Minute No. 64
Report - Standing Policy Committee on Infrastructure Renewal and Public Works - November 8, 2005

Item No. 2 **Water Treatment Program - Additional Controls Systems Infrastructure and Staff Facilities**
File WS-7

COUNCIL DECISION:

Council concurred in the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works and adopted the following:

1. That the Water Treatment Program approved by Council be amended to include additional control systems infrastructure, space for personnel and workshops at an estimated capital cost of $2.8 million, funded from retained earnings, in order to accommodate the Water Services Division staff complement.

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

Report - Standing Policy Committee on Infrastructure Renewal and Public Works - November 8, 2005

DECISION MAKING HISTORY:

Moved by Councillor Clement,

That the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works be adopted by consent.

Carried

(See Minute No. 62 for opposition recorded by Councillor Smith)

EXECUTIVE POLICY COMMITTEE RECOMMENDATION:

On November 16, 2005, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works and submitted the matter to Council.

STANDING COMMITTEE RECOMMENDATION:

On November 8, 2005, the Standing Policy Committee on Infrastructure Renewal and Public works concurred in the administrative recommendation and submitted its recommendation to the Executive Policy Committee and Council.

RE: WATER TREATMENT PROGRAM – ADDITIONAL CONTROLS SYSTEMS INFRASTRUCTURE AND STAFF FACILITIES

FOR SUBMISSION TO: THE STANDING POLICY COMMITTEE ON PUBLIC WORKS

ORIGINAL REPORT SIGNED BY: Barry D. MacBride, P. Eng., Director
Water and Waste Department

REPORT DATE: October 26, 2005

RECOMMENDATION(S):

That the Water Treatment Program approved by Council be amended to include additional control systems infrastructure, space for personnel and workshops at an estimated capital cost of $2.8 million, funded from retained earnings, in order to accommodate the Water Services Division staff complement.

REPORT SUMMARY

KEY ISSUES:

- Council approval is required to amend the water treatment program.
- Additional infrastructure is required to support changes to the Water Services Division organization and staff compliment. The optimal location for this infrastructure is at the new Water Treatment Plant.

IMPLICATIONS OF THE RECOMMENDATION(S):

General Implications

X	None
	For the organization overall and/or for other departments
	For the community and/or organizations external to the City of Winnipeg
	Involves a multi-year contract

Comment(s):

Policy Implications

X	No
	Yes – Comment(s):

Environmental Implications

X	None
	Yes – Comment(s):

Human Resources Implications

X	No
	Yes – Comment(s):

Financial Implications

	Within approved current and/or capital budget
X	Current and/or capital budget adjustment required Capital funding of $2.8 million is needed to build these facilities. This will result in projected annual savings of$407,000 per year and a ten-year NPV saving of $550,000.

REPORT

REASON FOR THE REPORT:

Council must approve the proposed changes to the water treatment program.

HISTORY:

1993 Council approved the creation of the Water Treatment Reserve Fund to cash finance a portion of the water treatment plant cost.

2000 On November 22, Council adopted the Water Treatment Program.

2004 On June 8, the Standing Committee on Fiscal Issues received "Water Treatment Program Financial Status Report No. 1" as information.

2004 On July 21, Council adopted a recommendation to reduce the water treatment plant design capacity from 515 to 400 million litres/day.

2004 On October 12, the Standing Committee on Fiscal Issues received "Water Treatment Program Financial Status Report No. 2" as information.

2004 On December 13, Council adopted the 2005 Capital Budget that included $84 million for the Water Treatment Plant project.

2005 On February 8, the Standing Committee on Fiscal Issues received "Water Treatment Program Financial Status Report No. 3" as information.

2005 On March 23, Council adopted a recommendation to amend the Water Treatment Program to include on-site generation of sodium hypochlorite for disinfection instead of

chlorine gas and a standby power system to allow operation of one train of the water treatment plant to produce 200 megalitres per day of treated water during power outages.

2005 On June 14 the Standing Committee on Fiscal Issues received "Water Treatment Program Financial Status Report No. 4" as information.

DISCUSSION:

It is recognized that construction of the new WTP as well as expansions to wastewater treatment facilities will result in a net increase in maintenance personnel required to service Departmental infrastructure, and an expansion of the Departmental staff facilities and shops that support the maintenance personnel. Consolidation of maintenance staff and control system operations at the WTP is an optimal solution and results in avoided staff costs and increased effectiveness when compared to alternatives where the facilities are constructed elsewhere. The attached business plan has identified a positive business case.

A net increase in shops, lockers, shower facilities and offices of approximately 900 m^2 will be necessary, as well as an increase in parking for personnel and City vehicles at the water treatment plant. The estimated cost of this additional infrastructure is $2.75 Million.

A summary of the additional costs to be budgeted is included below:

Additional Space (900 m2)	$1,600,000
Allowance for parking and incidentals	$165,000
Engineering,Contingencies and Escalation	$585,000
Sub-total	$2,350,000
Cost to move control system	$400,000
Total	$2,750,000

Finances:

The original budget for the Water Treatment Program including engineering, contingencies, financing administration and inflation through to the 2007 completion date was $214 million. The Construction Manager undertook an estimate at the end of Conceptual Design which confirmed that this budget was adequate. On March 23rd, 2005 Council approved additional funds of $13.3 million for on-site generation of sodium hypochlorite and standby power generation, bringing the total approved budget for the Water Treatment Program to $227.3 million.

As of September 30, 2005 funds committed to the Water Treatment Program stood at approximately $59.9 million, and funds expended were about $23.4 million. Committed expenditures to date are slightly below budget. A summary of project cost categories, budgets, and actual and forecast expenditures for the program is included in Appendix 1.

Funding for the additional water treatment plant facility components discussed above would require that additional funds of $2.8 million be approved in a future Capital Budget. This funding would be included in future capital estimates and would be funded by water utility retained earnings (rather than from the Water Treatment Plant Reserve).

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 17, 2005

Project Name:

First Year of Program **2007**

WATER TREATMENT PROGRAM – ADDITIONAL CONTROLS SYSTEMS INFRASTRUCTURE, WORKSHOPS AND STAFF FACILITIES

	2007	2008	2009	2010	2011
Capital					
Capital Expenditures Required	$ 2,800,000	$ -	$ -	$ -	$ -
Less: Existing Budgeted Costs	-	-	-	-	-
Additional Capital Budget Required	$ 2,800,000	$ -	$ -	$ -	$ -
Funding Sources:					
Debt - Internal	$ -	$ -	$ -	$ -	$ -
Debt - External	-	-	-	-	-
Grants (Enter Description Here)	-	-	-	-	-
Reserves, Equity, Surplus	2,800,000	-	-	-	-
Other - Enter Description Here	-	-	-	-	-
Total Funding	$ 2,800,000	$ -	$ -	$ -	$ -
Total Additional Capital Budget Required	$ 2,800,000				
Total Additional Debt Required	$ -				
Current Expenditures/Revenues					
Direct Costs	$ -	$ -	$ -	$ -	$ -
Less: Incremental Revenue/Recovery	407,000	407,000	407,000	407,000	407,000
Net Cost/(Benefit)	$ (407,000)	$ (407,000)	$ (407,000)	$ (407,000)	$ (407,000)
Less: Existing Budget Amounts	-	-	-	-	-
Net Budget Adjustment Required	$ (407,000)	$ (407,000)	$ (407,000)	$ (407,000)	$ (407,000)

Additional Comments: It is recommended that funding in the amount of $2,800,000.00 be included in the 2007 Capital Budget and that the project be financed by the water utility retained earnings.

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Moira L. Geer C.A.
Manager of Finance & Administration

IN PREPARING THIS REPORT THERE WAS CONSULTATION WITH AND CONCURRENCE BY:

The Water and Waste Department Water Services and Engineering Divisions

THIS REPORT SUBMITTED BY:

Department: Water and Waste Department
Division: Engineering Services Division
Prepared by: Tom Pearson
File No.: 020-18-29-05-00

WATER TREATMENT PROGRAM
WATER AND WASTE DEPARTMENT - ENGINEERING DIVISION
APPENDIX 1
As at September 30, 2005

	Components	COSTS: Total Budgeted Costs	Approved [1] Budget To Date	Costs Incurred up to last report	Costs submitted this report	Total Costs Incurred to Date (per G/L) 30-Sep-05	PROJECTED COSTS TO COMPLETE: 2005 [6]	2006	2007	Total Costs Remaining to Complete	TOTAL: Total Project Cost	VARIANCE: Variance from Budget (Unfavorable)	NOTE
A)	CONCEPTUAL ENGINEERING	3,700,000	3,765,300	3,765,297		3,765,297				-	3,765,297	(65,297)	(2)
B)	UV DISINFECTION	9,000,000	9,000,000	6,731,872	703,646	7,435,518	450,000	114,482		564,482	8,000,000	1,000,000	(3)
C)	CHLORAMINATION	3,000,000	3,000,000					1,500,000	1,500,000	3,000,000	3,000,000	0	
D)	PROGRAM'S PROJECT MANAGEMENT OFFICE	100,000	100,000	41,521	7,747	49,268	3,000	20,000	27,732	50,732	100,000	0	
E)	WATER TREATMENT PLANT ENGINEERING	24,260,000	22,700,000	2,007,929	6,003,058	8,010,987	4,797,751	7,595,559	4,290,406	16,683,716	24,694,703	(434,703)	(4)
F)	WATER TREATMENT PLANT CONSTRUCTION	187,240,000	91,476,700			2,591,658	9,118,958	92,439,959	83,589,425	185,148,342	187,740,000	(500,000)	(5)
	Total	**227,300,000**	**130,042,000**	**12,546,619**	**6,714,451**	**21,852,728**	**14,369,709**	**101,670,000**	**89,407,563**	**205,447,272**	**227,300,000**	**0**	
	Percentage Complete					10%							

1) **Council has approved a total budget of $130.042 Million for the Water Treatment Program; Distribution of costs to project activities A) to F) was done by the Water and Waste Department.**
2) **Negative variance due to additional study requirements.**
3) **Positive variance due to competitive bids received for UV equipment and installation contracts.**
4) **Negative variance due to additional engineering requirements.**
5) **Negative variance due to additional program requirements.**
6) **Expenditures projected for 2005 have been reduced from $77 M to $36 M due to changes in construction strategy and weather related delays. See report.**

APPENDIX 2
LOCATION OF WATER SERVICES PLANT MAINTENANCE STAFF AND AMALGAMATION OF CONTROL CENTRES
BUSINESS CASE

RECOMMENDATION(S):

1. That the staff responsible for maintenance of the regional water supply and distribution plants, be collocated with the proposed water treatment plant staff at the water treatment plant facility.
2. That the existing control centre for the water pumping station be amalgamated with the control centre for the water treatment plant.
3. That the capital cost of accommodating more staff at the water treatment plant, estimated to be $2.75 million be included in the 2007 capital budget submission of the Department.
4. That this additional cost of the water treatment plant project be financed by the water utility, rather than through the water treatment plant reserve.

SUMMARY:

With the construction of the water treatment plant it was appropriate to look at the costs and benefits of collocating staff presently housed at 598 Plinguet and at 360 McPhillips with similar staff at the treatment plant.

This report presents a business case for collocating the staff responsible for maintenance of regional water plants with the water treatment plant maintenance staff, and to amalgamate the control centres for the water pumping stations and the water treatment plant. An investment of $2.75 million will save approximately $407,000 per year. The 10-year net present value is a saving of $549,000 at discount rate of 4%.

DISCUSSION:

1. Co-location of Maintenance Staff at Water Treatment Plant

Currently about 22 maintenance staff (civil, mechanical, and electrical/instrumentation) work out of existing maintenance shops at 598 Plinguet in space of the Wastewater Services Division. Additional maintenance positions will be established within the Water Services Division for maintenance of the water treatment plant, reporting to the water treatment plant facility.

The benefits of collocating all Water Services plant maintenance staff include cohesive work planning, multi-skilling opportunities, improved training and succession planning, and a team-oriented work environment. All front-line staff, support staff and supervisors accountable for the operation and maintenance of the regional water supply, treatment and pumping facilities will be collocated. Work planning and scheduling can be undertaken cohesively and on-site through group meetings with the supervisor and CWMS planner. Maintenance staff will be trained and responsible for maintenance of all existing and new water pumping and treatment facilities, resulting in more opportunities for staff and better succession planning. There will also be opportunities for staff to become multi-skilled in both operations and maintenance. Finally, operations staff responsible for operating the water treatment plant and water pumping stations will have the opportunity to communicate face-to-face with maintenance staff regarding operational needs and concerns.

Financially, collocating staff will save money in terms of avoided costs. If the Water Services plant maintenance staff are not collocated, there will be an increase in the number of required positions. The staff responsible for maintenance of pumping stations would require foremen (one each for mechanical, electrical and civil), in addition to the foremen required for the mechanical, electrical and civil staff at the water treatment plant. The savings associated with the foreman positions are shown in Table 1.

There will also be an opportunity to avoid increased standby salary costs. Rather than having maintenance staff on standby for the pumping stations as well as for the water treatment plant, the multi-skilling that will take place (i.e. staff skilled and responsible for maintenance of all regional water facilities) will eliminate the need for standby in both areas.

At current collective agreement rates, the avoidance of costs associated with collocation of maintenance staff translates to an annual savings of $209,000.

However, there will also be an incremental increase in transportation costs due to maintenance staff travelling to worksites and meetings within the City from the water treatment plant rather than from 598 Plinguet. These incremental costs are estimated at $45,000 (see Table 2).

2. Amalgamation of Pumping Station and Water Treatment Plant Control Centres

Currently, a total of 6 FTE's are responsible for monitoring and control of the water pumping stations and reservoirs, aqueduct, and distribution system as well as the wastewater collection system. The control centre is located at the McPhillips Pumping Station at 360 McPhillips Street. Once the water treatment plant is commissioned, the nature of the work of a pumping station operator changes, in that they must be cognizant of the water treatment plant operation and manage pumping station reservoirs to optimize plant production as well as to manage water quality. As such, there is significant operational benefit in having this staff working alongside the water treatment plant staff. Additional benefits include succession planning, and operator safety issues associated with working alone (currently the control centre is staffed 24/7/365, with an operator working alone except during normal Monday to Friday working hours when other staff are in the

building). Finally, this strategy will provide clear accountability, given that the supervisor and staff responsible for water production through the water treatment plant will also be responsible for water pumping and storage.

The economic savings associated with this strategy are due to efficiencies in the staffing of the combined control centre. The plan for operation of the water treatment plant identified that 12 operators would be required. If the existing 6 pumping station operators are located at the water treatment plant and are trained appropriately (i.e. can operate both the pumping station and water treatment plant control systems), then an additional 9 operators will be required for the water treatment plant – resulting on an overall reduction of 3 operators. As well, the existing organization includes a pumping station foreman, and the water treatment operating plan includes a supervisor at the water treatment plant. If all the operators are collocated, then the pumping station foreman position will become redundant. At current collective agreement rates, this is a savings of $242,840 (see Table 1).

3. Facility Costs

The design consultant for the water treatment plant has provided an estimate of the incremental costs for collocating the existing maintenance staff as well as amalgamating the pumping station and water treatment control rooms. These costs are associated with construction of additional offices, workstations, lockers /

showers / change rooms, expanded lunchroom and shop facilities, and for changes to the pumping station SCADA system necessary for control from the water treatment plant.

A breakdown of the costs is as follows:

Additional Space (900 m2)	$1,600,000
Allowance for parking and incidentals	$165,000
Engineering,Contingencies and Escalation	$585,000
Sub-total	$2,350,000
Cost to move control system	$400,000
Total	$2,750,000

5. Other Impacts

Moving of staff from both 598 Plinguet and from 360 McPhillips will primarily impact the Wastewater Services Division who currently share the space. Normally, staff leaving the space would create additional cost to Wastewater Services who must take over responsibilities for operating and maintaining the additional space. However, the Department has identified that additional wastewater plant maintenance staff are required in the Wastewater Services establishment due to commissioning of new wastewater facilities. As a result, there would not have been sufficient space at the 598 Plinguet shops for all Water Services and Wastewater Services plant maintenance staff. Expansion of the existing shops at 598 Plinguet or construction of new shops will be required to accommodate the additional maintenance staff, equipment and tools required for these new wastewater facilities. Funds have been requested in the 2006 Capital Estimates to undertake a facilities study to review options for maintenance facilities associated with the addition of significant wastewater maintenance staff. Potential options are the expansion of the 598 Plinguet shops or construction of new shops. If the Water Services staff are collocated with the water treatment plant maintenance staff, some space will then be available at 598 Plinguet for the maintenance positions to be added to the Wastewater Services Division's organization.

The benefit of freeing up this space in avoided costs for the Wastewater Services Division is not included in the business case but it may be significant.

In addition, the control staff at McPhillips presently provide services to the Wastewater Services Division in terms of 24 hour monitoring of the Wastewater alarm systems. Moving the staff to the Water Treatment Plant will negatively impact Wastewater Services in the short term in that the wastewater staff will lose the day to day face to face coordination with control

staff. In addition, the cost of maintaining the building will fall to Wastewater Services. On the positive side however, the Wastewater Services Division is expanding and the space may be very valuable to that Division. In addition, the requirement for a new SCADA system for Wastewater and active 24 hour control associated with the mandated combined sewer overflow (CSO) control system would have required a change in any case.

5. Business Case

The business case to support the recommendations is detailed in Table 3. In summary, there is a net present value benefit of $549,537 over ten years. Additional benefits which have not been quantified include:

- Benefits of vacating space at 598 Plinguet
- Improved accountability and authority
- Improved work planning and scheduling
- Improved worker safety due to reduction of "working alone" situations
- Improved communications between operations and maintenance staff
- Improved succession planning
- Opportunities for multi-skilling

Collocating maintenance and control staff at the Water Treatment Plant will save money and improve operation.

Table 1 – Avoided Costs - Salary

Position Title	Biweekly Rate	FTE's	Annual Savings
Foremen	$1,815	3	$141,570
25% benefits and overheads			$35,393
Total Annual Salary			$176,963
Instrument tech - standby			$32,000
Annual Savings			**$208,963**
Operator pumping station	$1,835	3	$143,130
Foreman pumping station	$1,967	1	$51,142
Total Annual Salary			$194,272
25% benefits and overheads			$48,568
Annual Savings			**$242,840**
Total Avoided Costs			**$451,803**

Table 2 – Incremental Transportation Costs:

- Staff responsible for maintenance of pumping stations currently based from 598 Plinguet will be based from the water treatment plant.
    - 2 civil maintenance crews (2 City vehicles)
    - 2 mechanical maintenance crews (2 City vehicles)
    - 2 electrical maintenance crews (2 City vehicles)
    - 2 instrument technicians (2 private vehicles)
- Assume worst case scenario, each crew must travel from Deacon into City to attend to a facility or meeting each work day, therefore additional 36 km round trip per day

Vehicle	**Incremental Use**	**Incremental Cost**
2 civil maintenance fleet vehicles	9000 km/yr/vehicle	$5000/yr
2 mechanical maintenance fleet vehicles	9000 km/yr/vehicle	$5000/yr
2 electrical maintenance fleet vehicles	9000 km/yr/vehicle	$5000/yr
2 instrument techs – private vehicles	Change from car allowance to fleet vehicles	$30000
TOTAL:		**$45,000/yr**

- Assumptions:
    - Average fleet fuel costs for similar vehicle = $0.27 / km
    - Fleet costs for similar vehicle, including additional fuel costs = $15,000

Table 3 – Business Case Analysis

WATER SERVICES DIVISION												
NPV ANALYSIS - COLLOCATING MAINTENANCE STAFF AT WATER TREATMENT PLANT												
(Discount Rate of 4%)												
	Discount Rate	4%										
			YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Capital Investment		-$2,750,000										
Inflows	Salary Savings		$451,803	$451,803	$451,803	$451,803	$451,803	$451,803	$451,803	$451,803	$451,803	$451,803
Outflows	Incremental Travel Costs		-$45,000	-$45,000	-$45,000	-$45,000	-$45,000	-$45,000	-$45,000	-$45,000	-$45,000	-$45,000
			$406,803	$406,803	$406,803	$406,803	$406,803	$406,803	$406,803	$406,803	$406,803	$406,803
NPV over 10 years		***$549,537***										

NOTE: This analysis does not include the additional benefit of freeing up existing work space, and therefore avoiding expansion costs to provide work space for additional Wastewater staff.