

Minutes - Standing Committee on Fiscal Issues - November 8, 2005

REPORTS

**Minute No. 3 West End Water Pollution Control Centre Process Upgrading:
Biological Nutrient Removal and Disinfection System Enhancements
Financial Status Report No. 4 for the period from May 1, 2005 to
August 31, 2005
File WS-7**

STANDING COMMITTEE DECISION:

The Standing Committee on Fiscal Issues concurred in the administrative recommendation and received the report as information.

Minutes - Standing Committee on Fiscal Issues - November 8, 2005

DECISION MAKING HISTORY:

Moved by Councillor Pagtakhan,

That the administrative recommendation be concurred in.

Carried

RE: WEST END WATER POLLUTION CONTROL CENTRE (WEWPCC) PROCESS UPGRADING: BIOLOGICAL NUTRIENT REMOVAL (BNR) AND DISINFECTION SYSTEM ENHANCEMENTS FINANCIAL STATUS REPORT NO. 4 FOR THE PERIOD FROM MAY 1, 2005 TO AUGUST 31, 2005

FOR SUBMISSION TO: THE STANDING COMMITTEE ON FISCAL ISSUES

ORIGINAL REPORT SIGNED BY: Barry D. MacBride, P.Eng.

REPORT DATE: October 31, 2005

RECOMMENDATION(S): That this report be received as information.

REPORT SUMMARY

KEY ISSUES:

- Manitoba Conservation issued Environment Act Licence No. 2669 on September 3, 2004, revised Environment Act Licence No. 2669 E on April 12, 2005 and revised Environment Act Licence No. 2669 ER on August 17, 2005, for the West End Water Pollution Control Center.
- This project is necessary to meet the following requirements of this licence.
 - year round effluent disinfection
 - new effluent limits for nitrogen and phosphorous
 - complete the construction and commissioning of the upgraded wastewater plant by December 31, 2006
- Continued acceptance of septage (truck hauled waste) at the WEWPCC will negatively impact the new biological process.
- A risk management consultant has conducted a risk analysis for this project and has identified that additional funding may be required due to project scope definition being at a conceptual design level.
- Better costing information is expected at the completion of the Functional Design stage.
- The project will not be completed by December 31, 2006.
- Use of the storage ponds for cooling of the final effluent prior to discharge to the Assiniboine River may compromise the effluent quality to the point of non-compliance with the licence.

IMPLICATIONS OF THE RECOMMENDATION(S):

General Implications

- | | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | None |
| <input type="checkbox"/> | For the organization overall and/or for other departments |
| <input type="checkbox"/> | For the community and/or organizations external to the City of Winnipeg |
| <input type="checkbox"/> | Involves a multi-year contract |
- Comment(s):

Policy Implications

- No
- Yes - Comment(s):

Environmental Implications

- None
- Yes

Comment(s): Nutrient reduction at the WEWPCC, in concert with reduction of nitrogen and phosphorus at the NEWPCC in the centrate sidestream, will meet the interim nutrient reduction targets established for Lake Winnipeg by the Province in February 2003. Year-round disinfection is required by the licence rather than just May to September.

Human Resources Implications

- No
- Yes

Comment(s): Additional staff will be required to operate and maintain the expanded facility.

Financial Implications

- Within approved current and/or capital budget
- Current and/or capital budget adjustment required

Comment(s): While preliminary indications are that there may be an estimated \$5,080,000 shortfall in 2006 funding requirements, this estimated amount will be reevaluated after the functional design phase is completed in October 2005.

REPORT

REASON FOR THE REPORT:

At its meeting held on December 16, 1999 City Council adopted a policy whereby all Capital projects with a total estimated cost of \$10 million or more be submitted by the associated Civic Department to the Standing Committee on Fiscal Issues for review and recommendation prior to any bid solicitation being issued.

HISTORY:

- 2000 The funds approved in 1993 for disinfection were carried forward and re-approved by Council in the 2000 Supplementary Capital Estimates. This Capital had not been used for disinfection to date as the lagoons at the WEWPCC were already meeting proposed disinfection targets for the defined summer recreation season.
- 2003 On December 3, the City of Winnipeg authorized Earth Tech (Canada) Inc. (formerly Reid Crowther & Partners Ltd.) to undertake a WEWPCC Nutrient Removal Conceptual Design Study.
- 2003 On December 10, February 2 and February 24, 2004 meetings were held between the City and the Province to discuss implementation plans for wastewater system improvements.
- 2003 On December 16, Council adopted the 2004 Capital Budget and the 2005-2009 Five Year Forecast that included \$8,905,000.00 for Nutrient Removal - WEWPCC and \$3,398,000.00 for Wastewater Disinfection - WEWPCC.
- 2004 On June 23, Council received as information a report outlining the work schedule and financing plan for the sewer utility that included implementing biological nutrient removal and effluent disinfection upgrades at the WEWPCC by 2006.
- 2004 On October 12, the Standing Committee on Fiscal Issues received as information the first financial status report on the WEWPCC Process Upgrading: Biological Nutrient Removal and Disinfection System Enhancements.
- 2004 On December 13, Council adopted the 2005 Capital Budget and the 2006-2010 Five Year Forecast that included \$16,200,000.00 for Nutrient Removal - WEWPCC.
- 2005 On February 8, the Standing Committee on Fiscal Issues received as information the second financial status report on the WEWPCC Process Upgrading: Biological Nutrient Removal and Disinfection System Enhancements.

2005 On June 14, the Standing Committee on Fiscal Issues received as information Financial Status Report No. 3 for the WEWPCC Process Upgrading: Biological Nutrient Removal and Disinfection System Enhancements.

DISCUSSION:

1.0 INTRODUCTION

Administrative policy for projects with capital costs exceeding \$10 million requires the formation of a Major Capital Projects Steering Committee. This committee has been formed and its members are as follows:

- Barry D. MacBride - Director and Chair
- Mike Ruta - Corporate Controller (Alternate: Jason Ruby)
- Bill Larkin - Director, Public Works
- Harry Finnigan - Director, Planning Property and Development (Alternate: Ian McKay)

The Major Project Steering Committee has reviewed this report and recommended that the report be sent to the Fiscal Issues Committee.

2.0 SCOPE MANAGEMENT

2.1 General

On September 3, 2004, Manitoba Conservation issued Environment Act Licence No. 2669 to the City of Winnipeg for the West End Water Pollution Control Center, rescinding the previous Stage 1 Licence No. 1370. Pursuant to Section 27 of the Environment Act, the City appealed this licence on October 1, 2004.

On September 22, 2004, the City of Winnipeg authorized Earth Tech (Canada) Inc. to proceed with Design Services for the WEWPCC Biological Nutrient Removal and UV Disinfection Upgrade.

On April 12, 2005, Manitoba Conservation issued revised Environment Act Licence No. 2669 E in accordance with the Environment Act to the City of Winnipeg. The Licence was varied as directed by the Minister of Conservation, upon consideration of the City of Winnipeg's appeal. However, as discussed in Fiscal Issues Report No. 3, the appeal items were denied. These items were seasonal effluent disinfection as opposed to year-round, the exclusion of growing algae in the suspended solids, and a one-year commissioning period. Although not an appeal item, this new licence revised year round nutrient levels contained in the effluent to 15 mg/L nitrogen and 1mg/L phosphorus.

2.2 Engineering Design Services

Key Activities Completed:

- In December 2004, ETC submitted their WEWPCC Nutrient Removal and UV Disinfection Upgrade Draft Conceptual Design Report.
- In January 2005, for scope management and quality management reasons, the City retained an Independent Review Team (IRT) to review the draft Conceptual Design Report issued by ETC in December 2004.
- On April 28, 2005, ETC completed the WEWPCC Nutrient Removal and UV Disinfection Upgrade Conceptual Design Report. The Conceptual Design Report reflects recommendations made by the IRT.
- The Water and Waste Department has met with a subgroup of the truck haulers to discuss that truck hauled waste may be redirected from the WEWPCC to the NEWPCC, or possibly the SEWPCC. The Water and Waste Department will be submitting a separate report to the Standing Policy Committee on Public Works concerning this recommendation.
- Previous fiscal issues reports noted a potential high fraction of unbiodegradable and soluble nitrogen in the influent wastewater. Further testing by ETC has determined that the fraction of unbiodegradable and soluble nitrogen is within the typical range and not as high as first indicated. Accordingly, the scope of the project is not required to be increased.
- ETC submitted a draft Functional Design Report in August 2005.

2.3 Sequential Multi-Contract Project Delivery Model

In order to address the tight time-line for this project, a sequential, multi-contract project delivery model is being used. A total of four equipment supply and general construction contracts have been proposed. The proposed contracts are identified as follows:

2.3.1 UV Disinfection Facility

In addition to the facility itself, this contract will also include all the equipment components of the UV facility.

2.3.2 Aeration equipment for bioreactors

2.3.3 Waste activated sludge thickening (DAF) equipment

2.3.4 WEWPCC BNR Upgrade

This general contract will include all components of the WEWPCC treatment facility, including the new secondary clarifier, the new primary sludge fermenters, retrofit of the existing secondary clarifiers, the new chemical feed and DAF building, bioreactor modification, and all associated pumping piping, mechanical, electrical, controls, general upgrades and site work.

3.0 QUALITY MANAGEMENT

A Water & Waste Department Technical Advisory Committee was formed which reviews and approves the design phases of this project. This Committee consists of representatives from Engineering Division, Wastewater Services Division and Environmental Standards Division.

IRT:

- The City retained an Independent Review Team (IRT) to review the ETC's Conceptual & Functional Designs.
- The IRT requested further investigation and evaluation of BNR and chemically enhanced primary treatment (CEPT) which resulted in a positive modification to the design of the BNR process
- The IRT advised that continued acceptance of septage (truck hauled waste) at the WEWPCC will negatively impact the new biological process.

4.0 PROJECT TIME (SCHEDULE) MANAGEMENT

The schedules for different phases of the project from information provided in ETC's August 21, 2005 schedule update are listed in the table below:

DESCRIPTION	START	COMPLETION
Preliminary Design	August 2004	September 2004
Conceptual Design	September 2004	April 2005
Independent Review Team	January 2005	August 2005
Risk Assessment Workshop	February 2005	February 2005
Functional Design	April 2005	September 2005
Detailed Design	August 2005	March 2006
UV Disinfection Facility	November 2005	December 2006
UV Disinfection Commissioning	November 2006	December 2006
BNR Aeration Equipment Procurement	October 2005	July 2006
BNR DAF Equipment Procurement	October 2005	October 2006
BNR Upgrade	January 2006	June 2007
BNR Upgrade Commissioning	May 2007	October 2007

4.1 Schedule Issues

The addition of the IRT process review, and the IRT's request to further investigate and evaluate the BNR process, resulted in additional time being spent at the conceptual design phase.

Allowing for some schedule risk factors (see Section 6.2), the overall project is still expected to be complete in December 2007. This is 12 months later than the date stipulated in Environment Act Licence No. 2669 E for the WEWPCC. The Water and Waste Department will be dialoguing with the province with regards to the licencing dates.

5.0 COMMUNICATIONS MANAGEMENT

To promote internal project communications between the City and the Consultant, weekly project management coordination meetings, attended by ETC and City project management personnel, are held and minuted by ETC.

6.0 RISK MANAGEMENT

CSC Project Management Services was contracted in February 2005 to conduct an integrated cost and schedule risk review and analysis of the WEWPCC BNR Upgrade and UV Disinfection Facility. A preliminary results package was provided on February 28th, 2005. The risk analysis was updated on April 29th, 2005 and again on September 2, 2005 based on the draft Functional Design report.

6.1 Cost Risks

CSC begins their cost analysis by establishing a base cost which is ETC's conceptual estimate without contingencies. In the most recent review, CSC increased their base cost by approximately \$700,000 overall to reflect their concern for the uncertainties around project scope and material and labour costs. The projected total cost is \$31,300,000. This amount includes a risk contingency allowance of \$4,070,500. A better definition of project costs is expected when the functional design stage is completed in late October 2005. Major equipment scope was also identified as a possible future risk.

6.2 Schedule risks

The schedule risk analysis indicates the expected completion dates are December 2006 for the disinfection facility and December 2007 for the nutrient removal facilities. The disinfection completion date is consistent with ETC's schedule completion date while the nutrient removal facilities completion date is 2 months later than ETC's date. The schedule growth for the nutrient removal facilities is driven by engineering design duration, construction duration, process acclimatization and equipment commissioning.

6.3 Process Risks

The IRT and ETC recommended that truck hauled waste be diverted from the WEWPCC to the City's other treatment facilities prior to commissioning the BNR process. The Water and Waste Department accepts this recommendation and will be canvassing the waste hauling industry to determine the impact of this recommendation and will then report separately on this matter to the Standing Policy Committee on Public Works. The

WEWPCC Upgrade budget and design does not include provisions to accept hauled waste.

6.4 Mitigation

Mitigation strategies have been developed to reduce delays in completing the project. A contracting strategy has been developed which includes pre-purchasing specialized process equipment and setting early completion dates for key components of the project. The disinfection facility will be tendered this fall to take advantage of winter construction opportunities.

The Risk Register completed by the Project team to identify specific actions, accountable parties, and target completion dates has recently been reviewed and updated. This will ensure that the risks are being managed and cleared and will identify any new risk items and appropriate action steps required.

7.0 COST MANAGEMENT

7.1 Cost Estimate Summary

Components	Previous Capital Cost Fiscal Issues Report #3	Revised Capital Cost Fiscal Issues Report #4
Engineering	3,337,500	3,616,100
UV Facility	3,300,000	5,330,250
BNR Facility	19,888,000	18,283,150
Risk Assessment Contingency Allowance	4,070,500	4,070,500
Total Facilities	27,585,000	27,683,900
Total Capital Cost	\$30,596,000	\$31,300,000

Notes:

1. No costs have been included for septage facility upgrading.
2. The risk assessment contingency allowance amount of \$4,070,500 shown in the table is net of previously authorized additional engineering costs of \$305,500 and ETC's revised Draft Functional Design cost estimate of \$704,000.
3. The Functional Design is 80% complete and the risk assessment contingency amount will be reevaluated when the functional design is completed in October 2005.
4. The total cost of \$31,300,000 is the Risk Manager's capital estimate and is based on a 90% probability that the project will come in under this amount. The most recent estimate received from ETC is \$27,229,500. We expect to greater confidence in the cost estimate once the functional design is completed at the end of October 2005.

7.2 Project Budget Requirements

WEWPCC Biological Nutrient Removal and Disinfection Capital Budget (in \$000) Requirements

Year	Authorized Capital	Actual + Projected Cashflows	Cumulative Capital Budget Remaining
2000	\$ 520	\$ -	\$ 520
2004	9,500	34	9,986
2005	16,200	2,406	23,780
2006	-	22,766	1,014
2007	-	5,584	(4,570)
2008	-	510	(5,080)
Total	\$ 26,220	\$ 31,300	\$ (5,080)

Notes:

1. Additional financial information is provided in Appendix 1.
2. Includes Risk Assessment Contingency Allowance which will be reevaluated in late October 2005.
3. The Water and Waste Department plans on transferring funds from the NEWPCC Disinfection project fund and other surplus cash flow forecasted funds to make up the estimated shortfall.

7.2.1 Canada Strategic Infrastructure Funding

On March 19, 2004 and April 22, 2005 the City, Provincial and Federal governments announced an agreement in principle to provide strategic infrastructure funding for three key Winnipeg priorities including improvements to the City's wastewater treatment system.

The Water and Waste Department has provided necessary information to Infrastructure Canada for financial support under the Canadian Strategic Infrastructure Fund for this project and other related wastewater improvement projects in January, April and August 2005, and is awaiting ministerial approval.

Addition information was requested in August, and the response was sent October 14, 2005. To date no approvals have been received, therefore the Department may need to delay tendering of the major contracts of this project until ministerial approval is obtained or risk losing Federal funding. This would result in additional delay to the completion date of this project.

FINANCIAL IMPACT:

The following financial impact statement for this project has been prepared in accordance with the recommendation adopted by Council on December 13, 2000.

Financial Impact Statement

Date: October 25, 2005

Project Name: **First Year of Program** **2004**
WEST END WATER POLLUTION CONTROL CENTRE (WEWPCC) PROCESS UPGRADING;
BIOLOGICAL NUTRIENT REMOVAL AND DISINFECTION SYSTEM ENHANCEMENTS

COMMENTS

As this report is submitted for information only, there is no financial impact related to the recommendation.

Maira L. Geer C.A.

**IN PREPARING THIS REPORT THERE WAS CONSULTATION WITH AND
CONCURRENCE BY: N/A**

THIS REPORT SUBMITTED BY:

Water and Waste Department
Engineering Division
Prepared by: J. Veilleux, P. Eng.
File No. S-596

**BIOLOGICAL NUTRIENT REMOVAL AND DISINFECTION SYSTEM - WEWPCC
WATER AND WASTE DEPARTMENT - ENGINEERING DIVISION
APPENDIX 1
As at August 31, 2005**

Components	COSTS				PROJECTED COSTS TO COMPLETE					TOTAL	VARIANCE	NOTES	
	Total Budgeted Costs	Approved* Budget To Date	Costs Incurred up To last report	Costs submitted This report	Total Costs Incurred to Date (Per G/L) 31-Aug-05	2005	2006	2007	2008	Total Costs Remaining To Complete	Total Project Cost	Variance from Budget (Unfavorable)	
ENGINEERING													
A) PRELIMINARY/ CONCEPTUAL DESIGN	512,000	397,000	360,336	151,664	512,000	0	-	-	-	-	512,000	(115,000)	3.1
A1) INDEPENDENT REVIEW	127,500	-	29,100	33,966	63,066	64,434	-	-	-	64,434	127,500	(127,500)	3.2
A2) TESTING - INTERNAL LAB COSTS	63,000	-	45,169	15,456	60,625	2,375	-	-	-	2,375	63,000	(63,000)	3.3
A) Subtotal	702,500	397,000	434,605	201,086	635,691	66,809	-	-	-	66,809	702,500	(305,500)	
B) FUNCTIONAL/DETAILED DESIGN	1,737,470	1,518,000	-	111,679	111,679	1,625,791	-	-	-	1,625,791	1,737,470	(219,470)	4.1
C) CONTRACT ADMIN/COMMISSIONING	1,176,130	1,117,000	-	-	-	-	804,630	361,500	10,000	1,176,130	1,176,130	(59,130)	4.2
Total Engineering	3,616,100	3,032,000	434,605	312,765	747,370	1,692,600	804,630	361,500	10,000	2,868,730	3,616,100	(584,100)	4.3
FACILITIES CONSTRUCTION													
A) UV DISINFECTION FACILITIES	5,330,250	3,300,000	-	-	-	-	4,530,713	799,537	-	5,330,250	5,330,250	(2,030,250)	4.4
B) NUTRIENT REMOVAL FACILITIES	18,283,150	19,888,000	-	-	-	-	13,360,056	4,423,094	500,000	18,283,150	18,283,150	1,604,850	4.5
C) RISK ASSESSMENT CONT. ALLOW'CE	4,070,500	-	-	-	-	-	4,070,500	-	-	4,070,500	4,070,500	(4,070,500)	3.4, 4.6
Total Facilities Construction	27,683,900	23,188,000	-	-	-	-	21,961,269	5,222,631	500,000	27,683,900	27,683,900	(4,495,900)	
Total	31,300,000	26,220,000	434,605	312,765	747,370	1,692,600	22,765,899	5,584,131	510,000	30,552,630	31,300,000	(5,080,000)	4.7
Percentage Complete							2%						

* Council approval for total budget of \$26.22 million. Distribution of costs to project activities done by Water and Waste Department.

** Notes are located on page 2

Notes:		Date	Amount
3.1	Scope Changes:		
	Fnus Testing	11/3/2004	(\$59,000)
	Evaluate IRT alternatives for nutrient removal	1/27/2005	(\$56,000)
3.2	Independent Review Team Authorization	1/27/2005	(\$127,500)
3.3	NEWPCC Lab Estimate of Internal Testing Costs	1/1/2005	(\$63,000)
3.4	Risk Assessment Contingency less any variance to date -	4/30/2005	(\$4,070,500)
	This amount will vary throughout the project - no contingency funds will be		
	requested until more project information is available		
4.1	Variance: additional Functional/ Detail Engineering cost estimate per Function Design (\$1,538,000-\$1,737,470)	7/30/2005	(\$219,470)
4.2	Variance: additional Contract Admin./Commissioning Engineering cost estimate per Function Design (\$1,117,000-\$1,176,130)	7/30/2005	(\$59,130)
4.3	Variance: additional total Engineering cost estimate	7/30/2005	(\$584,100)
4.4	Variance: revised cost estimate for UV Facility (\$3,300,000 -\$5,330,250)	7/30/2005	(\$2,030,250)
4.5	Variance: revised cost estimate for Nutrient Removal Facilities (\$19,888,000-\$18,283,150)	7/30/2005	\$1,604,850
4.6	Variance: Risk Assessment Contingency allowance variances (less any other variances to date)	8/31/2005	(\$4,070,500)
4.7	Variance: Projected Budget Shortfall	8/31/2005	(\$5,080,000)