Niagara Region

Public Works
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MEMORANDUM

AC-C 7-2023

Subject: Garner Road Biosolids Facility Forcemain Operation

Date: March 27, 2023

To: Audit Committee

From: Robert Daw, Associate Director, Wastewater Operations Maintenance & Lab Services

This memo was prepared in response to a question from Councillor Gale as to the operation of the Garner Road Biosolids Facility forcemain and trucking activity from the site.

The Garner Road Biosolids Facility is located on Chippawa Creek Rd. in Niagara Falls. The site receives sludge from the wastewater and water treatment plants operated by Niagara Region and processes it for eventual use as a fertilizer. The sludge is received by tanker trucks from the various water and wastewater facilities six (6) days per week.

The site consists of 10 clay-lined storage lagoons, two (2) storm water ponds, three (3) above ground storage tanks and two (2) dewatering centrifuges. The site operates under an approval from the Ontario Ministry of the Environment, Conservation and Parks (MECP). Approximately half of the sludge collected on site is thickened, by gravity, in the storage lagoons for eventual liquid land application on agricultural fields. The other half of the material is dewatered using the on-site centrifuges to create a dewatered cake that is trucked off-site for lime stabilization for use as a solid fertilizer.

The site activities produce wastewater in the form of centrate (from the dewatering), supernatant (from the lagoon thickening operation) and storm water (from precipitation falling on the lagoons). This water must be removed from the site on a regular basis to prevent the lagoons from overflowing.

Historically, this water was trucked off site by the same contractor that delivered the solids to the facility. The centrate, stormwater and supernatant was delivered back to the wastewater treatment plants. When the City of Niagara Falls constructed a sewage pumping station close to the Garner Road facility, staff examined the possibility of connecting a pipeline from the biosolids facility to the new sewage pumping station. In 2012, a 1.3 km pipeline was constructed and put in service and the centrate,

supernatant and stormwater from the site was discharged to the sewer system at a significant cost savings to the biosolids operation.

The original sewage pumps installed at Garner Road were designed to discharge approximately 24 litres per second to the forcemain. Over time, staff noted a decrease in pumping efficiency (less flow being discharged). It was determined that the forcemain flow was being restricted by the accumulation of lime scale from the high calcium, magnesium and other components present in the wastewater stream. Contractors were hired to try to clear the pipeline by rodding and flushing. These techniques were limited to approximately 200 metres from the ends of the pipe and were only partially successful at increasing flow.

In 2022, flows through the pipeline were reduced to less than half the design flow rates. Another cleaning was attempted and a CCTV camera was used to determine the nature of the partial blockages. Some testing was performed and a chemical product was selected in an attempt to dissolve the scale. After the chemical addition, the flows increased from five (5) litres per second to approximately 12 litres per second but the flow was still considered too restrictive. Another contractor was hired to cut into the forcemain in targeted areas where large amounts of debris were detected by the CCTV camera. This clearing did not produce significant improvements in flows.

Due to the restrictions in pumping capacity, lagoon levels increased faster than water could be removed. A request to increase the operating levels (freeboard) of the lagoons was submitted to the MECP in accordance with the facility's environmental compliance approval (ECA). The "emergency condition" was accepted which allowed the facility to continue operating with more water being stored in the lagoons. Trucking was needed to ensure that the lagoon levels were still being kept within the requirements of the freeboard limit. The facility continues to operate under this emergency approval using pumping (with the restricted capacity of the forcemain) and trucking excess stormwater, supernatant and centrate off-site to the various wastewater treatment plants. This is not a desirable situation to be in and staff are working to minimize the impact of this extra water on the receiving facilities.

In 2022, approximately 15,000 cubic metres was trucked off site at a cost of approximately $116,000. In 2023, approximately 25,000 cubic metres have been trucked off site. A quantity of 60,000 cubic meters have been budgeted for until capacity can be restored.

The amount of water needed to be removed from site is dependent on many factors including rainfall, land application of biosolids and incoming sludge requiring storage. It is estimated that about 8,000 to 9,000 m3/week must be removed from the site. The forcemain is restricted to approximately 10 litres per second due to its current condition. If operated 24/7, approximately 6,000 m3 per week of wastewater can be pumped to the sewer system (about the equivalent 138 truckloads). Therefore, until the pumping improves, approximately 2,000 to 3,000 m3/week of water (45-70 trucks) has to be trucked from the site. The cost of trucking is approximately $8.50/m3, so the extended cost is roughly $25,000 per week.

In late 2022, a consultant was retained to review the forcemain construction and issues related to the scale buildup. The consultant is recommending the construction of a new forcemain, which would be directed right to the sewage pumping station. The new alignment will provide more capacity in the forcemain. By directing the flow to the station instead of the gravity sewer, the flow in the local sewer system will be reduced. This will free-up capacity for planned developments in the south Niagara Falls area.

Until a new forcemain is constructed or the current forcemain restrictions are removed, the Region will continue to require trucking for wastewater from this site in addition to the pumping through the restricted forcemain.

Respectfully submitted and signed by

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Robert Daw, C.Tech
Associate Director, Wastewater Operations, Maintenance & Lab Services