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DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION

City of Rutland
2023 Combined Sewer Overflow Control Project Report

Introduction

The City of Rutland's Wastewater Treatment Facility (WWTF) is a secondary conventional activated sludge treatment plant with phosphorus removal that serves the City's sanitary and combined sewer system. This collection system includes a total of four combined sewer overflow (CSO) outfalls that discharge into the Otter and East Creeks during significant wet weather events. Over the course of 2023 the City of Rutland experienced 15 separate rain events that resulted in a CSO.

This report outlines those events and compares the data to recent years. In addition, it will address the City's compliance with the Minimum Controls, the condition of the combined sewer system, and the status of the City's projects that are currently underway, which will contribute to the reduction of CSOs.

Required Content

(i) Compliance with Minimum Controls

(1) Proper operation and regular maintenance programs for collection systems and CSO outfalls:

The Wastewater Treatment and Wastewater Collection divisions operate the City's collection system, which includes all CSO outfalls, pump stations and sewer mains. One hundred percent of the system's catch basins, swirl separators, and sedimentation basins were inspected and cleaned. Problematic areas that are prone to the collection of grease were inspected and cleaned as needed. In addition, routine maintenance occurred with respect to the City's siphons.

In cases where grease deposits were determined to be discharged by habitual offenders, the City issued a Notice of Violation and worked with the property owner to mitigate the reoccurring issue.

(2) Maximum use of the collection system for storage without endangering public health or property, or causing solids deposition problems:

The City currently monitors four combined sewer overflow outfalls that incorporate weirs and/or flap gates at the outfall, as well as weirs upstream within the conduit. These outfall structures activate to relieve the combined sewer system during wet weather events. The weirs were designed and reconstructed over the years to improve storage capacity while preventing wastewater from backing up into streets and/or residential and commercial buildings.

During the 2023 construction season, the City hired Wind River Environmental and Green Mountain Pipeline to clean multiple sewer mains throughout the downtown district. This effort will increase storage capacity with the wastewater collection system and allow the city to inspect the integrity of these particular conduits.

(3) Review and modification of pretreatment requirements to assure that CSO impacts are minimized:

The City monitors the wastewater of industrial/large commercial customers. A High Strength Surcharge is invoiced quarterly to these customers, based upon Total Suspended Solids (TSS) and Ultimate Oxygen Demand (UOD) standards.

There are numerous customers within the City of Rutland and Rutland Town that have pretreatment facilities on site. These customers include the following:

1. General Electric, Windcrest Road (Industrial Metals - Chem. Precipitation)
2. General Electric, Columbian Avenue (Industrial Metals - Chem. Precipitation)
3. Stowe Corporation (Industrial Metals - Chem. Precipitation)
4. Bodycote Surface Technologies (pH Adjustment)
5. Isovolta (Settling Lagoons)

(4) Maximization of flow to the treatment plant for treatment consistent with an evaluation of alternative treatment options:

The City of Rutland has a long-standing history of implementing projects that increase the flow of combined sewage to the wastewater treatment plant in conjunction with combined sewer separation projects. Currently, the wastewater treatment plant has the capacity to treat 29 million gallons per day (MGD). However, the River Street Pump Station, which conveys one hundred percent of the City's sewerage to the plant, has a capacity of 22 MGD.

The Long-Term Control Plan identifies projects that will increase the flow of wastewater to the treatment plant, as well as the plant's treatment capacity. As part of the LTCP, the City developed a 5-year Project Implementation Schedule. This schedule has since been revised following the receipt of a substantial amount of CSO ARPA funding.

Specifically, the City is scheduled to construct three CSO abatement projects in the near-term. These construction projects are as follows:

<u>CSO Check Valves</u>

In 2023, the City hired Weston & Sampson to design this project. The project consists of installing check valves at the city' CSO 001 & CSO 002. This project will improve flow to the treatment plant, by preventing creek water from entering the combined sewer via the outfall during high water events. When creek water enters the system, it generates a significant bottleneck at critical locations within the network. Eliminating this bottleneck will increase the volume of combined sewage that's treated during rain events.

<u>Meadow Street Sewer Separation</u>

In 2023, the City hired Aldrich & Elliott to design this separation project. A new stormwater pipe will be installed below Meadow Street, from West Street to Connor Park, removing 15 +/- catch basins from the combined sewer system. A new dedicated stormwater outfall will be constructed, complete with a swirl separator. The removal of stormwater from the combined sewer system will reduce the frequency and magnitude of CSOs and improve treatment capacity at the wastewater treatment facility.

<u>Connor Park Storage</u>

In 2023, the City hired Aldrich & Elliott to design this storage project. Phase 1 of this project consists of installing a 1-million-gallon combined sewage storage facility under Connor Park, which is owned by the City. New sewer mains will be installed to divert combined sewage from CSO 002 & CSO 009 (003 & 004) to the new storage facility. The project will enable the city to store combined sewage collected during rain events that would otherwise be discharged to East Creek. Once the rain event has subsided and capacity is available at the treatment plant, the stored combined sewage will be pumped from the tank into the municipal system for treatment.

(5) Prohibition of CSOs during dry weather:

There were no dry weather combined sewer overflow events in 2023.

(6) Control of solid and floatable materials in CSOs:

The City limits solid and floatable materials within CSO's through the maintenance of the collection system and streets.

In 2023, every catch basin in both the combined and sanitary systems was cleaned at least once. The City's downtown had its streets swept weekly. The remaining City streets were swept at least 3 times from May to October.

(7) *Establishment of pollution prevention programs to minimize contaminants in CSOs*:

The City maintains a stormwater web page (www.rutlandcity.org/stormwater) that educates residents on the adverse impacts of stormwater pollution and what they can do to mitigate it.

(8) *Public notification*:

In 2023, the City notified the public of CSOs through the Department of Environmental Conservation's "Combined Sewer Overflows and Untreated Discharges" reporting web page.

(9) *Monitoring*

(A)(i) *Precipitation monitoring system*:

The City operates two tipping bucket rain gauges, one at the WWTF and another at the Streets Department located on Spruce Street. The first records data for later download and the second transmits data for near real-time monitoring through a web-based platform. Both devices comply with the specification in the CSO Rule and the 1272 Order.

(A)(ii) *Flow monitoring system*:

The City has installed ultrasonic level sensors with telemetry devices at all CSO overflow structures. With this equipment the City is able to estimate the duration and magnitude of the overflow. The City has been in contact with the company that supplies the telemetry equipment. Pending pricing, the City may upgrade the data collection software, which would improve internal reporting procedures.

The City also owns an additional 8 sets of flow metering equipment that are available throughout the course of the season to evaluate portions of the system if/when needed.

(ii) *The condition and operation of the CSS*:

The combined sewer system is in fair to good condition. There are many components that have aged significantly, but still operate well. The City is continuously inspecting the condition of the combined sewer system to ensure that it's functioning efficiently and effectively.

The mapping of the system is continuously being evaluated, particularly when preparing for the construction season. Projects typically include the rehabilitation of existing manholes and the installation of new structures that allow personal to better inspect and maintain combined sewer mains. The City has a robotic sewer camera that is capable of inspecting the majority of these mains. Private contractors are hired on an annual basis to inspect the larger truck lines. From these inspections, new construction and rehabilitation projects are developed and executed.

Notable projects that took place during the 2023 construction season include the replacement of 300-400 feet of 18" clay pipe that had begun to fail. An adjoining segment of 30" concrete truck sewer was also repaired following it's failure.

(iii) The frequency, duration and magnitude of precipitation events leading to CSOs:

In 2023 the City experienced 15 rain events that resulted in CSOs from one or more of the four outfall locations. Table 1 summarizes the duration, overall magnitude, and maximum rain fall rates associated with these events. This information was derived from rain data that is collected on five-minute intervals.

2023 Rainfall Data					
Event #	**Date**	**Total Rainfall (Inches)**	**Storm Duration (H:M)**	**Average Rainfall Rate (in/hr)**	**Max Rainfall (in/hr)**
1	13-Jan	1.54	11:15:00	0.25	0.36
2	13-Jun	0.48	3:20:00	0.61	1.03
3	14-Jun	0.56	3:35:00	0.70	0.46
4	25-Jun	0.12	0:25:00	0.06	2.89
5	27-Jun	1.01	1:40:00	0.42	4.14
6	28-Jun	0.36	1:15:00	0.28	3.69
7	10-Jul	2.04	3:40:00	0.69	2.01
8	15-Jul	0.32	0:45:00	0.15	7.02
9	4-Aug	2.88	0:50:00	0.26	16.46
10	8-Aug	0.44	1:05:00	0.41	2.52
11	10-Aug	0.52	0:20:00	0.30	3.92
12	12-Aug	0.44	1:10:00	1.89	3.92
13	18-Aug	0.43	1:55:00	0.27	2.53
14	21-Oct	1.61	4:05:00	0.77	0.93
15	18-Dec	1.05	4:40:00	0.46	0.51

TABLE 1

(iv) *The frequency, duration and magnitude of all CSOs from the system in the past year and comparison to prior years*:

Table 2 outlines the total CSO duration, magnitude, and rainfall associated with each storm event. Table 3 is a summary of this data for the entire year. Table 4 compares the frequency and magnitude of CSOs from 2023 to the previous 4 years.

2023 CSO Event Summary						
Event #	**Date**	**Start**	**Stop**	**CSO Duration (H:M)**	**CSO Volume (Gallons)**	**Total Rainfall (Inches)**
1	13-Jan	2:33 AM	8:46 AM	6:13	411,012	1.54
2	13-Jun	5:46 AM	6:33 AM	0:47	5,049	0.48
3	14-Jun	7:09 PM	7:57 PM	0:48	41,800	0.56
4	25-Jun	6:05 PM	8:03 PM	1:58	34,178	0.12
5	27-Jun	2:43 PM	5:09 PM	2:26	387,000	1.01
6	28-Jun	6:20 PM	7:37 PM	1:17	117,515	0.36
7	10-Jul	1:56 AM	4:53 AM	2:57	589,276	2.04
8	15-Jul	1:18 AM	3:29 AM	2:11	343,963	0.32
9	4-Aug	3:51 AM	2:55 PM	11:04	923,905	2.88
10	8-Aug	2:33 AM	3:37 AM	1:04	151,466	0.44
11	10-Aug	7:48 PM	9:33 PM	1:45	227,415	0.52
12	12-Aug	11:39 PM	11:53 PM	0:14	67,627	0.44
13	18-Aug	6:23 AM	7:57 AM	1:34	210,752	0.43
14	21-Oct	4:39 AM	6:44 AM	2:05	227,076	1.61
15	18-Dec	5:55 AM	8:11 AM	2:16	166,819	1.05

TABLE 2

2023 CSO Summary				
	CSO Duration (H:M)	**CSO Volume (Gallons)**	**Total Rainfall (Inches)**	**Rainfall Rate (Inches/Hour)**
Total	14:49	3,904,853	13.8	
Average	4:11	260,324	0.92	0.50
Max	11:04	923,905	2.88	16.46
Min	0:14	5,049	0.12	0.36

TABLE 3

CSO Data Over 5-Year Period				
YEAR	**Number of Storms Leading To a CSO**	**VOLUME (Gallons)**	**Total Duration (H:M)**	**Average Volume Per Storm**
2019	34	37,729,781	132:44:00	1,109,699
2020	22	5,928,241	52:36:00	269,466
2021	25	9,117,133	69:08:00	364,385
2022	20	9,460,980	77:44:00	473,049
2023	15	3,904,853	62:49:00	260,324

TABLE 4

(v) The overall status of the Long-Term Control Plan (LTCP)

The City's consultant, Weston & Sampson Consulting Engineers, completed the final draft of the CSO LTCP in 2022.

(vi) Key CSO control accomplishments, highlighting those that reduced the frequency and magnitude of CSOs; projects under design; and construction that occurred in the previous year.

A significant portion of the sewer mains in the downtown area were cleaned of all grit in sediment. This effort resulted in an increase in combined sewage storage capacity within the system.

In March of 2023, the city executed a contract with Aldrich & Elliott to complete preliminary engineering for the Connor Park CSO Storage project. This project consists of constructing a $1M gallon CSO storage facility beneath Connor Park, which is located on Meadow Street. Combined sewage from both CSO #002 & CSO #009 will be redirected to this storage facility and pumped back into the municipal system following the duration of the storm when treatment capacity is available.

In May of 2023, the city executed a contract with Aldrich & Elliott for the final design of the Meadow Street Separation project. This project consists of separating 14 +/- catch basins from the combined sewer system and constructing a new dedicated stormwater outfall, equipment with a swirl separator.

In June of 2023, the city executed a contract with Weston & Sampson for the design of the CSO Check Valves project. This project consists of installing check valves at CSO #001 & CSO #002. During times when the level of the Otter Creek and East Creek are high, the combined sewer system tends to take on creek water. As a result, there is a loss of treatment and storage capacity. The CSO Check Valves project will ultimately prevent this from occurring.