

CITY OF ROCKY RIVER
2011 ANNUAL PROGRESS REPORT

January 19, 2012

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

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ENVIRONMENTAL PROTECTION AGENCY ORDER

Docket No. V-W-09-AO-11

NPDES Permit OH0030503

January 19, 2012

The United States Environmental Protection Agency's (USEPA) Administrative Order, dated September 29, 2009, revised April 27, 2010, required the City of Rocky River under paragraph 25 to submit an annual progress report conveying the following information:

"25(a) (Revised April 27, 2010 Administrative Order) Respondent's progress on the projects described in the SSES implementation schedule, including specific references to the projects in that schedule. Respondent must identify any deficiencies and all steps that have been taken to correct the deficiencies."

Progress of Sewer System Evaluation Study (SSES):

INTRODUCTION

The Rocky River SSES Phase 1 is the first of a four (4) phased approach of Sanitary Sewer Evaluation Studies that are to be undertaken by the City in response to the Administrative Orders issued to the City of Rocky River by the United States Environmental Protection Agency. The Administrative Orders directed the City to eliminate its remaining SSO's as well as reduce the amount of rain derived water that is transported to the Rocky River Waste Water Treatment Plant through the sanitary collection system. This is to be accomplished through a long term capital improvement plan that includes a multi-phased, multi-year SSES investigation and subsequent rehabilitation of the collection system.

EXISTING COLLECTION SYSTEM BACKGROUND

The City of Rocky River owns and maintains separate storm and sanitary sewer collection systems within the city. There are four (4) sanitary pump stations in addition to one (1) storm pump station.

The City of Rocky River has a number of pumping stations throughout the city that, coupled with the gravity collection system, convey the City's sanitary sewage to the jointly owned Rocky River Wastewater Treatment Plant (WWTP) located on Lake Road in the northern portion of the

City. The WWTP is owned by the Cities of Rocky River, Westlake, Bay Village and Fairview Park. A total of eight pipes discharge sewage at, or near, the head-works of the WWTP. Five of the eight interceptors convey flows from the City of Rocky River. The sewage conveyed and treated at the WWTP is ultimately discharged to Lake Erie.

The City's storm sewer collection system collects and transports storm water to the various outfalls found within the City limits. In the case of excessive wet weather flow that enters the sanitary collection system, sewage that cannot be contained within the sanitary system is redirected to the storm sewer system through two (2) Sanitary Sewer Overflows (SSO's) in the sanitary collection system.

The two (2) active SSO's at the time of the SSES Phase 1 study are as follows:

- **EPA ID# 302** - Beach Cliff and Falmouth, upstream of the Beach Cliff Pump Station. The overflow manhole is located near the sidewalk at the south-west corner of the intersection of Beach Cliff Blvd. and Falmouth Drive.
- **EPA ID# 306** - Westway and Magnolia. The overflow manhole is located in the street at the intersection of Westway Drive and Magnolia Drive.

Since the issuance of the Administrative Orders from the USEPA, the City has been able to close one (1) of the original three (3) SSO's through the implementation of sewer improvements in the area. The following SSO is no longer active:

- **EPA ID# 303** - Avalon and Falmouth. The overflow manhole was located in the sidewalk at the north-east corner of the intersection of Avalon Drive and Falmouth Drive.

DESCRIPTION OF THE STUDY AREAS

The sewersheds chosen for the Phase 1 SSES study were initially defined during the City Wide Flow Monitoring Study that was completed in 2010. Sewersheds 4, 5, and 12 were given precedence based on the outcome of the Flow Monitoring Study and the acknowledgement that each contained an SSO at the time the Administrative Orders was issued. Since that time, the SSO has been closed based on enhancements to the sanitary sewer collection system implemented by the City within the area.

Sewersheds 4, 5 are next to each other and are located in the northeast section of the City. Sewershed 4 is all residential property while Sewershed 5 is primarily residential, but there is commercial property along Detroit Road. Sewershed 12 is centered roughly midway along the eastern corporate boundary. As with Sewershed 5, Sewershed 12 is primarily residential with some commercial in the Wooster Road/Center Ridge Road area.

MANHOLE INSPECTION AND SURVEY

Field inspection and investigation was conducted to inventory the sanitary sewer manholes, and the over\nder manholes in the Phase 1 sewersheds 4, 5 & 12. The inspection of each structure, primarily from the ground surface, totaled 293 structures. Information was recorded electronically that identified the condition of each manhole, the material of each component of the structure, and any identifiable defects.

Before the condition assessment and inventory was conducted by URS, each structure including sanitary manholes, storm manholes, and over\nder manholes were located through surveying methods by the Rocky River City Engineer. The connectivity of the sewer system was then mapped out based on archival information and field observations by the City Engineer. In addition, each sanitary manhole and over\nder manhole was provided an identification number by the City Engineer prior to inspection.

The survey information provided by the City Engineer was the basis for the detailed inspection of each manhole's condition. URS used its Digital Information Gathering Inspection Tool (DIGIT) that collects data electronically, in order to allow the collected data to be added electronically to the City's Geographical Information System (GIS) mapping system.

Inspection Protocol / Techniques

The inspections performed by URS focused on issues related to Inflow & Infiltration concerns, structural deficiencies and gathering "as-built" sewer information. In addition to documenting the visual observations, photographs, including a landscape view of the manhole to help identify its location and an image looking down to the trough of the manhole were captured.

MAINLINE DYE TESTING

The intent of mainline dye testing of the storm collection system is to identify storm water inflow and infiltration sources that enter the sanitary collection system on public property. The test is performed by adding dyed water from a fire hydrant or water truck to the storm sewer through either a connected catch basin or the upstream storm manhole.

A sewer plug is typically inserted downstream in the storm sewer to block the flow and allow the water level within the storm sewer to reach a level representative of a rainfall event. If the storm sewer is too large, sandbags are used to block up as much flow as possible to reach a water

level representative of a rainfall event. For this study, a plug was also inserted in opened invert plates for same trench sewers. This allowed access to the sanitary sewer below without adding additional dyed water to the sanitary sewer.

Tests were conducted under the following situations:

- Storm sewers that were parallel to the sanitary sewer.
- Storm sewers that crossed over the sanitary sewer.
- Over / under sewers that had a common trench.

Typically one test was performed in the storm sewers for each sanitary sewer segment between manholes. However multiple tests were conducted when there were multiple storm sewer cross-overs or there was a parallel storm sewer plus storm sewer cross overs in a single sanitary segment.

Once the storm sewer water levels reached testing levels, a CCTV camera was inserted in the sanitary sewer downstream of the dyed water to detect leaks. A test segment was considered positive if the observation of dyed water was confirmed in the sanitary sewer. The location, the estimated flow rate or transfer rate, and type of leak were documented in the CCTV test logs. The most common location for the dyed water to enter the sanitary sewer was through the joints of the sanitary sewer or at the joints where the private property service laterals were entering the sanitary sewer. URS also observed significant flow entering the sanitary sewers around and through the invert plates where the under / over sewers are located.

RESIDENTIAL DYE TESTING

“Residential Dye Testing” is being performed, within each sewershed for the Phase 1 SSES program. While the industry standard is to call this testing procedure “Residential Dye Testing,” a more accurate title would be “Private Property Dye Testing” since our testing is not exclusive to residential property. So, for the sake of this report, the reader should note that our testing involves more than just residential homes and the associated property surrounding each home. Our testing includes, or will include, commercial property as well as apartment building complexes.

Due to the large number of properties in this Phase 1 SSES program (approximately 1,100 properties), and the project initiation start date, we were not able to test every property prior to the submission of this report. However, for this submittal, URS has tested a significant number of homes in each of the three (3) watersheds that will allow conclusions to be made regarding the impact of private property contributions of storm water into the sanitary collection system. In

addition, it is the intent of the City to continue testing following the submission of this report until all of the properties are tested.

For this study, the dye testing was used as a “screening process” to identify the properties that tested positive for contributing infiltration and inflow into the sanitary sewer from sources such as leaking laterals or cross connections. With a positive result through this “screening process”, additional investigative work is required in the future to determine the location and identify the various sources of the inflow and infiltration. Once identified, the sources of the inflow and infiltration will be corrected to eliminate/reduce the likelihood of future contributions to the sanitary collection system.

For this study, the testing was conducted through the use of rainfall simulation at various storm water collection sources that were found on each private property. Typical testing locations included downspouts, cleanouts, low lying depressions in the ground, and driveway or yard drains.

Residents were notified by the letters from the City and door hangers prior to the testing. Upon arrival, URS personnel attempted to notify the resident of the property. Residents that were at home were asked to not use water for the duration of the test. The resident was also asked if a sump pump was active in the house.

Before the initiation of the test, a CCTV camera was inserted into the sanitary mainline and positioned at the house service connection to document the test results. URS also used a GIS linked electronic collection computer to inventory the storm structures on the property and to document the specific structures tested.

Testing was then initiated by running water from a fire hydrant to the location of the storm water collection structures on the property. This typically included one downspout on each corner of the house or garage and any in- ground structures outside of the house, such as driveway drains or yard drains. Dye was then added to each test location and given approximately 15 minutes to flow through the storm pipe and, if it was a positive test, into the sanitary lateral and then the mainline sewer. When a positive dye transfer occurred from any of the test locations into the sanitary lateral, the house was documented as a positive test result. Dyed water flowing from the sanitary lateral connection was recorded as a video file, and an image was taken for documentation. In addition, an estimated flow rate was determined and recorded during the positive test observation into the electronic data collection software program.

A positive test result only indicates that there was a positive dye transfer into the sanitary collection system. The test does not indicate the cause or the specific location of the dye transfer. As stated previously, the City will be undertaking additional testing in the future to locate the cause or the specific dye transfer location.

MODELING

URS has conducted hydraulic modeling to analyze the capacity conditions in Sewersheds 4, 5 and 12 of the City of Rocky River Collection System. The objective of the hydraulic analyses is to define system constraints and recommend an overall program of sewer rehabilitation and inflow and infiltration removal to remedy sanitary sewer overflows and basement flooding in the three sewershed areas.

Since each of the three (3) sewersheds discharge into different and distinct trunk sewers that make their way to the Rocky River Wastewater Treatment Plant, in essence there were three different hydraulic models created for this study, one for each sewershed. The development of three separate models allowed for each sewershed to be reviewed and evaluated independently of the other sewersheds.

The hydraulic modeling analysis was accomplished using the PCSWMM 2006 package. The PCSWMM 2006 utilizes US EPA's Stormwater Management Model (SWMM) Engine. PCSWMM 2010 also provides a powerful, easy-to-use Geographic Information System (GIS) interface with optional links to existing GIS/AM/FM/CAD databases.

MAINLINE CLOSED CIRCUIT TELEVISION INSPECTION

URS hired sub-consultant AAA Flexible Pipe to clean, televise and inspect the mainline sanitary sewers within each Sewershed. The process consisted of cleaning each sewer segment between manholes through the means of a jet truck that sprayed pressurized water through the sewer. A vacuum truck was positioned at the downstream manhole to collect the debris washed downstream. This process provided cleaning of encrustation, debris, and siltation that typically collects in the invert of a sanitary sewer. In situations where roots were encountered, a root cutter was passed through the sewer to remove the hydraulic constraint.

Each observation from the CCTV Inspection was recorded using industry standards developed through the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment & Certification Program (PACP). The NASSCO standards include a visual observation process to identify, quantify and rate the condition of a sanitary sewer segment including laterals,

junctions, structural defects, and operation and maintenance (O&M) issues. Each defect and O&M issue is given a NASSCO defined numerical value based on the severity of the observation. The total sum of these values per sewer segment has been provided for either structural defects or O&M issues, depending on the condition and the reason for the condition of each sewer segment.

REPORT

URS is preparing the report and submittal to the USEPA at this writing. The report will document the findings, provide the results and make recommendations for a capital improvement plan for the City of Rocky River to follow to remove I/I from the sanitary sewer system which will result in permanent closure of the two SSO's currently in service.

"25(b) (Revised April 27, 2010 Administrative Order) Respondent's progress in implementing the CMOM program once approved and incorporated into this Order."

Progress of the Capacity, Management, Operation and Maintenance (CMOM) Program:

On October 22, 2010, the City of Rocky River submitted as required by the USEPA Order, a CMOM schedule and program manual. The City received the approval from the USEPA for the CMOM program in a letter dated December 30, 2010. The City is currently implementing the approved CMOM program. During 2011, the completed CMOM manual has been dispersed to various departments involved in the implementation of the program. The following goals in year one have been achieved:

- 1) Initiated the Service Division's Best Management Practices (BMP) which is in a preliminary phase and will be updated and improved in the following years; **GOAL ACHIEVED.**
- 2) Take input from various departments about the emergency response plan and BMPs and make adjustments; **GOAL ACHIEVED.**
- 3) Improve inventories and maintenance logs – incorporate Good Housekeeping logs into BMP; **GOALS ACHIEVED.**

"25(c) (Revised April 27, 2010 Administrative Order) An inventory of all SSOs from the Respondent's sewers from the previous year, identifying the dates, sources, estimated volumes, receiving waters and principal pollutants contained in the discharges. Respondent must also issue a press release informing the public of the availability of the inventory and make the inventories available on its principle webpage."

Inventory of all Sanitary Sewer Overflows (SSOs) within the City of Rocky River's sewer system during 2011 including date of events, location, volume, receiving water and principal pollutant test results:

Date of SSO event	Location	Volume Million Gallons	Receiving Water
2/14/2011	Valley View sewer (ID 315)	0.0.008	Rocky River
2/15/2011	Valley View sewer (ID 315)	0.012	Rocky River
2/20/2011	Beachcliff and Falmouth (ID 302)	0.046	Lake Erie
2/20/2011	Westway and Magnolia (ID 306)	0.069	Spencer Creek
2/21/2011	Beachcliff and Falmouth (ID 302)	0.07	Lake Erie
2/21/2011	Westway and Magnolia (ID 306)	0.212	Spencer Creek
2/28/2011	Beachcliff and Falmouth (ID 302)	0.63369	Lake Erie
2/28/2011	Avalon and Falmouth (ID 303)	0.00035	Lake Erie
2/28/2011	Westway and Magnolia (ID 306)	0.04374	Spencer Creek
3/23/2011	Beachcliff and Falmouth (ID 302)	0.00112	Lake Erie
4/4/2011	Beachcliff and Falmouth (ID 302)	0.0377	Lake Erie
4/4/2011	Westway and Magnolia (ID 306)	0.1422	Spencer Creek
4/16/2011	Westway and Magnolia (ID 306)	0.00311	Spencer Creek
4/19/2011	Beachcliff and Falmouth (ID 302)	0.00137	Lake Erie
4/23/2011	Beachcliff and Falmouth (ID 302)	0.00146	Lake Erie
4/23/2011	Westway and Magnolia (ID 306)	0.00162	Spencer Creek
4/25/2011	Beachcliff and Falmouth (ID 302)	0.22413	Lake Erie
4/25/2011	Westway and Magnolia (ID 306)	0.62473	Spencer Creek
5/2/2011	Beachcliff and Falmouth (ID 302)	0.01965	Lake Erie
5/2/2011	Westway and Magnolia (ID 306)	0.01407	Spencer Creek
5/23/2011	Westway and Magnolia (ID 306)	0.00257	Spencer Creek
5/25/2011	Beachcliff and Falmouth (ID 302)	0.10946	Lake Erie
5/25/2011	Westway and Magnolia (ID 306)	0.05791	Spencer Creek
5/26/2011	Beachcliff and Falmouth (ID 302)	0.04638	Lake Erie
5/26/2011	Westway and Magnolia (ID 306)	0.0064	Spencer Creek
5/29/2011	Beachcliff and Falmouth (ID 302)	0.03865	Lake Erie
5/29/2011	Westway and Magnolia (ID 306)	0.00833	Spencer Creek
6/7/2011 **	Beachcliff and Falmouth (ID 302)	0.03547	Lake Erie
6/7/2011 **	Westway and Magnolia (ID 306)	0.00685	Spencer Creek
6/12/2011	Beachcliff and Falmouth (ID 302)	0.02285	Lake Erie
6/12/2011	Westway and Magnolia (ID 306)	0.0042	Spencer Creek
6/19/2011	Beachcliff and Falmouth (ID 302)	0.05937	Lake Erie
6/19/2011	Westway and Magnolia (ID 306)	0.01917	Spencer Creek
6/21/2011	Beachcliff and Falmouth (ID 302)	0.04134	Lake Erie
6/21/2011	Westway and Magnolia (ID 306)	0.00694	Spencer Creek
7/2/2011-7/3/2011	Beachcliff and Falmouth (ID 302)	0.013	Lake Erie
7/2/2011-7/3/2011	Westway and Magnolia (ID 306)	0.02637	Spencer Creek

7/19/2011	Beachcliff and Falmouth (ID 302)	0.2917	Lake Erie
7/19/2011	Westway and Magnolia (ID 306)	0.0209	Spencer Creek
7/22/2011	Beachcliff and Falmouth (ID 302)	0.03791	Lake Erie
7/22/2011	Westway and Magnolia (ID 306)	0.00462	Spencer Creek
7/23/2011	Beachcliff and Falmouth (ID 302)	0.04942	Lake Erie
7/23/2011	Westway and Magnolia (ID 306)	0.02299	Spencer Creek
7/28/2011	Beachcliff and Falmouth (ID 302)	0.02854	Lake Erie
7/28/2011	Westway and Magnolia (ID 306)	0.0035	Spencer Creek
8/3/2011	Beachcliff and Falmouth (ID 302)	0.02594	Lake Erie
8/3/2011	Westway and Magnolia (ID 306)	0.006	Spencer Creek
8/9/2011	Beachcliff and Falmouth (ID 302)	0.0017	Lake Erie
8/10/2011	Beachcliff and Falmouth (ID 302)	0.0003	Lake Erie
8/14/2011	Beachcliff and Falmouth (ID 302)	0.3582	Lake Erie
8/14/2011	Westway and Magnolia (ID 306)	0.0575	Spencer Creek
8/15/2011	Beachcliff and Falmouth (ID 302)	0.1469	Lake Erie
8/15/2011	Westway and Magnolia (ID 306)	0.0377	Spencer Creek
8/18/2011	Beachcliff and Falmouth (ID 302)	0.0091	Lake Erie
8/20/2011	Westway and Magnolia (ID 306)	0.0004	Spencer Creek
8/21/2011	Beachcliff and Falmouth (ID 302)	0.0021	Lake Erie
8/24/2011	Beachcliff and Falmouth (ID 302)	0.0027	Lake Erie
8/25/2011	Beachcliff and Falmouth (ID 302)	0.0165	Lake Erie
9/4/2011	Beachcliff and Falmouth (ID 302)	0.1176	Lake Erie
9/4/2011	Westway and Magnolia (ID 306)	0.0816	Spencer Creek
9/7/2011	Beachcliff and Falmouth (ID 302)	0.0173	Lake Erie
9/8/2011	Beachcliff and Falmouth (ID 302)	0.0811	Lake Erie
9/10/2011	Beachcliff and Falmouth (ID 302)	0.0707	Lake Erie
9/11/2011	Beachcliff and Falmouth (ID 302)	0.0503	Lake Erie
9/11/2011	Westway and Magnolia (ID 306)	0.0012	Spencer Creek
9/15/2011	Beachcliff and Falmouth (ID 302)	0.0117	Lake Erie
9/21/2011	Beachcliff and Falmouth (ID 302)	0.0594	Lake Erie
9/21/2011	Westway and Magnolia (ID 306)	0.01278	Spencer Creek
9/23/2011	Beachcliff and Falmouth (ID 302)	0.0078	Lake Erie
9/25/2011	Beachcliff and Falmouth (ID 302)	0.0382	Lake Erie
9/26/2011	Beachcliff and Falmouth (ID 302)	0.1587	Lake Erie
9/26/2011	Westway and Magnolia (ID 306)	0.0091	Spencer Creek
10/19/2011	Beachcliff and Falmouth (ID 302)	0.3899	Lake Erie
10/19/2011	Westway and Magnolia (ID 306)	0.0558	Spencer Creek
10/21/2011	Beachcliff and Falmouth (ID 302)	0.0101	Lake Erie
10/26/2011	Beachcliff and Falmouth (ID 302)	0.0018	Lake Erie
11/14/2011	Beachcliff and Falmouth (ID 302)	0.0101	Lake Erie
11/14/2011	Westway and Magnolia (ID 306)	0.0039	Spencer Creek
11/22/2011	Beachcliff and Falmouth (ID 302)	0.1046	Lake Erie
11/22/2011	Westway and Magnolia (ID 306)	0.0593	Spencer Creek
11/23/2011	Beachcliff and Falmouth (ID 302)	0.0083	Lake Erie
11/29/2011	Beachcliff and Falmouth (ID 302)	0.2672	Lake Erie

11/29/2011	Westway and Magnolia (ID 306)	0.2396	Spencer Creek
12/5/2011-12/6/2011	Beachcliff and Falmouth (ID 302)	0.5756	Lake Erie
12/5/2011-12/6/2011	Westway and Magnolia (ID 306)	0.8391	Spencer Creek
12/15/2011	Beachcliff and Falmouth (ID 302)	0.0023	Lake Erie
12/21/2011	Beachcliff and Falmouth (ID 302)	0.1026	Lake Erie
12/21/2011	Westway and Magnolia (ID 306)	0.0544	Spencer Creek
12/30/2011	Beachcliff and Falmouth (ID 302)	0.0005	Lake Erie

**** PRINCIPAL POLLUTANTS IN 2 SAMPLED EVENTS**

Date of SSO Event	Location	Volume MG	Suspended Solids	CBOD5	Phosphorus	Nitrogen Ammonia	E. coli
6/7/2011	Beachcliff @ Falmouth ID 302	0.03547 MG	148 mg/l	20 mg/l	1.63 mg/l	2.61 mg/l	Too Numerous to count
6/7/2011	Westway @ Magnolia ID 306	0.00685 MG	500 mg/l	79 mg/l	4.61 mg/l	5.16 mg/l	Too Numerous to count

All above recorded sanitary sewer overflows occurred during wet weather (rain and/or snow melt) events due to excessive infiltration and inflow (I&I) within the City of Rocky River sewer system. The City of Rocky River has implemented a long term maintenance and rehabilitation program to clean, repair and improve the sewer system and reduce I & I and sanitary sewer overflows.

All sanitary sewer overflows have been reported to the United States Environmental Protection Agency Region 5, the Ohio Environmental Protection Agency and the Cuyahoga County Board of Health as required by the Order and the Ohio EPA NPDES Permit 3PE00009*JD issued to the Rocky River Wastewater Treatment Plant.