Agenda – Council – December 17, 2020

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – December 1, 2020

Item No. 2 Biosolids Treatment Capacity for the City of Winnipeg

STANDING COMMITTEE RECOMMENDATION:

On December 9, 2020, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment and submitted the following to Council:

1. That the December 12, 2012 Council decision delegating authority to the Chief Administrative Officer to negotiate and approve service sharing with Winnipeg Metro Region municipalities be rescinded.

2. That any future service sharing agreements within the Winnipeg Metro Region be approved by Council.

3. That the current sewer service sharing agreements with the Rural Municipalities of Rosser and West St. Paul which do not have capacity limits, and current and new industrial users in the City of Winnipeg proposing to expand capacity, be reviewed by the Public Service with a report back to the Standing Committee in 90 days with recommendations to mitigate the potential impacts to remaining sewage treatment capacity.

4. That the current sewer service sharing agreements with the Rural Municipalities of Rosser and West St. Paul which do not have capacity limits, and current and new industrial users in the City of Winnipeg proposing to expand capacity, be reported on by the Public Service to the Standing Committee, explicitly including the impact on the City of Winnipeg's remaining sewage treatment capacity.

5. That a sewer service sharing agreement with the Rural Municipality of St. Andrews be approved, and that the authority be delegated to the Chief Administrative Officer to negotiate and enter into an agreement due to a previous commitment under a Memorandum of Understanding, and ensure it stipulates a cap of 1,800 dwelling units over the next 10 years.

6. That the Winnipeg Public Service be directed to provide the Standing Committee with the following:

    A. Semiannual verbal reports on the remaining biosolids capacity for the City of Winnipeg.

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – December 1, 2020

STANDING COMMITTEE RECOMMENDATION (continued):

B. Annual written reports on the remaining biosolids capacity for the City of Winnipeg.

7. That the Proper Officers of the City be authorized to do all things necessary to implement the intent of the foregoing.

Agenda – Council – December 17, 2020

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – December 1, 2020

DECISION MAKING HISTORY:

EXECUTIVE POLICY COMMITTEE RECOMMENDATION:

On December 9, 2020, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment and submitted the matter to Council.

STANDING COMMITTEE RECOMMENDATION:

On December 1, 2020, the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment concurred in the recommendation of the Winnipeg Public Service, with the following amendment:

- Delete Recommendations 3 – 6 in their entirety and replace with the following:

  "3. That the current sewer service sharing agreements with the Rural Municipalities of Rosser and West St. Paul which do not have capacity limits, and current and new industrial users in the City of Winnipeg proposing to expand capacity, be reviewed by the Public Service with a report back to the Standing Committee in 90 days with recommendations to mitigate the potential impacts to remaining sewage treatment capacity.

  4. That the current sewer service sharing agreements with the Rural Municipalities of Rosser and West St. Paul which do not have capacity limits, and current and new industrial users in the City of Winnipeg proposing to expand capacity, be reported on by the Public Service to the Standing Committee, explicitly including the impact on the City of Winnipeg's remaining sewage treatment capacity.

  5. That a sewer service sharing agreement with the Rural Municipality of St. Andrews be approved, and that the authority be delegated to the Chief Administrative Officer to negotiate and enter into an agreement due to a previous commitment under a Memorandum of Understanding, and ensure it stipulates a cap of 1,800 dwelling units over the next 10 years.

  6. That the Winnipeg Public Service be directed to provide the Standing Committee with the following:

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – December 1, 2020

DECISION MAKING HISTORY (continued):

STANDING COMMITTEE RECOMMENDATION (continued):

A. Semiannual verbal reports on the remaining biosolids capacity for the City of Winnipeg.

B. Annual written reports on the remaining biosolids capacity for the City of Winnipeg."

and submitted the matter to the Executive Policy Committee and Council.

The following persons submitted communications with respect to the matter:

- Larry Wandowich, Chief Administrative Officer, RM of Rosser, submitted a communication dated December 1, 2020
- DJ Sigmundson, Chief Administrative Officer, R.M. of St. Andrews submitted a communication dated October 30, 2020 and a presentation titled "Service Sharing Agreement City of Winnipeg and RM of St Andrews" dated December 1, 2020
- Alexis Kanu, Executive Director, Lake Winnipeg Foundation, submitted a communication dated November 30, 2020

On November 9, 2020, the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment laid the matter over for 30 days.

Larry Wandowich, Chief Administrative Officer, RM of Rosser, submitted a communication dated November 9, 2020 with respect to the matter.

ADMINISTRATIVE REPORT

Title: **BIOSOLIDS TREATMENT CAPACITY FOR THE CITY OF WINNIPEG**

Critical Path: **Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – Executive Policy Committee – Council**

AUTHORIZATION

Author	Department Head	CFO	CAO
G. K. Patton, P. Eng., Manager of Engineering Services	M. L. Geer, CPA, CA, Director, Water and Waste Department	N/A	M. Ruta, Interim CAO

EXECUTIVE SUMMARY

The proposed $1.8 billion North End Sewage Treatment Plant (NEWPCC) project is the largest capital project in the history of the City of Winnipeg and is considered the most important infrastructure priority by Council and the Public Service. The plant provides biosolids treatment for Winnipeg's three sewage treatment plants, but several plant components and facilities have reached the end of their service life and must be replaced to maintain reliable operation.

The new plant is required for both growth and to meet legislated regulatory requirements. The existing biosolids facility has a finite capacity and could halt or restrict development (residential, commercial and industrial) within the City of Winnipeg and the Winnipeg Metro Region in the next five to nine years.

The competing demands of residential growth within the City, industrial and commercial development and service sharing with surrounding municipalities will all have an impact on the remaining capacity, which is approximately 90,000 people equivalent (five to nine years). The needs of residential growth, economic development and service sharing will need to be balanced until a new facility is completed, currently estimated to be completed in eight years or 2028.

Due to the competing demands, the Public Service is recommending that Council be the authority to approve any requests which have a substantial impact on capacity.

If the City runs out of biosolids capacity, there is a risk of Environment Act Licence violations and significant delays in any new development.

RECOMMENDATIONS

1. That the December 12, 2012 Council decision delegating authority to the Chief Administrative Officer to negotiate and approve service sharing with Winnipeg Metro Region municipalities be rescinded.

2. That any future service sharing agreements within the Winnipeg Metro Region be approved by Council.

3. That any changes that increase the sewage treatment requirements under the existing sewer service sharing agreements with the Rural Municipality of Rosser and West St. Paul be approved by Council.

4. That large industrial developments that would consume greater than 5% of the remaining capacity be approved by Council.

5. That a sewer service sharing agreement with the Rural Municipality of St. Andrews be approved and that Council delegate authority to the Chief Administrative Officer to negotiate and enter into an agreement due to a previous commitment under a Memorandum of Understanding.

6. That the Public Service report back to the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment annually with an update on the remaining biosolids capacity for the City of Winnipeg.

7. That the Proper Officers of the City be authorized to do all things necessary to implement the intent of the foregoing.

REASON FOR THE REPORT

Council approval is required in order to rescind its previous decision.

IMPLICATIONS OF THE RECOMMENDATIONS

Council will be the approval body for all future service sharing within the Winnipeg Metropolitan Regions and any major industrial development applications.

A sewer service sharing agreement will be executed with the Rural Municipality of St. Andrews based on a previous commitment to provide the service.

The Public Service will keep the Standing Policy Committee apprised of current use levels.

HISTORY/DISCUSSION

Sludge Treatment in the City of Winnipeg

The City's three sewage treatment plants generate sludge (solids) that must be collected and treated before disposal. All sludge generated in the City is sent to a sludge treatment system/biosolids facility at the North End Sewage Treatment Plant (NEWPCC). The City also receives sludge from the Rural Municipality (RM) of East St. Paul for treatment, and wastewater from portions of the RM of West St. Paul and Rosser.

The biosolids facility uses bacteria in digesters (tanks) to treat the sludge, converting it to biosolids. The amount of sludge that the City receives can vary from year to year depending on weather, wastewater flows, and changes to the City's industrial activity and residential

populations. Treating the sludge is required by regulation and makes it safer (less pathogens) and easier (drier) to handle. The treatment process also reduces the amount of biosolids that need to be disposed of through beneficial reuse or landfilling.

The biosolids must be operated within its capacity to meet Environment Act Licence requirements. If the facility is operated beyond capacity for extended periods of time, then its process can be lost and the City could not treat and dispose of sludge. Depending on the time of year, it could take two to three months to regrow the bacteria needed to treat the sludge. As a result, the sludge would accumulate in the treatment plants and spill over into the river, resulting in licence violations at its three sewage treatment plants.

Landfilling of untreated sludge is not possible, as the product is too wet to handle.

History of Winnipeg's Sludge Treatment System

In 1937, the City of Winnipeg's biosolids facility at the North End Sewage Treatment Plant came online.

In 1965, the biosolids facility was expanded and upgraded to its current configuration (i.e., mesophilic anaerobic digestion).

In 1986, the biosolids facility was expanded for a second time. Between 1986 and 2020, the City completed numerous construction projects to maintain licence compliance and reliable operation of the facility. The facility has not been expanded since 1986.

In 2014, the City of Winnipeg submitted a Biosolids Master Plan to Manitoba Conservation and Sustainable Development and the plan was approved in March 2016. It indicated that some elements of the City's biosolids facility were nearing capacity, while others were nearing end-of-life. It also recommended a new biosolids facility that would provide future capacity and would meet more stringent regulatory requirements for:

- maximum beneficial reuse of biosolids
- nutrient recovery and reuse (while minimizing the use of chemicals)
- utilizing the best available technology

In January 2016, AECOM was awarded a contract to develop conceptual designs for the new biosolids facility, as part of the NEWPCC Upgrade Project.

In February 2019, a report to the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment recommended that the NEWPCC Upgrade be split into three main projects. Executing the upgrades as three separate capital projects is being done to mitigate the risk associated with a single large, complex and lengthy project, and will provide opportunities to better manage the overall project scope and cost. The report also indicated that, at that time, the existing biosolids facility would be nearing capacity in five to ten years.

The report (approved by Council on February 28, 2019) recommended that the Biosolids Facilities capital project be constructed as the second priority project. The Power Supply and Headworks Facility Upgrade was recommended as the first priority project, because of process criticality. The Headworks project contains the infrastructure necessary for the operation of the new biosolids facility. The Power Supply project is scheduled for completion at the end of 2020. The award of the construction of the Headworks facility is anticipated in Q1 2021.

In July 2019, a Notice of Alteration (NOA) licence request to Manitoba Conservation and Sustainable Development indicated that the existing biosolids facility was approaching capacity.

On September 26, 2019, Council approved a 2019 capital budget of $552,712,000.00 for the NEWPCC Upgrade: Biosolids Facilities project, subject to final written confirmation of federal and provincial funding satisfactory to the Chief Financial Officer. To date, the City has not received confirmation of provincial or federal funding. The Province of Manitoba has committed funds to the headworks and biosolids facilities but are conditional on federal government approval of both projects under the Manitoba Canada ICIP Bilateral agreement.

On January 30, 2020, Council approved $15,223,000.00 from the Biosolids Facilities project budget to secure engineering services. This engineering work has not yet started, as the Province has requested that the City undertake a review of a P3 project procurement methodology, which is ongoing.

On September 30, 2020, City Council approved the transfer of $321.4 million of federal funding under ICIP from the Public Transit Infrastructure to the Green Infrastructure Stream to fund the federal government's portion for the headworks and biosolid project.

The Province is working with the Government of Canada, the Canada Infrastructure Bank and the City of Winnipeg to explore the feasibility of utilizing a P3 delivery model to deliver the necessary upgrades to the City of Winnipeg's North End Sewage Treatment Plant.

A report on the NEWPCC Upgrade, written collaboratively by Manitoba Conservation and Sustainable Development and the City of Winnipeg Water and Waste Department, indicated that it would take approximately eight (8) years, from initiation, to build a new biosolids facility under a design-bid-build project procurement methodology. The City has already pre-selected provincially- approved treatment technologies, under competitive tenders, for use within the new biosolids facility. The pre-selection of technologies will accelerate the overall project schedule.

The 2020 City of Winnipeg Infrastructure Plan ranked the NEWPCC Upgrade: Biosolids Facilities Project as the City's most important infrastructure priority.

Sewer Service Sharing in the Winnipeg Metro Region

On December 14, 2011, City Council approved provision of water and sewer services to neighboring municipalities as at the time there was excess capacity within Winnipeg's water treatment and sewage treatment systems.

On December 12, 2012, City Council rescinded its decision of December 14, 2011 to provide only sewer services to neighboring municipalities. The City draws its water from Shoal Lake under an Order (dated January 14, 1914) from the International Joint Commission (IJC). The IJC expressed concern about the City providing water services outside its boundaries and as a result Council amended the policy.

Council also delegated authority to the Chief Administrative Officer to negotiate and enter into service sharing agreements for the provision of sewer services.

The City of Winnipeg has entered service sharing agreements with the Rural Municipalities of Rosser (2014) and West St. Paul (2013). The City also entered into a Memorandum of Understanding with the Rural Municipality of St. Andrews in 2014. This service sharing

agreement, is being recommended by the Public Service with a cap of 4,800 people (roughly 5% of estimated remaining capacity of 90,000 people) for existing homes. The build out is expected to take nine years and no new development will be permitted until such time as a new biosolids facility is operational.

In order to manage the remaining biosolids facility capacity, the Public Service is recommending that future service sharing and new developments within existing serviced areas be approved by Council.

Current Capacity and Future Demands

Over the past ten years, growth in the City of Winnipeg exceeded Conference Board of Canada projections by 16%. The unexpected rate of growth is directly attributable to immigration policy and specifically the Manitoba Provincial Nominee Program. There has also been an increase in sewer demand for large industries that produce substantial solids in the food and dairy industries.

To measure the biosolid facility's remaining capacity, various engineering parameters are evaluated, including solids loading, hydraulic loading, chemistry (i.e. pH and alkalinity) and the length of time the solids can be exposed to the bacteria (solids retention time).

To track capacity and measure the impacts of development, the public service estimates the demand and strength of wastewater as a 'people equivalent' (i.e. the wastewater is equivalent to the wastewater of a certain number of people).

Based on the historical performance of various engineering parameters and projected population growth, the public service estimates that the system has approximately 90,000 people equivalent left as capacity in the existing biosolids facility (approximately five to nine years), which assumes all digesters (tanks) are operational – this includes digester 11 which was brought back into service in 2020.

The forecasted capacity is a professional estimate and the actual remaining life will be influenced by:

- the rate of residential growth in the City
- addition or deletion of a large industrial customer who produces a lot of sludge
- the growth rates in the areas of Rural Municipalities that the City services, if approved by Council
- actual performance of the South End Sewage Treatment Plant (SEWPCC) after its upgrade and its impact on digester operation
- the capacity used by interim chemical phosphorus removal and impact on digester operation

Next Steps

In January 2020, Council approved $15.2 million to proceed with engineering services but the Public Service cannot commence this work until the project delivery model is approved by the Province. The Province has asked for a review of the feasibility of a P3 project delivery model- all ICIP funding is still subject to federal approval and a delivery model that meets provincial requirements. The City has hired an external consultant to assist in the review and will report

back to the Province as soon as possible. It is critical that the biosolids project proceeds without undue delay.

The Province of Manitoba has not yet submitted the City of Winnipeg's ICIP funding application to the Government of Canada. This could cause further delays to the biosolids facility.

Reporting back to Council on the remaining biosolids capacity within the City of Winnipeg is recommended by 2022 Q2, so this information can inform future decision-making.

FINANCIAL IMPACT

Financial Impact Statement **Date:** October 27, 2020

Project Name:

BIOSOLIDS TREATMENT CAPACITY FOR THE CITY OF WINNIPEG

COMMENTS:

There is no financial impact related to the recommendations in this report.

"Original signed by L. Szkwarek, CPA, CGA"
Lucy Szkwarek, CPA, CGA
Manager of Finance and Administration

CONSULTATION

This Report has been prepared in consultation with:

Planning, Property and Development Department
City Economist

OURWINNIPEG POLICY ALIGNMENT

01-3 Prosperity Direction 1: Provide efficient and focused civic administration and governance. This report supports demonstration of accountability through service performance measurement and reporting.

02-2 Environment: The NEWPCC Upgrade Projects will reduce the environmental impact of our citizens on the Red River and the downstream lakes and rivers. They are in collaboration with the Regulatory Licence requirements issued by the Province of Manitoba.

WINNIPEG CLIMATE ACTION PLAN ALIGNMENT

- NEWPCC Upgrade: Biosolids Facilities Project aligns with the Strategic Opportunity #6 Waste Reduction and Diversion found on page 51 of the Climate Action Plan approved by Council on September 20, 2018; Key Directions 6.3 & 6.4.

- The Water Protection Act requires the City to reuse the wastewater biosolids, and to recover the nutrients from the biosolids to the maximum extent possible. The intent is for the facility to produce a class A biosolids which could be used for agricultural purposes resulting in diversion of biosolids from the landfill.

SUBMITTED BY

Department:	Water and Waste
Division:	Engineering Services
Prepared by:	M. Paetkau, M.Sc., P. Eng., Acting Branch Head for Wastewater Planning and Project Delivery
Date:	November 4, 2020
File No.:	S-972