
Subject: South Niagara Falls Wastewater Treatment Plant Update

Report to: Committee of the Whole

Report date: Thursday, September 3, 2020

Recommendations

That the capital projects associated with the new South Niagara Falls Wastewater Treatment Plant **BE REFERRED** to Budget Review Committee of the Whole for consideration as part of the 2021 budget process

Key Facts

- The purpose of this report is to inform Council of the project status, provide an updated budget estimate for the capital projects associated with the new South Niagara Falls Wastewater Treatment Plant (SNF WWTP), and ask Council to refer the consideration of these projects with the 2021 Capital Budget
- The new South Niagara Falls WWTP was recommended from the 2016 Water and Wastewater Master Servicing Plan (MSP) Update and endorsed by Regional Council on June 8, 2017.
- The financing strategy for the SNF projects can accommodate a 2% rate increase for 2021 and with a 5.15% increase from 2022 – 2028.
- GM BluePlan Engineering Ltd is completing the Schedule 'C' Class Environmental Assessment (Class EA) for the program and is continuing to refine the recommendations from the MSP.
- The Class EA study is developing a holistic wastewater program to address not only the new wastewater treatment plant but also, major trunk sewer extensions, sewage pumping stations, and the overall wastewater strategy for Niagara Falls, and for parts of the City of Thorold. The holistic wastewater program will provide benefit to Niagara Falls, Thorold as well as Niagara-on-the-Lake and St. Catharines.
- In March 2020, the Region presented the selected preferred solution at a Public Information Meeting in Niagara Falls, with the preferred site identified on Reixinger Road, east of the QEW.
- At this time, Class D planning level cost estimates(which are based on conceptual information and are subject to a wide range of variability) indicate that the capital cost for the entire program could be \$325M (indexed to the year of cashflow), which

includes design, property acquisition, construction and commissioning of all components. Significant fieldwork and conceptual design is underway to refine the program and improve the accuracy of the cost estimate.

- In accordance with the budget planning by-law and capital financing policy, staff recommend including the complete budget for the entire program in the 2021 Capital Budget
- If the program is approved with the 2021 capital budget, it would be staff's intention in 2021 to commence design of the new WWTP, outfall and trunk sewers as well as to procure land for the preferred site of the new SNF WWTP.
- Construction of most projects, including the new WWTP and trunk sewer are not anticipated to commence until 2023.
- Region is actively pursuing funding from provincial and federal government. Region delegates gave a presentation at the AMO conference to Laurie Scott, Minister of Infrastructure, to request a portion of the announced Infrastructure Canada Investment Program funding be allocated to this critical infrastructure program.

Financial Considerations

The SNF capital projects and required debt financing can be accommodated within a 2% rate increase in 2021 with the following key strategies:

- Temporary reduction in the transfer from operating to the WW capital reserves.
- Use of plant operations, maintenance and debt charge budget to fund pay as you go infrastructure until the plant is operational.
- 5.15% increase from 2022 – 2028 required to re-establish the transfers to capital reserves to \$40 million from \$21 million in 2020 to support the asset management plan.

Capital Costs and Details

The projects and estimated costs are associated with the preferred solution of the new South Niagara Falls Wastewater Treatment plant are outlined below:

Table 1 – Project Budgets (in millions)

	Project	Total Project Cost	Previously Approved	2021 Budget Request
1	New SNF WWTP (NF)	\$ 192.65	\$4.90	\$ 187.75
2	New SNF WWTP Outfall (NF)	10.63		10.63
3	New South West Trunk Sewer – SNF (NF)	85.34		85.34
4	New South West Trunk Sewer (NF/TH)	9.77		9.77
5	Black Horse Sewage Pumping Station (TH)	4.39		4.39
6	Black Horse Force Main (TH)	12.73		12.73
7	Peel Street SPS Upgrades and Forcemain (TH)	5.92		5.92
8	South Side High Lift Pumping Station Decommissioning (NF)	0.63		0.63
9	Garner, Oakwood, Grassy Brook SPS Decommissioning (NF)	1.14		1.14
10	McLeod Road Overflow Diversion (MF)	1.89		1.89
	Total	\$ 325.10	\$4.90	\$ 320.20

NF - Niagara Falls
TH - Thorold

Descriptions of each of the projects is provided in the analysis section of the report.

The New SNF WWTP had a previously approved budget of \$4.9 million to proceed with the environmental assessment and land acquisition related costs. As of August 20, 2020, \$2.4 million has been spent and committed on the previously approved budget, leaving \$2.5 as uncommitted. Costs committed to date primarily relate to the Schedule C Environmental Assessment (EA) and enhanced conceptual design for the entire capital program associated with the South Niagara Falls WWTP.

Revised Estimates

The revised indexed projects cost estimate is \$325.10 million compared to the indexed cost estimates in 2017 of \$236.80 million for a difference of \$88.3 million. This is summarized below in Table 2.

Table 2 – Project Cost Comparison (in millions)

	2021 Estimate	2017 Estimate	Variance
Total Indexed Costs	\$325.10	\$236.80	\$ (88.30)

There were a number of components removed and added from the initial project scopes. Details of the projects and estimates and scope changes between 2021 and 2017 are outlined in Appendix 2.

The primary reasons for the increase from the 2017 estimates are as follows:

- The trunk sewer estimated depth and length increased based on conceptual design information (\$30 million)
- Increased property acquisition cost estimates (\$12 million)
- Addition of treatment costs and provision for potential tertiary treatment (\$23 million)
- Capital inflation rate of 4% per year dependent on timing of project cash flow/construction compared to 2% capital inflation rate used previously
- An updated wastewater strategy that will provide improved level of service, enhanced ability to address wet weather flows, and greater flexibility for efficient servicing in the future

It should be noted that the overall wastewater strategy and capital cost estimates continue to be reviewed and refined under the Class EA process. A final Class EA cost estimate will be provided in early 2021. Further to this cost estimate, the costs will continue to be refined and estimated with greater accuracy and detail as the projects move through detailed design and prior to tendering for construction.

Project Funding

The projects are to be funded by a combination of external grants, development charges, and debt. See Appendix 1 for a listing of the project budgets with associated funding sources.

The amount of debt to fund the South Niagara Falls projects is approximately \$212.2 million. Of this debt, \$148.20 million will be recovered by development charges over the life of the debt (30 years). The difference of \$64 million will be funded by the operating budget and rate requisition. Staff are currently forecasting a deficit in available

Wastewater development charges receipts. This is common in municipalities with large growth projects as the benefits of the growth expenditures through development charge receipts occur after the infrastructure has been constructed. As a result the Region is required to issue development charge debt funded by future development charge revenue (which is a practice adopted by municipalities).

Note that staff is monitoring the effect of incremental debt in the amount of \$212.2 million on its Standard and Poor Rating (S&P). S&P considers the ratio of total Region and lower tier debt combined compared to Region's operating revenues as one of the metrics. If the ratio is greater than 120% or consolidated debt surpasses \$1 billion, there is a risk of a downgrade to the Region's credit rating. Potential impacts on the S&P rating will be presented by staff at Budget Review Committee of the Whole in October.

Total consolidated debt is currently \$695.5 million (Region - \$379.5 million, LAM - \$316.4 million). At the end of Q2 2020, there was \$273.3 million of Regional unissued debt. This does not include any future LAM issuances which may occur.

The project budget is reliant on external funding in the amount of \$108 million for the SNF WWTP. This external funding estimate is in alignment with the funding formula for the new Niagara-on-the-Lake WWTP of 2/3 grant funding from Provincial and Federal sources. Staff will budget for 2/3 of the estimated plant cost as externally funded. This excludes land acquisition and design costs as funding has not yet been confirmed and staff intends to acquire land and start the design process in 2021. The total 2021 SNF WWTP budget excluding land and design costs is \$162 M x 2/3 = \$108M in estimated external funding.

If funding is confirmed to offset land and design costs, this will partially offset debt required to fund the project. Staff recommend partial initiation of projects identified in Table 3, specifically for land acquisition and design costs. The remaining project expenditures would be uninitiated until external funding is confirmed.

If these projects are approved with the 2021 capital budget, staff would intend to proceed with the following initiation in 2021:

Table 3 – 2021 Project Initiation

Project	2021 Action	Initiate
SNF WWTP	Land acquisition and design	\$ 26,176,240
New SNF WWTP Outfall	Design	\$ 780,400
New South West Trunk Sewer	Design	\$ 6,264,011
Black Horse SPS	Land acquisition	\$ 600,000
Total		\$ 33,820,651

Estimated timelines for design to construction of the projects are noted in the analysis section of the report.

Operating Costs

The W/WW Financial Plan (W/WW FP), which is required to be updated every five (5) years to comply with safe drinking water legislation, was endorsed by council in 2019 and proposed an annual rate increase of 5.15% until 2028. Staff recognizes the challenge faced by the COVID-19 pandemic and have recommended a 2021 budget strategy of 2% increase for W/WW as per CSD 41-2020 – 2021 Budget Planning. A reduction to the transfer to W/WW capital reserves will provide the necessary mitigation to the budget to realize a 2% increase for 2021. This reduction will be re-established by 2024 with the recommitment to the 5.15% rate increase in the forecast years. However, the contribution to WW capital reserves will be \$40 million by 2028 rather than the 2019 W/WW FP forecast of \$50 million by 2028.

Combined with the budget planning pressures, the operating impacts of the revised SNF WWTP project estimates are summarized in Table 4.

Gross operating cost impacts are estimated at approximately \$6 million, which would include staffing, utilities, repairs and maintenance, and lifecycle replacements costs. Staffing required to manage the plant operations would include a minimum of five operators, three maintainers, one instrumentation technician and one SCADA technician (10 FTE). Staff will be evaluating the need for additional FTE support as design and construction of the projects progresses. The request for FTE to operate the plant will be made in subsequent budget years when construction is anticipated to be substantially completed. Staff anticipates an approximate \$770,000 reduction in operations and maintenance costs due to sewage pumping station decommissioning.

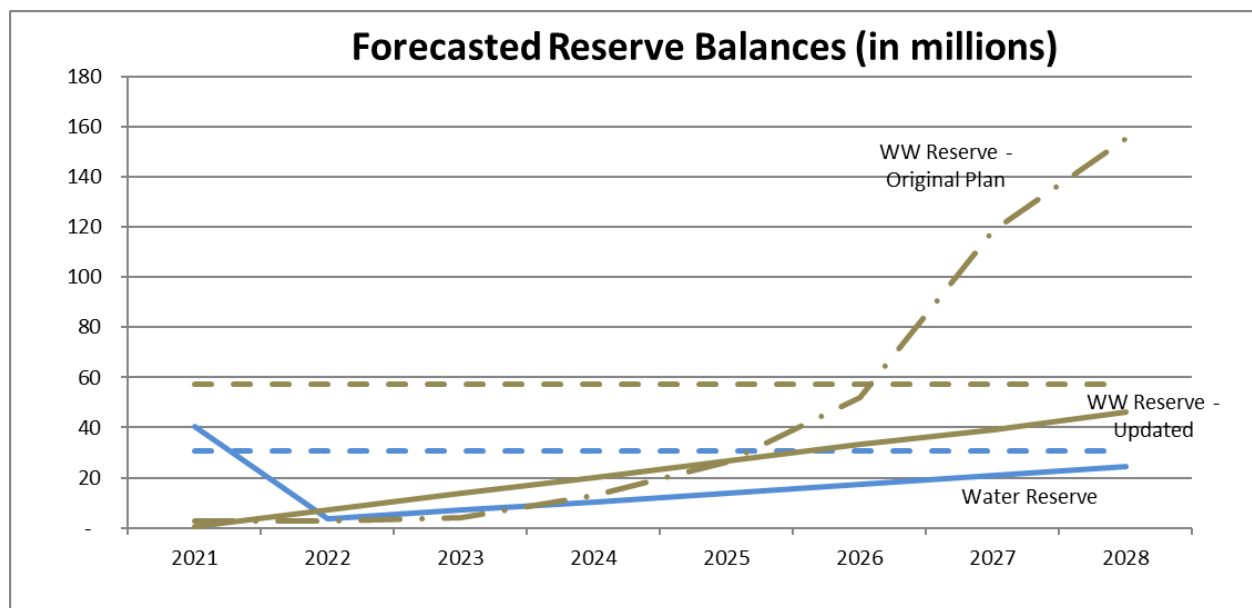
As per the budget planning by-law, the approval of capital projects that will result in an increase in operating costs in future years are to be budgeted in the year the project is

approved. Where a surplus may occur due to timing, that surplus will be used to fund pay as you go capital. This strategy will be adopted if these projects are approved with the 2021 capital budget as the projects are not anticipated to begin incurring debt financing or operating costs until after 2024. This surplus will assist in funding some pay as you go capital in lieu of the reduction in the annual transfer to capital reserves as noted above.

Table 4 – Summary of Annual Operating Budget Impact

Description	Original Financing Strategy	Updated Financing Strategy	Variance	Notes
Annual Debt Charge Budget (net of DC recovery)	N/A	\$12.5M <u>(8.7)M</u> \$3.8M	(\$3.8M)	- Original W/WW FP did not require debt for the SNF project as it was assumed adequate reserve contributions would have been established by construction (2025) - Updated Plan issues debt including debt to fund DCs not collected due to timing - Net impact is an increased Debt Charge of \$3.8M
Transfer to WW capital	\$21M	\$12.8M	\$8.2M	- Target - \$74M (being the Average Annual Renewal Investment per 2016 Asset Management Plan) - Reduction required to offset debt charges and operating impacts of the SNF projects to align with 2% budget strategy
Annual Operating, maintenance and lifecycle costs	N/A	\$6M	(\$6M)	Includes operational, maintenance, staffing costs associated with SNF projects
Annual Operating Savings	N/A	(\$.77M)	\$.77M	Savings associated with decommissioning of sewage pumping stations

The impacts to the WW reserve balance based on revisions to the 2019 W/WW FP are noted below:



The 2019 W/WW FP forecasted the WW reserve to climb above target toward the end of the forecast period at an estimated balance of \$152 million to provide additional financial flexibility should Upper Tier funding applications for the SNF WWTP not be successful and to close existing sustainability gaps in existing capital backlog. With the inclusion of the SNF projects in the 2021 capital budget, the reserve is now forecasted to have a balance of \$46 million at the end of 2028. Note the target reserve balance is 2% of \$2.8 billion in assets, or \$56 million.

It is important to note that staff continue to evaluate the adequacy of recommended rate increases and impacts on reserve forecasts given capital requirements. The next W/WW FP will be updated for 2024 at which time the analysis will be refreshed and revised rate impacts will be communicated to Council.

Analysis

Project History

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.

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 option to expand the existing wastewater treatment plant (WWTP) on Stanley Avenue and existing wastewater system in Niagara Falls was considered in the MSP. Through a detailed evaluation process, it was recommended that a new WWTP be implemented in South Niagara Falls to support growth, free up capacity in the existing system and at the WWTP, better manage wet weather flows and allow operational flexibility at the existing WWTP. A new WWTP will be located close to growth areas and provides the greatest flexibility and support for long-term servicing and benefit to the Niagara Falls and surrounding systems.

Expansion of the existing system to accommodate growth and wet weather flows would cause significant construction impacts due to the constrained corridors through built areas, environmentally sensitive areas and the difficulty in sequencing construction along critical infrastructure. As well, there would be increased operations costs with pumping the increased flows northerly through the City. Expansion of the existing WWTP would be significantly challenging due to the property constraints at the process areas requiring expansion, difficulty in sequencing construction in the operational plant and poor soil conditions.

The MSP Update recommended that the South Niagara Falls wastewater strategy, including the new WWTP be further evaluated under a Schedule C EA process.

Development Opportunities

There are development pressures and a strong interest in the South Niagara Falls area for servicing capacity, which is currently impacted by wet weather constraints. The proposed capital program is anticipated to provide the much needed servicing capacity to unlock the development potential in this area. Some developments include Thorold South/Rolling Meadows, Grand Niagara Secondary Plan, redevelopment of existing golf courses, including Oaklands Golf Club.

This new WWTP will be able to accommodate the servicing of the anticipated residential and employment growth from approximately 64,000 to 97,000 people and jobs for the estimated build out to 2041 of the existing urban boundary lands. The new WWTP and collection system strategy is also considering potential long term growth beyond 2041.

The South Niagara Hospital represents a significant investment of approximately \$1 Billion for health care in Niagara which will generate associated growth and development surrounding this area. The development along Fourth Avenue near the new St. Catharines Hospital is an example that demonstrates how a new Hospital is a catalyst for growth. The new WWTP will support this development area and timing of construction is being considered with intention to align in-service dates.

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.

Environmental Assessment and Conceptual Design

In November 2018, GMBP was retained via a public, competitive bid process (2018-RFP-34) to complete the Schedule C Environmental Assessment (EA) and enhanced conceptual design for the entire capital program associated with the South Niagara Falls WWTP that would review options to:

- Locate the new wastewater treatment plant in South Niagara Falls
- Determine the waterbody to receive the clean, treated water from the WWTP
- Best integrate the wastewater network to address growth, make the system as efficient as possible, and manage wet weather

Since award, the team has been working diligently to develop a solution that will support servicing for growth, minimize sewage pumping stations, reduce combined sewer overflows and maximize flexibility for the future. The project team is continuing to conduct extensive consultation with key stakeholder groups, approval agencies, property owners, residents, media and Indigenous communities. There have been three (3) public information centres held (May 2019, November 2019 and March 2020) and one Councillor drop-in session (June 2019). The PICs were held in open house format with good representation from residents in the study area. Facebook Live events were also held in advance of each PIC to provide additional opportunity for those not able or willing to attend the in person meeting. This format achieved over 1500, 1300 and 2900 views, respectively for each PIC.

With input from the public, key stakeholders and approval agencies, the project team developed and applied multiple-bottom line criteria (environmental, socio-cultural, legal / jurisdictional, technical and financial) to evaluate options for the new plant site, plant outfall location, and sanitary sewer system connections. Ten (10) long list alternatives were reviewed and evaluated from a high level and short-listed to four (4) alternatives that were evaluated in detailed. For each of the four (4) sites considered, the project team completed extensive reviews and investigations including: Natural Environment; Record Site Condition Review (Contamination); Stage 1 Archaeological; Cultural Heritage Screening; Agricultural Impact Screening; Geotechnical; Hydrogeological; Assimilative Capacity; and Conceptual Costing. There has also been consideration for public impact including: receptors (noise, odour, and air), traffic, transportation, and recreational activities.

Following the PIC 3 in March 2020 and a review and consideration of stakeholder input, the following preferred solution was selected:

- New WWTP site located at 6811 and 7047 Reixinger Rd.
 - o close proximity to growth areas
 - o close enough to existing residential and commercial to effectively service it but far enough away that the construction and operation will have minimal impacts
 - o selection of a greenfield property that will not impact current commercial and operational businesses.
- Plant outfall location at Chippawa Creek, east of the QEW
 - o adjacent to the site which facilitates a shorter outfall pipe
 - o favourable flow conditions to receive the treated effluent
- Associated sewer strategy

- Sewer alignment from South Side High Lift Pumping Station to the new WWTP site is still being confirmed as part of Phase 3 of the EA.
- Modifications to the Chippawa system are not included in this part of this phase of the project, but could potentially be incorporated as part of the long term growth. This could include decommissioning of Low Lift PS and a gravity pipe from the new plant to Chippawa along the south side of Chippawa Creek. The conceptual design of the new WWTP will include flexibility for this future option.

Now in Phase 3 of the Class EA, the Region project team is conducting further detailed investigations to support the decisions regarding design and construction concepts for the preferred solution. These site-specific studies include a more in-depth analysis of the natural environment; potential for soil contamination through an Environmental Site Assessment; Stage 1/2/3 and potentially Stage 4 Archaeological; Cultural Heritage Impact Assessment; and Geotechnical/ Hydrogeological Field Investigations. The Archaeology Assessment is currently ongoing and the Region has recently been made aware of a previously completed archaeology report, absent from the Ministry database, for the preferred site location. This report outlines the need for a Stage 3 and potential Stage 4 investigations at certain areas within the site. At this time the magnitude and associated costs of these investigations is not known. The project team is working with the archaeological consultant, Wood, to develop the best and most cost effective solution.

To support Provincial approvals, additional site-specific studies relating to: Noise and Odour Impact and Mitigation Assessment; Assimilative Capacity Detailed Modelling and Assessment; Traffic Impact Assessment; and detailed Costing Analysis will also be undertaken. These additional studies are necessary to confirm the site, orientation of the facilities on the property, and refine the sewer alignments.

The Class EA is anticipated to be complete and filed for public review in early 2021.

Project Descriptions for the 2021 Capital Program

The following describes each project associated with the new WWTP. Each project relies on the design and construction of the new WWTP.

1. South Niagara Falls Wastewater Treatment Plant – Land Acquisition (2021), Design (2021), and Construction (2024) - the new South Niagara Falls Wastewater Treatment Plant, with a capacity of 30 MLD that will service existing

and future growth areas in Niagara Falls, south of Lundy's Lane and south Thorold.

2. New South Niagara Falls WWTP Outfall – Design (2021) and Construction (2024) of a new outfall for the South Niagara Falls Wastewater Treatment Plant
3. New Trunk Sewer Connecting to the South Niagara Falls WWTP – Design (2021) and Construction (2024) of the new trunk sewer from the existing South Side High Lift Pumping Station to the new South Niagara Falls Wastewater Treatment Plant is necessary to support conveyance of flows. The alignment is currently being refined with options along Montrose Road, Oakwood Drive or the OPG corridor. The sewer will be tunneled from the upstream location, under the Welland River near the QEW bridge crossing and connect into the headworks of the plant. The sewer will support decommissioning of multiple sewage pumping stations and provide flexibility for gravity servicing of future growth areas.
4. (Thorold) New South West Trunk Sewer Connecting Thorold to the South Niagara Falls WWTP – Design (2023) and Construction (2025) of the new south-west trunk sewer to convey sanitary flows from the new Black Horse pumping station forcemain in Thorold, southerly to the existing sanitary sewer network in southwest Niagara Falls.
5. (Thorold) New Black Horse PS – Land Acquisition (2021), Design (2023), and Construction (2025) for the upgrades (or new) Black Horse Pumping Station in Thorold. This will reverse flows from the St. Catharines sanitary system to the new South Niagara Falls WWTP.
6. (Thorold) New Black Horse PS Forcemain – Design (2023) and Construction (2025) of a new 400mm diameter forcemain from the new Black Horse pumping station.
7. (Thorold) Peel St PS Upgrades and New Forcemain - Design (2023) and Construction (2025) of the Peel St Pumping Station upgrades and forcemain replacement in Thorold. This will reverse flows from the St. Catharines sanitary system to the new South Niagara Falls WWTP.
8. South Side High Lift PS Decommissioning – Design (2027) and Construction (2027) of the decommissioning of the South Side High Lift Pumping Station, the flows will be redirected south to the new South Niagara Falls Wastewater Treatment Plant via a new gravity trunk sewer. This presents long-term operations and maintenance cost savings for the Region by eliminated a major pumping station.
9. Garner Rd, Oakwood Dr, Grassy Brook PS Decommissioning – Design (2027) and Construction (2027) of the decommissioning of the Garner Rd, Oakwood Dr, and Grassy Brook Pumping Stations. As part of the overall servicing strategy for the new South Niagara Falls Wastewater Treatment Plant the Pumping Stations will be decommissioned as the catchment areas will have the ability to flow by gravity to the new trunk sewer along OPG corridor, Oakwood Dr or Montrose Rd.

This presents long-term operations and maintenance cost savings for the Region by eliminating a major pumping station.

10. Niagara Falls McLeod Rd Overflow Diversion – Design (2026) and Construction (2027) of the interception and diversion of the existing Niagara Falls McLeod Rd Overflow. This existing overflow will be connected to the existing sanitary system and ultimately flow to the new WWTP.

Project Resources

[How We Flow \(Master Servicing Plan\)](https://www.niagararegion.ca/2041/master-servicing-plan/default.aspx) (<https://www.niagararegion.ca/2041/master-servicing-plan/default.aspx>)

[SNF WW Solutions Project Webpage](https://www.niagararegion.ca/projects/south-niagara-falls-treatment-plant/default.aspx) (<https://www.niagararegion.ca/projects/south-niagara-falls-treatment-plant/default.aspx>)

Alternatives Reviewed

N/a

Relationship to Council Strategic Priorities

The SNF WW Solutions capital program achieves several priorities of the 2019-2022 Council Strategic Plan, including the following:

- Supporting Businesses and Economic Growth - The servicing strategy will help support growth by providing new servicing options south of Welland River.
- Healthy and Vibrant Community – Improving wastewater infrastructure in south Niagara Falls supports the Growth Plan for the Greater Golden Horseshoe. This project protects what matters most by improving Niagara's ability to manage wastewater and help mitigate future impacts of climate change that translates into the effective safeguarding of our Great Lakes and generating healthy sustainable communities.
- Responsible Growth and Infrastructure Planning – Planning for growth enables Niagara to remain open for business, strengthens local employment, and delivers the critical infrastructure that meets the needs of residents and businesses

Other Pertinent Reports

CL-C 24-2017 Waste & Wastewater Services Master Servicing Plan (How We Flow)
Project Update – South Niagara Falls Treatment Plant Review

PW 8-2019 – South Niagara Falls Wastewater Treatment Plant – Project Update and Award Notice

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Appendices

Appendix 1 Project Budgets and Funding

Appendix 2 Project Budget Cost and Scope Comparison