Minutes – Standing Policy Committee on Finance – May 4, 2017

REPORTS

Item No. 6 North End Sewage Treatment Plant (NEWPCC) Biological Nutrient Removal Upgrade Financial Status Report No. 10 for the Period from October 1, 2016 to February 28, 2017

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. 10 FOR THE PERIOD FROM OCTOBER 1, 2016 TO FEBRUARY 28, 2017

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 October 1, 2016 to February 28, 2017. 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. There are no schedule changes to the main NEWPCC Upgrade Project since last report.

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 / 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 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 $795.59 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 - 2017	$ 795,071,171
Total Adopted Budget		$ 795,589,958

[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. Also included in that Council Approval was that the threshold be adjusted for construction inflation on an annual basis. Per Appendix 6 in the 2017 Capital Budget Book, the threshold for 2017 is $21 million. The Committee has been formed and its members are:

Doug McNeil, Chief Administrative Officer
Georges Chartier, Chief Asset and Project Management Officer
Dave Wardrop, Chief Transportation and Utilities Officer (a new addition to the committee)
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, $795.59 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 $397.80 million to $1,591.18 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 Upgrade Projects. 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 projects will also incorporate structured Hazard and Operability Analysis and a Construction Hazard Assessment Implication Review. 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.

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

Milestone	**NEWPCC Power Supply**	**NEWPCC Main Upgrade**
End of Project Definition Design Phase	Completed	Completed
End of Preliminary Design Phase	Risk Workshop completed in 2016 with risk reviews continuing into Q1 2017	Q1 2018

The Risk Registers for each of the Projects contain cost and schedule risks associated with design, procurement, construction, operation and unknown events. The Risk Register is reviewed and updated regularly by the WSTP.

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**
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.
Safety issues could occur as a result of increased traffic on the NEWPCC site.	The Design Builder will be required to develop plans that address construction traffic and will be largely limited to a separate entrance to the plant.
Manitoba Hydro may not have the required power available within the required timeframe.	Ongoing close coordination with Manitoba Hydro and will obtain commitments from Manitoba Hydro based upon a firm schedule.
As part of construction activities, the power in an area believed to be de-energized could be energized resulting in a potential shock or arc flash and associated injury and equipment damage.	Ensure that the Design Builder has an appropriate Health and Safety Plan, Construction Phasing Plan and Interface Plan.
The Design Builder is not familiar with the existing equipment labelling, some of which may be confusing due to historical issues and thus there is a possibility of incorrect switching or electrical lock-out resulting in a potential shock or arc flash and associated injury and equipment damage.	City to carry out electrical switching of all equipment outside of the Design Builder's scope of work. Design Builder to prepare detailed plans of all switching events.
There will be a period during construction when only a single power line will be active. In the event of a construction induced failure of that single line there could be a complete loss of power to the site along with the associated process consequences.	Contractually limit time that only a single line will be active and ensure contractual consequences to Design Builder induced power outages are in place.

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

A summary of the critical risks for the main NEWPCC Upgrade Project related to cost, schedule and safety are indicated in the table below:

NEWPCC Upgrade Project Risk Matrix[1]	
Risk Statement and Explanation	**Mitigation**
There may be unknown conditions that may be associated with reusing existing facilities	The DB agreement to include mechanism to deal with unforeseen conditions of existing facilities. Proponents will also be provided access to the site for due diligence and examination.
Assumptions made on the grit quantities in the sludge may not be appropriate resulting in damage to grit sensitive equipment and under sizing of sludge facilities	A grit characterization study of the sludges from the City's sewage treatment plant will be carried out to quantify the grit in the sludge.
No existing legislation on odour release threshold causing potential impact and complaints from neighbors resulting in post- construction renovations or changes in operation at additional cost.	WSTP to define industry norm quantifiable odour limits and implement into DB design and performance requirements.
Project cost exceeds anticipated budget resulting in project delay and increased costs for implementation.	A revised Class 5 cost estimate for the project is being prepared by the owner's advocate. This will be compared against existing budget and reconciliation of changes will be developed. Additionally, a Class 3 cost estimate will be carried out after preliminary design to validate budget.
Unknown existing conditions related to geotechnical, environmental and hazardous material may be encountered during construction causing schedule delays and additional costs.	Geotechnical investigations and environmental impact assessments are being carried out prior to construction to minimize unknowns. It is also anticipated that contracting with a single entity responsible for construction risks would minimize impact.

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

4. CHANGES FROM LAST REPORT

NEWPCC Power Supply Upgrade:

- The development of the RFP and draft Design Build Agreement has continued. The Request for Proposals will be posted in Q1 of 2017.
- The Cost Development Documents have been submitted for final review.
- A site tour for the Prequalified Parties was completed.
- A meeting was held in December 2016 to update the Prequalified Parties on the status of the RFP.
- An Over Expenditure Report in the amount of $ 44,260 was approved as a scope change for the Fairness Advisor, Knowles Consultancy Ltd, to allow for time to review procurement documents and attend commercially confidential meetings.

NEWPCC Upgrade:

- Owner's Advocate Engineer, AECOM is continuing to work on the conceptual design/project definition aspect of the project.
- Work is starting on the development of procurement documents, such as the Request for Qualification, the Request for Proposals, and the Design Build Agreement.
- An Over Expenditure Report in the amount of $10,830 was approved as a scope change for AECOM to perform a sensitivity analysis on the potential changes to carbonaceous biochemical oxygen demand (cBOD) and total suspended solids (TSS) licence based on varying scenarios.

5. ISSUES/RISKS REQUIRING FURTHER ATTENTION

Cost Risk

The current project budget for the NEWPCC Nutrient Removal/Upgrade Project is $795.59 million and is based on a Class 5 estimate with an expected accuracy range of between -50% and +100%. 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 moved prior to the construction of the main NEWPCC Upgrade. Costs associated with moving this tower are included in the 2017 Adopted Capital Budget by Council. The relocation of the communication Tower will be managed by the Public Service. The current conceptual design for the NEWPCC Upgrade anticipates that the tower will be relocated to the additional parcel of land owned by the City of Winnipeg (under the jurisdiction of the Water and Waste Department) immediately west of the Canadian Pacific Rail Line.

The Owner's Advocate for the main NEWPCC Upgrade has developed a business case to determine the viability of building and using a combined heat and power (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	November 2016	February 2017
Cost Report	January 2017	February 2017[2]
Issue Design Build RFP	November 2016	March 2017
Design Builder Contract Award	October 2017	January 2018

[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 has not changed since last report. The following key schedule milestones 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

Detailed design and construction schedule for the main NEWPCC Upgrade Project will be provided upon project award to the Design Builder.

7. FINANCIAL ANALYSIS

The status of current Requests for Proposal and Bid Opportunities for both the NEWPCC Power Supply Upgrade and the main NEWPCC Upgrade Projects are as follows:

RFP or Bid Opportunity	Description	Current Status	Contract Value (GST & MRST extra as applicable)	Total Approved Over-Expenditures
NEWPCC Power Supply Project				
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

RFP or Bid Opportunity	Description	Current Status	Contract Value (GST & MRST extra as applicable)	Total Approved Over-Expenditures
10-2015	Fairness Advisor for the NEWPCC Power Supply Upgrade Project	Contract awarded to Knowles Consultancy Services Inc.	$37,620	$44,260
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*	-
816-2015	Cost Consultant for the NEWPCC Power Supply Upgrade Project	Contract awarded to Hanscomb Limited	$45,040	
136-2017	External Legal Counsel - NEWPCC Power Supply Project	Blakes Cassels & Graydon LLP	$100,000	-
The main NEWPCC Upgrade Project				
506-2014	Supply and Delivery of a Struvite Recovery System	Pre-selection awarded to Ostara Nutrient Recovery Technologies Inc.	TBD	-
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	$31,693
866-2016	Pre-Selection and Design Services for Thermal Hydrolysis Process System for the North End Sewage Treatment Plant	Evaluation of Proposal evaluations is ongoing	TBD	-
9-2017	Request for Proposal for a Fairness Advisor for the North End Sewage Treatment Plant Upgrade Project	Proposal Submission Deadline is March 1, 2017	TBD	-
Total *(NEWPCC Power supply and NEWPCC Upgrade Projects)*			$17,378,209	$138,455

*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 2017	795,590,000 [1]	16,561,455	779,028,545
2018		16,349,000	762,679,545
2019		179,414,000	583,265,545
2020		170,695,000	412,570,545
Beyond 2020		412,570,545	0
Total	795,590,000 [1]	795,590,000	

[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 Design Builder for the NEWPCC Power Supply Upgrade and the main NEWPCC Upgrade Projects in 2018 and 2019 respectively. A variance of $138,455 was indicated in Appendix 1 due to approved over-expenditures related to Professional Services Contracts.

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

- When a risk is identified; a contingency amount is to be derived and included as part of the project cost. The WSTP then manages the risk and cost through the life of the project. Risk sharing and any pain gain under the program is then shared by both Veolia and the City. In addition to risk identification the WSTP considers life-cycle cost and decisions are made to provide an optimal sewage treatment plant (construction cost and operation and maintenance cost) for the City. The WSTP takes into account the need to meet regulation. The cost to meet regulation is then assessed to ensure suitable technology and services are provided. The City is leveraging Veolia's experience in the management of risk and the operation and maintenance of sewage treatment plants in the delivery of the WSTP.

FINANCIAL IMPACT

Financial Impact Statement **Date:** **March 15, 2017**

Project Name:

NORTH END SEWAGE TREATMENT PLANT (NEWPCC) BIOLOGICAL NUTRIENT REMOVAL UPGRADE FINANCIAL STATUS REPORT NO. 10 FOR THE PERIOD FROM OCTOBER 1, 2016 TO February 28, 2017

COMMENTS:

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

"Original signed by L. 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

OurWinnipeg Reference: 2-2 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: April 27, 2017
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 Feb 15, 2017

		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) 15-Feb-2017	2017	2018	2019	2020	Total Costs Remaining to Complete	Total Project Cost	Variance from Budget (Unfavorable)
A	**PROFESSIONAL SERVICES[2]**	57,196,000	4,771,205	1,467,203	6,238,408	9,721,047	7,769,000	9,526,000	8,405,000	15,675,000	57,196,000	(138,455)
B	**CONSTRUCTION**	621,011,000	102,000	0	102,000	500,000	8,580,000	169,888,000	162,290,000	279,651,000	621,011,000	0
C	**CONTINGENCIES**	117,383,000	-	-	-	-	-	-	-	117,244,545	117,244,545	138,455
	TOTALS	**795,590,000**	**4,873,205**	**1,467,203**	**6,340,408**	**10,221,047**	**16,349,000**	**179,414,000**	**170,695,000**	**412,570,545**	**795,590,000**	**0**
	Percentage Complete	**0.80%**										

[1] Total budget of $795.59 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	329.59							329.59
Estimated Program Costs	**795.59**		**33.54**		**161.46**	**-**	**195.00**	**600.59**

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	795.59		33.54		161.46		195.00	600.59
Estimated Program Costs	**1,216.50**	**17.71**	**65.15**	**35.29**	**169.66**	**53.00**	**234.81**	**928.69**

Notes:

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