

Waste Management Plan

Geotechnical Drilling Program - City of Yellowknife
Submarine Waterline

Project number: 60673796

July 27 2022

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Quality information

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1 Introduction

The City of Yellowknife (the City) has retained AECOM Canada Ltd. (AECOM) to conduct a geotechnical drilling program to support the design and construction of the proposed submarine waterline.

This Waste Management Plan (WMP) outlines the plan for managing waste management issues related to the geotechnical drilling program to be undertaken this summer. The WMP has been produced in general accordance with the Mackenzie Valley Land and Water Board's (WVLWB 2011) Guidelines for Developing a Waste Management Plan.

The purpose of the WMP is to provide a strategic action for effectively managing potential waste management issues that may occur in relation to any component of the Project. All persons involved with the Project should read and be familiar with the WMP.

The objectives of the WMP are to minimize the generation of wastes, employ best practices for the effective handling and disposal of waste, and to comply with applicable legislation, regulations, authorizations, permits, and licences for the duration of the Project. The WMP will be provided to all employees and contractors.

2 Company, Contact, and Effective Date

The City of Yellowknife is the proponent for the proposed Project. Key contact information for this Project is as follows:

Wendy Newton
Manager, Sustainability & Solid Waste
Public Works & Engineering
City of Yellowknife
Box 580, City Hall
Yellowknife, NT X1A 2N4
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The information presented herein is current as of August 2022.

3 Project Description

3.1 Geotechnical Drilling Program

On behalf of the City of Yellowknife, AECOM is planning to undertake a geotechnical drilling program as part of the pre-design geotechnical investigation work required for the City of Yellowknife proposed Submarine Waterline Replacement Project. The future submarine waterline replacement work and associated pumphouse upgrades will be submitted separately for regulatory approvals once preliminary designs and project planning activities are complete. The geotechnical investigation includes drilling boreholes at Pumphouse No.1 and No.2, along Pumphouse No. 2 Access Road and Highway 4, and at Lift Station No.1.

A total of twelve (12) boreholes will be drilled for the geotechnical program over approximately twelve days.

- Pumphouse No.1 - three (3) boreholes will be drilled at this site with two (2) locations drilled to refusal with standard penetration test (SPT) sampling for the full depth of overburden and one (1) location drilled and cored to a depth of seven (7) meters below the bedrock surface. Expected depth of overburden is between four (4) and eleven (11) meters based on historical data.
- Pumphouse No.2 - three (3) boreholes will be drilled at this site with two (2) locations drilled to refusal with SPT sampling for the full depth of overburden and one (1) location drilled and cored to a depth of seven (7) meters below the bedrock surface. Expected depth of overburden is between thirteen (13) and twenty-one (21) meters based on historical data.
- Pumphouse No.2 Access Road and Ingraham Trail (Hwy 4) - four (4) boreholes will be drilled adjacent to the roadways and within the easement boundaries. These locations will be drilled five (5) meters deep or to refusal on bedrock. No historical data from these areas is available.
- Lift Station No. 1- two (2) boreholes will be drilled at this wastewater lift station located at the corner of School Draw and Franklin Avenue. One (1) location will be drilled to bedrock refusal and the second location drilled and cored to a depth of 5 m below the bedrock surface.

Map figures showing the areas for the proposed borehole drilling locations are provided with the application package.

The area required at each drill location to host the truck-mounted sonic drill rig (Figure 1), the pipe truck, and two support trucks is approximately 350m². So, the combined work area for the 12 locations is approximately 4200m² or 0.42 hectares total.

The investigation also includes installation of two monitoring wells (one at each pumphouse location) to the full depth of the bedrock, complete with monitoring well protectors at the surface. Upon completion of the monitoring well installation, two in-situ pump tests will be completed to estimate groundwater in-flow rates and inform future contractors of site conditions.

Boreholes without monitoring wells will be backfilled with bentonite chips. Borehole locations and elevations will be surveyed by handheld GPS. It is not anticipated that clearing or tree removal will be necessary in order to complete the program.

AECOM plans on completing drilling of four (4) boreholes adjacent to roadways and will use delineators and flaggers in areas, if necessary, to allow the safe flow of traffic and to protect drilling equipment and workers. Before mobilizing to the sites, AECOM will develop a project-specific safety plan, in consultation with the drilling contractors so that the safety features and any potential hazards of the equipment being used on the project are included in the plan.

AECOM's field representatives will monitor the drilling of the boreholes and log subsurface conditions and found ice conditions (if encountered). Standard penetration testing will be performed every 1.5 m to assess the soil strength (if unfrozen soil), and disturbed soil samples will be collected at regular intervals, or as warranted by changes in subsurface stratigraphy. AECOM's field representative will collect samples and log the core. Samples will be shipped and tested for UCS.

Clean, municipal water will be made available from the City of Yellowknife for use during drilling activities. Small volumes of water may be used during drilling to provide a pressure head within the well to mitigate sluffing, and/or as a lubricant, estimated to be less than 3 m³ total. Any waste generated by the geotechnical drill project will be managed in accordance with the project Waste Management Plan (WMP). All drill cuttings resulting from the geotechnical investigation will be collected in soil bags and taken to the City's Solid Waste Facility. Minimal water will be used during coring and would be below surface. Any water that does surface would contain suspended drill cuttings and would be contained by creating small, localized drainages at the work site for drill cuttings to settle and be collected.

Any wastes generated by the Geotechnical drilling program will be managed in accordance with this WMP. In the unlikely event of a spill incident, the spill will be responded to and cleaned up in accordance with the project Spill Contingency Plan. As the Geotechnical drilling program will be conducted with mobile drilling equipment, and the boreholes backfilled, no further restoration is anticipated to be required upon drilling completion.



Figure 1. Gus Pech Brat-a-Sonic Truck Drill 50K Head Truck Mount Sonic

4 Regulatory Environment

Specific legislation, regulations, and guidelines related to waste management that may have applicability to the Project are summarized in the following subsections.

4.1 Federal

- *Canadian Environmental Protection Act*
- *Waters Act*
- *Transportation of Dangerous Goods Act and Regulations*
- *Work Site Hazardous Materials Information System (WHMIS) Safety Act*
- *Territorial Lands Act*

4.2 Territorial

- Mackenzie Valley Land and Water Board guidelines for Developing a Waste Management Plan
- *Northwest Territories Environmental Protection Act*
- Northwest Territories *Public Health Act*
- Northwest Territories *Transportation of Dangerous Goods Act*
- Northwest Territories *Waters Act*
- Used Oil and Waste Fuel Management Regulations.

It should be noted that very few waste types will be generated by this Project and will be primary limited to the generation of a small daily amount of domestic garbage (food scraps, associated wrappings/containers), and possibly some residual auger cuttings (gravel/soil) remaining after the drill holes have been backfilled. As a result, most of the legislation identified above will have limited applicability to this Project.

5 Waste Types and Management

A material is considered to be a waste when it can no longer be used for its original intended purpose. The types of wastes anticipated to be generated for this small project are mainly limited to:

- **Garbage** – All daily site garbage generated by the Project personnel will be temporarily bagged and placed in garbage cans or transported back to staging area within the City of Yellowknife for eventual transfer to the City of Yellowknife Landfill, as part of the facility's normal practice. The garbage is anticipated to consist of food scraps and associated packing waste.
- **Residual Auger Cuttings** – Although some of the cuttings may be used for backfilling, some residual auger cuttings may be left on the surface after the boreholes have been backfilled. In this event, these inert residual materials will be dispersed over the nearby surface terrain or transported for disposal in the City of Yellowknife Landfill. Written confirmation has been obtained from the City confirming the acceptance of drill cuttings at the facility.
- **Domestic Sewage** – As the drill sites are located within proximity to municipal services, personnel will use designated washrooms as needed during the anticipated 12-day Geotechnical drilling program.

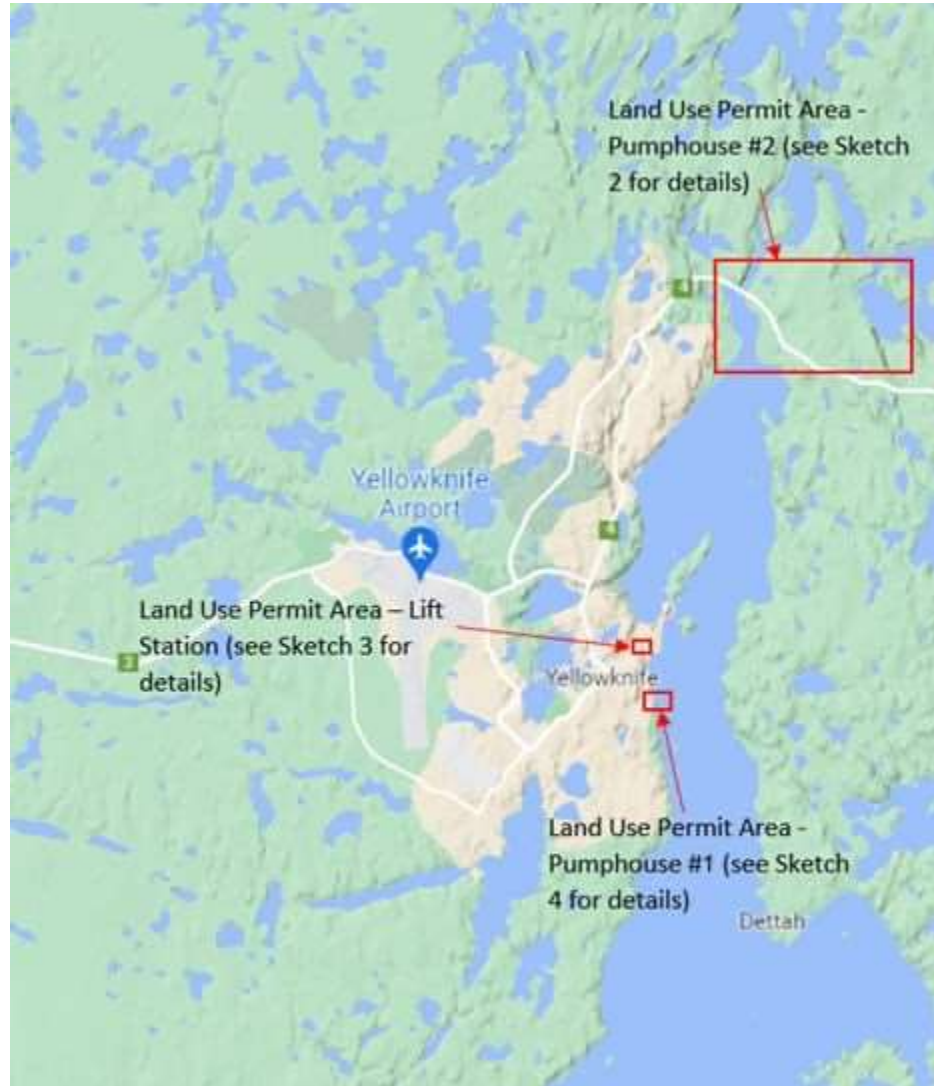
6 References

Mackenzie Valley Land and Water Board (MVLWB). 2011. Guidelines for Developing a Waste Management Plan. March 31, 2011

Appendix A

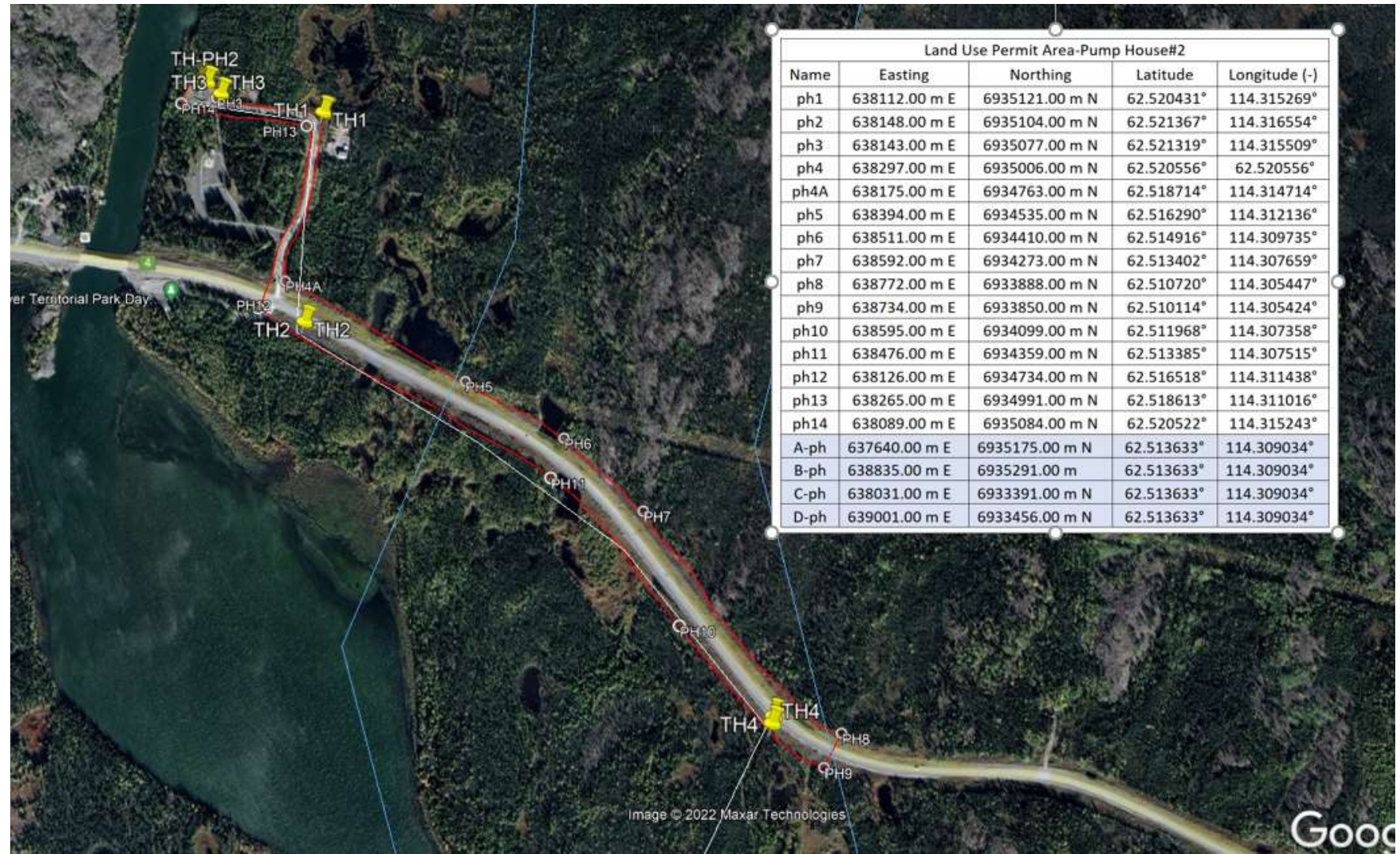
A.1 Figures for the Geotechnical Investigation Program

Sketch 1: General location of the work (Pumphouse #1, Pumphouse #2 and Lift Station):



Sketch 2: Land Use Permit Area – Pumphouse #2

The application requests the area within the red lines to be permitted.



Sketch 3: Land Use Permit Area – Lift Station

The application requests the area within the red lines to be permitted.



Sketch 4: Land Use Permit Area – Pumphouse #1

The application requests the area within the red lines to be permitted.



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