

# MEMORANDUM



**Date:** May 01, 2013  
**To:** Sheila Kitz, CAO. County of St. Paul, No. 19  
**cc:** Bryan Bepalko, Matt Brassard, P.Eng.  
**From:** Bander Abou Taka, P.Eng and Cristina Fonseca, Ph.D, P.Eng  
**File:** 3144.003.02  
**Subject:** Ashmont WTP Class A Cost Estimates

Dear Sheila,

On February 15, 2013 Urban Systems (Urban) submitted a letter to the County, summarizing the estimated costs to complete work associated with the Ashmont water treatment plant (WTP) and Ashmont / Lottie Lake transmission line. We have since finalized the pre-tender (Class A) cost estimates for the Ashmont WTP and there are some differences between these and the costs submitted in February. This memorandum (memo) summarizes these differences.

**Table 1** summarizes the estimated cost to complete the project, as submitted in February 15, 2013, the Class A cost estimate and calculated additional costs between the two estimated. Please note that additional items were added during the detail design that were not included in the preliminary cost estimates provided earlier this year on Feb 15, 2013. These items are summarized in **Table 2**.

A detailed cost estimate is in **Appendix A**. **Table 1** provides a summary of the final costs and a comparison between previous cost estimates and the Class A cost estimate.

**Table 1: Summary of Cost Estimates**

Item	Predesign Costs	Class A costs (1)	Additional Costs
Raw water System	\$ 50,000	\$ 91,700	\$ 41,700
WTP Upgrades	\$ 2,165,000	\$ 2,694,600	\$ 529,600
Total Costs including Contingency, Construction Fees and General Requirements.	\$ 2,215,000	\$ 2,786,300	\$ 571,300

(1) Included 15% for Contingency, Construction fees and General Requirements.

The increased costs are mainly associated with the raw water system upgrades and site conditions that were unknown at the time of predesign. **Table 2** provides a summary of the additional items added to the WTP during detailed design.

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**Table 2: Summary of Scope Change Costs**

<b>Extra Items</b>	<b>Class A Estimate</b>	<b>Reason for Addition / Modification</b>
Removal of Sewage Tank	\$ 10,000	Forklift operation requires a stable base; maintaining the tank at the current location presented stability / construction challenges.
Relocate gas line, Install gas meter	\$ 6,500	Existing location will be under the proposed WTP
Relocate potable line	\$ 4,600	Existing location will be under the proposed backup generator concrete pad
Concrete Loading Pad	\$ 34,000	Required for forklift operations
Process Materials And Components Related to Pumping Systems	\$ 64,500	Required piping, valving and process equipment for the raw water system inside the WTP.
Programming	\$ 85,000	Not included in predesign costs by electrical
Increased building size (includes electrical and HVAC)	\$ 180,260	Increased area to accommodate booster pumps, forklift access / manoeuvring and connecting new and old WTP buildings.
Vertical Inline Raw Water Booster Pumps (Inc. MCC)	\$ 25,500	Booster pumps required to meet RO membrane pressure requirements; pressure losses between groundwater wells and the WTP required pressure to be boosted
Emergency Genset	\$ 135,800	Was an optional item in predesign
Well Pump Upgrades (Include MCC)	\$ 79,500	The existing groundwater pumps do not meet required flows to properly operate the WTP equipment.
Forklift	\$ 20,000	Required to transport / replace chemical totes and drums
Total Costs including Contingency, Construction Fees and General Requirements (15%)	\$ 742,509	

The backup generator can be removed from this upgrade and a power switch for a portable generator can be added instead at a cost of \$15,000. The county can rent or purchase a portable backup generator separately and bring it to site when required. However, we recommend that a permanent backup generator for the WTP be installed, as it a high risk system and potable water must be provided at all times.

In summary, the costs for the WTP upgrades increased by 21% mostly due to additional costs required by the raw water system upgrades and unforeseen site conditions during predesign.

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We hope this meets your approval and we look forward to discussing the costs with you and potential for savings.

**URBAN SYSTEMS LTD.**

A handwritten signature in black ink, appearing to read "Bander Abou Taka".

**Bander Abou Taka, P.Eng**  
Water and Wastewater Engineer

A handwritten signature in black ink, appearing to read "A. Cristina Fonseca".

**A. Cristina Fonseca, Ph.D., P.Eng.**  
Process Engineer

/BAT

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## Appendix A

### County of St. Paul - Ashmont Water Treatment Plant Upgrade

Project Number: 3144.0003.02

#### DIRECT FILTRATION WITH RO MEMBRANES

Date 29-Apr-13

#### ASHMONT WTP CAPITAL CONSTRUCTION COSTS - CLASS A ESTIMATE

Section	Description	Unit	Quantity	Material or Equipment Costs		Labour & Overhead (1,2)	TOTAL COSTS
				Unit Price	Total Price		
<b>1.0</b>	<b>SITE WORKS AND YARD PIPING</b>						
1.1	Site Excavation Trenching and Backfill, onsite disposal	m^3	18	\$ 15	\$ 270	\$ -	300
1.2	Building Excavation and backfill and disposal	m^3	400	\$ 55	\$ 22,000	\$ -	22,000
1.3	100mm topsoil	m^2	460	\$ 5	\$ 2,300	\$ -	2,300
1.4	Hydroseeding	m^2	460	\$ 3	\$ 1,380	\$ -	1,400
1.5	Granular base						
1.6	- Base (300mm Thickness)	m^2	170	\$ 40	\$ 6,800	\$ -	6,800
1.7	- Sub base (250mm Minus)	m^2	170	\$ 35	\$ 5,950	\$ -	6,000
1.8	<b>Yard Piping</b>				\$ -		
1.9	Cathodic Protection and Testing Station	LS	1	\$ 2,000	\$ 2,000	\$ 1,000.00	3,000
1.10	Pipe locates	each	3	\$ 500	\$ 1,500	\$ -	1,500
1.11	Raw water Tie-in						
1.12	- Transmission Coupling - 100mm	each	2	\$ 300	\$ 600	\$ -	600
1.13	- HXF Gate Valve - 100mm	each	1	\$ 750	\$ 750	\$ -	800
1.14	- FXF gate Valve - 100mm	each	1	\$ 750	\$ 750	\$ -	800
1.15	- 22.5 Bend - 100mm	each	2	\$ 300	\$ 600	\$ -	600
1.16	- 45 Bend - 100mm	each	1	\$ 300	\$ 300	\$ -	300
1.17	- 100mm PVC Pipe DR 25	m	30	\$ 150	\$ 4,500	\$ -	4,500
1.18	Potable Water Line						
	- 50mm PVC Series 160	m	50	\$ 75	\$ 3,750	\$ -	3,800
	- 45 Bend - 50mm	each	2	\$ 200	\$ 400	\$ -	400
	- 90 bend - 50mm	each	2	\$ 200	\$ 400	\$ -	400
1.19	Core into Reservoir and seal around pipe	LS	1	\$ 1,500	\$ 1,500	\$ -	1,500
1.20	Sanitary						
	75mm PVC SDR26	m	4	\$ 100	\$ 400	\$ -	400
1.21	1200 mm X 3m deep manhole, C/W base, riser and cover	each	1	\$ 3,500	\$ 3,500	\$ 1,750.00	5,300
1.22	1200 mm manhole upgrades - Raise by 112mm	LS	1	\$ 750	\$ 750	\$ -	800
1.23	1200 mm manhole for pressure transmitter - well site	LS	1	\$ 3,500	\$ 3,500	\$ 1,750.00	5,300
1.24	Install new gas line and meter	LS	1	\$ 5,000	\$ 5,000	\$ -	5,000
1.25	Remove retaining wall	LS	1	\$ 1,500	\$ 1,500	\$ -	1,500
1.26	Remove gas line	LS	1	\$ 1,500	\$ 1,500	\$ -	1,500
1.27	Remove and dispose of the septic tank	LS	1	\$ 10,000	\$ 10,000	\$ -	10,000
						<b>Subtotal - Site Works And Yard Piping</b>	<b>86,800</b>
<b>2.0</b>	<b>DEMOLITION AND CONSTRUCTION REQUIREMENTS</b>						
2.1	Demolition, existing filter removal, piping, components, repairs, etc.	LS	1	\$ 20,000	\$ 20,000	\$ -	20,000
2.2	50mm Potable Mainline Relocation, Heat Trace and Insulation System	LS	1	\$ 2,500	\$ 2,500	\$ -	2,500
2.3	Relocate Existing Potable Water Main within Existing Facility	LS	1	\$ 1,500	\$ 1,500	\$ -	1,500
2.4	Install Heat Trace and Insulation System on Potable Water Penetration	LS	1	\$ 2,250	\$ 2,250	\$ -	2,300
2.5	Temporary Connection to Existing Raw Water Piping (Incl. restrained flange adapter)	LS	1	\$ 2,250	\$ 2,250	\$ -	2,300
						<b>Subtotal - Existing Water Treatment Plant Demolition</b>	<b>28,600</b>
			16				
<b>3.0</b>	<b>WTP BUILDING</b>						
3.1	Building						
	- Superstructure and Exterior Enclosure	m^2	334	\$ 1,000	\$ 334,000	\$ -	334,000
	- Building Electrical and Power Distribution (includes 3Phase power Pole, security, lighting etc.)	m^2	334	\$ 902	\$ 301,252	\$ -	301,300
	- Building Mechanical (HVAC / Plumbing)	m^2	334	\$ 534	\$ 178,356	\$ -	178,400
	- Gratings	LS	1	\$ 10,000	\$ 10,000	\$ -	10,000
3.2	Concrete - includes building slab, concrete forming and loading pad	m^3	160	\$ 1,200	\$ 192,000	\$ -	192,000

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Section	Description	Unit	Quantity	Material or Equipment Costs		Labour & Overhead (1,2)	TOTAL COSTS
				Unit Price	Total Price		
3.3	Concrete Piling	each	20	\$ 2,000	\$ 40,000	\$ -	40,000
3.4	Control Room Loose furniture allowance	ls	1	\$ 1,000	\$ 1,000	\$ -	1,000
3.10	Safety Equipment						
	- Shower/eyewash system	each	1	\$ 1,400	\$ 1,400	\$ 700	2,100
	- Thermostatic mixing valve	each	1	\$ 2,500	\$ 2,500	\$ 1,250	3,800
	- Hot water tanks	each	2	\$ 900	\$ 1,800	\$ 900	2,700
3.12	Lifting Hoist						
	- Lifting hoist and trolley	each	1	\$ 1,200	\$ 1,200	\$ 600	1,800
	- Structural rails	each	4	\$ 500	\$ 2,000	\$ 1,000	3,000
						Subtotal - WTP Building Subtotal	1,070,100
4.0	PROCESS RELATED COMPONENTS AND MATERIALS						
4.1	Water piping, valves and fittings	LS	1	\$ 202,283	\$ 202,283	\$ -	202,300
4.2	Chemical piping, valves and fittings	LS	1	\$ 17,888	\$ 17,888	\$ -	17,900
4.3	Process Instrumentation	LS	1	\$ 4,050	\$ 4,050	\$ -	4,100
4.4	Static Mixers	each	4	\$ 1,500	\$ 6,000	\$ 1,500	7,500
						Subtotal - Process Related Components And Materials	231,800
5.0	REVERSE OSMOSIS FILTRATION EQUIPMENT						
5.1	Complete RO Skid Package	LS	1	\$ 328,781	\$ 328,781	\$ 16,439	345,300
	- Membrane Filters Package - 2 trains. C/w cartridge filters						
	- PLC control panel, and Color Touchscreen Operator Interface						
	- CIP Skid Package						
	- CIP chemical feed skid						
	- Antiscalant metering pumps						
	- VFDs per train	each	2	\$ 8,750	\$ 17,500	\$ 8,750	26,300
	- pH Probe for the CIP return	each	1	\$ 3,000	\$ 3,000	\$ 750	3,800
						Subtotal - Reverse Osmosis Filtration Equipment	375,400
6.0	VERTICAL INLINE PUMPS						
6.1	Booster Pumps 15HP Grundfos	each	2	\$ 8,500	\$ 17,000	\$ 8,500	25,500
						Subtotal - Vertical Inline Pumps	25,500
7.0	CHEMICAL STORAGE AND DOSING EQUIPMENT						
7.1	Antiscalant Secondary Containment Pallett	LS	2	\$ 250.00	\$ 500.00	\$ 125.00	700
7.2	Sodium Hypochlorite Storage Totes	each	3	\$ 500.00	\$ 1,500.00	\$ 375.00	1,900
7.3	Sodium Hypochlorite Secondary Containment Pallet	each	2	\$ 1,200.00	\$ 2,400.00	\$ 600.00	3,000
7.4	Sodium Hydroxide Storage Day Tank	each	1	\$ 800.00	\$ 800.00	\$ 200.00	1,000
7.5	Sodium Hydroxide Secondary Containment Pallet	each	1	\$ 400.00	\$ 400.00	\$ 100.00	500
7.6	Sulfuric Acid IBC Totes	each	3	\$ 600.00	\$ 1,800.00	\$ 450.00	2,300
7.7	Sodium Hypochlorite Duplex Metering Skid - Complete	each	1	\$ 20,000.00	\$ 20,000.00	\$ 1,000.00	21,000
7.8	Sodium Hydroxide Duplex Metering Skid - Complete	each	1	\$ 20,000.00	\$ 20,000.00	\$ 1,000.00	21,000
7.9	Sulfuric Acid Duplex Metering Skid - Complete	each	1	\$ 20,000.00	\$ 20,000.00	\$ 1,000.00	21,000
7.10	Portable Chemical Trasfer Pump	each	2	\$ 2,000.00	\$ 4,000.00	\$ 200.00	4,200
						Subtotal - Chemical Storage and Dosing Equipment's	76,600

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