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July 26, 2021
Our File: 621101-P

Jason Marr, P.Eng.,
Director of Public Works
Town of Pelham
20 Pelham Town Square
P.O. Box 400
Fonthill ON L0S 1E0

Re: Wastewater Model and GIS Update

Dear Jason

Please consider this as a proposal for the works discussed during our most recent conversations. We understand that this assignment will provide an update to the original model / GIS build and condition assessment project(s) that we completed in the fall of 2017.

This project will involve the following key tasks aimed at providing tools and data to assist the Town in the management of the capacity, growth, and condition, state of good repair, and fulfillment of the requirements of O Reg 588 with respect to their wastewater system:

1. **Updating of the Town's wastewater collection GIS to reflect any omissions in the data from three primary data sources:**

    - Niagara Region Pelham WW collection system GIS data*
    - Pelham WW collection system GIS data*
    - Additional information, new developments and or subdivision servicing that is not reflected in the preceding.

    *Note that we have this data in our possession which shows a reasonable correlation, however, there appear to be inconsistencies between both data sets and gaps in each data set.

    It should be noted that GMBP has been tasked with updating the Town's wastewater system geometry and calibration via Region supplied GIS and SCADA data respectively, as part of the *2021 Niagara Region Water / Wastewater Master Plan*. This is at no direct cost to the Town. The work described here will not overlap with that effort and will serve as an enhancement.

    The update will comprise the following tasks:

- Review of geometry and attribution for errors and any significant gaps.
- Addition of data not evident in the sources not within our possession.
- Verification of the topology and attribution of the GIS.

This analysis will provide a reference quality data set for the Town's reference for operational, maintenance, TCA, capital planning and asset management activities. We will endeavour to harmonize the GIS created with the all pipe hydraulic model developed for the purposes of the Master Plan. Where data cannot be inferred nor sourced, we will flag gaps for later resolution.

In addition to the GIS, and as a value-added deliverable, GMBP will provide an indexed pdf file of Town wastewater system mapping to allow the Town to distribute new mapping books for operations staff. These can either be distributed as paper map books or digitally on a suitable mobile device or laptop. This data set will allow for the attachment of condition data on a pipe segment basis.

Deliverable: Updated GIS and attributes data set, PDF system map book.
Cost: XXX

2. **Review and update of system condition data to support O Reg 588 and system renewal planning**

GMBP is now in receipt of the Close Circuit Television Inspection data conducted by the Town's contractor for 2016 to the present day. These records appear to have been completed in accordance with Pipeline Assessment Certification Program (PACP) standard over the past 5 years as per GMBP recommendations resulting from a previous project.

A detailed examination of the CCTV information submitted has revealed that the database reporting requirements for the contract may not have been met for the 2016 – 2017 inspections which will impact the level of effort for this task.

This task will involve the analysis of the CCTV information submitted, our analysis shows approximately 300 manhole to manhole sections of new information, and connection of the following to the extent of the available information:

- Removal and clean up of legacy inspections that are no longer valid due to pipe replacements and or new inspection information.
- Assignment of pipe structural scope – PACP.
- Assignment of pipe operating score – PACP.
- Risk score by pipe based on condition, likelihood of failure and consequence of failure, to allow for analysis of investment need on a priority basis.

The resulting data set will provide an overview of system condition to the extent of the information available. For the pipe sections without information, we will perform a cohort analysis which will involve the assignment of pipe condition based on common age, material of construction etc.. Inferred values will be clearly flagged for future inspection. We will also provide a staged multiyear plan complete with costs to allow for inspection of any pipes without condition data.

Analysis of the aggregate of the data supplied will provide the basis for a short form technical memorandum which will outline system repair priorities complete with budget level costs.

Deliverables: Updated GIS with condition scores applied. Updated plan to fill gaps in inspection record. Short form tech memo outlining priority repairs.
Cost: XXX

3. **Optional – Detailed Model Calibration via In System Flow Metering**

The current model calibration process for the Niagara MSP models is predicated upon the use of SCADA data at pump station and plant sites. Whilst valid for master planning, high level, this calibration may not support other Town centric initiatives such as inflow and infiltration identification and prioritization of catchments for extraneous flow removal.

It is understood that the Town has recognized some significant development in the intervening 5 years since the last model calibration and flow monitoring effort.

This task would involve the installation of approximately 5 flow meters within the Town's wastewater collection system to define the following:

- Current dry weather flow loading inclusive of groundwater infiltration.
- Wet weather flow analysis to discretize rainfall derived inflow and infiltration.
- Available capacity based on the preceding.

This effort will result in a series of flow monitoring tech memos, dependent upon the monitoring period, and refinement of the existing InfoSwmm model beyond that provided by the MSP. It will also serve to prioritize catchments for additional investigations as to inflow and infiltration. The period for flow metering would be limited to the measurement of at least one month of dry weather data and the measurement of at least 3 critical rainfall events with measured precipitation of 25 mm or more and a peak hour intensity of 5mm/hour or more. This will ensure that the wet weather calibration in the model reflects the actual wet weather performance of the system.

Deliverables: Installation of 5 flow meters for a period of 3 months or 3 critical rainfall events. Recalibration of the Town's model and a short form tech memo prioritizing catchments for extraneous flow removal.
Cost: XXX

4. **Optional – Corridor Capital Planning**

This optional deliverable would involve the aggregation, distillation and analysis of available road, water and wastewater system condition and performance data on a corridor, intersection to intersection, basis to develop a 10-year prioritized renewal listing. Costing would be completed in conjunction with Town staff. Supporting data for this analysis is as follows:

- Watermain break record as a proxy for condition
- Road Pavement Condition Index

- Sewer CCTV
- Planned / Committed Capital

Deliverables: High level sequenced and scheduled 10-year capital prioritization of infrastructure works on a corridor basis.

We believe that the core tasks as presented fulfill the project requirements that we initially discussed and the optional services would provide significant value from an overall wastewater system collection system capacity and state of good repair perspective.

Yours truly,
GM BLUEPLAN ENGINEERING LIMITED
Per:

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