Minutes – Standing Policy Committee on Finance – April 7, 2016

REPORTS

Item No. 3 Water Supervisory Control and Data Acquisition (SCADA) Upgrade Financial Status Report No. 4 for the Period from October 1, 2015 to January 31, 2016

STANDING COMMITTEE DECISION:

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

Further, the Standing Policy Committee on Finance did not concur in recommendation number two of the Winnipeg Public Service and requested that quarterly reporting be maintained under Administrative Directive No. FM-004.

Minutes – Standing Policy Committee on Finance – April 7, 2016

DECISION MAKING HISTORY:

Moved by Councillor Lukes,

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

That recommendation number two of the Winnipeg Public Service not be concurred in.

Carried

ADMINISTRATIVE REPORT

Title: **WATER SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) UPGRADE FINANCIAL STATUS REPORT NO. 4 FOR THE PERIOD FROM OCTOBER 1, 2015 TO JANUARY 31, 2016**

Critical Path: **The Standing Policy Committee on Finance**

AUTHORIZATION

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

RECOMMENDATIONS

1. That this report be received as information.

2. That the next status report be provided at the October 13, 2016 Standing Policy Committee on Finance.

REASON FOR THE REPORT

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

EXECUTIVE SUMMARY

This report is to provide a quarterly update on the status of the Water Supervisory Control and Data Acquisition (SCADA) Upgrade Project. This capital project is financed from the approved Capital Budget for Water Supervisory Control and Data Acquisition (SCADA) Upgrades. The project is currently on schedule and on budget.

IMPLICATIONS OF THE RECOMMENDATIONS

The next report is proposed to be deferred from the June 23, 2016 Standing Policy Committee on Finance meeting to the October 13, 2016 meeting and will cover the period from February 1, 2016 to July 31, 2016. A return to quarterly reporting will be evaluated at the time of the next report.

HISTORY / DISCUSSION

DISCUSSION:

1. THE PROJECT

The Water Services Division utilizes a Regional SCADA control system to operate, control and monitor processes at the Shoal Lake Intake Facility, regional pumping and booster stations, and the Deacon Chemical Feed Facility. The Regional SCADA provides automated control and visualization of the water supply and distribution system to operators on a 24/7 basis so they can control and monitor these processes. The Regional SCADA system is made up of instrumentation, remote communication equipment and specialized computer hardware with customized software, such as Programmable Logic Controllers (PLCs). The regional pumping and booster stations as well as the water supply intake at Shoal Lake are controlled locally via PLCs and are monitored remotely via the City's Regional SCADA.

The Regional SCADA is comprised of server hardware and software that are approaching end of life. In addition, the PLCs at the aforementioned locations have also reached the end of their useful life and are no longer manufactured.

The Department currently has two water SCADA system providers; Telvent, which is used for the regional water system, and Wonderware, which is used for the water treatment plant. A Regional SCADA Upgrade Life Cycle Cost Analysis was completed in June 2015. The analysis considered two options for upgrading the regional SCADA system:

1. Updating the existing Telvent system
2. Replacing the existing Telvent system with a Wonderware system

The analysis considered costs for hardware, software and support agreements over a 25-year period. The report found that Wonderware was the preferred option having the lowest life-cycle cost.

The project objective is to upgrade the Regional SCADA and PLCs to ensure timely replacement of end of life hardware and software. The delivery method for this project is design-build (D-B). The project requires specialized systems integration knowledge. As such, an Owner's Advocate Engineer will be engaged to assist the City in developing the D-B Request for Proposal (RFP) and monitoring construction. Proponents for the D-B RFP will be shortlisted using a Request for Qualifications (RFQ) process.

A preliminary design for the PLC upgrades was completed in 2013. This predesign was undertaken in conjunction with the predesign of power reliability upgrades required at the pumping stations.

The Water SCADA Upgrade adopted project budget (which does not include the proposed 2016 Budget) includes the following Project Identifications:

Project ID	Project Year	Amended Budget
2005000211	2011	367,339.00[1]
2005000214	2014	$432,661.00[2]
2005000215	2015	$7,600,000.00
Total Amended Budget		$8,400,000.00[3]

[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

[2] The amount shown in the Capital Expenditures Monthly Report is $1,100,000, however $300,000 was transferred to 552/598 Plinguet Fire Protection (Project ID 2001002914) as approved by Council March 26, 2014. The $300,000 was rebudgeted and is included in the proposed 2016 Capital Budget funds request.

[3] The "Total Amended Budget" does not include the proposed 2016 Capital Budget ($3,900,000).

The Executive Project Sponsor is the Director of Water and Waste. The Project Manager is Rob Carroll, P. Eng.

2. MAJOR CAPITAL PROJECT STEERING COMMITTEE

Administrative policy for projects with capital cost exceeding $20 million requires formation of a Major Capital Project Steering Committee. This threshold was approved by Council on October 28, 2015. Any project reporting to SPC Finance under the previous $10 million threshold will continue to report. The Committee has been formed and its members are:

Clive Wightman, Director, Community Services
John Kiernan, Director, Planning, Property and Development
Jason Ruby, Manager of Capital Projects
Moira Geer, Acting Director of Water and Waste
Lucy Szkwarek, Acting Manager of Finance and Administration, Water and Waste
Geoff Patton, Manager of Engineering, Water and Waste
Rob Carroll, Project Manager, Water and Waste

3. RISKS AND RISK MITIGATION STRATEGIES

An ongoing risk management strategy has been implemented for the project encompassing a proactive process of identifying and assessing project risk, defining appropriate risk handling strategies and plans, and monitoring those actions to completion.

Formal risk and opportunity analyses of the project are scheduled to be performed by the project team at major milestones as the project progresses. Global project risks of significance include:

Risk Matrix[1]	
Risk Statement and Explanation	**Mitigation**
PLC components to be replaced are at the end of their intended service life and may fail prior to project completion. These components are no longer manufactured.	An inventory of spare PLC components has been obtained by the Department. D-B has been selected as the delivery method for this project, allowing for design and construction to occur simultaneously, resulting in earlier replacement of PLC components.

Risk Matrix[1]	
Risk Statement and Explanation	**Mitigation**
D-B reduces the City's control during detailed design, resulting a sub-optimal final design.	Project requirements will be specified as detailed as possible in the D-B RFP. The RFP will include strict performance requirements.
Bid prices for the D-B RFP exceed budget resulting in inability to award and schedule delay.	Ongoing discussion with the Owner's Advocate Engineer on any significant cost impacts, obtain an updated cost estimate of D-B RFP as early as possible.
An unqualified/inexperienced contractor bids on the D-B RFP with a low price that skews the evaluation.	Bidders for the D-B RFP will be pre-qualified using an RFQ.
D-B reduces the City's ability to control risks associated with tie-ins to existing equipment and coordination of work.	Project constraints will be clearly defined in the D-B RFP. D-B proponents will be required to submit a detailed implementation plan.

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

4. CHANGES SINCE THE LAST REPORT

D-B has been selected as the delivery method for this project. D-B and Design-bid-build were the delivery method options assessed by the project team. The following points are the main considerations that led to the selection of D-B:

- Commissioning of the new SCADA system, programming the upgraded PLCs, and coordinating operational shutdowns to perform the work are all large components of the project in comparison with construction. With a traditional design-bid-build procurement model, the roles and responsibilities for shutdown coordination and commissioning can be unclear. It was argued that these responsibilities could be better defined with a D-B procurement methodology. Additionally, performance measures can be established to ensure that the D-B contractor is fulfilling their complete role.

- With a D-B contract, the City only has one contractor responsible for the design and construction works. With the specialized knowledge requirements for this project, this is beneficial as the system integration contractor's knowledge can be used during design, rather than only at construction, and the design consultant's expertise can be used more effectively as they are directly involved in not only the design but also the construction and commissioning of the works.

- Completing the upgrades in a timely manner is critical as many of the components to be replaced are at or beyond their original intended service life. A D-B strategy will help to reduce the schedule as design and construction can happen simultaneously and the schedule can be contractually firm at the initiation of the design build contract.

Further, it was decided that an Owner's Advocate Engineer will be hired as specialized expertise is needed in order to complete the project. The Owner's Advocate Engineer will be engaged to assist with the development of the D-B RFP and provide guidance to the City during the project.

The RFP for the Owner's Advocate Engineer is currently in development and is anticipated to be issued and awarded within the next reporting period.

5. ISSUES/RISKS REQUIRING FURTHER ATTENTION

Cost Risk

The cost estimate of $9 million for engineering and construction for the PLC upgrade work is based on a Class 3 estimate, prepared as part of the preliminary design, with an expected accuracy range of -20% ($7.2 million) to +30%.(11.7 million). The cost estimate of $9 million includes a 20% contingency ($1.5 million).

The cost estimate for the Regional SCADA upgrade has been refined from a Class 5 estimate of $3.3 million to a Class 4 estimate of $3.1 million based on the results of the life cycle cost analysis completed during this reporting period. The current estimate is slightly lower than the original estimate, however the Department is not recommending a change in the requested budget at this time due to the class of the estimate. The updated cost estimate has an expected accuracy range of -30% ($2.17 million) to +60% ($4.96 million). The cost estimate of $3.1 million includes a 20% contingency ($0.5 million).

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

Schedule

The SCADA and PLC upgrades will be undertaken in conjunction with power reliability upgrades required at the pumping stations in order to reduce pumping station shut-down times and potentially reduce design and construction costs. Any design or construction delays related to the power reliability upgrades have the potential to affect the schedule of the SCADA and PLC upgrades. As station shut downs will only be permitted during periods of low demand and, as no more than two stations will be upgraded at one time (to minimize potential risk to the distribution system), design issues can be dealt with in advance of, or between, station upgrades. Construction issues will be minimized through careful construction planning including the development of an overall construction schedule, implementation/changeover planning, and preparation of shutdown protocols. Further, lessons learned through the sequential station upgrading will be applied to succeeding upgrades.

6. SCHEDULE

Current key schedule milestones are:

Milestone Description	Timeline	
	Previous Report	This Report
Issue RFP for Owner's Advocate Engineer	--	June 2016
Start D-B RFQ/RFP Development	--	September 2016
Issue D-B RFQ	--	December 2016
Issue D-B RFP	--	May 2017
Start SCADA Detailed Design/Upgrading	--	August 2017
Start PLC Upgrading Phase 1 (Tache/Shoal Lake)	--	November 2017
Complete SCADA Upgrading/Commissioning	--	May 2018
Start PLC Upgrading Phase 2 (McPhillips/Hurst)	--	October 2018
Start PLC Upgrading Phase 3 (MacLean/Deacon)	--	October 2019
Complete Commissioning of all project components	--	May 2020

7. FINANCIAL ANALYSIS

The status of current RFPs and Bid Opportunities are as follows:

RFP or Bid Opportunity	Description	Current Status	Contract Value (GST and MRST extra as applicable)
RFP 224-2012	PLC Replacement and Power Reliability Upgrades Preliminary Design	Completed by SNC Lavalin Inc.	$315,562.96
Sole Source Consultant Assignment 307-2012	Equipment Identification Standard and Electrical Design Guide Development	Completed by SNC Lavalin Inc.	$46,947.84
Consultant assignment at or under $35,000	Regional SCADA Life Cycle Cost Analysis	Completed by Dillon Consulting Ltd.	$35,000.00

Future major RFQs, RFPs and Bid Opportunities include:

- RFP – Owner's Advocate Engineer for PLC, Regional SCADA and Power Reliability Upgrades
- RFQ – Design & Build PLC, Regional SCADA and Power Reliability Upgrades
- RFP – Design & Build PLC, Regional SCADA and Power Reliability Upgrades

Project funding
The approved capital and 2016 projected budget are as follows:

Year	Capital Program	Actual and Projected Cash Flows	Cumulative Capital Budget Remaining
Up to 2015	$8,400,000	$402,339	$7,997,661
2016	$3,900,000	$400,000	$11,497,661
2017		$4,280,303	$7,217,358
2018		$3,460,606	$3,756,752
2019		$2,939,773	$816,979
Beyond 2019		$816,979	$0
Total	$12,300,000	$12,300,000	

A summary of the budget to forecast comparison is contained in Appendix 1 (attached).

The Water SCADA upgrade project is funded by retained earnings.

The variance in spending up to 2015 from this report to the Capital Expenditure Monthly Report is $367,339, which is equivalent to the expenditure in the closed 2011 budget. These funds were spent on preliminary engineering.

8. ANTICIPATED PROGRESS DURING NEXT REPORTING PERIOD

The next report is proposed to be deferred from the June 23, 2016 Standing Policy Committee on Finance meeting to the September 15, 2016 meeting. During the next reporting period the Request for Proposal (RFP) for an Owner's Advocate Engineer will be developed. It is not anticipated that this RFP will be awarded within the next regularly scheduled reporting period and no other significant activity is expected to occur. A return to quarterly reporting will be evaluated at the time of the next report.

FINANCIAL IMPACT

Financial Impact Statement **Date:** March 22, 2016

Project Name:

WATER SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) UPGRADE FINANCIAL STATUS REPORT NO. 4 FOR THE PERIOD FROM OCTOBER 1, 2015 TO JANUARY 31, 2016

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

01-1b Key Directions for Building a City That Works
>Provide clean, safe, reliable, sustainable drinking water.

SUBMITTED BY

Department: Water and Waste
Division: Engineering Services
Prepared by: R.W. Carroll, P. Eng.
Date: March 24, 2016
File No.: W-761

c: Major Capital Project Steering Committee (email)
G.K. Patton, P. Eng., Water and Waste Department (email)
R.W. Carroll, P. Eng., Water and Waste Department (email)

ATTACHMENTS:
Appendix 1 – SCADA Upgrade Estimated Costs and Project Costs to Complete

WATER SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) UPGRADE
WATER AND WASTE DEPARTMENT - ENGINEERING DIVISION
APPENDIX 1
As at January 31, 2016

	Components	COSTS			PROJECTED COSTS TO COMPLETE					TOTAL	VARIANCE	NOTE
		Approved Budget To Date [1]	Costs submitted this report	Total Costs Incurred to Date (to Jan 31, 2016)	2016	2017	2018	2019	Total Costs Remaining to Complete	Total Project Cost	Variance from Budget (Unfavorable)	
A	**PROFESSIONAL SERVICES**	$5,600,000	$0	$402,339	$400,000	$1,463,636	$1,527,273	$1,527,273	$279,479	$5,600,000	0	[2]
B	**CONSTRUCTION**	$6,700,000	$0	$0	$0	$2,816,667	$1,933,333	$1,412,500	$537,500	$6,700,000	0	
	TOTALS	$12,300,000	$0	$402,339	$400,000	$4,280,303	$3,460,606	$2,939,773	$816,979	$12,300,000	0	

Percentage Complete 3%

[1] Total budget of $12,300,000 for the Water SCADA Upgrade Project; Distribution of costs to Components A and B was done by the Water and Waste Department. The budget included $9 million for PLC upgrades and $3.3 million for SCADA upgrades. The cost estimate for the SCADA upgrades has been refined to $3.1 million, however a change in budget is not recommended at this time.

[2] Professional Services include Professional Engineering Services (preliminary design, life cycle cost analysis, detailed design, programming and contract administration), overhead and administration charges.