City of Rutland
2024 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 2024 the City of Rutland experienced 17 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 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. Inspection reports outlined the maintenance that occurred are recorded and filed. 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. During recent years, the city has become more aggressive in response to these types of violations, which has proven to be beneficial to the collection system and the surrounding rate payers.

(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 2024 construction season, the City hired Wind River Environmental to clean and inspect multiple sewer mains. This effort will increase storage capacity with the wastewater collection system and allow the city to inspect the integrity of these particular conduits. As a result of these inspections, Public Works was able to identify previously unknown failures within the collection system and schedule to necessary repairs.

(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 sewage 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.

Currently, this project is on hold, until bid pricing for the construction of the following two CSO projects is acquired. At that point in time, the city will be able to evaluate where we are standing from a funding perspective and determine the steps that will be necessary to implement the Check Valve project.

<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.

Thie project has experienced significant delays during the design process, which are attributed to acquiring the necessary outfall easement from surrounding property owners. As a result, the project was redesigned as needed. The project is expected to be advertised for bid during the spring of 2025.

Connor Park Storage

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.

The final design of this project is near completion. As the design has developed, we now understand that the city may not be able to afford a 1-million-gallon storage facility as originally anticipated. The expectation is that the city will be able to fund a 500 to 750-thousand-gallon facility. If bid pricing allows for this level of construction, the overwhelming majority of the CSOs that occur at CSO 2 & 9 will be eliminated. In other words, according to the data from recent years, the majority of the CSOs that occur at CSO 2 & 9 are collectively less than 500 thousand gallons.

(5) Prohibition of CSOs during dry weather:

There was no dry weather combined sewer overflow events in 2024.

(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 2024, 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 about the adverse impacts of stormwater pollution and what they can do to mitigate it.

Recently, the city reviewed the web page and determined that it should be updated during 2025.

(8) *Public notification*:

In 2024, the City notified the public of CSOs through the Department of Environmental Conservation's "Combined Sewer Overflows and Untreated Discharges" reporting web page.

The Engineering Department will be recommending that the public be notified through social media as well.

(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 can 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.

Recently, the City has begun to re-evaluate the current monitoring system. The City has contacted a local vendor and has begun exploring improvements that can be made.

(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 can inspect many 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.

The Engineering Department will be recommending that the City replace the current camera equipment. The current equipment has limitations. A more robust piece of equipment will allow the City to better manage the collection system.

Notable projects that took place during the 2024 construction season include the replacement of 325-feet of 12-inch clay pipe that services several medical facilities, including the Rutland Regional Medical Center. In addition, there were multiple repairs made to larger conduits within the Route 4 & 7 corridor in advance of the Class 1 Paving Project, which were identified during camera inspections.

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

In 2024 the City experienced 17 rain events that resulted in CSOs from one or more of the four outfall locations. Table 1 summarizes the duration, overall magnitude, and maximum rainfall rates associated with these events. This information was derived from rain data that is collected on five-minute intervals.

2024 Rainfall Data					
Event #	**Date**	**Total Rainfall (Inches)**	**Storm Duration Contributing to CSO (H:M)**	**Average Rainfall Rate (in/hr)**	**Max Rainfall (in/hr)**
1	26-Jan	0.47	1:15:00	0.38	0.25
2	6-Mar	1.18	1:15:00	0.94	0.27
4	10-Mar	1.3	1:05:00	1.20	0.59
4	8-May	0.36	0:35:00	0.62	0.57
5	22-May	0.47	0:11:00	2.56	1.69
6	6-Jun	0.68	11:13:00	0.06	3.18
7	7-Jun	0.34	2:34:00	0.13	4.50
8	24-Jun	0.52	0:12:00	2.60	3.37
9	11-Jul	0.47	0:28:00	1.01	0.95
10	16-Jul	0.26	0:07:00	2.23	3.08
11	24-Jul	0.89	0:36:00	1.48	4.36
5	31-Jul	0.44	0:42:00	0.63	3.74
6	5-Aug	2.08	2:51:00	0.73	9.76
14	6-Aug	0.53	1:01:00	0.52	4.65
15	9-Aug	1.14	2:00:00	0.57	4.76
16	26-Sep	1.02	1:10:00	0.87	0.83
17	11-Dec	1.95	3:14:00	0.60	0.55

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 2024 to the previous 4 years.

2024 CSO Event Summary									
Event #	Date	Start	Stop	CSO Duration (H:M)	CSO Duration (Decimal)	CSO Volume (Gallons)	Total Rainfall (Inches)	Average Rainfall Rate (in/hr)	Max Rainfall (in/hr)
1	26-Jan	7:59 AM	9:14 AM	1:15	1.25	126,959	0.47	0.38	0.25
2	6-Mar	11:02 PM	6:18 AM	1:15	1.25	881,240	1.18	0.94	0.27
3	10-Mar	9:02 PM	10:07 PM	1:05	1.08	246,134	1.3	1.20	0.59
4	8-May	8:58 AM	9:33 AM	0:35	0.58	132,533	0.36	0.62	0.57
5	22-May	10:40 PM	10:51 PM	0:11	0.18	97,853	0.47	2.56	1.69
6	6-Jun	10:37 AM	9:50 PM	11:13	11.22	252,480	0.68	0.06	3.18
7	7-Jun	4:10 PM	6:44 PM	2:34	2.57	67,213	0.34	0.13	4.50
8	24-Jun	10:10 PM	10:22 PM	0:12	0.20	19,200	0.52	2.60	3.37
9	11-Jul	4:01 AM	4:29 AM	0:28	0.47	106,027	0.47	1.01	0.95
10	16-Jul	12:13 AM	12:20 AM	0:07	0.12	42,507	0.26	2.23	3.08
11	24-Jul	11:08 PM	11:44 PM	0:36	0.60	402,187	0.89	1.48	4.36
5	31-Jul	3:02 PM	3:44 PM	0:42	0.70	92,427	0.44	0.63	3.74
6	5-Aug	6:50 PM	9:41 PM	2:51	2.85	832,641	2.08	0.73	9.76
14	6-Aug	10:38 PM	11:39 PM	1:01	1.02	231,787	0.53	0.52	4.65
15	9-Aug	5:30 PM	7:30 PM	2:00	2.00	590,796	1.14	0.57	4.76
16	26-Sep	11:28 AM	12:38 PM	1:10	1.17	267,167	1.02	0.87	0.83
17	11-Dec	4:47 PM	8:01 PM	3:14	3.23	734,614	1.95	0.60	0.55

TABLE 2

2024 CSO Summary				
Outfall	Average Duration (H:M per event)	Total 2023 Duration (H:M)	Average CSO Volume (Gal/event)	Total 2023 CSO Volume
CSO #001	1:28	23:37:00	161,120	2,577,924
CSO #002	1:29	22:22:00	48,430	726,443
CSO #009	1:29	22:22:00	86,680	1,300,198
CSO #005	1:43	17:15:00	51,920	519,200
TOTAL	**-**	**85:36:00**	**341,584.33**	**5,123,765**

TABLE 3

CSO Data Over 5-Year Period				
YEAR	**Number of CSO Storms**	**VOLUME (Gallons)**	**Total CSO Duration (H:M)**	**Average Volume Per Storm (Gallons)**
2020	22	5,928,241	52:36:00	269,466
2021	25	8,681,758	69:08:00	347,270
2022	20	9,460,980	77:44:00	473,049
2023	15	3,904,853	62:49:00	260,324
2024	17	5,123,765	85:36:00	301,398

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.

Following the completion of the three previously outlined CSO mitigation projects, the City intends to evaluate their effectiveness and reopen the LTCP and determine how best to proceed moving forward.

The expectation is that we will focus on reducing the number of overflows that occur at CSO 1. This outfall historically has been the leading contributor to CSOs. The LTCP, however, identified a potential project that the City believes to be insufficient for our needs. At this point in time, the City would like to explore the option of designing a large storage facility, mimicking the design of Connor Park Storage. This project, in conjunction with the replacement of the Otter Creek Interceptor, in theory could generate a large amount of storage capacity.

(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.

One of the major conduits in the downtown area was cleaned of all grit in sediment. This conduit is located on the north side of Center Street, below several buildings. This effort resulted in an increase in combined sewage storage capacity within the system.

The design of Connor Park CSO Storage project is nearing completion. This project consists of constructing a 500K to 750K 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.

The design of the Meadow Street Separation project is also nearing completion. 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. This project will be advertised for construction in spring of 2025, around the same time that the Connor Park storage project is advertised, to maximize the number of bidders, with the goal of reducing construction costs to the best extent practical.

Lastly, the City began designing a water main replacement project for Center Street and Wales Street. In conjunction with the project, the city is proposing to separate stormwater from the combined sewer system on Center Street. The stormwater pipe will serve as a detention facility, prior to discharging back into the combined system. However, detaining stormwater during the peak intensity of the storm will have a positive effect on the magnitude of CSOs. The design is expected to be completed during 2025. The goal is to construct this project in 2026.

The City recently received a $1M USDA grant for the design and construction of new street tree pits. The goal is to construct several new tree pits throughout downtown, which will incorporate modular suspended pavement systems, which will increase soil volume available to street trees. Nearby catch basins will be redirected to these tree pits. Although minor by comparison, these tree pits will have a positive effect on CSOs. An RFP for design services will be issued in 2025. The City has 5 years to spend all the available funding.