TO:	**CITY BUILDING COMMITTEE**
SUBJECT:	**APPROVAL OF WASTEWATER ASSET MANAGEMENT PLAN**
WARDS:	**ALL**
PREPARED BY AND KEY CONTACT:	**S. DREWETTE, CET, SENIOR ASSET MANAGEMENT PROGRAM COORDINATOR**
SUBMITTED BY:	**K. OAKLEY, P. ENG., ASSOCIATE DIRECTOR OF CORPORATE ASSET MANAGEMENT**
GENERAL MANAGER APPROVAL:	**B. ARANIYASUNDARAN, P.ENG., PMP, GENERAL MANAGER OF INFRASTRUCTURE AND GROWTH MANAGEMENT**
CHIEF ADMINISTRATIVE OFFICER APPROVAL:	**M. PROWSE, CHIEF ADMINISTRATIVE OFFICER**

RECOMMENDED MOTION

1. That the 2022 Wastewater Asset Management Plan dated January 17, 2022, attached to Corporate Asset Management Report dated February 8, 2022, be approved.

PURPOSE & BACKGROUND

2. The primary purpose of this Staff Report is to receive Council approval of the Wastewater Asset Management Plan (AMP) in accordance with Provincial Regulations.

3. Additionally, the Staff Report and AMP serve to provide valuable information to Council about:

   a) The City's wastewater infrastructure needs in order to protect public health and safety, and the environment, specifically Lake Simcoe;

   b) The levels of service for wastewater that the City is currently providing;

   c) The investment needs to support current service levels, and the associated risks to levels of service that may result from underinvestment.

4. The goal of asset management is to ensure the City's financial sustainability by making informed investment decisions that deliver City services at the desired level while minimizing costs and maintaining an acceptable level of risk. The City's wastewater collection and treatment service is critical for residents and businesses, as well as the environmental health of Lake Simcoe and the City's drinking water supply.

5. The Province of Ontario's *Infrastructure for Jobs and Prosperity Act, 2015 (IJPA)* was enacted with the purpose of "establish[ing] mechanisms to encourage principled, evidence-based and strategic long-term infrastructure planning that supports job creation and training opportunities, economic growth and protection of the environment, and incorporate design excellence into infrastructure planning". The IJPA applies to the province but also to the broader public sector, including municipalities.

6. The first regulation made under the IJPA was *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure.* O. Reg 588/17 came into effect in January 2018 and prescribed timelines for Ontario municipalities to develop asset management plans. In 2021, those timelines were revised, giving municipalities an additional year to achieve the previously prescribed milestones. The current timelines and requirements are summarized in the table below:

Provincial Prescribed Milestone	City of Barrie status
Phase 1 (by July 1, 2019): Strategic Asset Management Policy	Adopted June 2019
Phase 2 (by July 1, 2022): Asset management plans for core infrastructure assets which include water, wastewater and stormwater assets, Transportation (roads, bridges, and culverts); within this, the plans for core assets must include current levels of service and costs to maintain these levels.	Stormwater – Approved by Council in Q1, 2021 Transportation – Approved by Council in Q2, 2021 Water – Approved by Council in Q4, 2021 Wastewater – Subject of this report
Phase 3 (by July 1, 2024): Asset management plans for all other municipal assets, including current levels of service and costs to maintain these levels.	Funding for Facilities, Recreation and Culture, Parks and Fleet AMPs is approved within the 2022 capital plan, and projects are being initiated in early 2022. Staff anticipate meeting the prescribed milestone.
Phase 4 (by July 1, 2025): Builds on phases 2 and 3 where plans shift from current levels of service to focus on proposed levels of service and related lifecycle management and financial strategies for all assets.	Preliminary efforts have been included in the 2021 Water and Wastewater AMPs and will be revisited in advance of the 2025 deadline.

7. The 2022 Wastewater Asset Management Plan is an update of the City's previous asset management plan which was completed in 2011.

ANALYSIS

State of the City's Wastewater Assets

8. The AMP includes wastewater assets owned and operated by the City including the wastewater treatment facility (WwTF), Oro-Medonte biosolids storage facility (BSF), 13 pumping stations, and approximately 550km of sewers and maintenance holes, which together total almost $1.4 billion in replacement value. These assets and the staff and processes that support them, are essential to protecting public health and the environment, in particular the health of Lake Simcoe.

9. The Barrie WwTF is the most valuable of the City's vertical wastewater assets at approximately $800 million. Other vertical assets include the BSF, valued at approximately $119 million, and pumping stations worth about $30 million. Sewers and maintenance holes make up the remaining $405 million in assets.

10. The wastewater system is anticipated to grow substantially over the next 10 years including the addition of about 12km of sewers, 2 pumping stations, and upgrades to the WwTF, not including assets assumed from new developments.

11. Most of the City's wastewater collection infrastructure has more than half of its service life remaining, this is expected as much of it was constructed during the rapid growth that occurred from the 1990s through the 2000s. Over 60% of the City's sewers and maintenance holes were installed in the last 30 years.

12. The WwTF is the City's oldest wastewater asset, and its current components vary widely in age. Many component assets of the WwTF have exceeded their theoretical service lives and are likely to require replacement in the near future. The City is in the process of upgrading and expanding the WwTF, and

many of the aging and deteriorated components will be addressed through the planned improvements, however staff will need to continue to monitor the remaining assets and prioritize renewals as appropriate.

13. The condition of the City's wastewater assets was considered as part of this project. Condition ratings are based on data from visual inspections where available and based on age where inspections have not been completed.

14. Sewer condition was assessed based on data collected through the City's annual sewer inspection program. The wastewater collection system is in very good condition on average, with 99% of sewers in fair to very good condition.

15. Inspections were completed on some components of the WwTF as part of the project and the condition of the remaining plant components was estimated based on age. The plant is currently considered to be in good condition on average, though approximately $130 million in component assets are at or near the end of their service lives and are expected to require renewal in the near future. An estimated $92 million worth of these aging assets at the WwTF will be replaced or renewed as part of the planned upgrades at the plant over the next 10 years. The remaining $38 million in assets will continue to be monitored and prioritized for inclusion in the capital plan as appropriate.

16. The condition of most of the BSF was estimated based on age with the exception of some components which underwent inspections as part of this project. The average condition of the BSF is good overall, however some rehabilitation work was recommended and is included in the capital plan.

17. Twelve sewage pumping stations were inspected as part of this project, excluding only the Holly pumping station which was recently reconstructed. On average, the pumping stations are in good condition, however some rehabilitation work is recommended; some of this is in the current capital plan and the remaining work will be reviewed and considered in upcoming capital planning exercises.

18. In general, the physical condition of Barrie's wastewater infrastructure is good with 99% of the assets in the collection system, and 86% of vertical facilities, in fair to very good condition. This is to be expected since most of the City's wastewater assets are relatively early in their estimated service lives.

19. The asset management plan considers asset risk by comparing the probability of failure, which is estimated based on asset age and condition, to the consequence of that asset failing, which is based on size, replacement value, function, and location. Based on this analysis approximately 9%, or $119 million worth, of the City's wastewater assets are currently considered to be in the 'high' risk category. Some of these high-risk assets are included in the capital plan and the remainder will be monitored and prioritized for inclusion as appropriate. None of the wastewater assets are currently considered 'very high' risk.

Levels of Service

20. Defining and documenting the level of service is a key part of asset management. This allows the City to consider investment needs with a specific level of service in mind, and it provides Council and the public with clear expectations for the services they receive. Ontario Regulation 588/17 defines mandatory level of service measurements for wastewater systems and requires that current levels of service are documented for the 10-year planning period.

Levels of Service for Wastewater Assets (Table 2 - O. Reg 588/17)*

Community levels of service (qualitative descriptions)	Technical level of service metrics (technical metrics)	2021 Technical performance
Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.	Percentage of properties connected to the wastewater system.	99.5%
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	The number of connection days per year [that service is disrupted] due to backups compared to the total number of properties connected to the municipal wastewater system.	35 connection days out of 45,009 properties connected to the system
Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid overflow or backup events.		
Descriptions of the effluent that is discharged from the sewage treatment plants in the municipal wastewater system.	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0

*Prescribed measures related to combined sewers are excluded because Barrie doesn't have combined sewers.

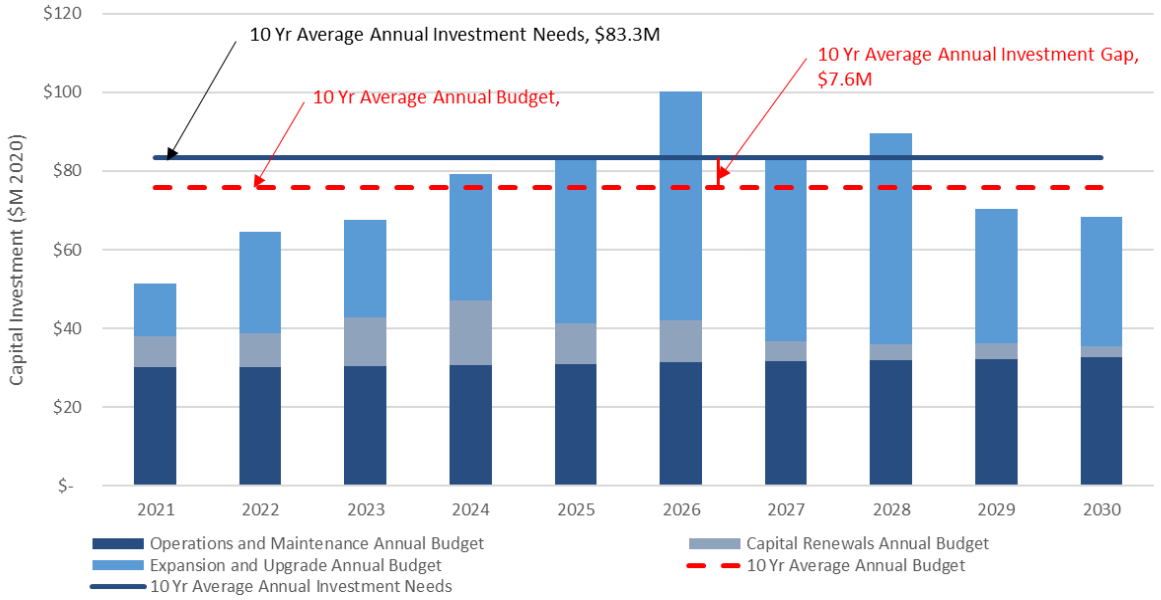
21. In addition to levels of service, O.Reg. 588/17 also requires that additional performance measures established by the municipality be included in the AMP. The City tracks and manages the performance of wastewater services through a number of metrics such as asset condition, inflow and infiltration, Environmental Compliance, and completion of sewer inspections. These metrics along with the 2021 performance are included in the AMP.

22. On average, the City's wastewater assets are in good condition, of adequate capacity, and performing well at delivering expected service levels. The City provides good wastewater service to 99.5% of properties in the City and discharges high quality effluent to Lake Simcoe. These levels of service and performance are projected to be sustainable over the 10-year planning period despite the investment gaps discussed below.

Investment in the City's Wastewater Assets

23. The Asset Management Plan considers the life cycle activities needed to ensure that the City's wastewater infrastructure can sustainably meet the current levels of service. The Wastewater AMP considers the cost of the City's current operational programs as well as long term renewal needs and planned projects to address additional capacity and growth needs.

24. The figure below summarizes the projected cost of the City's operations, maintenance, renewal, expansion, and upgrade needs over the next 10 years, and compares it to planned expenditures. On average, the City is underspending by approximately $7.6 million per year over the next 10 years. Planned expenditures are based on the 2021 Business Plan and the 2021-2030 capital plan. This was the most current, approved budget information available at the time the analysis was completed.



25. The majority of the investment gap over the 10-year period is related to the renewal of aging assets, primarily at the WwTF. These assets have not failed yet but will need to be monitored going forward to ensure that timely renewal can be implemented for the most critical assets. By the end of the 10-year capital planning period, planned upgrades at the WwTF will have addressed the majority of the existing renewal backlog by upgrading or replacing aging components. The average needs shown here reflect the remainder of the current backlog as well as the anticipated needs of assets that will continue to age and may require renewal over the next 10 years. When compared to the planned investment in the capital plan and operating budget forecast, the average gap is approximately $7.6 million per year. At the end of the 10-year period, the City would have invested about $445 million in the renewal, expansion, and upgrade of wastewater infrastructure based on the 2021 Capital Plan.

26. The 2021-2030 Capital Plan includes substantial planned expenditures on projects to address increased capacity and growth needs, including the above noted WwTF upgrades. The 2019 Wastewater Master Plans identified over $400 million in expansion and upgrade projects that would be needed to address growth projections for the City by 2031. Since growth has been proceeding more slowly than projected, the City has refined the identified needs and this was reflected in the City's 2021 Capital Plan and Outlook. The planned expenditures for expansion and upgrade of the City's wastewater assets in the City's 2021-2030 capital plan are $363 million. Approximately $9 million in expansion and upgrade projects from the Wastewater Collection Master Plan are not included in the 2021 Capital Plan. This gap is not anticipated to result in impacts to levels of service, or to limit growth over the 10-year planning period but staff from the Infrastructure and Corporate Asset Management departments will continue to monitor growth needs and adjust plans as appropriate. This analysis is considered appropriate, despite the 2022 budget recently being approved. The wastewater projects and planned spending within the 2022-2031 capital plan, are not significantly changed from the 2021-2030 capital plan.

27. Although the City has a relatively small renewal gap in the shorter (10-year) term, it will require significantly more investment over the longer term to sustain the wastewater network in a state of good repair as the assets continue to age and deteriorate. To maintain the long-term sustainability of the wastewater system, reserves will need to be adequately funded so that the City can afford to renew the large quantity of relatively new wastewater assets as they begin to age. Continued under-investment will increase this gap and the associated burden placed on future ratepayers beyond the 10-year horizon. Underfunding the lifecycle needs for these assets will result in reduced levels of service and increased risks over the long term.

28. A long-term strategy needs to be considered when exploring ways of closing this gap. The City will need to consider increasing the amount of debt borrowed or increasing rates to build reserves, which in turn would allow for more capital spending when it's needed. A combination of these options may also be considered, along with revising service levels and accepting higher risk.

29. Long term, as the City plans for increased expansion, upgrade, renewal, operations, and maintenance needs, it will be important to also consider the resourcing needs for the City's Infrastructure department to deliver the required projects and programs.

Advancing Asset Management

30. Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time.

31. Asset management decisions are made by staff in all areas of the City and by Council. The value of asset management planning is in providing data to inform these decisions, identifying areas for improvement, documenting risks, and outlining the requirements for long term sustainability.

32. The City must continue to improve its asset management capabilities, including data tracking and analysis, in order to be able to model and understand the risks associated with different asset management strategies and funding scenarios. This is a required level of analysis under O.Reg. 588/17 and also a critical capability to enable the City to effectively manage its assets to provide the desired levels of service at acceptable levels of risk and the lowest sustainable cost.

33. This Staff Report and the attached AMP have summarized the status, levels of service, and funding needs of the City's wastewater assets. It represents an important step in the continuously improving process of asset management at the City of Barrie. Over the coming months and years, Council will be hearing more about asset management as the City completes AMPs for all of our assets. This information will be used to plan long term in a way that is sustainable and fair to current and future generations.

ENVIRONMENTAL AND CLIMATE CHANGE IMPACT MATTERS

34. The following environmental and climate change impact matters have been considered in the development of the recommendation:

    a) A key function of the City's wastewater service is the protection of Lake Simcoe. Though this plan does not directly relate to climate change impacts, asset management planning will be important when considering actions to address climate change and the relationship to levels of service, costs, and risk.

ALTERNATIVE

35. The following alternative is available for consideration by General Committee:

Alternative #1 General Committee could choose not to approve this Staff Report and the attached Wastewater Asset Management Plan.

This alternative is not recommended, as the Asset Management Plan provides useful information and guidance for the City to use in future decision making around operations and maintenance strategies, capital budgeting and more. In addition, not having Council approval of the Asset Management Plan would jeopardize the City's compliance with Ontario Regulations. Being out of compliance could impact the City's ability to compete for grants and external funding from the province.

FINANCIAL

36. There are no direct financial implications for the Corporation resulting from the proposed approval of this report. The AMP includes a Financial Analysis section, and the details and conclusions are presented in the analysis section of this Staff Report.

37. The information in the Wastewater Asset Management Plan aligns with the Water and Wastewater Financial Plan approved in May of 2021 (INF-005-21), and both documents will be used to help inform capital and operating budgets, rate setting, and serve as inputs into other studies.

LINKAGE TO 2018–2022 STRATEGIC PLAN

38. The recommendation(s) included in this Staff Report support the following goals identified in the 2018-2022 Strategic Plan:

- ✓ Fostering a Safe and Healthy City
- ✓ Building Strong Neighbourhoods
- ✓ Offering Innovative & Citizen Driven Services

39. Efficient, well maintained, and sustainable assets are critical for building a greener Barrie while mitigating and adapting to climate change, growing responsibly, and making tax dollars go further.

40. Asset management planning is an ongoing and long-term process that allows the City of Barrie to make the best possible investment decisions for its assets, which in turn improves the services offered to citizens. Specific to Wastewater assets, this enables the City to protect and enhance the natural environment and ensure a healthy Lake Simcoe for generations to come.