

WORK PROGRAM

THE COUNTY OF ST. PAUL

*Ashmont/Lottie Lake Water Treatment Plant and
Transmission Line*

Detailed Design and Construction Services

Submitted by:

URBANSYSTEMS.

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October 20, 2011

Work Program for
The County of St. Paul
Ashmont/Lottie Lake Water Treatment Plant and
Transmission Line
Detailed Design and Construction Services

Prepared for
The County of St. Paul
5015 - 49 Avenue
St. Paul, Alberta, T0A 3A4

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USL File No. 3144.0003.01

October 20, 2011

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1 LETTER OF TRANSMITTAL

October 20, 2011

File: 3144.0003.01

County of St. Paul
5015 - 49 Avenue
St. Paul, Alberta T0A 3A4

Via email: skitz@county.stpaul.ab.ca

Attention: Sheila Kitz, Chief Administrative Officer

**RE: COUNTY OF ST. PAUL – ASHMONT/LOTTIE LAKE WATER TREATMENT PLANT AND TRANSMISSION LINE –
DETAILED DESIGN AND CONSTRUCTION SERVICES**

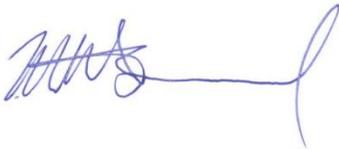
Thank you for the opportunity to submit this work program to continue with the pre-design and detailed design of the Ashmont/Lottie Lake Water Treatment Plant (WTP) and the detailed design of the Ashmont – Lottie Lake transmission line. We have enjoyed working with you through the conceptual and preliminary design phases and look forward to continuing our relationship with you to deliver the final phases and ultimately commissioning the system.

If you have any questions regarding this proposal, please do not hesitate to contact us at 780-430-4041.

Regards,

URBAN SYSTEMS LTD.

Reviewed by:



Matthew Brassard, P.Eng.,
Principal



Cristina Fonseca, Ph.D, P.Eng., PE,
Water Treatment Specialist

/mm

Enclosure

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2 EXECUTIVE SUMMARY

The conceptual Ashmont water treatment plant (WTP) and preliminary Ashmont – Lottie Lake transmission report, Submitted October 18, 2011 was recently completed for the County of St. Paul and forms the basis for the services moving forward. This report evaluated three treatment and two alignment options with regards to the supply of water to the Hamlets of Ashmont, Lottie Lake, and future treatment capacity to service Mallaig.

On September 22, 2011, a decision to locate the WTP in Ashmont was made after discussions with Council, Senior Administration, Alberta Transportation (Mike Yakemchuk) and our team. Based on the report and discussions with you, we understand the intent of the current assignment is to complete the following tasks:

Transmission Line

- Complete the detailed design of the water transmission line and infrastructure to deliver water from the new Ashmont WTP (located in Ashmont) to the existing clearwell at the Lottie Lake WTP,
- Assess and complete related works required to meet regulatory requirements to construct the regional infrastructure,
- Prepare a cost estimate of the transmission line and associated work
- Prepare a proposed timeline for construction of the regional infrastructure,
- Prepare construction contract documents for the work,
- Tender, evaluate, and recommend award of the work.

Water Treatment Plant

- Confirm water quality targets for aesthetic parameters, namely total dissolved solids and hardness,
- Confirm disinfection approach to meet 4-log virus inactivation with Alberta Environment,
- Develop pilot-scale study protocol to be accepted by Alberta Transportation and Alberta Environment,
- Coordinate pilot-scale equipment delivery and start-up with equipment suppliers and the County,
- Support the County during pilot-scale testing,
- Confirm water treatment process design criteria and expansion requirements with Alberta Transportation,
- Confirm water treatment process and reverse osmosis membrane treatment blending ratios,
- Complete the preliminary and detailed design of the drinking water treatment plant to service the communities of Ashmont and Lottie Lake,
- Prepare a pre-tender water treatment plant cost estimate,
- Prepare a proposed timeline for construction of the regional infrastructure,
- Prepare construction contract documents for the work,
- Tender, evaluate, and recommend award,
- Conduct the Project Management responsibilities for the pilot-scale testing and engineering phases of the project.

Other

- Water diversion license application. This includes a hydrogeotechnical background investigation and testing to amend (augment) current water diversion license to meet required raw water demands,
- Evaluate residuals generation and handling opportunities,
- Conduct environmental assessment and mitigation plan/archaeological overview assessment
- Lagoon Study and/or evaluation of direct discharge opportunities,
- Complete the geotechnical investigations along the transmission line alignment as well as on the proposed WTP site,
- Topographic and legal land survey for the transmission line and proposed WTP site,
- Land acquisition assistance,
- Utility locates,
- Corrosion protection design,
- Drawing and document production,

3 PROJECT APPROACH

Due to the proposed schedule and nature of the project (proposed construction in 2012/2013), a variety of activities will occur concurrently. A start-up meeting will be held at the onset of the project. Major project goals and milestones will be reviewed and Communication Lines established.

3.1 Project Leadership

Matt Brassard is the Project Leader. Matt led the preliminary design of the Ashmont and Lottie Lake WTP/transmission line project and is familiar with the County expectations. As part of USL's general approach to project leadership, we place great emphasis on:

- Establishing a Qualified and effective team;
- Understanding and defining project goals and objectives;
- Maintaining scope, schedule and budget;
- Effective consultation and management of expectations; and
- Effective internal (project team) and external communication.

Meetings – Monthly meetings will be held with regulatory agencies and the County of St. Paul, either on site or via conference call. These meetings will be attended by the PL and, if required, by a technical specialist. A monthly progress report will be provided.

3.2 Schedule

Should USL receive the approval of the scope of work and fees, we have capacity to commence work immediately. The project schedule and budget will be maintained by establishing milestone dates at the outset of the project and clearly communicating expectations around roles and responsibilities, establishing the required level of effort by team members, and through continuous open dialogue as the project progresses.

Our proposed schedule which achieves this goal is provided in **Appendix A**.

4 PROJECT TEAM

We have assembled a team with both corporate and personal experiences that are very well aligned to deliver this project. All work associated with the transmission line will be performed in house, by Urban Systems professionals. With regards to the Ashmont drinking water treatment plant, some of the work will be done by sub-consultants to Urban Systems, namely:

- Structural Engineering – Ptarmigan Engineering (Rick Imai, P.Eng.)
- Architectural – Rockliff Architects (Jan Pierzchajlo, MAAA, MRAIC)
- Electrical, Instrumentation and Controls – Canadian Consulting Group (Roxanne Yakemchuck, P.Eng.)
- Mechanical (HVAC / Plumbing) – Alberta Ltd (Craig O’Brien, P.Eng.)

A short description of the team members is found below:

Matt Brassard, P.Eng.

Matt is the proposed Project Leader led the preliminary design of the Ashmont/Lottie Lake WTP and transmission line project and is currently working with the County on the Water Policy project. He is currently the managing partner for USL in Edmonton and brings great experience in all phases of water infrastructure projects and project management.

Dr. Cristina Fonseca, P.Eng.

Cristina is a process engineer and brings a wealth of knowledge in the field of drinking water treatment to the Team. She will lead the WTP design Team. Cristina led the preliminary design of the WTP for the Ashmont/Lottie Lake project.

Ken Oliver, P.Eng.

Ken is a senior consultant and principal of Urban Systems Ltd. and will provide senior oversight to ensure conformance with our quality objectives for this assignment. Ken brings 35 years of engineering and municipal consulting experience to the project.

Keith Fransson, A.Sct.

Keith brings a wealth of experience in the field of large scale project delivery. Keith is currently managing the detailed design and construction of the Alberta Central East regional water line.

Dr. Mohammed Elenany, P.Eng.

Mohammed is the USL in-house hydraulics expert and has supported many offices in projects similar to the current assignment. Mohammed is currently working with the County of St. Paul on the Ashmont/Lottie Lake WTP and transmission line project.

Nellshah Khakoo, EIT

Nellshah will support Cristina in the detailed design and delivery of the WTP. Nellshah has 4 years of WTP design experience ranging from feasibility to construction.

4.1 Subconsultants

Roxanne Yakemchuck, P.Eng.**Canadian Consulting Group**

Roxanne is an instrumentation and controls expert with over 11 years of design experience. She is currently working on the preliminary design of the Ashmont/Lottie Lake WTP and transmission line project.

Rick Imai, P. Eng.**Ptarmigan Engineering Ltd.**

Rick is the president and senior engineer in Ptarmigan Engineering Ltd. He has 27 years of experience in structural design, specifications and construction supervision for water treatment plants, pumping and storage facilities. He has worked with Urban Systems on a variety of projects most recent being the structural design of West Park Lift Station in the City of Fort Saskatchewan and the Alberta Central East Reservoir and Pumphouse in Vegreville.

Craig O'Brien, P.Eng**1389667 Alberta Ltd.**

Craig provides over nineteen years of experience with engineering design and project management and is a heating, ventilation, and air-conditioning systems (HVAC), controls, fire protection, and plumbing systems mechanical engineering consultant. Craig has a variety of knowledge and experience designing systems specifically for water treatment plants, reservoir, and pumping station projects.

Jan Pierzchajlo, Architect AAA**Rockliff Pierzchajlo Architects and Planners Ltd.**

Jan is the managing partner in Rockliff Pierzchajlo Architects and Planners Ltd. He has worked with Urban Systems on a number of projects over the last 8 years. Jan will be responsible for all of the building envelope requirements for this project.

5 PROJECT METHODOLOGY

Based on the conceptual WTP and preliminary transmission design report, discussions with the County and our understanding of the project, a project delivery approach was developed and is detailed below.

5.1 Project Leadership

Strong leadership and communication often make the difference between a good project and a great project. Our project leadership best practices include:

- Confirm project objectives and the scope of work and scope change protocols in consultation with the County and AT;
- Confirm roles and responsibilities (internal and external);
- Confirm deliverables, milestones, and budget;
- Assess project risks and adapt project plan accordingly;
- Implement quality review protocols;
- Develop and implement a communication plan (internal and external);
- Track progress;
- Provide frequent and clear feedback to team members;
- Adhere to quality review protocols;
- Regularly review project budget and schedule;
- Monitor and issue scope changes as required;
- Provide written progress updates to the County along with invoice;
- Conduct project completion meeting and document lessons learned;

Key Team Members: Matthew Brassard

Deliverables: Quality Management Plan (internal), Monthly Progress Reports, Cash Flow Forecast, Communication Plan, Project Completion Report

5.2 Confirm Location of WTP in Ashmont

We propose to confirm the preferred connection points at the source, the delivery point, and the preferred alignment by the first week of November 2011. This will allow time for the appropriate geotechnical investigation and reporting to be completed this year (2011).

Key Team Members: Matthew Brassard

Deliverable: Memorandum

5.3 Geotechnical Investigation

Based on the current length and proposed pipe diameter of the transmission line, a Conservation and Reclamation Plan and Historical Resources Act Clearance (Terrestrial, Archaeology and Aquatics) approval is **NOT** required (index calculation < 2,690). Urban Systems Ltd. will meet with AENV to confirm requirements for this project.

The geotechnical scope will include a site reconnaissance followed by a field investigation including approximately 18 boreholes along the proposed route to support the design and construction of the proposed pipeline and 2 boreholes near the proposed WTP in Ashmont. This work will review construction methods and procedures, information learned from recent projects of a similar nature, and a review of available published geological maps and selected air photos pertaining to the entire alignment and structure site. This work will provide an understanding of the anticipated geological hazards and geotechnical conditions along the entire alignment. This will inform the design Team as the alignment relates to constructability and design requirements.

Deliverable: Geotechnical Report, Geotechnical drilling investigation Report.

5.4 Complete the Detailed Design of the Transmission Line

Based on the preliminary design, Option A (which locates the WTP in Ashmont) is the preferred route. The following will be completed in order to complete the detailed design:

- Alignment route for transmission line, including pipe size, materials, hydraulic profile;
- Steady state and transient analysis model and hydraulic analysis;
- Survey of existing pipeline crossings (location and depth) and connections;
- Staging/construction options;
- Proposed installation methods (e.g. open trenching / directional drilling);
- Confirm quality of water with respect to chlorine residual (degradation) at the point of delivery;
- Detailed drawings (at 2 stages – Issued For Approval, Issued For Tender);
- Connection point designs (at the Ashmont WTP and at the Lottie Lake WTP).

Key Team Members: Nellshah Khakoo, Mohammed Elenany, Ken Oliver

Deliverable: 2 sets of Drawings (Issued for Approval, Issued for Tender)

5.5 Transmission Line Contract Documents

With the signs of the Alberta Construction Sector heating up and the anticipated rise in Construction costs there are a few things that we can do as your design consultants that will result in the most competitive pricing available at the time of Tendering. This includes:

- Use our recent contract and tendering experiences on similar projects to improve the design, contract, and tendering framework to maximize the benefits to the County.
- Strive to get your tender out in the market as early as possible in 2012. As seen in 2011 the number of bids decreases and competitiveness of the bids decreases the later the Tendering occurs in the construction season.
- Provide a design and contract structure that enables the Contractors available to bid on the project to use their most cost effective means of construction.

Key Team Members: Keith Fransson, Ken Oliver, and Matthew Brassard

Deliverable: Contract Documents

5.6 Transmission Line Tender/Award

Tender Phase - Upon receipt of authorization by the County, we will proceed with tendering of the project as a single contract. Tendering includes:

- Preparation of the tender advertisement and electronic distribution of the Tender documents.
- Advisory services to the County's Project Manager during tender period.
- Interpretation of technical provisions of the document and preparation and issuance of addenda as required.
- Attendance at tender opening.
- Evaluation of tenders based on Contractor's competence, tender price, conformance with tender documents and schedule.
- Recommendations to the County on tender acceptance and award.

Key Team Members: Ken Oliver, and Matthew Brassard

5.7 Water Treatment Plant Design Tasks

The work program developed for the pilot-scale, WTP preliminary and detailed design phases is described herein. To enable a quick evaluation in terms of effort proposed, the tasks described in this section are associated with line items in the budget (provided in **Appendix A**).

Task 1 – Project Initiation

Project Initiation (Tasks 1.1 and 1.2) will focus on confirming lines of communication and continuing our dialog with Alberta Transportation and Alberta Environment. USL’s overall approach to the different design phases will be discussed and input will be sought from the different stakeholders.

Key Team Members: Cristina Fonseca and Matthew Brassard

Deliverable: Meeting minutes.

Task 2 – Bench- and Pilot-Scale Testing

As discussed with Alberta Environment and Alberta Transportation, the water treatment process selected will have to be tested at pilot-scale. Additionally, some bench-scale testing may be necessary. The duration and scope of these tests will be discussed with the County and Alberta Transportation. All tasks associated with this work (Tasks 2.1 – 2.8) focus on supporting the County with all activities associated with bench- and pilot-scale testing. Our involvement will focus on developing testing protocols, coordination of equipment delivery with suppliers and the County, pilot-scale start-up support, and results evaluation and reporting. Similarly support will be provided for all bench-scale testing.

Key Team Members: Cristina Fonseca and Nellshah Khakoo

Deliverable: Bench- and pilot-scale study technical memorandum.

Task 3 – Pre-Design Tasks

Tasks 3.1 and 3.2 will focus on confirming design criteria with Alberta Transportation and Alberta Environment, namely with regards to project design flows and expansion requirements. Issues associated with final design approach (including blending options), equipment redundancy, chemical rooms design, remote system access and control, among others, will be confirmed prior to moving forward with the pre-design of the facility.

Task 3.3 was already described in Section 3.2 of the current proposal and mostly aims at identifying the final location of the WTP, based on footprint requirements, ease of access to chemical delivery trucks, and optimal location for the transmission line and residuals discharge.

An Environmental Assessment and Mitigation, and Archaeological Assessment (Task 3.4) will be conducted to help incorporate environmental factors into the project decision-making. The environmental overview will be a desktop study based on information gathered from available local/provincial/federal sources. The information gathered will summarize the current environment with respect to aquatic, terrestrial, and heritage resources and will outline the applicable regulatory requirements for the project.

The report will include a summary of potential environmental effects and best management practices in pipeline construction in prairie environments to avoid, reduce, or control adverse effects of the works associated with this project. Recommendations will be made for further field studies/surveys, or plans to monitor the impact of the project, if deemed necessary.

A preliminary site and building layout will be prepared (Task 3.5) once the building location is identified, followed up by a survey (Task 3.6). Tasks 3.7 to 3.9 focus on additional pre-design work tasks associated with instrumentation and controls, and HVAC and plumbing. These will support equipment discussions with suppliers as well as identify functional requirements to do with space and layout of the treatment equipment.

Task 3.10 focuses on the development of preliminary design drawings. The design will be developed to 50 percent completion. At this stage most drawings available will focus on process design and process and instrumentation drawings. Site WTP layouts will also be provided. Limited architectural, structural, electrical, and HVAC / plumbing will be provided at this stage. A summary list of proposed drawings is shown below, in association with Task 4 (subtasks 4.2 and 4.6).

Where advantageous from a detailed design perspective, equipment will be pre-selected prior to tender issue (Tasks 3.11 and 3.12). This approach allows the design to be developed around a known key piece of equipment instead of having to accommodate a variety of suppliers that may be selected by the successful contractor. Once pre-selected, this supplier is carried in the respective specification, during tender.

Tasks 3.13, 3.14, and 3.15 focus on key issues to do with the water treatment design and construction. Task 3.13 will identify ways to minimize any disruption to the supply of water to consumers during construction. Task 3.14 objective is to provide for a review of all disciplines, identify any conflicts in the design and also to devise the simplest possible ways to build the WTP with minimum disruptions to the community at large. Finally, based on the findings of Tasks 3.13 and 3.14 a staging plan will be developed to minimize construction period and make use of any possible synergies during this phase. Although no environmental concerns are anticipated, we will incorporate any construction window limitation in our staging plan.

An updated class "C" costs estimate will be prepared (Task 3.16) and included in the pre-design report (Task 3.17). The findings of the work done during the preliminary design phase will be discussed with the County, Alberta Environment and Alberta Transportation in a collaborative workshop (Task 3.18). It is anticipated that this workshop will be used to discuss the design approach, confirm the functional layout of the drinking water treatment plant, overall control philosophy, among other issues. All comments and feedback will be incorporated in the final pre-design report (Task 3.19).

Key Team Members: Cristina Fonseca, Sean Dodd, Nellshah Khakoo, and Rhonda Maskiewich

Deliverables:

- Environmental assessment and mitigation / archaeological assessment technical memorandum.
- Survey report.
- Preliminary design drawings (50% completion).
- Equipment preselection request for quotation (RFQ).
- Pre-design report.

Task 4 – Detailed Design Tasks

During this stage our team will start addressing all permits and approvals required for the WTP and transmission line for the successful completion of the project (Task 4.1). Any additional permits or approvals required for the residuals discharge will be included in a separate work program pending discussions with AENV.

Detailed drawings will be finalized during this phase. Submittals to the County will be done at 85 and 100 percent completion (Tasks 4.2 and 4.6). The table below shows a summary of the proposed drawings. As for the preliminary design, a constructability and quality review will be done by senior reviewers (Task 4.5). The objective will be to identify and resolve design conflicts as well as optimize the WTP constructability.

Drawings	Number of Sheets
General	2
Civil	5
Structural	11
Architectural	3
Process	8
Instrumentation	6
Electrical	10
HVAC / Plumbing	7
Total Estimated WTP Drawings	52

Specification packages (Tasks 4.3 and 4.7) will be submitted to the County and Alberta Transportation, for review, along with the 85 and 100 percent detailed design drawings. The objective, as for the drawings, is to obtain feedback prior to issuing the tender. Once the detailed design is finalized, a class “A” cost estimate will be prepared (Task 4.8).

At the end of the detailed design phase, a collaborative workshop is planned between the design team, the County and Alberta Transportation (Task 9). This workshop will focus on a final review of the design documents (drawings and tender).

Key Team Members: Cristina Fonseca, Sean Dodd, and Nellshah Khakoo

Deliverables:

- Detailed design drawings (100% completion).
- Pre-tender (Class “A”) cost estimate.
- Tender documents package.
- Capital funding brief.

Task 5 – Tender Issue and Evaluation

Task 5 will focus on finalizing contract documents (Task 5.1), tender issues, response to questions and clarifications, tender review and award (Task 5.2). A site visit with interested contractors is assumed at this stage. The intent is to provide for an overview of the project, raise any critical issues associated with integration with existing facilities, show staging areas available to contractors and clarify any questions that prospective bidders may have about the project.

Key Team Members: Cristina Fonseca and Sean Dodd

Deliverable: Tender review summary memo and award recommendation.

6 FEES

A detailed task and associated fee list is attached in **Appendix A**. The breakdown of fees is summarized as follows:

Transmission Line	\$185,000
Bench- and Pilot-Scale Testing	\$53,750
Water Treatment Plant	\$366,650
Geotechnical (WTP and transmission line)	\$38,000
Land Acquisition (includes west & east)	\$46,300
Residuals generation and handling options	\$15,000
Hydrogeotechnical (license amendment)	\$48,300*
Total Estimated Fees (+ GST)	\$753,000

* The County of St. Paul and AT have already authorised Thurber to proceed with the Hydrogeotechnical component of this work program.

The above fee summary is based on the following assumptions:

- A total of four meetings / workshops are planned with the County, Alberta Transportation and relevant design team members, at key project milestones.
- Two month pilot-scale testing was assumed, at an assumed cost of \$35,000 and bench-scale work assumed to cost approximately \$5,000 (including water quality analysis). This cost assumes piloting of pressure filters and RO membranes, and includes shipping. If any additional processes require testing, this will be discussed with Alberta Transportation. If after discussions with Alberta Environment it is confirmed that pilot-scale testing duration is less than two months, the costs may be reduced.
- The pilot-scale testing costs assume that the pilot-scale skids will be housed in an existing building. If a temporary structure is required to house the pilot-scale testing, additional funds may be required.
- It is assumed that Dr. Cristina Fonseca will be on-site during pilot-scale start-up, for two days. County operators will operate the pilot-scale skid with remote support from Cristina and Nellshah Khakoo.
- The preliminary and detailed design components associated with structural, architectural, electrical / instrumentation and controls, and mechanical (HVAC and plumbing) have been included in the WTP fee. As mentioned above, these services will be provided by Ptarmigan Engineering (structural), Rockliff Architects

(architectural), Canadian Consulting Group (electrical, instrumentation and controls), and Alberta Ltd (mechanical).

- No allowance has been made for system programming and control. This component will be discussed with the County and Canadian Consulting Group during the final stages of the detail design phase. It is anticipated that Canadian Consulting Group will work in partnership with BI Systems Electrical & Controls to program the Ashmont remote access and control network. BI Systems has been working with the County, upgrading the PLC and remote monitoring for the Lottie Lake and Mallaig and will provide feedback on all issues associated with standardizing the County control system.

7 SCHEDULE

As previously noted, the schedule proposed for the project is shown in **Appendix A**. This schedule was prepared based on the following assumptions:

- Consulting work program approved in November 2011;
- Start-up meeting to take place within one week of project award (November, 2011);
- Residuals handling framework established by November 2011;
- Field Survey and geotechnical investigations completed in November 2011;
- Water supply testing (for license augmentation) completed in November 2011;
- Treatment Piloting completed by March 2012;
- Transmission main tender in February 2012;
- Transmission main construction completion by fall 2012;
- WTP tender in July 2012
- WTP construction completion by March 2013
- Project Completion and Commissioning in March 2013.



APPENDIX A

Fees and Schedule

Task No.	Task Description:	Fees	Disbursements	Total	Subconsultant Fees	Total
I	Project Management and Administration					
1.1	Overall Project Management	\$ 17,900	\$ 1,440	\$ 19,340		\$ 19,340
	Subtotal	\$ 17,900	\$ 1,440	\$ 19,340		\$ 19,340
II	Preliminary Design and Data Collection					
2.1	Confirm Pipeline Routing and Connection Points	\$ 2,060	\$ 170	\$ 2,230		\$ 2,230
2.2	Geotechnical Investigation	\$ 2,930	\$ 80	\$ 3,010	\$ 38,000	\$ 41,010
2.3	Land Acquisition	\$ 3,930	\$ 130	\$ 4,060	\$ 46,300	\$ 50,360
2.4	Corrosion Potential Investigation	\$ 2,110	\$ 150	\$ 2,260	\$ 5,000	\$ 7,260
2.5	Complete Ground Truthing and Base Mapping Correction	\$ 3,280	\$ 260	\$ 3,540		\$ 3,540
2.6	Cadastral Base (completed with ground truthing)	\$ 5,420	\$ 260	\$ 5,680	\$ 42,690	\$ 48,370
2.7	Driveway and Shelter Belt Review	\$ 1,080	\$ 890	\$ 1,970		\$ 1,970
2.8	Utility Locates and Field Survey	\$ 3,250	\$ 220	\$ 3,470	\$ 10,000	\$ 13,470
	Subtotal	\$ 24,060	\$ 2,160	\$ 26,220	\$ 141,990	\$ 168,210
III	Detail Design and Tender					
3.1	Site Visit	\$ 2,390	\$ 990	\$ 3,380		\$ 3,380
3.2	Confirm Hydraulics/ Pipe Sizing	\$ 920	\$ 70	\$ 990		\$ 990
3.3	Surge Analysis	\$ 2,160	\$ 170	\$ 2,330		\$ 2,330
3.4	Review Constructability	\$ 2,760	\$ 220	\$ 2,980		\$ 2,980
3.5	Develop Plan and Profiles	\$ 3,130	\$ 250	\$ 3,380		\$ 3,380
3.6	Road Profile Reviews (of potential future road regrading)	\$ 1,870	\$ 150	\$ 2,020		\$ 2,020
3.7	Crossings (Plans, Applications and Coordination)	\$ 5,040	\$ 400	\$ 5,440		\$ 5,440
3.8	Prepare Class B Cost Estimate	\$ 6,350	\$ 510	\$ 6,860		\$ 6,860
3.9	Detail Drawings	\$ 6,390	\$ 510	\$ 6,900		\$ 6,900
3.10	Corrosion Protection Design	\$ 2,210	\$ 160	\$ 2,370	\$ 5,000	\$ 7,370
3.11	Drawings Production	\$ 1,040	\$ 80	\$ 1,120	\$ 2,000	\$ 3,120
3.12	Design Reviews	\$ 8,860	\$ 710	\$ 9,570		\$ 9,570
3.13	Prepare Pre Tender Cost Estimates	\$ 3,870	\$ 310	\$ 4,180		\$ 4,180
3.14	Prepare Specifications and Tender Documents	\$ 14,060	\$ 1,130	\$ 15,190		\$ 15,190
3.15	Tender Administration Services	\$ 7,180	\$ 980	\$ 8,160		\$ 8,160
	Subtotal	\$ 68,230	\$ 6,640	\$ 74,870	\$ 7,000	\$ 81,870
	Total	\$ 110,190	\$ 10,240	\$ 120,430	\$ 148,990	\$ 269,420

APPENDIX A

URBANSYSTEMS.						
Ashmont WTP Upgrade Fee Schedule		USL			Subcon. Fees	Totals
Client: County of St. Paul Project: Ashmont WTP Upgrades and Transmission Line Ashmont - Lottie Lake		Fees	Disb.	Totals		
BOYER WTP TESTING, PRE-DESIGN AND DETAIL DESIGN PHASES						
1.0	PROJECT INITIATION					
1.1	Start-Up Meeting in Edmonton	\$ 1,400	\$ 1,112	\$ 2,512	\$ -	\$ 2,520
1.2	Follow-up with Regulatory Agencies (AENV and AT)	\$ 175	\$ 14	\$ 189	\$ -	\$ 190
	SUBTOTAL	\$ 1,575	\$ 1,126	\$ 2,701	\$ -	\$ 2,710
2.0	BENCH- AND PILOT-SCALE TESTING					\$ -
2.1	Develop Bench- and Pilot-Scale Test Protocols for Selected Options	\$ 700	\$ 56	\$ 756	\$ -	\$ 760
2.2	Selection, Coordination, Mobilization of Pilot-Scale Equipment	\$ 1,780	\$ 142	\$ 1,922	\$ -	\$ 1,930
2.3	Bench-Scale Testing Execution	\$ 350	\$ 28	\$ 378	\$ 5,000	\$ 5,380
2.4	Install, Commissioning of Pilot Equipment / Pilot-Scale Testing	\$ 2,800	\$ 1,474	\$ 4,274	\$ -	\$ 4,280
2.5	Pilot-Scale Test Execution (Assumes 2 Mths of Pilot-Scale Testing)	\$ 2,860	\$ 229	\$ 3,089	\$ 35,000	\$ 38,090
2.6	Bench-Scale Test Results Evaluation	\$ 350	\$ 28	\$ 378	\$ -	\$ 380
2.7	Pilot-Scale Results Evaluation	\$ 1,780	\$ 142	\$ 1,922	\$ -	\$ 1,930
2.8	Bench- and Pilot-Scale Test Technical Memorandum	\$ 900	\$ 72	\$ 972	\$ -	\$ 980
	SUBTOTAL	\$ 11,520	\$ 2,172	\$ 13,692	\$ 40,000	\$ 53,730
3.0	PRE-DESIGN TASKS					\$ -
3.1	Confirm Design Criteria	\$ 350	\$ 28	\$ 378	\$ -	\$ 380
3.2	Finalize Water Treatment Process Selection	\$ 350	\$ 28	\$ 378	\$ -	\$ 380
3.3	s 5.2 and	\$ 1,780	\$ 142	\$ 1,922	\$ -	\$ 1,930
3.4	Environmental Assessment and Mitigation Plan / Archeological Overview Assessment	\$ 8,120	\$ 650	\$ 8,770	\$ -	\$ 8,770
3.5	Prepare Preliminary Layout (Site and Building)	\$ 2,730	\$ 218	\$ 2,948	\$ -	\$ 2,950
3.6	Survey Report	\$ 620	\$ 50	\$ 670	\$ 10,000	\$ 10,670
3.7	Preliminary Floor Plan Layout	\$ 1,650	\$ 132	\$ 1,782	\$ -	\$ 1,790
3.8	Identify Electrical Requirements (Primary and Standby Power)	\$ 870	\$ 70	\$ 940	\$ 500	\$ 1,440
3.9	Identify HVAC/ Plumbing Requirements	\$ 870	\$ 70	\$ 940	\$ 500	\$ 1,440
3.10	Drawings (General, Civil, Process-Mechanical Design and Instrumentation and Control, Structural, Electrical)	\$ 50,245	\$ 4,020	\$ 54,265	\$ 21,593	\$ 75,860
3.11	Develop Pre-Selection Equipment Sizing and Specifications	\$ 5,230	\$ 418	\$ 5,648	\$ -	\$ 5,650
3.12	Issue and Evaluate Equipment Pre-Selection Proposals	\$ 3,130	\$ 250	\$ 3,380	\$ -	\$ 3,390
3.13	Investigate Maintainance of Operation and Service During Construction	\$ 2,040	\$ 163	\$ 2,203	\$ -	\$ 2,210
3.14	Constructability and Quality Review	\$ 860	\$ 69	\$ 929	\$ -	\$ 930
3.15	Project/Construction Staging Plan	\$ 1,130	\$ 90	\$ 1,220	\$ -	\$ 1,230
3.16	Prepare and Submit Class 'C' Cost Estimate	\$ 6,860	\$ 549	\$ 7,409	\$ -	\$ 7,410
3.17	Submit Draft Pre-Design Report	\$ 5,360	\$ 429	\$ 5,789	\$ -	\$ 5,790
3.18	Collaboration Workshop with County, AENV and AT (Discussion of Draft Pre-Design Report Comments)	\$ 1,400	\$ 1,112	\$ 2,512	\$ -	\$ 2,520
3.19	Submit Final Pre-Design Report	\$ 2,500	\$ 200	\$ 2,700	\$ -	\$ 2,700
	SUBTOTAL	\$ 96,095	\$ 8,688	\$ 104,783	\$ 32,593	\$ 137,440
4.0	DETAIL DESIGN					\$ -
4.1	Permits and Approvals	\$ 2,480	\$ 198	\$ 2,678	\$ -	\$ 2,680
4.2	Submit 85% Complete Design Drawings	\$ 62,880	\$ 5,030	\$ 67,910	\$ 72,800	\$ 140,720
4.3	Submit 85% Complete Specifications Document	\$ 10,900	\$ 872	\$ 11,772	\$ 5,000	\$ 16,780
4.4	Review of Design Documents	\$ 4,940	\$ 387	\$ 5,227	\$ -	\$ 5,230
4.5	Constructability and Quality Review	\$ 2,420	\$ 194	\$ 2,614	\$ -	\$ 2,620
4.6	Finalize Design (100%)	\$ 15,760	\$ 1,261	\$ 17,021	\$ 12,500	\$ 29,530
4.7	Finalize Specifications (100%)	\$ 4,700	\$ 376	\$ 5,076	\$ 3,500	\$ 8,580
4.8	Prepare and Submit Class 'A' Cost Estimate	\$ 4,240	\$ 339	\$ 4,579	\$ -	\$ 4,580
4.9	Collaborative Workshop	\$ 2,800	\$ 1,224	\$ 4,024	\$ -	\$ 4,030
4.10	Prepare Final Design Capital Funding Brief	\$ 1,240	\$ 99	\$ 1,339	\$ -	\$ 1,340
	SUBTOTAL	\$ 112,260	\$ 9,981	\$ 122,241	\$ 93,800	\$ 216,090
5.0	TENDER ISSUE AND EVALUATION					\$ -
5.1	Prepare Contract Documents	\$ 1,310	\$ 105	\$ 1,415	\$ -	\$ 1,420
5.2	Tender Issue, Site Visit, Management, Review and Award	\$ 5,220	\$ 1,418	\$ 6,638	\$ 2,500	\$ 9,140
	SUBTOTAL	\$ 6,530	\$ 1,522	\$ 8,052	\$ 2,500	\$ 10,560
TOTAL FEES - ALL TASKS (Excluding GST)		\$ 227,980	\$ 23,488	\$ 251,468	\$ 163,893	\$ 420,362

Project Schedule

	2011			2012												2013		
	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March
Silt Density Index Test	█																	
Determine Direct RO Membrane Use	█																	
Refine and Balance Process/Objectives	█	█																
Pilot Testing		█	█	█	█													
Pre-Design				█	█													
Detailed Design						█	█	█	█	█								
Tender										█	█							
Construction												█	█	█	█	█	█	█
Commissioning																		█
Water Demand Criteria	█																	
Evaluation of Residuals Generation & Handling	█																	
Lagoon Study	█																	
Confirmation of Groundwater Source & Quantity	█																	
Water Div. License Application	█	█	█															
Confirm WTP Location		█																
Transmission Line Detailed Design			█	█														
Tender Transmission Line					█													
Transmission Line Construction Window (2 months)								█	█	█	█	█						