Appendix C

City of Regina

Semi-Annual Sewer Source Control Report

Environmental Services
Water, Waste & Environment
Citizen Services

May 2022

EXECUTIVE SUMMARY

The City of Regina (City) treats wastewater from residential, commercial and industrial properties. The quality of wastewater entering the sewage collection system is regulated by *The Wastewater and Storm Water Bylaw, 2016* (Bylaw). The Bylaw sets allowances for various parameters that have been determined by weighing the needs of the wastewater treatment and collection system against realistic industrial, commercial and institutional wastewater quality.

Source control is the practice of tracking and managing what enters the sewer system. Source control programs use the Bylaw to ensure the wastewater quality is met so it can effectively and efficiently be treated by the wastewater treatment plant (WWTP). The City's various sewer source control programs are in place to allocate costs fairly, protect the sewer infrastructure from harmful materials that can damage the collection and/or treatment system and to prevent detrimental releases to the environment as a result. The program functions through site inspections, sampling and education campaigns, and when appropriate enforcement and compliance actions.

This report outlines the various sewer source control programs, their main function, goals and costs. It does not present information on releases to the environment, that information can be found in the Annual Discharge and Release Report.

The next step in the program will be to increase inspections on(industrial, commercial and institutional (IC&I) customers to further help prevent issues and increase effective wastewater treatment and consistency in compliance activities including surcharges to businesses.

Table of Contents

Table of Tables

Table of Figures

DEFINITIONS

Regulatory Release is a spill or discharge that meets federal or provincial regulatory limits and is required to be reported as per the Saskatchewan Ministry of Environment Discharge and Discovery Reporting Standard. Information on these releases is in the annual Discharge and Release Report.

Non-Regulatory Release is a spill or discharge that does not meet the Saskatchewan Ministry of Environment Discharge and Discovery Reporting Standard. It has the potential to cause minor harm to the environment but is not serious enough to be reportable to regulatory agencies. Information on these releases is in the annual Discharge and Release Report.

Sewer Release is a spill or discharge into the either the wastewater or storm water system that could cause an adverse impact to the sewer system but does not have a negative impact on the environment and is not reportable as per the Discharge and Discovery Reporting Standard.

1.0 INTRODUCTION

The City of Regina (City) treats wastewater from residential, commercial and industrial properties. The City's Permit to Operate a Sewage Works (Permit) and *Wastewater and Storm Water Bylaw, 2016* (Bylaw) regulate the treatment and collection of the wastewater. The Bylaw and Permit include stipulations around what is and is not allowed in the City's infrastructure, and at what concentrations, to protect the sewer collection and treatment system from any adverse effects. Except in very rare situations, commercial and industrial clients are required to pre-treat any wastewater, where the wastewater's quality is outside the Bylaw's parameters, before it enters the wastewater sewer system.

Source control is the practice of tracking and managing what enters the sewer systems. The City's various sewer source control programs are in place to allocate costs fairly, protect the sewer infrastructure from harmful materials that can damage the collection and/or treatment system and to prevent detrimental releases to the environment as a result. The program functions through site inspections, sampling and education campaigns and when appropriate, enforcement and compliance actions.

The programs were developed with consideration to *The Wastewater Master Plan* (WWMP) which provides a comprehensive wastewater overview designed to support the *Official Community City Plan (OCP)* Community Priorities. The WWMP defines source control and how the initiatives help to reduce parameters of concern that industrial, commercial and industrial (IC&I) residents discharge into the wastewater sewer system. The WWMP sets out standards to ensure work is completed in a sustainable and cost-effective way to provide reliable and affordable wastewater services to citizens.

This summary report will include, but is not limited to, the following information:

- Sewer Releases into the City wastewater sewer system with the potential to cause adverse effects that are contained within the wastewater system
- offending parties and the associated costs
- summarized wastewater quality
- mitigation strategies to help prevent, reduce, control and assist in the recovery of compensation resulting from harmful material entering to the wastewater system
- Initiatives and metrics to assess the effectiveness of the municipal wastewater systems and their associated costs and overall effectiveness

Information on the municipal sewer systems, including associated infrastructure for the collection, treatment and hauling of wastewater, Sewer Releases, and strategies implemented to address the issues is included. Regulatory and Non-Regulatory Releases to the environment are reported in the annual Environmental Discharge and Release Report.

2.0 BACKGROUND

The City operates two separate sewer systems (Appendix A). The storm water sewer system collects runoff from precipitation events and directs the untreated water to Wascana Lake or

Wascana Creek. The wastewater sewer system collects wastewater (i.e., sewage) from residents, commercial business, institutions and industries across the city. Wastewater enters the collection system and travels into one of four wastewater sewer trunks. From there, it enters McCarthy Boulevard Pumping Station (MBPS) on the west side of the city where it is pumped through a forcemain to the WWTP. At the WWTP, the wastewater undergoes treatment before it is discharged into Wascana Creek west of Regina.

Storm Sewer:

- 20 lift stations
- Approximately 20,700 storm drains
- Approximately 10,321 storm maintenance holes,
- More than 1,1320 kilometers (km) of storm mains

Wastewater Sewer:

- WWTP
- MBPS
- Hauled Wastewater Station (HWS)
- 19 lift stations
- More than 960 km of pipes and 704 km of building service connections
- More than 10,580 maintenance holes

3.0 SEWER SOURCE CONTROL

Sewer source control exists to track, control and reduce the occurrence of potentially damaging substances in the wastewater and storm water sewer systems from industries, businesses, institutions and households. The primary role of the program is to reduce through education, inspections and other preventative measures, the occurrence of harmful substances entering one of the sewer systems. In the event a harmful substance does enter the system, processes are in place to help mitigate damage, track back the substance to the source and recover costs. Due to the size and nature of the sewer system, a varied approach to source control needs to be taken.

For wastewater source control, EPCOR currently operates and maintains the City-owned WWTP and hauled wastewater station (HWS). The City and EPCOR both conduct extensive sampling within the wastewater system and the WWTP as part of the source control program:

- to monitor the wastewater sewer system for potentially harmful compounds that could adversely impact the WWTP or the collection system
- to gather information to help the City and EPCOR effectively operate collection and treatment systems.

Other information that the City and EPCOR gather is used internally to help make informed decisions on technical adjustments to the WWTP's operations. This reduces the impact on the environment and on the City's sewer systems and helps improve the efficiency of the City's wastewater related processes.

For stormwater source control, the focus to date has been on educating residents about the two sewer systems and to only put "rain down the drain." However, a number of other programs also exist.

- The City requires industrial business with stormwater ponds to submit the analytical results for review before approval to discharge to the storm sewer is given
- Adopt a drain communication campaign
- Requiring businesses using a hydrant carts to submit a "Water Discharge Plan" to prevent discharges into natural waterways
- Sampling of stormwater during spring runoff to better understand the effects city runoff has on Wascana Creek water quality

3.1 WASTEWATER AND STORM WATER BYLAW

All of the sewer source control programs are governed by the Bylaw. In 2016, the City repealed *The Sewer Service Bylaw*, Bylaw No. 5601 and replaced it with the new Bylaw. The bylaw changes were made based on the City's new biological nutrient removal WWTP requirements, through comparison to other municipalities, and industry best practice (Canadian Council of Ministers of the Environment – Canada-wide Strategy for the Management of Municipal Wastewater Effluent). The new Bylaw is more restrictive in terms of allowed substances and concentrations of those substances into the wastewater sewer system, but still takes into consideration realistic IC&I wastewater quality. When the new Bylaw came into effect in 2016, the City, with Council approval, implemented a two-year, phase-in approach to allow businesses time to introduce the necessary changes to meet the new Bylaw.

If an infraction has been discovered, depending on the severity, the City will issue a remedial order letter with respect to the Bylaw subsection(s) that has been violated to inform the offending party of the violation details and to request a remedial action be completed within a practical timeframe. In more severe cases, costs and expenses that will be charged to the offending party are also included. In the event the corrective action is not completed in a practical timeframe, the City may perform the work and include those costs as well. For minor infractions, the City will work with the individual or business to ensure they understand the Bylaw and the requirements they need to meet to discharge into the wastewater sewer system.

When a letter is issued, the offending party must respond in writing to the City outlining the remedial plan and timeframe and pay any fees back to the City. If fees are not paid and/or no improvements occur after a reasonable timeframe, the City may then enter into litigation to recoup costs and/or fine under the Bylaw.

In the event of a Sewer Release into the wastewater sewer system where damage to the WWTP or the collection system occurs, additional sampling would be completed within the treatment and collection system to prove where the Sewer Release originated and the sections of the Bylaw that were in violation. The City would then use this information to recoup costs from

the offending party. To date, this form of enforcement has been successful in educating users about the Bylaw and their non-compliance, as well as obtaining compliance and cost recovery.

3.2 WASTEWATER QUALITY MONITORING

To effectively run the collection and treatment systems and track back any Sewer Releases, appropriate monitoring programs must be in place. The City and EPCOR work seamlessly together to monitor and understand Regina's wastewater quality.

EPCOR performs approximately 15,000 analyses per year on routine laboratory testing. The testing includes a combination of regulatory, quality control, process control, and downstream creek samples. Approximately half of the samples are required by the City's contract or regulators, the remaining samples are related to source control initiatives and process control. Additional testing is also conducted when the WWTP experiences influent contamination.

Significant improvements and progress have been made over the years to the City's wastewater quality monitoring. In addition to the samples ECPOR completes, a City wastewater quality program was implemented following the completion of the WWTP upgrades to better understand Regina's wastewater and to monitor the system for potentially harmful substances.

Since inception, the program has evolved from discrete manual sampling to automated sampling at six key locations within the wastewater sewer system, with the added ability to sample at additional locations as required. The permanent locations allow the system to be divided to determine if differences exist between the areas and if those differences need to be further investigated. Sampling at the six permanent locations is completed routinely. Sampling frequency is determined based on the need for the information to make informed decisions, and/or in the event of a Sewer Release to determine the source and potential damage.

Figure 1. Wastewater Sewer Trunks and Associated Sampling Locations

3.2.1 McCarthy Boulevard Pump Station (MBPS)

MBPS receives approximately 95 per cent of the wastewater that enters the WWTP. It is therefore an ideal location to monitor the wastewater before it enters the WWTP to help prevent harmful substances from entering the WWTP. It takes approximately three hours for wastewater from MBPS to reach the valve chamber at the WWTP that is upstream of the treatment process. This delay provides the City with an opportunity to warn EPCOR in the event a harmful substance has been identified at MBPS.

In addition to visual observation completed by the operators at MBPS, the City has implemented a sampling and real-time monitoring location at MBPS to help identify unwanted and harmful substances before they reach the WWTP.

The implementation of the real time analyzers at MBPS occurred concurrently with other upgrades needed at MBPS in 2020/2021. To facilitate the required upgrades the wastewater was routed around the area that has the analyzers, postponing the full implementation of the new system. The MBPS monitoring program, therefore, has not had sufficient time to run since installation to determine its full effectiveness. However, in the short time that it ran, the monitoring equipment was able to help detect harmful polycyclic aromatic hydrocarbons (PAHs) at elevated levels. The City was able to use this information to quickly relay information back to the business that was identified as the cause of the increase and reduce impacts to the WWTP and the WWTP final effluent quality.

More information on the effectiveness of the MBPS wastewater quality analyzers will be provided in the next update.

3.2.2 Hauled Wastewater Station (HWS)

The HWS is a disposal location for commercially-hauled wastewater by permitted haulers. Accepted wastewater comes from construction and excavation sites, septic and holding tanks, and portable toilet and other wastewater holding structures. Users are from both inside and outside Regina city limits. Users and generators must ensure that any IC&I wastewater has City approval before it is disposed at the HWS. Sampling can be conducted on the disposed wastewater to help identify loads that have resulted in contamination. Haulers are monitored using Radio Frequency Identification Device (RFID) Tag, which provides site usage information for billing purposes.

In 2021, Administration communicated with the haulers and generators approximately 50 times to discuss onsite rules, wastewater quality allowances and testing requirements.

3.2.3 Parameters of Concern

There were no parameters of concern documented in 2021 for the HWS.

Identified parameters of concern for the WWTP and collection system in 2021 were anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, naphthalene and pyrene (PAHs) and sulphide.

Appendix A includes the maximum, minimum and average values of the above parameters in the wastewater that enters the WWTP. Benzo(a)pyrene is the only parameter of concern that was also identified as a Reportable Release. For more information on the release to the environment, please see the Annual Discharge and Release Report.

3.2.4 Industrial, Commercial, & Institutional (IC&I) Engagement

In an effort to ensure businesses are aware of their requirements under the Bylaw, and under what conditions surcharges are required, the City conducted an IC&I questionnaire in 2020 and 2021. The questionnaire focused on high water users that were more likely to have an impact on the overall wastewater quality and businesses that may be contributing to metal levels within the wastewater sewer system. Metals were identified through the wastewater quality monitoring program as a potential parameter of concern in previous years. Seventy-two businesses were contacted and provided answers to the questionnaire through multiple conversations with administration. Results identified no major concerns; however, the City will inspect six of the contacted businesses and reassess parameters of concern following those inspections. The objectives are to:

- better understand IC&I wastewater within Regina
- help make informed decisions from a wastewater treatment perspective, but also the effect those decisions can have on businesses within Regina
- further educate businesses as to what is acceptable to put in the wastewater sewer system based on the Bylaw, and how their wastewater can affect the wastewater collection and treatment system
- increase City presence within IC&I businesses through conversations and questions
- increase the effectiveness of the WWTP processes and support regulatory compliance for wastewater
- prevent the release of harmful substances into the wastewater sewer system

The IC&I engagement program works in collaboration with the wastewater sampling results to identify parameters of concern and corresponding businesses that may be the cause. Through public engagement activities such as this questionnaire, businesses become more aware of what type of wastewater they produce and how their wastewater should properly be disposed of or pre-treated so as to not increase costs to the City and the public as a whole.

When a new IC&I business comes through Servicing & Infrastructure Approval, compliance with all bylaws is investigated, including wastewater. Businesses that are flagged as potentially having wastewater that could be detrimental to the wastewater sewer system are required to

pre-treat their wastewater and, if necessary, enter into an agreement with the City. The wastewater is then tested by either the City and/or business in question to guarantee the Bylaw is being met. Businesses that have wastewater that is not detrimental to the public sewer system, but discharge wastewater that costs more to treat are required to pay surcharges based on the heightened parameter and the volume of water.

3.2.5 Wastewater Quality Monitoring Total Costs in 2021

The 2021 total costs for the wastewater quality monitoring activities were approximately $300,000, not including those costs that the City is currently working to recoup. Table 2 provides a cost breakdown for wastewater quality monitoring.

No fines were issued by the court in 2021.

The City identified wastewater in excess of Bylaw parameters in 2021 and the City's investigation concluded that the Co-op Refinery Complex (CRC) had breached the Bylaw. The City advised CRC of this breach and CRC reimbursed the City for one event. The City is currently working to recoup the costs associated with the other events. CRC advised the City that it intends to invest in improved wastewater treatment.

Table 1. Costs associated with harmful wastewater events

Source	Cost	Amount Recouped
2021 Wastewater testing directly downstream of CRC	Still under investigation	
2021 Costs Associated with Harmful Wastewater Events from CRC		
Total Sewer Sampling Costs		

Table 2. Costs associated with the Wastewater Quality program

Source	Cost
Wastewater Source Control Quality Labour Costs	$196,847
Wastewater Source Control Quality Analytical Costs	$53,618
Wastewater Source Control Quality Other Costs	$27,009
Total Sewer Sampling Costs	**$277,473**

* This table does not include costs associated with harmful wastewater events.

Table 3. List of Claims submitted by EPCOR.

Relief Clam	Year	Costs (GST excluded)	Cost Recouped	Cause	Comments
Relief Claim 1	2015	$ -	N/A		Issue during construction. Epcor requested permit relief.
Relief Claim 2	2015	$ -	N/A		Issue during construction. Epcor requested permit relief.
Relief Claim 3	2015	$ -	N/A		Issue during construction. Epcor requested permit relief.
Relief Claim 4	2018	$ -	N/A		Issue during construction. Epcor requested permit relief.
Relief Claim 5	2019	Information relating to this claim is the subject of litigation and will not be disclosed as part of this report.			
Relief Claim 6	2019				
Relief Claim 7	2020	$ 71,789.74	Yes	PROCOR	Feb 2020 hydrocarbon release.
Relief Claim 8	2020	Information relating to this claim is the subject of litigation and will not be disclosed as part of this report.			
Relief Claim 9	2020				
Relief Claim 10	2020				
Relief Claim 11	2020				
Relief Claim 12	2020				
Relief Claim 13	2020				
Change Order 12	2020				
Relief Claim 14	2021	$ 69,196.85	Yes	CRC	CRC had issues with their wastewater treatment process.

3.3 FATS, OILS AND GREASE SOURCE CONTROL

The primary objective of the Fats, Oils and Greases (FOG) Control Program is to reduce sewer overflows and blockages and protect public health and the environment by minimizing public exposure to unsanitary conditions. FOG released to the wastewater sewer system can accumulate along pipe walls, coating pipes until wastewater flow through the line is restricted, causing backups, and blockages. By controlling FOG to the wastewater collection system, sewer surcharge occurrences are reduced and the system operating efficiency is increased. In addition, an effective FOG Control Program can reduce financial liabilities and revenue losses associated with enforcement actions and the associated impacts.

The City has two main approaches to reduce FOG in the system including, 1) education and awareness communications and 2) inspecting restaurants grease traps.

Over the past few years, the City has increased emphasis on sewer blockage prevention through FOG initiatives, including public campaigns to educate the relevant stakeholders on how FOG causes blockages in wastewater collection systems and how to properly dispose of FOG. The campaigns target the relevant stakeholder groups including restaurants, and other industry associations.

The City campaign objectives in 2021 focused on public education related to what substances are acceptable to put into the sewer system to reduce blockages (Prevent the Plug). The total cost to fund the campaign in 2021 was $50,000.

The campaigns were successful through social media performance metrics such as the increased number of website visitors, opinion feedbacks, and click rates in 2021 in comparison to previous years. The increase in number of public participants for the campaigns indicate that the campaign was a success and that funding allotted to educational campaigns are a good use of public funding.

In addition to the public education campaigns, the City also performs regular inspections of restaurants grease traps.

Although the campaigns are starting to reach a wider audience, more work has to be done as the City has not seen a reduction in the number of lift station cleanings required due to grease accumulation and also the ongoing disposal of non-dispersible wipes and rags. Municipalities across Canada are advocating that companies do not label baby or facial wipes as flushable. The wipes may be flushable but they are not dispersible; they do not break down in the sewer system and the City has had instances where wipes and/or rags shut down pumps, as they get entangled on the pumps.

In 2021, due to COVID, many restaurants closed for short durations so grease trap inspections were put on hold. The source control staff were deployed to focus their efforts on investigating cross connections in Harbour Landing and Whitmore Park. A cross connection is when a break or an incorrect tie in results in sewage entering the storm sewer. When issues are observed, more frequent inspections occur. When it becomes evident that the business is non-compliant, an official letter is written and after three such letters the City would take the business to court. To date, the City has not prosecuted generators because the City has been able to achieve compliance with the Bylaw through education and follow up inspections.

3.4 STORM WATER SOURCE CONTROL PROGRAMS

3.4.1 Adopt a Storm Drain Educational Campaign

In addition to all the source control programs that exist for the wastewater system, the City has also recently started an educational campaign for the storm system. The City campaign objectives in 2021 focused on public education to encourage citizen participation to adopt and name a storm drain (Adopt a Storm Drain), and to determine the most effective marketing media to educate and engage citizens. The campaign significantly exceeded its objective and over 700 storm drains were adopted. The City also determined that direct and organic marketing was the most effective marketing strategy. Partial success of the program was seen during the spring melt as storm drains that were cleared reduced the risk of street and property flooding.

The total cost to fund the campaign in 2021 was $20,000.

3.4.2 Industrial and Commercial Storm Source Control

The City has a few main storm sewer source control programs for industrial and commercial businesses:

1. Testing of industrial stormwater ponds before release into the City's storm sewer. Industries with stormwater ponds are required to test the pond water for specific parameters that have the potential to be elevate based on the specific industry. The City reviews the submitted analytical information against provincial guidelines and regulations for surface water and approves discharge if they're met.
2. Businesses that use hydrant carts are required to inform the City what the cart will be used for, how water will be discharged and if the water will be dechlorinated before discharge. This information is required to help reduce the occurrence of chlorinated water from entering surrounding water bodies and having potentially negative effects.

3. Businesses are not allowed to discharge potentially contaminated standing water from construction sites into the storm sewer. They must use the HWS if there is a potential for elevated levels of parameters of concern.

3.4.3 Spring Runoff Sampling

Each spring, the City samples within the creek and the storm sewer system to better understand the effects city winter runoff and the snow storage site has on Wascana Creek water quality. The results of this work help make decisions on the running of the snow storage site and the roadways salting program.

4.0 SUCCESSES AND CHALLENGES

Since the inception of the wastewater sewer source control program, there have been many successes. The major ones are listed below.

- The line of communication in regard to wastewater between the City and its businesses improved.
- IC&I achieved a greater understanding of the wastewater bylaw, their wastewater and the impacts it can have on the sewer system.
- Although the MBPS analyzer was only available for use for a short period, it was able to help identify high PAHs. The information was then used to reduce impact to the treatment system.
- The City is in a good position to not only identify, but also track down Sewer Releases and recoup costs. Multiple Sewer Release have been identified and the source confirmed. Before the program, when issues at the WWTP occurred, there were no means to identify why the issues were occurring or what may be causing them. This process has led to increased efficiency at the WWTP.
- The City's source control program has become a regular name within food service establishments and an improved working relationship with property management companies, and maintenance personnel in hospitals, has occurred.
- Educational campaigns have reached a large portion of Regina and have helped educate residents on what can and can't go down the drain.

Although the programs have seen many successes, there are still challenges within the program. The wastewater sewer and the treatment of wastewater is a large, complex system that is constantly changing and is different for each municipality. The main limitations to the programs are listed below.

- Workforce Optimization - allow staff to specialize and streamline source control operations. By enabling teams of staff to focus resources on similar issues, we will be able to better monitor and control our levels of service. This includes increased funding to add on more staff to be trained to conduct inspections and to do checkups on a regular basis for compliance.

    - The 2022 budget allowed for the hiring an additional FOG Inspector and two support staff. Additional staff will allow the program to start garage sump inspections in addition to restaurant inspections.
    - The additional senior position identified in CR21-131 regarding this report, the Water Quality Advisory Committee and helping implement environmental enforcement efforts will require an additional permanent senior position to oversee the work and implement new environmental strategies.

- There have not been a reduction in cleanings that need to be performed to remove FOG from the wastewater sewer system following the “Don’t Abuse the Sewers” communication campaign and restaurant inspections. The “Don’t Abuse the Sewers” was an educational campaign that told residents what not to put down the drain. Discussions on next steps are currently underway to help improve the situation and determine if more targeted communication tactics and other enforcement options may result in increased results.

- Technology. Real time analyzers for all parameters of concern do not exist. Correlations and trends must be reviewed by trained staff to understand much of the information. Further, test results from external laboratories takes up to two weeks to receive, limiting the ability to quickly act in specific situations.

Although the source control programs have challenges, the improvements and successes over the last years highlight the importance of the programs and the need for them to continue to grow and reach more industrial, commercial and institutional businesses and individual residents to improve overall wastewater, while maintaining economic development.