and validated.
- Where appropriate, RDI/I reduction and build-out were applied to the validated models.
- Initial solutions were developed and presented at Wet Weather Team (WWT) Stakeholder Group meetings for review and comments.
- Solutions were evaluated that addressed SSOs and reduced known surcharging using a number of solution technologies.
- Benefits, capital costs, and benefit-cost ratios were developed for each solution at the baseline level of protection (1.82-inch cloudburst storm). The technology in the solution with the best benefit-cost ratio was selected for the solution.
- The selected technology was evaluated at other storm levels (2.25-inch cloudburst and, in some cases, 2.60-inch cloudburst). The storm level with the best benefit-cost ratio was selected as the preferred level of service for the solution.
- More detailed cost estimates were prepared for each solution at the detailed design stage.
- Projects were scheduled over the course of the Final SSDP based on available downstream infrastructure, benefits, and costs.

A wide range of technology approaches is available for the development of SSO elimination strategies and alternatives. These approaches include:

- Source control through infiltration and inflow (I/I) flow reduction;
- Peak Flow storage alternatives (constructed tanks or oversized pipes);
- Increased conveyance capacity (through larger pipe diameter, parallel relief sewers, or new or expanded pump stations);
- Flow diversion to other portions of the system that have available capacity;
- Expanded wastewater treatment capacity, provided either at existing regional treatment facilities or remotely as high-rate wet weather treatment facilities.

A total project capital cost and present worth (including O&M) cost was computed for each solution alternative using the MSD Project Cost Estimating Tool, which uses cost curves based on common parameters obtained from model runs. This includes parameters such as pipe diameters, location, and site conditions. It also includes costs for easements and land acquisitions, as well as O&M costs for pumping, cleaning, and other recurring tasks.

The WWT identified community values that were to be considered during SSO abatement planning. Five project-specific values were used to evaluate projects, determining both the technology and the level of protection.

The MSD Benefit-Cost Value Model was used to consistently calculate benefits for all solution alternatives. The total weighted benefit-cost ratio was calculated for alternatives based on the total costs and the weighted benefit scores. Once the ratios were calculated, the alternatives were reviewed relative to overall program values and objectives to determine which alternative best fit the overall needs of the community.

Five Project-Specific Values

- 1 Regulatory Performance
- 2 Public Health Enhancement
- 3 Asset Protection
- 4 Environmental Enhancement
- 5 Eco-Friendly Solutions

Chapter 4 Selection of Final Sanitary Sewer Discharge Plan

This chapter describes the selection process for the final plan, including selected level of protection, prioritization of projects, implementation schedules to comply with Consent Decree requirements, and measures to evaluate success of projects.

The solution selected at the 1.82-inch cloudburst level was modified to prevent SSOs during a 2.25-inch cloudburst storm and 2.60-inch cloudburst (if needed) storm, using the same technology selected for the baseline storm. For each storm, the costs and benefits were re-evaluated for the modified solution and a new benefit-cost ratio was determined. The storm with the highest benefit-cost ratio was chosen as the preferred level of protection.

The final projects selected to address SSOs include a mixture of source control (including I/I reduction efforts), wet weather storage, system diversion, and conveyance/transport. This mix of control options for SSO locations is a reflection of the benefit-cost analysis by how the project alternatives affect the community values identified by the Wet Weather Stakeholder Group, and site-specific considerations. Consistent with the Final Combined Sewer Overflow Long-Term Control Plan (Final CSO LTCP), the Final SSDP project alternatives are designed to be built around MSD's existing infrastructure, which may include large diameter pipes and wastewater treatment plants (WWTP), and draw on synergistic benefits from other MSD projects.

Overall, the Final SSDP includes 42 gray infrastructure projects and seven I/I reduction projects. The Interim SSDP includes six gray infrastructure projects which are incorporated into the final solutions. The gray infrastructure projects are divided into a combination of the following categories, (some projects fall into more than one category):

- 24 conveyance capacity upgrades
- 19 storage projects, inline and offline, many with pipe upgrades as well
- Upgrades or replacements to 10 pump stations
- Elimination of 10 pump stations and one small WWTP
- Elimination of 5 small WWTPs in the Prospect area
- One WWTP Expansion

The site-specific level of protection for the 42 Final SSDP gray infrastructure projects as determined by the value-based benefit-cost analysis resulted in the following:

- 30 projects eliminate SSOs up to the 1.82-inch cloudburst storm
- 7 projects eliminate SSOs up to the 2.25-inch cloudburst storm
- 5 projects eliminate SSOs up to the 2.60-inch cloudburst storm

Table ES.1 represents the final projects chosen for eliminating SSOs at the selected site-specific design level of protection. The table includes a list of projects, SSOs controlled by that project, selected level of protection, capital costs, and scheduled project completion year. In total, there are 214 documented, suspected, and modeled SSOs addressed by the 55 projects (49 Final SSDP and 6 Interim SSDP) listed in Table ES.1 and displayed in Figure ES.1. This number includes SSOs eliminated by the Interim SSDP projects. Projects are listed by modeled area.

Final project maps and fact sheets with information pertaining to the selected project details and SSOs addressed by the projects are included at the end of Chapter 4. The maps show the general project layout and key features. The fact sheets list information about the project size, costs, benefits and related issues. Final project maps and fact sheets are presented in Chapter 4 in the same order as the projects listed in Table ES.1. The implementation schedule to achieve Consent Decree Requirements and final project implementation schedule is shown in Figure ES.2.

MEASURES OF SUCCESS

Measures of success are a means to demonstrate compliance with the Consent Decree requirements and to quantify the benefits achieved from SSO elimination projects. The success of the Final SSDP in meeting Consent Decree compliance requirements will be measured incrementally as the plan is implemented and also at plan completion in December 2024. A review of the Final SSDP projects after completion will evaluate how well the project accomplished the performance goals.

The four performance goals to be tracked under the Final SSDP include:

1. No wet weather capacity related SSOs from the system within the selected level of protection.
2. No wet weather capacity related system surcharges causing basement back-ups within the selected level of protection and within the pre-remediation zone of influence.
3. Secondary treatment of all flow within the selected level of protection.
4. Project flow monitoring performed and documented. Post-construction flow rates are comparable to projected flow rates established in the design process.

TABLE ES.1 SSDP FINAL PROJECTS

SSDP Recommended Project Name/Location	SSO(s) Controlled	Technology	Selected Level of Protection	Capital Cost \$ ¹	Scheduled Completion Year
Cedar Creek Model Area					
Idlewood Inline Storage	28998, 28984, 63094, 63095, 70158	Inline Storage	1.82-inch	\$2,317,000	2023
Fairmount Rd. Pump Station (PS) Inline Storage	Fairmount Road Pump Station (81316 & 97362)	Inline Storage	1.82-inch	\$217,000	2023
Little Cedar Creek Interceptor Improvements	67997, 67999, 86423, 89195, 89197	Pipe Upgrades	1.82-inch	\$1,875,000	2024
Bardstown Rd. Pump Station Improvements	88545	Pump Station Upgrades	2.25-inch	\$281,000	2021
Running Fox Pump Station Elimination	MSD1080-LS	Pipe Upgrades	1.82-inch	\$77,000	2010
Hite Creek Model Area					
Meadow Stream Pump Station Inline Storage	Meadow Steam Pump Station (91087 & MSD1082-PS)	Inline Storage	1.82-inch	\$974,000	2012
Floydsburg Rd. I/I Investigation	Floydsburg Road (MSD1086-PS, 90776, 108956, 108957, 108958)	Infiltration Reduction	SSES	\$57,000	2010
Kavanaugh Rd. Pump Station Improvements	Kavanaugh Road (MSD1085-PS)	Pump Station Upgrades	2.60-inch	\$1,110,000	2024
Floyds Fork Model Area					
Woodland Hills Pump Station Diversion	33003, 65531	Pipe Upgrades	1.82-inch	\$20,000	2011
Eden Care Pump Station Inline Storage	Eden Care Pump Station (MSD1105-PS)	Inline Storage	1.82-inch	\$53,000	2021
Ashburton Pump Station Improvements & Diversion	Olde Copper Court Pump Station (MSD0165-PS), Ashburton Pump Station (MSD0166-PS)	Upgrade Force Main & Pipes	1.82-inch	\$118,000	2021

¹ Detailed cost evaluations are included in Appendix 4.1.2

TABLE ES.1 SSDP FINAL PROJECTS

SSDP Recommended Project Name/Location	SSO(s) Controlled	Technology	Selected Level of Protection	Capital Cost \$ ¹	Scheduled Completion Year
Jeffersontown Model Area					
Jeffersontown WWTP Elimination	28390, 28391, 28392, 28395, 31733, Jeffersontown WWTP (28173 & 64505 & MSD0255 & IS028-SI)	Offline Storage & Pipe Upgrades	1.82-inch	\$23,737,000	2015
Chenoweth Hills WWTP Elimination, Chenoweth Run and Chippewa Pump Station Improvements	Chenoweth Run Pump Station (MSD0196-PS & 86052 & 64096), Chippewa Pump Station (92061), Chenoweth Hills WWTP PS (MSD0263A-PS), Chenoweth Hills WWTP (MSD0263)	Pump Station & Force Main Upgrades	1.82-inch	\$3,140,000	2015
Dell Rd and Charlane Pkwy Interceptor Improvements	Charlane Pky (28250, 28249, 28340, 28336, 104289), Dell Rd. (28413, 28414, 28415, 28416, 28417)	Pipe Upgrades	1.82-inch	\$917,000	2022
Raintree & Marian Ct Pump Station Eliminations	28719, 28711, Marian Court Pump Station (28729), Raintree Pump Station (MSD0149-PS)	Pipe Upgrades	1.82-inch	\$618,000	2021
Monticello Pump Station Elimination	Monticello Place Pump Station (MSD0151-PS & 27969)	Pipe Upgrades	2.60-inch	\$207,000	2022
Middle Fork Model Area					
Middle Fork Relief Interceptor, Wet Weather Storage, and UMFPS Diversion	02932, 02933, 02935, 08537, 23211, 23212, 27005, 45835, 47583, 47593, 47596, 47603, 47604, 51221, 51161, 51160, 90700, IS021A-SI, Middle Fork at Breckenridge (08935-SM)	Offline Storage & Pipe Upgrades	1.82-inch	\$26,369,000	2 Phases - 2013, 2023
Goose Creek Pump Station Improvements & Wet Weather Storage	Devondale Pump Station (21628-W), Goose Creek Pump Station (46891 & 62418 & 91629 & 91630 & 105936), Saurel PS (43472)	Storage & Force Main Upgrades	2.25-inch	\$2,844,000	2024
Anchor Estates Inline Storage & Pump Station Eliminations	Vannah Pump Station (01106), Anchor Estates #1 Pump Station (00746 & 00056-W), Anchor Estates #2 Pump Station (MSD0057-LS)	Inline Storage & Diversion	2.25-inch	\$1,061,000	2013

TABLE ES.1 SSDP FINAL PROJECTS

SSDP Recommended Project Name/Location	SSO(s) Controlled	Technology	Selected Level of Protection	Capital Cost \$ ¹	Scheduled Completion Year
Hurstbourne I/I Investigation	01793	Infiltration Reduction	SSES	\$536,000	TBD
Southeastern Diversion Model Area					
Parkview Estates I/I Investigation	47250	Infiltration Reduction	SSES	\$285,000	2011
Klondike Interceptor	25676 (Alcona), 26650, 26651	Pipe Upgrades	2.25-inch	\$558,000	2015
Sutherland Interceptor	Sutherland (16649)	Pipe Upgrades	2.60-inch	\$412,000	2023
Beargrass Interceptor Rehab Ph. 2	51594	Pipe Rehab	1.82-inch	\$57,000	TBD
Pond Creek Model Area					
Charleswood Interceptor Extension	25477, 25478, Cooper Chapel Pump Station (25480 & MSD0130-PS)	Pipe Upgrades	1.82-inch	\$603,000	2022
Cinderella Pump Station Wet Weather Storage	Cinderella Pump Station (60679 & MSD1013-PS), 35309	Offline Storage	1.82-inch	\$1,079,000	2023
Lantana Pump Station Wet Weather Storage	Lantana Drive #1 Pump Station (25484 & 93719 & MSD0101-PS)	Offline Storage & Pipe Upgrades	1.82-inch	\$432,000	2022
Government Center Pump Station Wet Weather Storage	Government Center Pump Station (MSD0180-PS)	Offline Storage & Pipe Upgrades	1.82-inch	\$1,843,000	2024
Avanti Pump Station Wet Weather Storage	Avanti Pump Station (21229-W)	Offline Storage	1.82-inch	\$180,000	2021
Lea Ann Way System Improvements	19360, 19369, 29933, 29948, 29943, 31083, 31084, 79076, Lea Ann Way Pump Station (MSD1010-PS)	Pipe Upgrades	1.82-inch	\$827,000	2021
Outer Loop & Caven Ave Wet Weather Storage	27116, 70212, 17724, Caven Ave Pump Station (MSD0133-PS)	Offline Storage	1.82-inch	\$6,304,000	2024
Leven Pump Station Wet Weather Storage	Leven Pump Station (36419 & MSD1019-PS)	Offline Storage	1.82-inch	\$631,000	2022
Edsel Pump Station I/I Investigation	Edsel Pump Station (92098 & MSD1048-PS)	Infiltration Reduction	SSES	\$367,000	2011

TABLE ES.1 SSDP FINAL PROJECTS

SSDP Recommended Project Name/Location	SSO(s) Controlled	Technology	Selected Level of Protection	Capital Cost \$ ¹	Scheduled Completion Year
ORFM Model Area					
Mellwood System Improvements & Pump Station Eliminations	26752, 41374, 41416, Mockingbird Valley Pump Station (MSD0007-PS), Winton Pump Station (MSD0010-PS), Mellwood Avenue Pump Station (24472 & MSD0023-PS), Canoe Lane Pump Station (24152-W & MSD0024-PS)	Pump Station Upgrades, Pipe Upgrades & Diversion	2.25-inch	\$3,047,000	2024
Leland Rd. Relief Sewer	96020	Pipe Upgrades	2.25-inch	\$64,000	2021
Derington Ct. Pump Station I/I Investigation	Derington Court Pump Station (MSD0095-PS)	Infiltration Reduction	SSES	\$265,000	2012
Prospect Area WWTP Eliminations	40870, 40871, 40872, Barbour Lane Pump Station (42680 & 65633 & 65635), West Goose Creek Pump Station (22436 & MSD0123-PS), Phoenix Hill Pump Station (MSD1044-PS), Glenview Hills Pump Station (MSD0183-PS), Barbour Lane Pump Station (MSD0192-PS), New Market Pump Station (MSD0193-PS), Deep Creek Pump Station (MSD1063-PS), Hunting Creek South WWTP (MSD0292)	Pump Station, Pipe Upgrades & WWTP eliminations	2.25-inch	\$28,902,000	2015
Mill Creek Model Area					
Shively Interceptor	04498, 04542, Pioneer Pump Station (81814-W), Fern Lea Pump Station (MSD0047-PS), Garr's Lane Pump Station (MSD0050-PS)	Pipe Upgrades	1.82-inch	\$15,317,000	2014
East Rockford Pump Station Relocation	East Rockford Pump Station (04699-W)	Pump Station Replacement and Relocation	1.82-inch	\$1,044,000	2021

TABLE ES.1 SSDP FINAL PROJECTS

SSDP Recommended Project Name/Location	SSO(s) Controlled	Technology	Selected Level of Protection	Capital Cost \$ ¹	Scheduled Completion Year
Small WWTP Model Area					
Lucas Ln. Pump Station Inline Storage	Lucas Lane Pump Station (MSD0199-LS)	Inline Storage	1.82-inch	\$183,000	2021
Riding Ridge Pump Station Improvements	Riding Ridge Pump Station (MSD1060-LS)	Pump Station Upgrades	1.82-inch	\$27,000	2014
Gunpowder Pump Station Inline Storage	Gunpowder Pump Station (MSD1055-LS)	Inline Storage	1.82-inch	\$176,000	2021
Fox Harbor Inline Storage	Fox Harbor #1 and #2 Pump Station (62769)	Inline Storage	2.60-inch	\$328,000	2021
Fairway View Pump Station Improvements	Fairway View Pump Station (MSD1065-PS)	Pump Station Upgrades	1.82-inch	\$87,000	2014
Lake Forest Pump Station Improvements	Lake Forest Pump Station (MSD1169-LS)	Pump Station Upgrades	1.82-inch	\$77,000	2015
St. Rene Rd. Pump Station Inline Storage	94187	Inline Storage	1.82-inch	\$30,000	2021
CSO Model Area					
Sonne Pump Station I/I Investigation	Sonne Avenue Pump Station (MSD0042-PS)	Infiltration Reduction	SSES	\$265,000	2011
Camp Taylor System Improvements	08717, 13931, 13943, 36763, 44396, 44397, 66349, 104223, 104231	Offline Storage & Pipe Upgrades	2.60-inch	\$28,279,000	3 Phases - 2011, 2013, 2023
Hazelwood Pump Station I/I Investigation	Hazelwood Pump Station (55665)	Infiltration Reduction	SSES	\$173,000	2011
FINAL SSDP TOTAL				\$158,370,000	

TABLE ES.1 SSDP FINAL PROJECTS

SSDP Recommended Project Name/Location	SSO(s) Controlled	Technology	Selected Level of Protection	Capital Cost \$¹	Scheduled Completion Year
Interim SSDP Projects					
Beechwood Village Sanitary Sewer Replacement	21061, 21089, 21101, 21153, 21156	Sewer Replacement	--	\$11,800,000	2011
Hikes Lane Interceptor and Highgate Springs Pump Station	17571, 18134, 18298, 18302, 18318-W, 18434, 18471, 18483, 18505, 18595, 49236, 49672, 49673, 49224, MSD0012-PS	Pump Station Elimination and New Interceptor	--	\$21,216,000	2012
Northern Ditch Diversion Interceptor	MSD0271	New Interceptor	--	\$20,397,000	2011
Sinking Fork Relief Sewer	21103, 25012, 63319	New Relief Sewer	--	\$1,690,000	2011
Southeastern Diversion Structure and Interceptor	08426, 08427, 08430, 08431, 30701, 30702, 49647, 63779, 30680, 30681, 72571-X	New Relief Sewer and Flow Control Modifications	--	\$1,744,000	2011
West County WWTP	22370, 22385, 32682, 32688, 59169, MSD0277	WWTP Upgrade	--	\$102,700,000	2011
INTERIM SSDP TOTAL				\$159,547,000	