
Subject: 2021 Reserve Water and Wastewater Treatment Capacities

Report to: Planning and Economic Development Committee

Report date: Wednesday, April 6, 2022

Recommendations

1. That this Report **BE RECEIVED** for information; and
2. That this Report **BE CIRCULATED** to the Ministry of the Environment, Conservation and Parks and Local 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. 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.

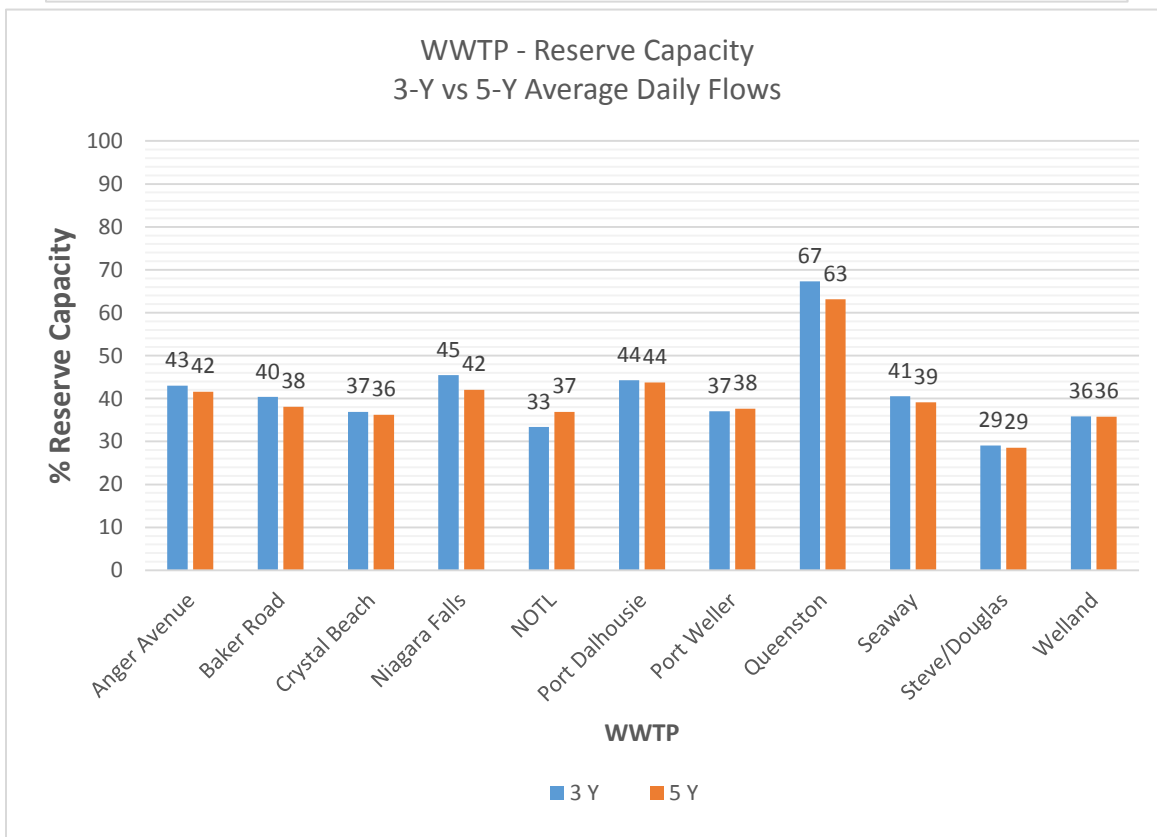
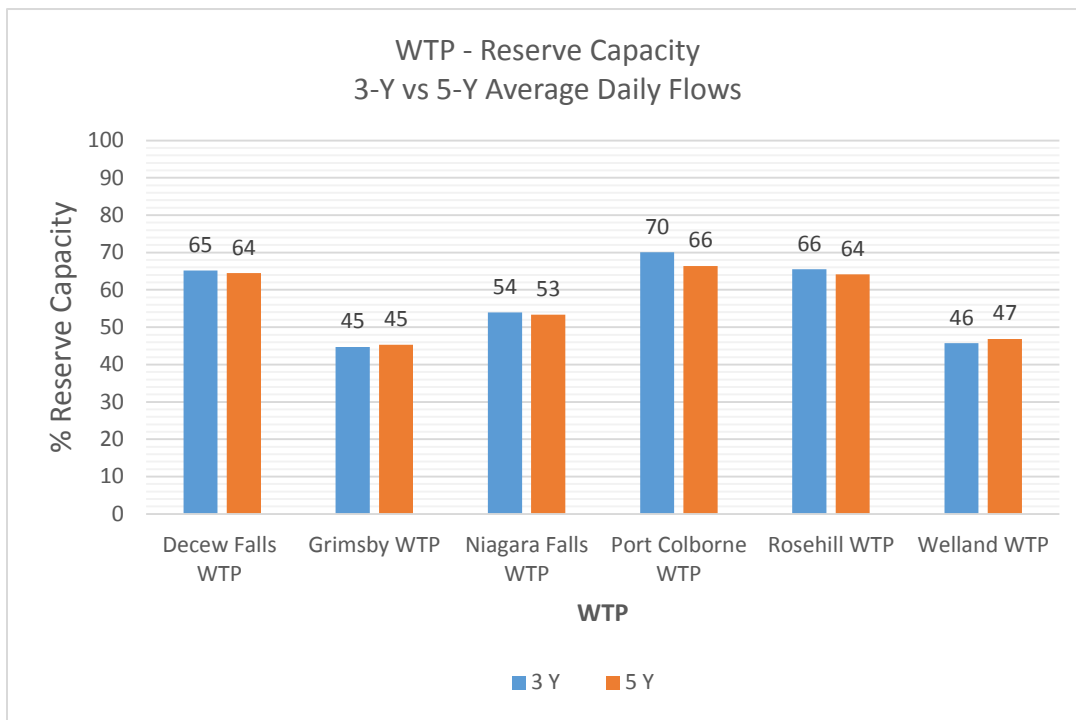
For municipal wastewater treatment, weather is the key factor that results in peak wet weather flow, which impacts the collection and trunk sewers in both local and regional systems through "Rainfall Derived Inflow and Infiltration" (RDI&I). Wet weather flows can have substantial impact on available 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, five and three-year average flows from 2017 to 2021 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 growth rates in recent years show an increase compared to time before, which consequently can affect the way this desktop exercise conducts the reserve capacity calculations. This can create a skewed sense of a greater reserve capacity available for the future if the annual daily flows are averaged over longer period. With a higher growth rate seen recently in the Region, it would be expected that Reserve Capacities averaged over a 3-year period are less than averaged over a 5-year period. Due to COVID over the last 2 years, there may have been some impacts on flows. However, averaging daily flows over a 5-year period versus a 3-year period in the Reserve Capacity calculations for 2021 does not show a compelling difference or significant trend.

Figure 1 shows a comparison of the percentage of remaining reserve capacities for WTPs and WWTPs when daily flows are averaged over the last 3 and 5 years.

Figure 1: Reserve Capacity – Annual Flows Averaged over 3-Year and 5-Year Period



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 Local 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 Local 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 Local Municipalities.

The available funding for the 2022 CSO Control Program has been fully utilized and subscribed with applications from the Local Municipalities. A future report on the 2022 CSO Control Program is anticipated to be presented to the Planning & Economic Development Committee in the next month.

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 stakeholders to move forward with a consistent approach for the review the flow monitoring of new subdivisions.

New South Niagara Falls Wastewater Treatment Plant

Although this report identifies there is short term capacity available at the existing Niagara Falls WWTP, it only considers the treatment capacity at the plant for the next 10 years. It does not consider the constraints in the existing sanitary collection system, wet weather flow issues, consideration for development demands and longer term growth, or the required infrastructure improvements to get the flows to the plant.

As part of Niagara 2041, there was an update to the Water and Wastewater Master Servicing Plan (MSP). Niagara Region retained GM BluePlan Engineering Ltd. (GMBP) to review, evaluate and develop water and wastewater servicing strategies for all servicing within the urban areas of the Region. The MSP Update used updated population and employment growth forecasts based on a 2041 planning horizon. Niagara Region is now working on the current 2021 MSP Update which is looking at potential growth out to 2051. Based on the Niagara 2051 planning review, the implementation and timing of the preferred solution for the new South Niagara Falls Wastewater Treatment Plant and Servicing Solution (SNF Servicing Solution) continues to be supported and is necessary to accommodate growth.

In Niagara Falls, there is not enough capacity in the existing sewer system nor at the existing treatment plant to meet the increasing system demands resulting from growth as well as the increased wet weather flows due to aging infrastructure and climate change. The SNF Servicing Solution is essential to unlocking the development potential in the broader South Niagara area. The ability to redirect existing flows to the south, provide additional capacity in the new trunk sewer, provide flexibility for storage in the trunk sewer, and ultimately treat the wastewater flows at the new WWTP all contribute to a significant wet weather management program. In addition, the location of the new WWTP will provide flexibility for the potential for additional wet weather management through potential connections of other service areas such as Chippawa. Through the analysis undertaken as part of the Class EA process, it is estimated that the new South Niagara Wastewater Solutions strategy, will result in a reduction of over 60% of wet weather volume overflow to the environment.

This new WWTP is integral to the overall growth servicing strategy that supports the anticipated residential and employment growth in the Niagara Falls, NOTL, and Thorold South service areas. This total growth is estimated to be over 75,000 people and jobs in the area out to the year 2051 with the new WWTP servicing approximately half of this growth along with the existing residents and businesses in South Niagara Falls and Thorold South. The new WWTP and collection system strategy is also considering

potential long term growth beyond 2051. The capital program to support the new WWTP will provide greater flexibility for development servicing in St. Catharines, Niagara Falls, Thorold, and Niagara-on-the-Lake.

Alternatives Reviewed

An alternative to use a 3-year average daily flow in the reserve capacity calculation was reviewed. Since no significant difference or trend was found for the 2021 Reserve Capacity calculations, a 5-year average daily flow continued to be used.

Relationship to Council Strategic Priorities

The report aligns with Council's Priority of Responsible Growth and Infrastructure Planning by highlighting the reserve capacity available for 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

- PW 39-2021, September 9, 2021, South Niagara Falls Wastewater Treatment Plant – Budget and Property
- PDS 22-2021, April 14, 2021, 2020 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 2017 to 2021 WTP
Appendix 2	Annual Average Daily Flow 2017 to 2021 WWTP
Appendix 3	Water Reserve Capacity Calculations for 2021
Appendix 4	Wastewater Reserve Capacity Calculations for 2021