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June 27, 2019  
Our File: 519021-P

Municipality of South Huron  
322 Main Street South, PO Box 759  
Exeter, Ontario N0M 1S6

Attention: Don Giberson  
Environmental Services Director

Re: Snider Crescent PS Upgrades  
2019 Detailed Design

Dear Mr. Giberson,

We are pleased to present the following work plan and fee estimate for our engineering services relating to detailed design services for the Snider Crescent Pumping Station Upgrades as identified as Phase 1a and 1b in the previously completed GM BluePlan Technical Memorandum dated April 6, 2018.

Phase 1a and 1b are identified as the following:

**Phase #1a:** Replace the existing pumps to improve reliability and regain lost capacity.

**Phase #1b:** TSSA compliance and generator upgrades.

The team assembled has an extensive history with the design and construction of wastewater pumping station across Southwestern Ontario. Our team has a thorough understanding of the wastewater collection system within the Municipality of South Huron, with specific background knowledge of the Snider Crescent Pumping Station and overall wastewater collection and conveyance system.

## **1. PROJECT UNDERSTANDING**

The Snider Crescent Pumping Station is located at 31 Snider Crescent in Exeter, within the Municipality of South Huron. Originally constructed in 1992, the pumping station conveys sewage from approximately 141 hectares (ha) of the southern portion of Exeter to the Wastewater Treatment Facility via a 300mm PVC forcemain.

In Spring of 2017, South Huron Operations inspected the submersible pumps due to ongoing maintenance issues and continuing reduction in pump performance. At that time, it was noted that significant corrosion has occurred within the pump casings and was recommended to be replaced by Nevro Sales. Initially South Huron sent the pumps to Nevro Sales in London, Ontario to determine if it would be possible to refurbish the pumps. Nevro identified the pumps as Pumpex submersible pumps, a brand which have since been purchased by Sulzer Pumps and discontinued. South Huron retained GM BluePlan to complete a hydraulic assessment and review of the station to determine suitable upgrades.

Due to the discontinuation of the pump and deterioration of the pump performance, GM BluePlan recommended the pumps be replaced with similar sized pumps to restore the pumping capacity of the station. This will involve minor wet well modifications to replace existing deficiencies as well as upgrade the pump rail and connection systems.

GM BluePlan was also advised by Gencare Services that the existing emergency generator does not meet the current TSSA regulations as well as not meeting the exemption criteria for the Ministry of Environment, Conservation and Parks (MECP) for emergency generators emissions permits. Therefore, it is recommended that a new outdoor generator be installed at the facility to become compliant with current TSSA regulations and MECP requirements.

It was noted onsite that the MCC has exceeded its typical life expectancy and most likely will soon be considered legacy equipment by the manufacturer and will be difficult to maintain and upgrade going forward. In addition, the electrical upgrades associated with the generator retrofit may trigger various retroactive upgrades to bring the station to current

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electrical code. Specifically, with area classifications under *NFPA 820 - Standard for Fire Protection in Wastewater Treatment and Collection Facilities*, the dry pit located directly under the control room is rated Class 1 Division 2 (Explosion Proof). This dry pit shares the space with existing control room and therefore the same electrical classification would retroactively apply to the existing electrical equipment in the building. Therefore, GM BluePlan is proposing that a separation of space be completed by constructing a separation wall between the dry pit and the control room. This will also require the relocation of miscellaneous equipment such as the PLC, heater, thermostats etc. All remaining electrical equipment within the dry pit area will be upgraded to Class 1 Division 2 explosion proof to comply with current electrical codes. It is our intention that the control building will be reused with minor building modifications to reduce costs. GM BluePlan has included a conceptual figure to outline the proposed control building alterations have been included as part of this workplan.

## **2. SCOPE OF SERVICES**

GM BluePlan has reviewed the upgraded requirements and have developed the following scope of work to re-establish the firm capacity of the station as well as comply with current electrical and TSSA regulations.

### **2.1 Task 1 - Project Initiation and Management**

GM BluePlan is prepared to start this assignment immediately upon acceptance of the work plan by the Municipality. These tasks include:

- Kick-off meeting at the Municipality's Office to go over project objectives, goals, timelines and confirm scope of work
- Project management throughout the project
- QA/QC Review by Senior Project Advisor at each major milestone
- Two (2) additional design meeting at the 50% and 90% design phase

### **2.2 Site Investigation and Analysis**

- Site Inspection, additional forcemain testing and building inspection
  - Additional pump testing is proposed to be completed to better characterize the forcemain properties for pump selection
- High level topographic survey to develop site plan and to confirm as-built elevations, and to develop site plan for outdoor generator placement
- Electrical Engineer with licensed electrician to open all MCC panels to investigate conditions and background information for upgrades and to confirm scope of work
- Investigation of existing air valve chambers to determine functionality and recommend upgrades

### **2.3 Detailed Design**

- Complete a detailed design drawing package for the Municipality to use to solicit tender submission from selected General Contractors. A 50%, 90% and 100% submission package have been accounted for in this scope of work
- Develop a Division 16 specification for the work to be completed within the pump station and associated tender package for the Municipality's use
- The scope of work for the detailed design shall include the following:

#### **A. Pump & Process Piping Upgrades**

- GM BluePlan will select replacement pumps for the failing PumpEx pumps that match the current capacity of the station. It is our understanding that the Municipality does not wish to proceed with a three (3) pump system without a jockey pump at this time and will wait for further development prior to upgrading the station
- Complete minor process piping modifications within the dry pit such as the installation and replacement of the existing check valves with swing check valves and associated piping modifications to allow for sufficient room.
- Specify a bypass pumping station to be set up to allow for the isolation of the wet well structure and removal of the electrical equipment

**B. Building Modifications**

- Complete the detailed design for internal control building modifications to allow for a separation of space to comply with current electrical regulations. This would include:
  - Design of a separation wall within the control building complete with floor supports as required.
  - Design of a secondary entrance at the location of the current generator exhaust louvre

**C. Generator Modifications**

- Design the new location of an outdoor standalone generator unit complete with all required electrical conduit to connect to the proposed transfer switch

**D. Air Valve Investigation/Replacement**

- GM BluePlan understands that the current air valves are buried chambers within an agricultural field. If feasible, GM BluePlan will review and provide recommendations on venting of the air valve chambers to avoid buildup of corrosion and hazardous gasses

**E. Electrical & Control Upgrades**

- Site visit with GMBP to review existing electrical and confirm as-built drawings
- Design of a new outdoor pad mounted generator wiring and transfer switch
- Design of a new MCC Unit and associated wiring modifications as required to support the building modifications
- Minor electrical upgrades such for separate HVAC, lighting, and heating as required to support the building modifications
- Relocation of the existing PLC Panel to the new control room
- **PROVISIONAL** - Design of new PLC Panel to replace existing panel
- **PROVISIONAL** – Replacement of the existing instrumentation and control devices within the wet well with like for like replacement units

**Note:**

- 1) *Provisional item for the PLC replacement is for additional efforts to replace the PLC in excess of the base scope of work.*
- 2) *It is our understanding that the Municipality requires some SCADA upgrades in general including their top end Wonderware system. The scope of work does not include any programming modifications for the new PLC panel as this will require larger discussions with the Municipality as it impacts many facilities.*

**2.4 Approvals**

- The site falls within the Ausable Bayfield Conservation Authority Regulated Area, therefore we will prepare a permit submission for the relocation of the generator and the proposed site works
- We will complete a review of the proposed upgrades and determine if approvals are required. It is not expected given the proposed scope of work that an ECA amendment for sewage or air would be required
- **PROVISIONAL** – Should an ECA Amendment be required, GM BluePlan will complete the necessary documentations and approval forms to obtain the ECA for this scope of work

**Note:**

- 1) *It is assumed that the Municipality will pay all permitting and approval fees.*

**2.5 PROVISIONAL - Tender Services**

- Address questions from bidders during tender period
- Receive and evaluate tenders and provide recommendation of award
- Prepare contract documents for execution

## 2.6 PROVISIONAL – Contract Administration and Inspection Services During Construction

For this workplan, GM BluePlan assumed a twenty (20) week duration of construction at the pumping station:

- Attend a pre-construction meeting with the successful contractor
- Contract administration (8 hours/week)
- Part-time construction inspection (20 hours/week)
- Preparation of progress payment certificates and change orders (as necessary)
- Construction completion final walkthrough
- Electrical construction support throughout construction
- Provide as-built drawings and package including all shop drawings, testing reports, etc.
- One year maintenance period walk-through and deficiency report

Note:

- 3) *As noted above, the provisional item for contract administration and inspection services does not include programming implementation of the new PLC panel as the exact scope of work will be impacted by the Municipality's current top end SCADA upgrades.*

## 3. PROJECT TEAM

The Engineering team assigned to the project will primarily consist of for the following members.

### 3.1 Project Director – Brad Bunke, P.Eng.

Brad is a company principal, the London Office branch manager, and will serve as Project Director for this assignment. Brad's responsibilities include the coordination, administration and leadership of his project team's resources and providing oversight on the project. Brad will review all major milestones for this project and ensure all of the Municipality's expectations are met or exceeded.

### 3.2 Senior Project Engineer - Colin Wiebe, M.A.Sc., P.Eng.

With degrees in mechanical and civil engineering from the University of Waterloo, Colin has been involved extensively in sewage collection and pumping systems analysis, including design and construction of sewage pumping stations, valve chambers, flow meter chambers, master planning, standby power facilities and TSSA compliance reviews. He has developed technical expertise in hydraulics and fluid mechanics through his extensive field work in wastewater resource management. Colin exemplifies a boots-on-the-ground generalist with a strong and well-developed appreciation for how things work and an operator's mindset towards long-term performance and care of an asset.

Colin has experience with collection system modelling and transient analysis, forcemain evaluation, backup power systems, sewage conveyance and treatment facilities, chemical dosing, and unique treatment processes for fire training facilities, agricultural wastewater, and private industry waste streams. Colin is well-versed in the guidelines and codes affecting the design and operation of municipal water and wastewater infrastructure. Furthermore, Colin supports other municipal and private clients with energy optimization, innovative design, construction, and controls integration.

### 3.3 Project Engineer / Project Manager – Matthew Hartfiel, P.Eng.

Matthew is a Project Engineer in the Water and Wastewater group of GM BluePlan with experience in both pump station design and construction administration/inspection. His experience includes sewage inflow investigation, hydraulic modelling of pump stations, pump selection, optimization of forcemain and linear infrastructure routing, constructability and commissioning review. Matthew has extensive experience with design and construction administration on a variety of water and wastewater vertical infrastructure and will bring a comprehensive approach to the design and proposed implementation to the project. Matthew will serve as the primary contact for the Municipality and will coordinate all internal and subconsultant forces to complete the project.

### 3.4 Structural/Building Engineer – Ryan Frouws, P.Eng.

Ryan is a Project Engineer in the Structural group of GM BluePlan. With over 6 years' experience, he has provided design, contract administration and construction inspection services for numerous rehabilitation projects, primarily in south-western Ontario. His experience includes delivering both heavy civil infrastructure and building envelope/structural projects. He is well versed in the various stages of design, approval and construction. Ryan's primary responsibility will be to complete the structural modifications designs for the control building modifications and will assist in the assembly of the tender documents for this project.

### 3.5 Rob Schellenberger – Eramosa Engineering – Eramosa Lead

Robert has 20 years of experience in the automation, chemical and water industries as a system integrator. He has been involved in all aspects of the project lifecycle from programming and integration to project management. He has been responsible for project management of multimillion dollar upgrade projects including overseeing an entire greenfield plant build. Since joining the Eramosa team in 2018, Robert has lead and managed the London office, serving southwestern Ontario. With Roberts strong project manager background, he has lead and expanded the team both in resources and client base, working with both small and large clients.

### 3.6 Radu Ilie – Eramosa Engineering – Electrical Lead

Radu accrued over 26 years of experience in designing power and control systems for various industrial and municipal applications. He has been a key member on projects for water and waste water, renewable energy, vehicles, biotech, pharmaceutical, food industry, machine tools, traffic applications. Radu accrued over 26 years of experience in designing power and control systems for various industrial and municipal, with expertise in the areas of conceptual and preliminary design, detailed design, system integration, commissioning and troubleshooting of electrical, instrumentation and control, PLC and SCADA system projects.

### 3.7 Patrick Fritz - Eramosa Engineering – Instrument and Control Lead

Patrick has expertise in the areas of project management, contract administration, conceptual and preliminary design, detailed design, system integration, system factory acceptance testing, commissioning and troubleshooting of electrical, instrumentation and control, PLC and SCADA system projects. Patrick brings his strong technical engineering and project management skills to the project team and is capable of understanding the clients' specific requirements given his experience with water and wastewater projects as well as industrial and municipal projects throughout Ontario, Louisiana (USA), China, and Africa. He looks forward to working alongside your team to deliver an integrated solution based on the projects requirements.

## 4. ANTICIPATED PROJECT SCHEDULE

In discussion with the Municipality, GM BluePlan anticipates the following schedule:

Milestone	Anticipated Deadline
Project Award	July 16, 2019
Initial Site Visit	Week of July 22 <sup>nd</sup> , 2019
50% Design Submission	September 27 <sup>th</sup> , 2019
90% Design Submission	November 22 <sup>nd</sup> , 2019
Tender Ready Submission	December 15 <sup>th</sup> , 2019
Start of Construction	June 2020

## 5. ESTIMATED FEES

Based on the information received to date and our understanding of the scope of work, we are prepared to provide you with an estimated fee budget for the above noted engineering tasks. We anticipate our fees (including disbursements & contingency) to be approximately **\$72,005.60 + HST** for the above noted work. This amount does not include the provisional items as listed on the detailed breakdown. For a detailed breakdown of the fees, please refer to the time-task breakdown included as part of this workplan

In consideration of the uncertain nature of factors affecting professional services for projects such as this, and in order to provide you with a high and unique level of service with an opportunity to reduce costs, we consider that consulting provided on a 'time-plus-expenses' fee basis typically represents the most mutually equitable structure. Services would be provided therefore at our standard hourly rates, with internal expenses billed at cost and external disbursements billed



at cost plus 10%. During this assignment we would advise you in advance when the established budget or work program requires revisions.

The above costs exclude HST, application fees, other services not specifically mentioned above, and changes and additional efforts due to unforeseen complications, changes to existing standards, guidelines and scope of services, or circumstances beyond GM BluePlan's control.

## 6. CLOSING

GM BluePlan understand Municipalities request to complete the design of this assignment by the end of 2019 and are prepared to undertake this assignment immediately upon authorization. We trust that you will find the above to be appropriate and reasonable.

We look forward to working with you on this very important project, and will start upon your reply. In the meantime, should you have any comments or questions, please do not hesitate to call.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:

A handwritten signature in blue ink, appearing to read 'Brad Bunke'.

Brad Bunke, P.Eng.  
Branch Manager, Partner  
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Per:

A handwritten signature in blue ink, appearing to read 'Matthew Hartfiel'.

Matthew Hartfiel, P.Eng.  
Project Engineer