Minutes – Standing Policy Committee on Finance – December 1, 2016

REPORTS

Item No. 12 North End Sewage Treatment Plant (NEWPCC) Biological Nutrient Removal Upgrade Financial Status Report No. 9 for the Period from July 1, 2016 to September 30, 2016

STANDING COMMITTEE DECISION:

The Standing Policy Committee on Finance concurred in the recommendation of the Winnipeg Public Service and received the report as information.

DECISION MAKING HISTORY:

Moved by Councillor Lukes,

That the recommendation of the Winnipeg Public Service be concurred in.

Carried

ADMINISTRATIVE REPORT

Title: NORTH END SEWAGE TREATMENT PLANT (NEWPCC) BIOLOGICAL NUTRIENT REMOVAL UPGRADE FINANCIAL STATUS REPORT NO. 9 FOR THE PERIOD FROM JULY 1, 2016 TO SEPTEMBER 30, 2016

Critical Path: Standing Policy Committee on Finance

AUTHORIZATION

Author	Department Head	CFO	CAO
G.K. Patton, P. Eng. Manager of Engineering Services	M. L. Geer, CPA, CA Acting Director, Water and Waste Department	M. Ruta	D. McNeil

EXECUTIVE SUMMARY

This report identifies the financial status and significant events for the North End Sewage Treatment Plant (NEWPCC) Biological Nutrient Removal Upgrading and Expansion for the period July 1, 2016 to September 30, 2016. The NEWPCC Power Supply project, which is proceeding as a Design Build, is currently on budget and is trending behind schedule. A delayed delivery of this project will not impact any future projects. The main NEWPCC Upgrade Project, the majority of which is also proceeding as a Design Build, is currently on budget but is behind schedule. The project completion date of December 2019 will not be achieved.

RECOMMENDATIONS

That this report be received as information.

REASON FOR THE REPORT

Administrative Directive No. FM-004 requires quarterly reporting to the Standing Policy Committee on Finance.

IMPLICATIONS OF THE RECOMMENDATIONS

There are no implications associated with receiving this report as information.

HISTORY / DISSCUSSION

DISCUSSION:

1. THE PROJECT

The goal of this project is to upgrade the North End Sewage Treatment Plant (NEWPCC) to meet new Regulatory Licence requirements regarding the maximization of nutrients and biosolids reuse and new effluent limits for nitrogen and phosphorous. The upgrade will also add wet weather treatment capability; add a new facility to treat the sludge from all three plants (based on recommendation to Council) and replace end-of-life equipment. The Project design will accommodate expected influent flows and loads to 2037. It will also take into account future regulatory trends and long term planning to year 2067 to facilitate effective process or facility modifications should they be required.

A new power sub-station is required at the NEWPCC to accommodate the additional power demand of the upgrades at the facility. The power supply upgrade is being delivered as a separate project from the main NEWPCC upgrade to allow for early procurement of long-lead items such as transformers, to ensure that the electrical power upgrade is available for the new processes when needed.

The delivery method for NEWPCC Power Supply Upgrade Project is design build (DB). The main NEWPCC Upgrade Project will be largely a DB project with a small scope being procured as design bid build (DBB).

The upgraded facility will have an economical whole-life cost and be an efficient and safe workplace for operational personnel. In addition, the plant must operate continuously during the work and continue to meet current effluent limits. The impact of construction and commissioning to the treatment's facility capability will be minimized as much as possible.

The Adopted Budget to date for the NEWPCC – Nutrient Removal/Upgrade is $794.61 million (Class 5 Estimate). The NEWPCC – Nutrient Removal/Upgrade adopted project budget includes the following Project Identifications:

Project ID	Project Year	Adopted Budget
2031001304 [1]	2004	$ 213,958
2031001310[1]	2010	$ 304,829
203110013B	2012 - 2016	$ 794,091,171
Total Adopted Budget		$ 794,609,958

[1] Does not appear in the Capital Expenditures Monthly Report as the funds have been expended and it is designated as a closed Project ID.

The Executive Project Sponsor is the Director of Water and Waste. The Project Manager is Remi Adedapo, M.A.Sc., PMP, P. Eng.

2. MAJOR CAPITAL PROJECT STEERING COMMITTEE

Administrative policy for projects with capital cost exceeding $20 million requires formation of Major Capital Project Steering Committee. This threshold was approved by Council on October 28, 2015. The Committee has been formed and its members are:

Doug McNeil, Chief Administrative Officer
Georges Chartier, Chief Asset and Project Management Officer
Moira Geer, Acting Director of Water and Waste
Lucy Szkwarek, Acting Manager of Finance and Administration, Water and Waste
Jackie Veilleux, Project Director, Winnipeg Sewage Treatment Program, Water and Waste

The Committee has reviewed this report and recommended that the report be sent to the Standing Policy Committee on Finance.

3. RISKS AND RISK MITIGATION STRATEGIES

There are risks associated with the cost and schedule for a project that is this large and complex especially at the early stages. In addition, the final bid amounts for projects are unknown until the project agreement is finalized with the Design Builder. The Adopted Budget to date, $794.61 million, is based on a Class 5 cost estimate which has an Association for the Advancement of Cost Engineering (AACE) expected accuracy range of -50% and + 100% or $397.31 million to $1,589.22 million.

In consultation with our engineering advisors, it was necessary to make estimates about the pace of engineering design and the pace of construction. Any delays typically result in increases in cost.

An ongoing risk management strategy has been implemented for both the main NEWPCC Upgrade and the NEWPCC Power Supply Project. It includes a proactive process of identifying risks, performing qualitative and quantitative risk analyses, creating response plan strategies and ongoing monitoring. The risk management process is an active part of the management of the projects.

The Winnipeg Sewage Treatment Program (WSTP), the design consultants and key City stakeholders for the main NEWPCC Upgrade and the NEWPCC Power Supply Project are scheduled to perform formal risk and opportunity analyses at the following project milestones.

Milestone	NEWPCC Power Supply	NEWPCC Main Upgrade
End of Project Definition Design Phase	completed	Q2 2017
End of Preliminary Design Phase	completed	Q1 2018

Since detailed design and construction will be carried out through a DB contract, the WSTP will be transferring as much risk as reasonable to the Design Builder.

A project risk register will be developed for each separate project under the NEWPCC budget. Currently, a risk register has been developed for the NEWPCC Power Supply project and contains over 40 specific cost and schedule risks associated with design, procurement, construction, operation and unknown events. The project will also incorporate structured

Hazard and Operability Analysis and a Construction Hazard Assessment Implication Review. A risk register for the main NEWPCC Upgrade is being developed. Critical risks for the main NEWPCC Upgrade will be provided in a future Report.

Critical risks associated with the NEWPCC Power Supply will be reviewed prior to issuing of the Design Build RFP and currently include:

NEWPCC Power Supply Upgrade Risk Matrix[1]	
Risk Statement and Explanation	**Mitigation**
There are tight project constraints associated with the installation/removal of high voltage (HV) lines into the plant by MB Hydro as this work can only be carried out in the spring or fall. This may result in project delays.	Ongoing review of project concept and load requirements with Manitoba Hydro.
If power failures occur during construction when no line redundancy exists, Project delays and process upset may occur, resulting in additional costs for remediation, and lack of power for new plant facilities.	Provide backup capacity as part of the design and install temporary equipment early to be available as backup.
A safety issue as a result of work near energized high voltage equipment, project delay could occur resulting in additional costs for safety measures and longer project duration.	The design build RFP to require specific safety practices for work around HV equipment (safety watcher) as well as the development of very detailed step-by-step work execution plan and close monitoring to maintain adherence.
Old electrical equipment and building parts may contain asbestos.	Provide existing asbestos surveyed list in DB RFP. Include a process in the RFP for identifying and handling unidentified asbestos and include a requirement for mandatory asbestos training for all DB construction staff.
Delays in equipment delivery may result in project delay.	Expedite construction schedule and contractor awards.
Safety issues could occur as a result of increased traffic on the NEWPCC site.	The DB contractor will be required to develop a construction traffic management plan and be restricted off certain areas of the plant.

[1]Risk Matrix is arranged vertically from higher to lower assessed risk

4. CHANGES FROM LAST REPORT

NEWPCC Power Supply Upgrade:

- The Preliminary Design Report – 100% Draft has been submitted for review.
- An Over Expenditure Report for the Consultant's scope change in the amount of $62,502 taxes extra to allow for future centralized power distribution has been approved. The scope change also affected schedule of the original assignment.
- The Request for Qualifications (RFQ) for the power supply design builder has closed. Black & McDonald Limited & Wescan Electrical Mechanical Services have being identified

as pre-qualified parties, and will be invited to submit proposals. The Request for Proposals is to be posted before the end of 2016.

NEWPCC Upgrade:

- The RFP to engage a consulting firm to act as the design build owner's advocate and the design bid build consultant for the main NEWPCC Upgrade closed in July 2015 and, based on the authority delegated by Council on May 19, 2010, the CAO approved award of the contract to AECOM.
- AECOM is currently working on the conceptual design/project definition aspect of the project. As part of AECOM's Conceptual Layout Options review, it was determined that the NEWPCC expansion will require additional space than what is currently available on the immediate site east of the existing Canadian Pacific Rail Line. It will therefore be necessary to use the parcel of land owned by the City of Winnipeg (under the Water and Waste Department jurisdiction) just west of the plant site as part of this upgrade. This parcel of land is bounded to the north by the future Chief Peguis Extension and to the west by Ferrier Street. This land is currently zoned appropriately to permit the expansion of the existing sewage treatment plant.
- The following Over Expenditure Reports were approved for additional engineering services:
    - The amount of $11,250 was approved as a scope change for AECOM to perform a sensitivity analysis on the potential changes to the ammonia licence based on varying scenarios.
    - The amount of $10,063 was approved as a scope change for AECOM to investigate alternative layouts and to document the impacts and costs for the communication tower to remain in its current location or in a new location on the NEWPCC property.

5. ISSUES/RISKS REQUIRING FURTHER ATTENTION

Cost Risk

The current project budget for the NEWPCC Nutrient Removal/Upgrade Project is $794.61 million and is based on a Class 5 estimate with an expected accuracy range of between -50% and +100%. It is anticipated that the estimate will be refined based on cost estimates from design consultants for the NEWPCC Power Supply and the main NEWPCC Upgrade Projects at the completion of the conceptual design and preliminary design phases.

A City-owned communications tower is located on the land proposed for the NEWPCC Nutrient Removal/Upgrade and therefore must be removed prior to the construction of the main NEWPCC Upgrade. Costs associated with moving this tower are currently estimated to be $862,400. The estimate is based on a Class 4 cost estimate with an expected accuracy range of between -30% to +60%. This cost has been included in the 2017 budget process for Council review. A public consultation has been carried out for the proposed relocation of the communication tower to a City-owned parcel of land north of the future Chief Peguis Extension and east of Ferrier Street.

A Thermal Hydrolysis with Mesophilic Anaerobic Digestion (TH-MAD) process is proposed to be installed as part of the main NEWPCC Upgrade based on the Biosolids Master Plan. The TH-MAD process will generate more bio-gas than the existing process and will also require a significant amount of high pressure steam to aid the sludge digestion. This bio-gas could be used as an energy source for the boilers to produce the steam for the TH-MAD process or it

could be used by a combined heat and power (CHP) facility to produce both steam and electricity. The steam from the CHP could be used by the TH-MAD process while the electricity produced could be used to offset electricity costs.

The owner's advocate for the main NEWPCC Upgrade has developed a business case to determine the viability of building and using a CHP facility versus the use of boilers for the bio-gas. The business case is under review. Costs related to the design construction of the CHP facility have not been included in the Biosolids – Alternative Disposal Delivery and Management System budget or the NEWPCC - Nutrient Removal/Upgrade budget. These costs may be added to the NEWPCC budget for Council review if justified by the business case.

It is an AACE International-accepted practice that cost estimates are adjusted as design progresses.

Provincial funding of $195 million was committed in 2007; to date the City has received $33.5 million of this commitment.

6. SCHEDULE

Key schedule milestones for the NEWPCC Power Supply Upgrade project's professional engineering services, as provided by the consultant, are as follows:

NEWPCC Power Supply Upgrade		
Milestone Description	**Timeline**	
	Previous Report	**This Report**
Complete Project Definition Report	November 2015	November 2015[1]
Complete Preliminary Design Report	September 2016	November 2016
Cost Report	January 2017	January 2017[2]
Issue Design Build RFP	September 2016	November 2016
Design Builder Contract Award	May 2017	October 2017

[1] Consultant Class 5 Estimate
[2] Consultant Class 3 Estimate

Detailed design and construction schedule for the NEWPCC Power Supply Upgrade Project will be provided upon project award to the Design Builder. Completion of the Preliminary Design Report and issue of the Design Builder's RFP is not anticipated to result in a delay to the main NEWPCC Upgrade Project.

The project schedule for the main NEWPCC Upgrade is under review. The project completion date of December 2019 is not achievable due to the size and complexity of this project. The following key schedule milestones are for the main NEWPCC Upgrade project's professional engineering services, as provided by the consultant are as follows:

NEWPCC Upgrade		
Milestone Description	**Timeline**	
	Previous Report	**This Report**
Complete Project Definition Report	April 2017	April 2017[1]
Complete Preliminary Design Report	March 2018	March 2018

Cost Report	July 2018	July 2018[2]
Issue Design Build RFP	March 2018	March 2018
Design Builder Contract Award	May 2019	May 2019

[1] Consultant Class 5 Estimate
[2] Consultant Class 3 Estimate

More detail project schedule information will be developed upon the completion of the project preliminary design phase and will be updated in future reports.

7. FINANCIAL ANALYSIS

The status of current Requests for Proposal and Bid Opportunities are as follows:

RFP or Bid Opportunity	Description	Current Status	Contract Value (GST & MRST extra as applicable)	Total Approved Over-Expenditures
40-2014	Professional Engineering Consulting Services for the NEWPCC Power Supply Upgrade – Phase 1	Contract awarded to KGS Group Inc.	$1,180,110	$62,502
506-2014	Supply and Delivery of a Struvite Recovery System	Pre-selection awarded to Ostara Nutrient Recovery Technologies Inc.	TBD	
10-2015	Fairness Advisor for the NEWPCC Power Supply Upgrade Project	Contract awarded to Knowles Consultancy Services Inc.	$37,620	
182-2015	Professional Engineering Consulting Services for the North End Sewage Treatment Plant (NEWPCC) Upgrade – Phase 1	Awarded to AECOM Canada Ltd.	$16,015,439	$21,313
816-2015	Cost Consultant for the NEWPCC Power Supply Upgrade Project	Contract awarded to Hanscomb Limited	$45,040	
599-2015 A	Request for Qualifications for Design Build of the City of Winnipeg's North End Sewage Treatment Plant Power Supply Upgrade Project	Pre-qualified parties are Black & McDonald Limited Wescan Electrical Mechanical Services	N/A*	
	Total		$17,278,209	$83,815

*This is the first stage of two stage process and the contract value will be determined in the second stage.

Project Funding

The approved capital and current projected budget are as follows:

YEAR	CAPITAL PROGRAM	ACTUAL + PROJECTED CASH FLOWS	CUMULATIVE CAPITAL BUDGET REMAINING
Up to 2016	794,610,000 [1]	6,502,205	788,107,795
2017		15,850,000	772,257,795
2018		28,139,000	744,118,795
2019		85,201,000	658,917,795
Beyond 2019		658,917,795	0
Total	794,610,000 [1]	794,610,000	

[1]Capital budget approved by Council

A summary of the budget to forecast comparison is included in Appendix 1 (attached). The Appendix reflects the award of the DB Contractor for the NEWPCC Power Supply Upgrade and the main NEWPCC Upgrade Projects in 2017 and 2019 respectively.

Overall Sewage Treatment Program Funding (NEWPCC, SEWPCC, WEWPCC)

The Province of Manitoba has committed $234.8 million towards the sewage treatment plant upgrades:

- $25 million is committed from the Canada Strategic Infrastructure Fund program.
- $11 million is committed from the Green Infrastructure Fund program.
- $3.8 million is committed from the 2004 Urban Capital Projects Allocation.
- $195 million committed by the Province of Manitoba in its 2007 Throne Speech.

NEWPCC Nutrient Removal/Upgrade Funding

The City projects provincial funding of $195 million towards the NEWPCC Nutrient Removal/Upgrade out of the total $234.8 million committed to sewage treatment plant upgrades. The balance of $599.61 million will be funded using a combination of cash, Environmental Projects reserve and debt funding. Each of these sources is internally funded by rates as forecast in the Council approved rate report.

There are no federal funds committed for this project.

Funding for the NEWPCC and the WSTP is outlined in Appendix 2 (attached).

8. OTHER

Winnipeg Sewage Treatment Program (WSTP)

Under the WSTP, Veolia will provide advice to the City of Winnipeg in the design and construction of the NEWPCC project. As indicated in the latest WSTP Annual Report (tabled at Standing Policy Committee on Water and Waste, Riverbank Management and the Environment meeting September 8, 2016) Veolia is delivering value to the City of Winnipeg. In this project, the City of Winnipeg is benefitting from:

- Provision of expert advice on NEWPCC Nutrient Removal/Upgrade and expansion
- Share in the risks of the capital project delivery

FINANCIAL IMPACT

Financial Impact Statement Date: October 24, 2016

Project Name:

NORTH END SEWAGE TREATMENT PLANT (NEWPCC) BIOLOGICAL NUTRIENT REMOVAL UPGRADE FINANCIAL STATUS REPORT NO. 9 FOR THE PERIOD FROM JULY 1, 2016 TO SEPTEMBER 30, 2016

COMMENTS:

As this report is submitted for informational purposes only, there is no financial impact associated with this recommendation.

Original signed by Lucy Szkwarek, CPA, CGA
Lucy Szkwarek, CPA, CGA
Acting Manager of Finance and Administration

CONSULTATION

In preparing this report there was consultation with:

N/A

OURWINNIPEG POLICY ALIGNMENT

02-2 Environment
The NEWPCC Biological Nutrient Removal Upgrade will reduce the environmental impact of our citizens on the Red River and the downstream lakes and rivers. It is in collaboration with the Regulatory Licence requirements issued by the Province of Manitoba.

SUBMITTED BY

Department: Water and Waste
Division: Engineering Services
Prepared by: R.Y. Adedapo, M.A.Sc., PMP, P.Eng.
Date: November 1, 2016
File No.: S-972

c: Major Capital Project Steering Committee (email)

ATTACHMENTS:
Appendix 1 – NEWPCC Nutrient Removal/Upgrade Estimated Costs and Project Costs to Complete
Appendix 2 – Funding: North End Sewage Treatment Plant (NEWPCC) and Winnipeg Sewage Treatment Program (WSTP)

NEWPCC NUTRIENT REMOVAL/UPGRADE
WATER AND WASTE DEPARTMENT - ENGINEERING DIVISION
APPENDIX 1
As at Sep 30, 2016

		COSTS				PROJECTED COSTS TO COMPLETE					TOTAL	VARIANCE
	COMPONENTS	Approved Budgeted to Date[1]	Costs Incurred up to last report	Costs submitted this report	Total Costs Incurred to Date (per G/L) 12-Oct-2016	2016	2017	2018	2019	Total Costs Remaining to Complete	Total Project Cost	Variance from Budget (Unfavorable)
A	**PROFESSIONAL SERVICES[2]**	57,196,000	3,825,128	946,077	4,771,205	1,545,185	9,611,000	12,757,000	8,631,000	19,880,610	57,196,000	0
B	**CONSTRUCTION**	620,031,000	102,000	0	102,000	0	6,239,000	15,382,000	76,570,000	521,738,000	620,031,000	0
C	**CONTINGENCIES**	117,383,000	0	0	0	83,815	0	0	0	117,299,185	117,383,000	0
	TOTALS	**794,610,000**	**3,927,128**	**946,077**	**4,873,205**	**1,629,000**	**15,850,000**	**28,139,000**	**85,201,000**	**658,917,795**	**794,610,000**	**0**

Percentage Complete **0.61%**

[1] Total budget of $794.61 Million for the NEWPCC Nutrient Removal/Upgrade and Distribution of costs to Components A, B and C was done by the Water and Waste Department. These are estimates and will be revised as the project progresses.

[2] Professional Services include Professional Engineering Services, other expert design and cost review, overhead and administration charges

Funding: North End Sewage Treatment Plant (NEWPCC) and Winnipeg Sewage Treatment Program (WSTP)
Appendix 2

1) Funding for the NEWPCC is as follows:

NEWPCC Nutrient Removal/Upgrade		Funded to Date		Funding Pending		Total Funding		City Share of
(in $millions)	Total Cost	Canada	Manitoba	Canada	Manitoba	Canada	Manitoba	Costs
Provincial Funding								
Environment Act Licence								
Driven	466.00		33.54		161.46	-	195.00	271.00
Other	328.61							328.61
Estimated Program Costs	**794.61**		**33.54**		**161.46**	**-**	**195.00**	**599.61**

2) Funding for the Winnipeg Sewage Treatment Programs is as follows:

WSTP All Projects		Funded to Date		Funding Pending		Total Funding		City Share of
(in $millions)	Total Cost	Canada	Manitoba	Canada	Manitoba	Canada	Manitoba	Costs
WEWPCC Biological Nutrient Removal	33.23	5.07	8.19			5.07	8.19	19.97
NEWPCC Centrate and UV Disinfection	52.08	5.59	14.54			5.59	14.54	31.95
SEWPCC Nutrient Removal/Expansion	335.60	7.05	8.88	35.29	8.20	42.34	17.08	276.18
NEWPCC Nutrient Removal/Upgrade	794.61		33.54		161.46		195.00	599.61
Estimated Program Costs	**1,215.52**	**17.71**	**65.15**	**35.29**	**169.66**	**53.00**	**234.81**	**927.71**

Notes:

- WEWPCC Biological Nutrient Removal and NEWPCC Centrate and UV Disinfection have been completed.