
Subject: Comprehensive report on the recovery of the Crystal Beach Wastewater Treatment Plant after Winter Storm Elliott

Report to: Public Works Committee

Report date: Tuesday, July 11, 2023

Recommendations

1. That report PW 26-2023 be **RECEIVED** for information.

Key Facts

- The purpose of this report is to inform the Council on the actions taken in response to the raw sewage spill that occurred at the Crystal Beach Wastewater Treatment Plant (WWTP) during Winter Storm Elliott.
- The wastewater treatment plant lost both utility power and, later, emergency power during the storm. Without power, sewage pumping stopped, which resulted in the discharge of sewage to Lake Erie via the storm sewer system between Dec 25 and 27, 2022.
- Staff have instituted a number of preventive and corrective actions to reduce the likelihood of this type of spill occurring at this location.
- Staff have also implemented new protocols to provide more notification to the Council and the public in the event of any future spills Region-wide.

Financial Considerations

Expenditures related to the repairs at the Crystal Beach WWTP were managed within the budget at an overall approximate cost, including future preventative measures, of \$215,020. Within the overall cost, the cost of repairs to resume operations were approximately \$71,020. The fuel costs for running diesel and natural gas generators during the utility power outages in Port Colborne and Fort Erie was approximately \$16,705 as noted in Appendix 1 to Report PW 26-2023.

Analysis

Details on the impact of Winter Storm Elliott on the Crystal Beach WWTP in December 2022 have been communicated to various Committees and Council over the past months. In response to information requests from councillors, a more comprehensive report has

been prepared to detail actions taken by the Water & Wastewater (W-WW) Division since the incident in December.

Questions asked by council members:

- Provide information respecting the difference between a spill and a discharge

The Environmental Protection Act defines a spill as:

“spill”, when used with reference to a pollutant, means a discharge,

(a) into the natural environment,

(b) from or out of a structure, vehicle or other container, and

(c) that is abnormal in quality or quantity in light of all the circumstances of the discharge,

and when used as a verb has a corresponding meaning;

The discharge from the Crystal Beach WWTP due to a pump failure is classified as a spill as it was abnormal in quality (untreated sewage was released), and quantity (a large amount was released) and was an abnormal event (sewage is not normally released without treatment). In contrast, overflow events (discharges in wet weather) are not defined as spills since more flow enters the plant than it is designed to treat and any discharge that occurs is by design.

- Provide information respecting the cost of repairs required to resume operations at the WWTP

This is detailed in the Financial Section of this report and in Appendix 1.

- Provide information respecting the City of Hamilton's process for publishing all spills and discharges on a dedicated public website, updated weekly (CL-C 11-2023).
Councillor Gale.

This is answered later in this report.

- Provide information respecting best practices for notifying Regional Council of spills/discharges that align with Section 19 of the Safe Water Drinking Act (CL-C 11-2023). Councillor Gale.

This is detailed later in this the report. The regulatory requirements of the Safe Drinking Water Act and Duty of Care pertain to Drinking Water Systems and not Wastewater Treatment Systems or spills. There is no requirement in the wastewater regulations to notify Council of spills, however there are requirements to report spills and overflows to the Ministry of Environment, Conservation and Parks (MECP) and the Medical Officer of Health. As a best practice, the Division is now notifying Council of spills as detailed in this report.

Staffing Levels at the Crystal Beach WWTP:

The Wastewater Operations section has 11 wastewater treatment facilities and a biosolids management facility. The section is divided up into three administrative areas (Areas 1, 2 and 3). The Crystal Beach WWTP is part of wastewater Area 2 which also includes the Seaway and Welland WWTPs. The Seaway and Welland WWTPs were staffed 24/7 while the Crystal Beach WWTP was staffed only during regular business hours. For Crystal Beach WWTP, one licenced operator would be present, in-person, on weekdays from 7:00 a.m. until 3:00 p.m. After hours and on holidays and weekends, operating staff from the Seaway WWTP in Port Colborne would remotely monitor the Crystal Beach WWTP using the Region's SCADA system. Staffing levels could be increased at the Seaway or Welland WWTPs in the event that a heavy rainfall event was forecasted. The extra operator on shift at the Seaway WWTP could then be dispatched to the Crystal Beach WWTP if needed to respond to situations in the collection system or alarms received from the plant.

In 2023, the staffing hours in Area 2 were adjusted so that more in-person operator coverage was given to the Crystal Beach WWTP. The objective has been to try to staff the plant up to 8 hours per day, 7 days per week (including holidays) without an increase to staff complement in Area 2. However, the staffing levels in Area 2 can fluctuate depending on unplanned absences, training, vacation time etc. When this occurs, staffing is maintained at Seaway and Welland 24/7 and an operator will be sent to Crystal Beach at least once per day to monitor the plant in-person. Monitoring through SCADA by the Seaway operators will occur when there is no operator present on-site at Crystal Beach. If a severe weather event is forecasted, an operator will be on-site at the Crystal Beach WWTP for the duration of the event.

Due to Climate Change, there is an increase in the frequency of intense weather events and the Division has recognized a need to increase staffing at all wastewater plants in general and give more attention to remotely monitored facilities

Communications - Mobile Phones/Radios:

After the difficulties making contact with operators and maintenance staff due to cellular phone disruption with the current provider, the Region requested that W-WW staff and plant cellular phones have the “roaming” feature enabled. This will allow staff to connect to another available cellular provider in the event the signal with the primary provider is not available. During the storm, the cell tower in Ridgeway that provides a Rogers cell service was damaged. As Rogers is the Region’s cellular provider, this meant that all cell service in the area was lost or only available intermittently. Communicating with staff enroute to plants in bad weather was difficult. Cell phones will be kept set “not to roam” by default to save on roaming fees but in the event the primary provider signal is out, other providers can now be selected to ensure staff have the best possible access for cellular service during emergencies. Management reviews cellular charges on a monthly basis.

Staff are also investigating purchasing two-way radios for use in the plants to allow communication with other Regional staff in Public Works or staff in other municipalities in the event of an emergency.

Snow Removal-Plant Access:

The Division has made contact with the Town of Fort Erie to ensure that the Town snow removal contractor is aware that the Rosehill Water Treatment Plant (WTP), Anger Avenue WWTP, Stevensville-Douglastown Lagoon and Crystal Beach WWTP should be given priority during a severe snowfall event. In addition, the Niagara Parks Commission will be contacted to ensure that the entrance to the Anger Avenue WWTP from the Niagara Parkway is given priority snow clearing when storms are forecasted.

Spill and Overflow reporting to Council and Public:

Beginning on May 19, 2023, staff began reporting spills to Council through memos included in the Council Weekly Correspondence Distribution (CWCD) package. CWCD 2023-99 was the first such report. The CWCD is posted on the Region’s website and is available to the Public. The Division has been reporting similar information as part of its annual Quality Management System reporting to Council.

Staff currently report combined sewage overflows (CSOs) to the public via its website and that site is updated on a quarterly basis. Staff are working on several initiatives that will improve the frequency of overflow and spill reporting. A web-based map similar to what is being done by the Cities of Kingston and Hamilton is being developed to provide near

real-time reporting of overflows. In order to make this possible, over a dozen CSO locations require meters to be installed or upgraded. In addition, CSO and SSO (sanitary sewer overflow) locations will be identified by signage at or near the location of the overflow. New requirements in the wastewater system's Environmental Compliance Approvals have been added by the MECP and the signage is now required to be installed by September 21, 2025. Funding has been made available from the MECP for some of this work but there is a significant amount of work required to get this initiative in full operation. The funding deadline for the work to be completed is March 2024. Staff will keep Council and the public informed once these initiatives are completed and the site is operational.

City of Hamilton Public Reporting:

Staff reviewed the City of Hamilton's Sewage Spill reporting website. The City of Hamilton had extensive media coverage in November 2019 for some high-profile sewage spills into Chedoke Creek that had been ongoing for several years without notification of the public. In response to this criticism, the City developed a web-based CSO and bypass reporting system whereby sewage overflow and spill events could be graphically reported in real time. By accessing the website, residents can see a map of active overflows to the environment within the City of Hamilton. This map does not include information of non-sewage spills however.

Protection of source water from impact of sewage spills:

Staff reviewed the locations of overflows and potential bypass locations at the 11 Wastewater Treatment Plants (WWTP) and reviewed the Source Protection Plan for the six Water Treatment Plants (WTP). According to the plan, the WTPs that require significant threat policies are Decew WTP, Niagara Falls WTP, Welland WTP and Port Colborne WTP. The Rosehill WTP does not require a significant threat policy.

Crystal Beach WWTP/Rosehill WTP: The normal effluent discharge location from the Crystal Beach WWTP is located 300 metres into Lake Erie. The outfall sewer is buried in the lake bottom and has several diffusers at a depth of approximately 4.7m. The raw water intake for the Rosehill Water Treatment Plant is located 457 metres into Lake Erie at a depth of approximately 2.7 metres. From point to point, the distance between the Crystal Beach WWTP outfall area and the Rosehill WTP intake is approximately 6.8 km.

The source protection authority, which is the Niagara Peninsula Conservation Authority (NPCA), produced the Source Protection Plan for the Region. The plan contains intake

protection zones (IPZ) around all the Region's WTP intakes. Within the intake protection zones, threats to drinking water were assessed and scored. The Crystal Beach WWTP effluent outfall is within IPZ-2 of the Rosehill WTP. The Crystal Beach WWTP overflow location (where the December spill occurred) is outside IPZ-2. According to the Source Protection Plan, none of the IPZs for the Rosehill WTP contains significant drinking water threats.

In light of the Crystal Beach Wastewater Treatment Plant spill being to the storm sewer just outside the IPZ, the NPCA was contacted for additional comment on the potential threat. In response, the NPCA confirmed that the outfall from the plant was taken into consideration when determining the vulnerability scoring of significant threats to drinking water but it did not score high enough to be declared a significant threat. However, the NPCA recommended that, even though the spill occurred outside of IPZ-2, it would be a good practice for the operators of the WWTP to notify the operators at the Rosehill WTP anytime there is a bypass or spill.

Taking action on this comment, the Division has revised its spill reporting protocol for the Crystal Beach Wastewater Treatment Plant to include notifications to the operator at the Rosehill WTP and Public Health in the event of any spill in the system, whether within the IPZ or not. Public Health will determine if notification of the public is required.

Alternatives Reviewed

None. Not applicable.

Relationship to Council Strategic Priorities

This recommendation relates to Objective 1 -An Effective Region – Implement Continuous Improvement. Through debriefs, root-cause analysis and implementation of preventive actions, the Region ensures that the impacts of severe weather are lessened.

Other Pertinent Reports

- [CL-C 11-2023 Sewage Spill – Crystal Beach WWTP-December 25, 2022](https://pub-niagararegion.escribemeetings.com/Meeting.aspx?Id=9e186089-275e-4553-91a6-7de1ae06bca2&lang=English)
(<https://pub-niagararegion.escribemeetings.com/Meeting.aspx?Id=9e186089-275e-4553-91a6-7de1ae06bca2&lang=English>)
- [AC-C 6-2023 Impact of Winter Storm Elliot on the Crystal Beach WWTP](https://pub-niagararegion.escribemeetings.com/Meeting.aspx?Id=84931c07-f172-40d8-8924-b9d747005648&Agenda=Agenda&lang=English&Item=20&Tab=attachment)
(<https://pub-niagararegion.escribemeetings.com/Meeting.aspx?Id=84931c07-f172-40d8-8924-b9d747005648&Agenda=Agenda&lang=English&Item=20&Tab=attachment>)

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Appendices

Appendix 1 Costs related to use of generators during Winter Storm Elliott

Winter Storm Elliott 2022 - Wastewater Generator Fuel Costs

Facility Name	Address	Municipality	Hours	Fuel Type	Generator Size (kW)	Est Fuel Consumed (Diesel =L, Nat =m3)	Estimated Fuel Cost (\$)
Crystal Beach WWTP	500 Ridgeway Rd	Fort Erie	33.0	Diesel	750	2452	\$4,058.00
Shirley Rd SPS	120 Shirley Rd	Fort Erie	79.6	Natural gas	30	191	\$58.00
Erie Rd SPS	4474 Erie Rd	Fort Erie	100.7	Natural gas	18.5	424	\$114.00
Nigh Rd SPS	3828 Nigh Rd	Fort Erie	88.6	Diesel	45	400	\$662.00
Fretz SPS	185 Johnston St.	Port Colborne	0.4	Natural gas	80	3	\$1.00
Arena SPS	52 West Side Rd	Port Colborne	117.4	Diesel	90	450	\$745.00
Sugarloaf SPS	274 Sugarloaf St	Port Colborne	70.4	Natural gas	35	78	\$22.00
Elm St. SPS	137 Princess St	Port Colborne	38.0	Diesel	250	1000	\$1,655.00
Rosemount South SPS	42 Bayview Lane	Port Colborne	55.8	Natural gas	42	81	\$23.00
Rosemount North SPS	101 Rosemount Ave	Port Colborne	55.8	Natural gas	60	299	\$84.00
Anger WWTP	1 Anger Ave	Fort Erie	5.6	Diesel	750	696	\$1,151.00
Alliston Ave. SPS	900 Garrison Rd	Fort Erie	9.7	Diesel	400	585	\$970.00
Thompson Rd. SPS	1800 Thompson Rd	Fort Erie	3.1	Diesel	900	228	\$378.00
Lakeshore Rd. SPS	14A Lakeshore Rd	Fort Erie	129.5	Natural gas	60	463	\$130.00
Catherine St. SPS	8 Catherine St	Fort Erie	37.0	Diesel	85	769	\$1,274.00
Rose Ave. SPS	821 Edgemere Rd	Fort Erie	1.3	Diesel	60	6	\$9.00
Bardol SPS	725 Lakeshore Rd	Fort Erie	0.4	Diesel	60	2	\$3.00
Dominion Rd. SPS	1027 Dominion Rd	Fort Erie	74.6	Diesel	350	3006	\$4,976.00
Stevensville SPS	2550 Winger Rd	Fort Erie	53.3	Diesel	60	238	\$395.00

TOTAL \$16,705.00

Note: Diesel cost excludes HST

Note: Natural Gas costs excludes monthly services fees

Note: Diesel cost \$1.6551 per litre, Natural Gas cost \$0.26 - \$0.30 per cubic meter