



## **Non-Hazardous Waste Pile Materials Segregation - Process Description Hall Beach Sewage Lagoon Project Hall Beach, NU**

**Type of Document**  
DRAFT

**Client:**  
Government of Nunavut  
Department of Community and Government Services  
Client Project No. CGSHQ-15225-00011

**EXP Project Number**  
OTT-00220382-A0

**Prepared By:** Robert Renaud, P. Geo.

**Reviewed By:** Patricia Stelmack, P. Eng. (ON)

EXP Services Inc.  
100-2650 Queensview Drive  
Ottawa, ON K2B 7H6 Canada

**Date Submitted**  
April 17, 2018

## TABLE OF CONTENTS

<b>SECTION 1: INTRODUCTION.....</b>	<b>2</b>
1.1 SITE DESCRIPTION AND BACKGROUND .....	2
1.2 OBJECTIVES.....	3
<b>SECTION 2 - INFORMATION FOR BIDDERS.....</b>	<b>3</b>
2.1 DEFINITIONS .....	3
2.2 DESCRIPTION OF WORK.....	4
2.3 BIDDERS INVESTIGATIONS.....	5
2.4 BOUNDARIES OF WORK .....	5
2.5 PROTECTION OF SITE .....	5
2.6 APPROVALS AND PERMITS .....	5
2.7 USE OF WATER, ELECTRICITY AND OTHER .....	5
2.8 ERRORS BY CONTRACTOR .....	6
2.9 INDEMNIFICATION .....	6
2.10 NO SMOKING ENVIRONMENT.....	6
2.11 SAFETY REGULATIONS .....	6
2.12 INSURANCE .....	6
<b>APPENDIX A:       SITE PLAN</b>	
<b>APPENDIX B:       PHOTOGRAPHS</b>	

## SECTION 1: INTRODUCTION

### 1.1 Site Description and Background

The Hamlet of Hall Beach (Hamlet), Nunavut is located on the east shore of the Melville Peninsula, on the western shore of the Foxe Basin. It is in a zone of continuous permafrost and is located on sand and gravel raised beaches, with flat to gently rolling terrain surrounded by numerous lakes and ponds. The population was reported to be 546 according to the 2011 census.

The Hamlet's sewage treatment facility is located approximately 1 km north of the community. The lagoon system consists of two adjacent cells. The southernmost cell, referred to as Cell 1, and the northernmost cell, referred to as Cell 2. The original lagoon cells were unlined, and Cell 2 was designed to exfiltrate through the berm wall into a wetland area receiving secondary treatment, and then into the Foxe Basin. The original lagoon system encountered problems with leakage under and through the southern berm of Cell 1 between 2008 and the spring of 2013. Several remedial measures were taken in attempt to rectify the leaking as a short term solution. It was determined by the Government of Nunavut's Department of Community and Government Services (CGS) that in order to meet the Hamlet's long term needs, a more permanent solution was required.

A Feasibility Study (2014) and a Sewage Lagoon Design Brief (2014) were undertaken to evaluate alternatives and to determine design parameters. These reports identified the possibility that landfill material would need to be removed from the area under the new lagoon footprint and berm. This was confirmed during a subsequent geotechnical investigation when inert material was discovered. However, the actual quantity and contents of the unsuitable material was unknown heading into construction.

During the construction of the new sewage lagoon cell in Hall Beach, approximately 4000 m<sup>3</sup> (about 220 truckloads) of garbage and granular materials were removed from the shallow subsurface, from within the footprint of the new lagoon cell. The garbage included metal waste, organic waste (i.e., household garbage), wood waste, etc. The waste was generally buried beneath a thin layer of native gravel material. In some locations, waste was observed to extend below the base of the active layer, which was approximately 1.2 to 1.5 m deep at the time of excavation. The bulk of the garbage excavated during the lagoon cell construction was deemed to be inert or non-hazardous, based on field screening techniques undertaken by an EXP environmental technician, who was present during the excavation work. This waste was taken to a site immediately west of the existing (licensed) landfill site, and deposited into two stockpiles. Berms were constructed on three sides of the waste stockpiles, with the roadway, located at a higher elevation providing a barrier on the fourth side of the stockpiles.

In 2016, EXP undertook two sample collection programs of the soil matrix present in the non-hazardous waste stockpiles, where a total of fifteen (15) soil samples were collected (14 samples + 1 blind duplicate). The analytical results from the sampling undertaken by EXP showed some impacts, with several samples containing various metals, polycyclic aromatic hydrocarbons (PAH), and petroleum hydrocarbons (PHC) parameters, at concentrations that exceed the Canadian Council of Ministers of the Environment (CCME) soil quality for industrial land-use guidelines. However, despite the measured exceedances, the soil matrix of waste stockpiles is considered to be non-hazardous, according to the definition of hazardous waste provided in the document entitled: "*Environmental Guideline - General Management of Hazardous Waste in Nunavut*", dated January 2002, and prepared by the Environmental Protection Service, Department of Sustainable Development, Government of the Nunavut (GN).

In July 2017, EXP conducted a surface water sampling (monitoring) program, where samples were collected from the surface water bodies near the non-hazardous waste stockpiles. The samples were collected from selected upgradient locations, as well as selected downgradient locations, and were analyzed for metals, benzene, toluene, ethylbenzene, xylenes (collectively referred to as BTEX), PHC, and PAH. A total of fifteen (15) surface water samples were collected, including two samples for quality

assurance and quality control (QA/QC) purposes. The results of the analytical program indicated that four surface water samples from the source zone (i.e., in direct contact with the waste stockpiles) had metals concentrations that exceeded the water quality guidelines.

Following the 2017 monitoring program, EXP had recommended that, in the short to medium term, strategies should be developed to deal with these wastes, with the goal of removing these stockpiles from their current locations. EXP understands that CGS has decided to obtain a temporary water license from the Nunavut Water Board (NWB), which will permit the continued short-term storage of the waste stockpiles in their current location, while a materials segregation program will be undertaken. This program will consist of separating the garbage from the granular materials. The garbage will be disposed of in the landfill, and the granular materials will be re-used as landfill cover material.

## **1.2 Objectives**

The objective of this project is to remove garbage and any deleterious materials from the non-hazardous waste stockpiles, dispose of the garbage in the landfill, segregate and containerize any deleterious materials not suitable for landfill disposal, stockpile the remaining granular materials in an approved location for re-use as landfill cover material, and to restore the area to pre-stockpile conditions (including removal of berms constructed around the stockpiles).

# **SECTION 2 - INFORMATION FOR BIDDERS**

## **2.1 Definitions**

- "Contractor" or a pronoun in place thereof means the person or persons or firm to who have undertaken to carry out the Contract.
- "Consultant" means the environmental/geotechnical consultant retained on behalf of the Owner.
- "Owner" means Government of Nunavut.
- "Place of the Work" is the designated site or location of the Project of which the Work may be the whole or a part.
- "Project" means the total enterprise, undertaking and construction contemplated of which the Work may be the whole or a part.
- "Subcontractor" is a person, firm or corporation having a direct contract with the Contractor to perform a part or parts of the Work, or to supply products worked to a special design according to the Contract Documents, but does not include one who merely supplies products not so worked.
- "Work or Works", in these and related documents, unless the context otherwise requires, shall be deemed to include all labour, materials, matters or things to be furnished or removed by the Contractor incidental to the performance of the Contract or that part of the Contract to which the work relates.
- "Site", means the designated site or location of the Project of which the Work may be the whole or a part. For this Project, the site location is shown in Figure 1 in Appendix A.
- "Granular materials" refers to the matrix which forms the basis of the waste stockpiles. It includes a range of particle sizes from fine materials to coarse gravels and cobbles.
- "Deleterious materials" refers to any hazardous or non-hazardous waste materials recovered during the materials segregation activities, which are not suitable for disposal in the Hamlet's landfill site, and may require special handling and transfer to specialized facilities outside of the territory. Examples of such materials include, but is not limited to, car batteries, containers of automotive fluids (motor oil, hydraulic oil, antifreeze), etc.

## **2.2 Description of Work**

The Work to be completed includes furnishing all the labour, materials, and equipment necessary for the completion of all work tasks outlined in this process description. The layout of the property, herein referred to as the Place of Work is provided in the Figure 1 in Appendix A. Photographs illustrating the typical composition of the waste stockpiles are provided for information purposes in Appendix B.

The Contractor will chose the method of work employed to accomplish the project objectives. The following information should be considered an outline of the proposed actions necessary to meet the project objectives.

*The proposed methodology provided below is intended as a general guideline, however, the contractor has the flexibility to utilize alternative techniques, as long as the project objectives are met.*

1. Mobilize heavy equipment (such as an excavator, a front-end loader, haul trucks, and a bulldozer) to the Place of Work.
2. Set up a materials segregation work zone in an area pre-approved by the GN and the Hamlet. Material segregation may be assisted through the use of a mechanical screening apparatus or a Flip Screen™ screening bucket (or similar).
3. Using an excavator and other heavy equipment deemed to be warranted by the contractor, the waste pile material will be transferred to the materials segregation work zone. The waste pile material shall be placed through a mechanical screen so that the granular materials will pass through the screen and the waste materials will be retained on the screen mesh. Alternatively, a Flip Screen™ screening bucket (or similar) may be used to separate the waste materials from the granular materials.
4. The granular materials should be stockpiled in an area pre-approved by the GN and the Hamlet, while the waste materials should be transferred to another location pre-approved by the GN and the Hamlet for further manual sorting. The latter location is where garbage, suitable for disposal in the Hamlet landfill site should be separated from deleterious materials that may require special handling and possible shipment to receiving sites outside of the territory. At the discretion of the CGS and the Hamlet, further sorting of the waste materials may be required, where metal waste, and/or wood waste, is segregated from municipal garbage.
5. Waste materials suitable for landfill disposal in the Hamlet landfill site, shall be transported to the landfill and be disposed of in accordance to the Hamlet's landfilling practices.
6. The granular materials should be stockpiled with care taken to avoid excessive dust generation.
7. The mechanical screening process should continue until the entire non-hazardous waste piles have been removed from their current, temporary locations. All granular materials recovered during the screening operation should be inspected by the Contractor for the presence of deleterious materials that may have passed through the screening mesh. Any deleterious material should be manually removed from the granular material stockpiles and transferred to the deleterious material storage location.
8. Following the completion of the waste stockpile material segregation activities, a bulldozer will be used to re-grade the area formerly occupied by the waste stockpiles, removing any berms previously constructed to protect the surrounding area from the waste stockpiles.

A suitably trained inspector will regularly inspect the progress of the materials segregation activities on behalf of the Owner, and identify any deficiencies to the Contractor and the Consultant. The contractor will correct the deficiencies to the Owner and Consultant's satisfaction. As stated above, any deleterious materials encountered during the materials segregation activities shall be containerized in suitable receptacles for over winter storage, prior to shipping, via retrograde sealift, to receiving facilities outside of the territory.

### **2.3 Bidders Investigations**

All Bidders are to satisfy themselves regarding all local conditions affecting the Work by personal investigation, at their expense, and neither the information contained herein or otherwise communicated to the Bidders by any employee of EXP Services Inc. or its agents shall act to relieve the Contractor from any responsibility hereunder or from fulfilling any and all of the terms and requirements of the Contract. In this regard, Bidders expressly waive any claims they may have against EXP Services Inc. now or in the future, arising out of their reliance upon the information contained herein.

The Contractor declares that in quoting for the Work and entering into a Contract, it has either investigated for itself the character of the Work to be done and all local conditions including the location of any underground or aerial utility, that might affect the Quotation or acceptance of the Work, or that, having not so investigated, he/she is willing to assume all risk of conditions now existing or arising in the course of the Work, which could make the Work more expensive in character, or more onerous to fulfil, than was contemplated or known when the quotation was made or the Contract signed.

The Contractor also declares that in bidding for the Work and entering into a Contract, it does not rely upon information furnished by the Owner or its agent(s) respecting the location or depth of any underground utilities or services or the location of aerial utilities.

### **2.4 Boundaries of Work**

The Contractor shall not enter on or occupy with personnel, tools, equipment or materials any ground outside the land secured for the Work without the consent of the Owner or their Consultant.

### **2.5 Protection of Site**

The Contractor shall, at all times protect all structures, pipelines, and all other accessed property; shall remove from all identified properties all debris and unused materials; and shall, upon completion of the Work, restore the site and roadways as nearly as possible to its original condition subject of course to the due performance of those specific items of improvement comprising part of the Work. In performing the Work, the Contractor shall at all times maintain the site and surrounding areas in a clean and tidy state. Property which has been accessed and, as a result, destroyed or damaged during the expected performance of the Contract, or because of the Contractor's negligence shall be replaced or restored to its original condition at the Contractor's sole expense. Work must be executed with least possible interference or disturbance to the site resident.

### **2.6 Approvals and Permits**

The construction of the Works and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all municipal, territorial and federal and other authorities having jurisdiction in respect to any matter embraced in this work specification. The Contractor shall ensure that the Work is performed in compliance with all applicable laws, regulations, standards and specifications.

### **2.7 Use of Water, Electricity and Other**

The Contractor shall make his own arrangements for a supply of water and electricity to be used in carrying out the Contract and shall bear all costs for water, electricity, and temporary connections. The Contractor is responsible for the maintenance and operation of the equipment used to undertake the work, including, but not limited to, arranging for fuel for the equipment.

## **2.8 Errors by Contractor**

Errors, mistakes or unauthorized changes made by the Contractor or his agents, workers or employees, and all settlements, failures, washouts and defects shall be rectified by the Contractor at his own expense. Delays and work stoppages resulting from the Contractor's failure to comply with the requirements of this project or due to equipment malfunction will be at the expense of the Contractor and at no additional cost to the Owner.

## **2.9 Indemnification**

The Contractor shall indemnify and save harmless the Owner and Consultant from and against all claims, losses, costs, damages, suites, proceedings, or actions arising out of or related to the Contractor's activities in executing the work, other than those arising from a defect in title to the site of the work but including his/her omissions, improper acts or delays in executing the work under the contract. The Owner reserves the right to not accept any bids and not proceed with the work.

## **2.10 No Smoking Environment**

Smoking is not permitted at the Place of Work.

## **2.11 Safety Regulations**

The Contractor's attention is directed to the *Consolidation of Occupational Health and Safety Regulations, R-003-2016*. The Contractor shall comply with the requirements of these regulations.

This Contract is deemed to be an individual "project" for the purposes of the Consolidation of Occupational Health and Safety Regulations, and the Contractor to whom that Contract is awarded shall be deemed to be the "constructor", as defined in the said regulations.

The Contractor must, at his own expense, and without further or other order, provide, erect, and maintain all requisite barriers, fences or other proper protection; and must provide, keep and maintain all signs, delineators, barricades, lanterns, and flashing lights, as may be necessary or as may be ordered by the Consultant or the Owner, in order to ensure safety to the public as well as to those engaged about the premises or Works.

## **2.12 Insurance**

The successful bidder shall at their own expense, within 10 days of notification of acceptance and prior to the commencement of work, obtain and maintain until the termination of the contract or otherwise stated, provide the Owner with evidence of:

### **Commercial General Liability Insurance**

Commercial General Liability Insurance issued on an occurrence basis for an amount of not less than \$5,000,000. per occurrence / \$5,000,000. annual aggregate for any negligent acts or omissions by the contractor relating to its obligations under this Agreement. Such insurance shall include, but is not limited to bodily injury and property damage including loss of use; personal injury; contractual liability; premises, property & operations; non-owned automobile; broad form property damage; owners & contractors protective; occurrence property damage; products & completed operations; employees as Additional Insured(s); contingent employers liability; tenants legal liability; cross liability and severability of interest clause

Such insurance shall add Government of Nunavut as Additional Insured with respect to the operations of the bidder. This insurance shall be non-contributing with and apply as primary and not as excess of any



insurance available to the Owner. The successful bidder shall indemnify and hold Government of Nunavut harmless from and against any liability, loss, claims, demands, costs and expenses, including reasonable legal fees, occasioned wholly or in part by any negligence or acts or omissions whether willful or otherwise by the bidder, its agents, officers, employees or other persons for whom the bidder is legally responsible.

**Automobile Liability Insurance**

Automobile liability insurance with respect to owned or leased vehicles used directly or indirectly in the performance of the services covering liability for bodily injury, death and damage to property with a limit of not less than \$5,000,000. inclusive for each and every loss.

**Environmental Impairment Liability (if applicable)**

The bidder shall effect and maintain Environmental Impairment Liability with a limit of not less than \$1,000,000. Per Incident /Annual Aggregate. Coverage shall include Third Party Bodily Injury and Property Damage including clean-up. Such insurance shall be maintained for a period of two years subsequent to conclusion of services provided under this Agreement.

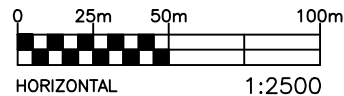
The Policies shown above shall not be cancelled unless the Insurer notifies the Owner in writing at least thirty (30) days prior to the effective date of the cancellation. The insurance policy will be in a form and with a company which are, in all respects, acceptable to the Owner.




# **APPENDIX A**

## **SITE PLAN**

Filename: P:\Projects\Civil Engineering Services\220000\QTT-00220382-A0 - Hall Beach Sewage Lagoon Upgrade - GN\0 - DRAWINGS\Sketches and Figures\FIGURE 1-R1.dwg  
Last Saved: Apr 17, 2018 1:07 PM  
Last Plotted: Apr 17, 2018 1:08 PM  
Plotted by: KelleyM



CLIENT		GOVERNMENT OF NUNAVUT COMMUNITY AND GOVERNMENT SERVICES		 exp Services Inc. t: +1.613.688.1899   f: +1.613.225.7330 2650 Queensview Drive, Unit 100 Ottawa, ON K2B 8H6 Canada <a href="http://www.exp.com">www.exp.com</a> • BUILDINGS • EARTH & ENVIRONMENT • ENERGY • • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •	
SCALE	1:2500	PROJECT		PROJECT No.	
DATE	APRIL 27/17	HALL BEACH MATERIALS SEGREGATION PROGRAM		220382	
CAD	A0	TITLE		DRAWING No.	
		NON-HAZARDOUS WASTE STOCKPILES		FIG 1	

## **APPENDIX B**

## **PHOTOGRAPHS**





**Photograph No. 1**

Construction and metal wastes in non-hazardous waste stockpiles



**Photograph No. 2**

Garbage and wood wastes in non-hazardous waste stockpiles



**Photograph No. 3**

Garbage and wood wastes in non-hazardous waste stockpiles



**Photograph No. 4**

Garbage, metal and wood wastes in non-hazardous waste stockpiles





**Photograph No. 5**

Garbage, metal and wood wastes in non-hazardous waste stockpiles



**Photograph No. 6**

Construction and metal wastes in non-hazardous waste stockpiles