Subject: 2020 Reserve Water and Wastewater Treatment Capacities

Report to: Planning and Economic Development Committee

Report date: Wednesday, April 14, 2021

Recommendations

1. That Report PDS 20-2021 **BE RECEIVED** for information; and
2. That Report PDS 20-2021 **BE CIRCULATED** to the Ministry of the Environment, Conservation and Parks and Local Area Municipalities.

Key Facts

- The purpose of this report is to inform Council of the reserve treatment capacities at Niagara's Water and Wastewater Treatment facilities. This reporting is required by the Ministry of Environment, Conservation and Parks (MECP).
- The data contained in this report assists in commenting on new development proposals and related servicing as well as planning for future treatment capacity.
- All of Niagara Water Treatment Plants (WTPs) and Wastewater Treatment Plants (WWTPs) are positioned to accept growth beyond the minimum 10 year horizon.

Financial Considerations

This report provides Council with historical and projected treatment capacity and flow data. There are no direct financial implications in receiving this report.

The reserve treatment capacities at the water and wastewater (W&WW) facilities are considered in commenting on new development proposals and related servicing and, as a result, could result in a financial impact related to specific future applications.

Analysis

The Infrastructure Planning and Development Engineering section of Planning and Development Services Department annually reports on an assessment of the average daily W&WW flows based on the previous five years, as recorded at our various facilities compared to MECP rated capacities for the facilities. Included in the analysis are the 10-year growth projections in accordance with Niagara 2041 *(How we Grow, Flow and Go).*

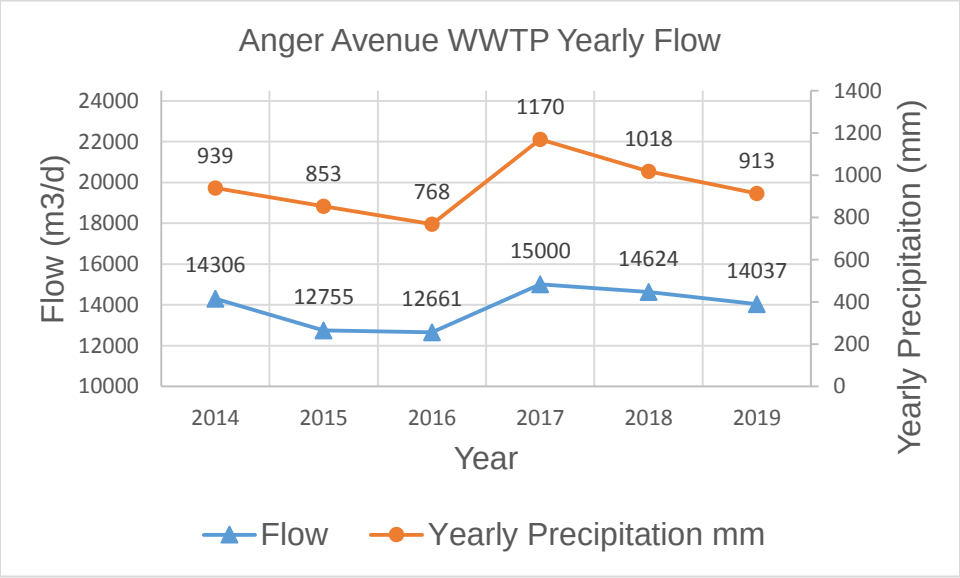
A key objective of this report is to highlight potential capacity constraints and allow sufficient lead time to plan for future capacity increases through the W&WW capital programs so that development may continue unencumbered. This is a 'desktop' exercise, which compares five-year (annual) average flows to the respective MECP Environmental Compliance Approval(s), formerly known as Certificate of Approval(s) for each facility, then incorporates 10-year growth forecasts into the calculation. Ongoing phasing and staging strategy works with our local municipal partners will further refine this assessment for understanding development capacity.

This assessment does not reflect specific compliance, quality, sustainability, risk, or operational deficiencies at the treatment plants or trunk conveyance/transmission systems, which may affect the Region's ability to approve new development or permit servicing extensions.

For municipal wastewater treatment, weather is the key factor that results in peak wet weather flows, which impacts the collection and trunk sewers in both local and regional systems through "Rainfall Derived Inflow and Infiltration" (RDI&I). Even though, it is expected to record higher flows due to population growth, the annual average daily flows to the WWTPs are higher due to the wet weather flows entering the systems.

Just for an example, Figure 1 illustrates a direct correlation of wastewater plant flows and yearly precipitation at Anger Avenue WWTP.

Figure 1: Correlation of Wastewater Flows with Precipitation



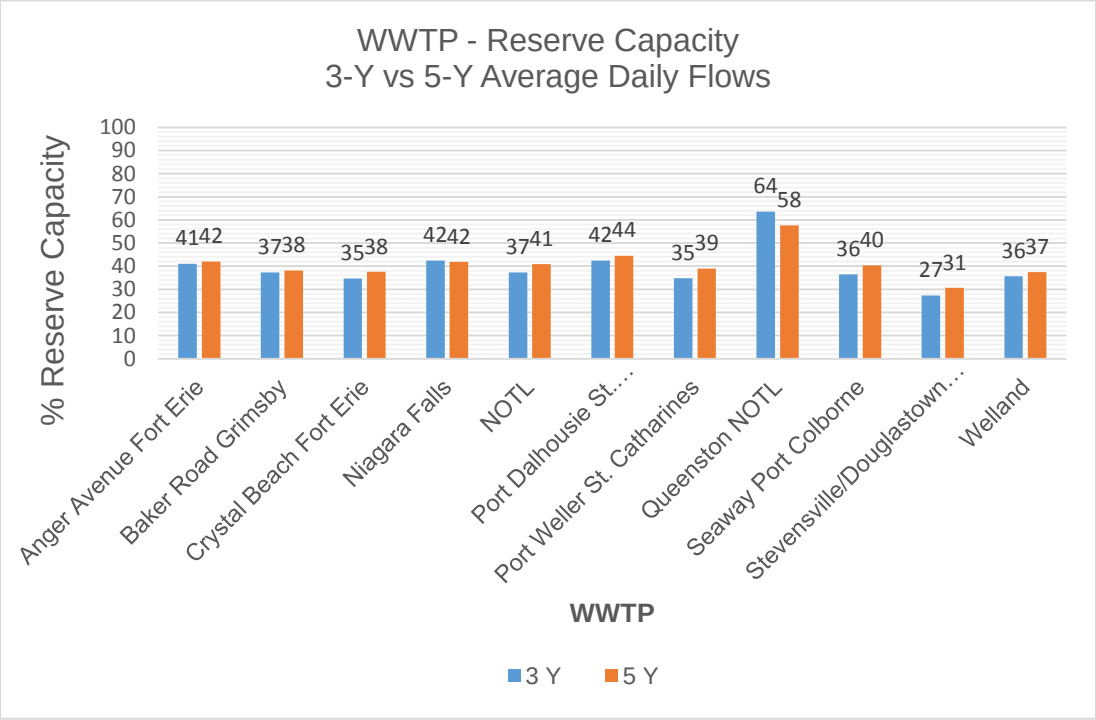
Wet weather flows can have substantial impact on available WWTP capacities and a direct impact on the limitations of available servicing capacity for future growth.

Appendix 1 and 2 provide the annual average daily flows from 2016 to 2020 as well as the three-year and five-year averages for the water and wastewater treatment plants, respectively. Appendices 3 and 4 provide a summary of Niagara's six water treatment facilities and eleven wastewater treatment facilities presenting their respective reserve capacities.

It is worth noting that the greater growth rates in recent years in Niagara show a more consistent increase in flows over the last few years, which consequently can impact the way this 'desktop' exercise conducts the reserve capacity calculations. If the annual daily flows are averaged over longer period of time, it can potentially create a skewed sense of greater reserve capacity. Therefore, an analysis of the three-year and five-year annual average daily flows for reserve capacity was completed to better understand this potential impact.

As shown on Figure 2 below, in general, the three-year average of Reserve Capacity for WWTP were slightly less than the five-year (expect for Queenston NOTL WWTP); however, this was not a significant difference.

Figure 2: Reserve Capacity – Annual Flows Averaged over 3-Year and 5-Year Period



Going forward, the annual average daily flows over the last 3-years and 5-years will be compared and analyzed to understand if a more significant difference in Reserve Capacity develops.

At present, all of Niagara's WTPs and WWTPs are positioned to accept growth beyond the minimum 10-year period (Appendix 3 and Appendix 4).

Wet Weather Management

In order to accommodate the anticipated growth from Niagara 2041, the 2016 W&WW Master Servicing Plan (MSP) investigated capacity upgrades (upgrades to trunk sewers, pumping station capacities, etc.), upstream management (storage, peak shaving, diversion), and peak flow management (flow reduction, Inflow & infiltration (I&I) reduction projects) for every wastewater system. Based on this review, there are wet weather projects listed with identified areas for targeted I&I removal to offset the requirement to upgrade and expand more expensive infrastructure all the way to the WWTPs. It is crucial to achieve the I&I reductions in order to offset the capacity needs from growth, to protect the environment, and mitigate potential basement flooding.

The Region and Area Municipalities are continuing to work collaboratively to facilitate ongoing development throughout the region and provide the requisite servicing and capacity allocation in a responsible way to service the communities.

In addition, the Region has been aiding Area Municipalities by funding the CSO Control program as a part of the overall Wet Weather Management Strategy to support various I&I related projects and programs on the municipal side. This program has been reducing the impacts of I&I and has been a benefit to both, the Region and the Area Municipalities.

Staff is working with the Development Industry including Public Works Officials, Building Officials, Developers, Consultants and Contractors to raise awareness on the wet weather management issues and potential upcoming changes to address this. The Region is also represented at the Expert Stakeholder Committee (ESC) for the *Guideline to Undertaking Flow Monitoring of New Construction* and will work with all stakeholder to review the flow monitoring of new subdivisions as mandatory.

Alternatives Reviewed

No alternatives were reviewed for this report.

Relationship to Council Strategic Priorities

The report aligns with Council's Priority of Responsible Growth and Infrastructure Planning by highlighting the reserve capacity available to growth at all Regional Water and Wastewater Treatment Facilities.

The report also provides MECP and local municipal partners operational summary and reserve capacity projections for Region's Water and Wastewater Treatment facilities

Other Pertinent Reports

- PDS 13-2020, April 8, 2020, 2019 Reserve Water and Wastewater Treatment Capacities
- PW 22-2017, May 30, 2017, 2016 Water and Wastewater Master Servicing Plan Update

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Appendices

Appendix 1 Annual Average Daily Flow 2016 to 2020 WTP

Appendix 2 Annual Average Daily Flow 2016 to 2020 WWTP

Appendix 3	Water Reserve Capacity Calculations for 2020
Appendix 4	Wastewater Reserve Capacity Calculations for 2020